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Cartographic Heritage of the Institute of Geography

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Abstract

The Vakhushti Bagrationi Institute of Geography at Ivane Javakhishvili Tbilisi State University preserves a rich and multifaceted cartographic legacy, yet its chronological development and evaluation remain largely unexamined. Georgian cartographic traditions trace their roots to the seminal works of Vakhushti Bagrationi (1696–1756), whose Description of the Kingdom of Georgia and accompanying atlas marked the birth of Georgian geographic science. These foundational works, now part of UNESCO's Memory of the World Register, influenced subsequent generations of Georgian scholars. In the early 20th century, Ivane Javakhishvili and Aleksandre Javakhishvili significantly advanced historical and geographical research through the production of thematic maps, including those representing state borders, natural resources, and agricultural zones. Collaborating with topographers such as Sergi Tskhakaia, they institutionalized Georgian cartography through the establishment of the Cartography Cabinet (1924), which later evolved into the Cartographic Institute and merged with the newly founded Institute of Geography in 1933. Throughout the Soviet era and into independence, the Institute expanded its activities, producing numerous thematic, physical, and educational maps, including the 1964 Georgian SSR Atlas—considered the country's first national atlas. Pioneers such as A. Aslanikashvili advanced cartographic theory, contributing works that gained international recognition, while the institute contributed to major projects abroad, such as the National Atlas of Cuba. Thematic atlases addressing climate, landscapes, tourism, and socio-economic development have remained key outputs, including recent region-specific publications like the Kakheti Atlas (2023). Technological advancements ushered in the use of GIS and digital mapping for both printed and web-based formats, including 3D general maps for educational use. Today, the institute continues to integrate traditional geographic knowledge with modern cartographic methodologies, developing regional web atlases and promoting sustainable development through spatial analysis. The evolution of Georgian cartography, deeply rooted in historical scholarship and driven by modern scientific needs, reflects a continuous pursuit of geographic understanding and national identity through map-making.

Keywords: cartographic heritage, mathematical basis, geodesy, cartographer, topographer, maps, scientific direction

Introduction

Cartographic heritage, encompassing historical maps, atlases, and cartographic documents, plays a crucial role in understanding the evolution of human knowledge, culture, and spatial awareness. These artefacts are not merely tools for navigation; they are rich sources of information that reveal how different societies perceived and represented their world across time. Preserving and studying cartographic heritage is vital for historical, educational, scientific, and cultural reasons.

First and foremost, cartographic heritage offers a unique window into the past. Maps reflect the geographical knowledge and worldviews of the people who created them. Early maps often combined mythological elements with physical geography, revealing the cultural and religious beliefs of their time. For example, mediaeval European maps such as the T-O maps placed Jerusalem at the centre of

the world, reflecting a theological rather than a purely geographic perspective. Through such documents, historians gain valuable insight into the intellectual and social contexts of past civilisations.

In addition to offering historical context, cartographic heritage supports the study of territorial and political changes over time. Boundaries of countries, empires, and cities have constantly shifted, and historical maps provide records of these changes. They help researchers track the development of borders, land ownership, and geopolitical conflicts. This is particularly important in regions with complex histories, where maps can serve as evidence in legal or diplomatic discussions about territorial rights and cultural claims.

Moreover, cartographic heritage is invaluable to researchers in many fields beyond history and geography. Environmental scientists use old maps to analyse changes in landscapes, forests, coastlines, and water bodies. Urban planners and archaeologists examine historical maps to study the growth and transformation of cities, the location of ancient roads or settlements, and patterns of land use. By comparing past and present maps, they can identify trends and make informed decisions about preservation and sustainable development.

Cartographic documents are also cultural artefacts. They reflect the artistry, craftsmanship, and technological capabilities of their time. Many historical maps are visually striking, richly decorated with illustrations, elaborate borders, and imaginative depictions of unknown lands. These artistic qualities make them important pieces of cultural heritage that deserve to be preserved and exhibited in museums and archives. They also have educational value, sparking curiosity and encouraging people to explore the past.

In the digital age, efforts to preserve and digitise cartographic heritage are expanding. Online map libraries and digital archives make rare and fragile maps accessible to a global audience. This not only protects the physical artefacts from deterioration but also fosters academic research, public engagement, and cultural exchange.

In conclusion, cartographic heritage is far more than a collection of old maps. It is a vital record of human thought, exploration, and expression. By studying and preserving these documents, we gain a deeper understanding of our past, a clearer perspective on the present, and valuable tools for shaping the future. The continued appreciation and protection of cartographic heritage is essential to maintaining the richness of our collective memory and cultural identity.

Vakhushti Bagrationi Institute of Geography, Ivane Javakhishvili Tbilisi State University has a rich cartographic heritage; however, its chronological research and evaluation have not been done yet. Those who set the life goal of love for their homeland and scientific field created this legacy. Several sciences, including cartography, have their fundamentals connected to the historical past. Under the guidance of the author, the topographer Evsevi Baramidze transferred the results of Ivane Javakhishvili's historical research onto the mathematical basis of the Georgia map. On these maps, Georgia's territory is presented in different aspects: state borders (1919), historical content (1913 and 1923), detailed general geographic content (1922), and botanical and agronomic areas (1930). The active process of construction of Georgian geographical maps has begun after the famous anthropologist Aleksandre Javakhishvili (1875-1973) and the experienced topographer-cartographer Sergi Tshkakaia (1880-1966) returned to Georgia from Russia. The collaboration between Al. Javakhishvili and S. Tshkakaia began in 1920, when Al. Javakhishvili invited cartographer S. Tskhakaia and drawer M. Kavtaradze. At that time, S. Tskhakaia headed the geodesic-cartographic services for Transcaucasia and Georgia. Later he was the head of the topography-cartography department at TSU and the head of the cartography department at the Institute of Geography. The first Georgian language textbooks in geodesy, cartography and topography are his. Al. Javakhishvili founded modern Georgian geography, and S. Tskhakaia founded modern Georgian cartography. The collaboration of these two scientists left a rich cartographic heritage for the educational and scientific directions of geography in the 20th century.

Glorious Beginning

The geographer, historian, and cartographer Vakhushti Bagrationi (1696–1756) left two immortal works for posterity: the "Description of the Kingdom of Georgia", which includes the history and geography of Georgia, and the geographical atlas of Georgia in three parts (1735–1745). These works clearly show the exceptionally special education of the author and the thorough knowledge of his country. Both works are included in the UNESCO Recollection of the World Register (2013). They are translated into French and Russian. As a geographer and cartographer, Vakhushti Bagrationi has no predecessor in Georgia; he is considered the founder of Georgian geographical science.

Soviet Georgian Cartographic School

The discovery and research of the natural and economic resources of Georgia has been the main task of geographical science since the 50s of the 20th century. In order to carry out this mission, Al. Javakhishvili decided to create geographical institutions upon his arrival in Georgia. In 1924 he founded the Georgian Geographical Society and Cartography Cabinet (Javakhishvili, 2015). Here, under the leadership of Al. Javakhishvili and S. Tskhakaya, maps of the Caucasus were drawn up and published: maps of mineral wealth, hypsometric, orographic, political and administrative, as well as a physical map of Georgia, a political-economic map, and a geographical atlas (Javakhishvili, 2015). In 1928, the Cartographic Cabinet was transformed into the Cartographic Institute to better provide research with maps for scientific and educational purposes. Under the leadership of Al. Javakhishvili and S. Tskhakaya, the Institute of Cartography compiled and published a physical map of the Georgian SSR (1:400,000), a geographical atlas of the Georgian SSR, a geographic-statistical atlas of Georgia (with diagrams and cartograms), and maps of the republics of Adjara, Abkhazia, and the North Caucasus, as well as maps of Azerbaijan, Armenia, and the Ottoman Empire. Two 12-sheet coloured general-geographical maps of Georgia on a scale of 1:200,000, created according to international standards, deserve special attention. Among the sectoral maps, the vegetation map of Georgia by the botanist N. Ketskhoveli and the colourful thematic maps of Al Javakhishvili for the school textbook on the geography of Georgia (Javakhishvili, 2015) are worth mentioning.

The current geographical studies required the training of highly qualified researchers in the fields of geomorphology, climatology, hydrology, topography—cartography and economic geography. For this purpose, a scientific research institute of geography was established at Tbilisi State University in 1933, which was joined by the cartography institute of the geographical society. As a result, Al Javakhishvili's numerous efforts to establish a solid scientific foundation for geography were successful. Al Javakhishvili headed the institute until 1962 (Javakhishvili, 2015; Aslanikashvili, 1968; VBIG 50, 1990; Matureli, 1990; Jorbenadze, 1968; Cheishvili, 1977; Kharadze, 2003; Aslanikashvili, 1970).

In 1945, the Institute of Geography, named after Vakhushti, joined the Academy of Sciences of Georgia, which was created on the basis of Tbilisi State University. The name Vakhushti was given to the institute in honour of the founder of geographical science, Vakhushti Bagrationi. Three departments were established at the institute: general geography, regional geography and cartography (VBIG 50, 1990).

Since the 1950s, Al Javakhishvili has collaborated with A. Aslanikashvili, whose topographical maps stand out for their high professional level of relief depiction. With the cooperation of Al. Javakhishvili, S. Tshkakaia and A. Aslankashvili, methods of depicting the relief of Georgia were elaborated, and scientific works were created. Under the editorship of Al. Javakhishvili and A. Aslanikashvili, a 1:1,000,000 scale physical map of Georgia was published in 1957, which is the best example of relief depiction at that time and to this day.

In the 1950s, providing schools and colleges with maps was a priority. Georgian scientists made educational thematic wall maps: climate, soils, plants, natural zones, landscape, zoogeography, industry, agriculture, and economics. They were printed in the Georgian and Russian languages, were used for years and have not lost their importance even today.

At the end of the 1950s, Al. Javakhishvili and A. Aslanikashvili developed a complex geographic atlas program of Georgia. Scientists from the Institute of Geography and other research institutions of the country worked on the content of the thematic maps of the atlas. The compiled maps were discussed at the Scientific Council of the Institute of Geography, which was headed by Academician Al. Javakhishvili until 1962 and then by Academician T. Davitaia. Atlas maps were drawn up and prepared for publication under the leadership of A. Aslanikashvili in the Cartography Department of the Institute. In 1964, the Georgian SSR Atlas, which is actually the first national atlas of the country, was printed in Georgian and Russian languages at the Tbilisi cartographic factory. The variety and high scientific level of the atlas maps represented geography and related sciences well. In 1971, leading scientists of the institute were awarded the state prize.

Since 1965, the institute, under the leadership of Academician T. Davitaia, has become a scientific-research institution responsible for the geographical study of mountainous countries. This goal was reflected in the research directions of cartography: working on theoretical issues, drawing up general geographic and thematic maps, sectoral and regional atlases and preparing them for publication. A. Aslanikashvili's monographs on the issues of cartography theory received high international praise: "Cartography, issues of general theory" (1969) and "Metacartography" (1974). Tosimoto Kanakuba, a

Japanese cartographer, translated Metacartography from Russian into Japanese, leading to its publication in Tokyo in 1998. In 1979, A. Aslanikashvili was elected a corresponding member of the Georgian Academy of Sciences. In 1980-1981, he was the director of the Institute of Geography until his death.

Climatologists and cartographers of the Institute of Geography participated in the compilation of climatic and agroclimatic maps of the National Atlas of Cuba (1970, 1978), for which the director of the Institute, Acad. T. Davitaya, was awarded the State Prize of the USSR in 1973. Cartographer M. Khabazishvili compiled a polarimetric lunar atlas based on the data of the Abastumani Astrophysical Observatory, which, as an important cartographic work, was awarded the F. Bredikhini prize.

In 1983, an important scientific work—"Landscape Map of the Transcaucasia" (1:600,000)—was created in collaboration with the geography institutes of the South Caucasus Republic's Academies of Sciences. Its methodical and theoretical foundations were elaborated and implemented in the landscape science laboratory of the Vakhushti Bagrationi Institute of Geography under the leadership of Davit Ukleba.

In the cartographic department of the Institute, in cooperation with the Institute of Resort Studies, the Atlas of Resorts and Resort Resources of the SSR of Georgia was compiled and prepared for publication (1989). Based on the maps of the Atlas of the SSR of Georgia published in 1964, the Educational Geographical Atlas of Georgia was prepared and published (1992).

Cartography after Independence of Georgia

In 1997, in connection with the 300th anniversary of the birth of Vakhushti Bagrationi, the result of many years of work in the cartography department of the Institute of Geography was published— the atlas of Vakhushti Bagrationi, which included the maps of all three of his atlases. The jubilee edition of the Atlas was printed at the Tbilisi cartographic factory.

In 2006–2009, the second national atlas of Georgia (2012) was compiled and published in the cartography–geoinformatics laboratory with the participation of the employees of the Institute of Geography and invited scientists. After updating the maps of the socio-economic content of the said atlas, within the framework of cooperation with the Department of Geography of the University of Giessen, Germany, the atlas was published in English (Stuttgart, 2018).

The interests of the wider society and the educational sphere required the preparation of the geographical atlas of Georgia with a concept different from the traditional one. This was done in the reference destination atlas of Georgia, where each topic is presented with a map, text and photographs ("Geographical Atlas of Georgia", 2018).

In 1964, plans were made to compile and publish atlases of the regions of Georgia according to economic districts, immediately after the publication of the Atlas of the SSR of Georgia. The eastern economic district (Kakheti) was selected as the first region, but the atlas was not published. In the 1990s, atlases of the Autonomous Republic of Adjara and Colchis were compiled in the institute, but they were not published either. The institute returned to regional atlas cartography in 2019, and by 2023, the first of this series – a complex geographical atlas of the Kakheti region with maps, text and photographs – was prepared for publication. The atlas was compiled in the cartography-geoinformatics laboratory, but other departments and research centres of the institute also participated.

To determine the structure of the Atlas, it was necessary to combine the traditionally formed structure with modern visions. For instance, the traditional structure considered viticulture and winemaking as the primary economic sector of Kakheti. However, this time, one of its components, wine cellars, was transferred to the tourism department in the form of agro-tourism facilities. From the environmental chapters, the protected areas, as ecotourism objects, also moved to the tourism chapters and acquired a different content load—tourist routes are displayed in the protected areas with the appropriate infrastructure, text, and photos.

Thematic chapters of the regional atlas provide an opportunity to enquire into the individual topics, enriching the atlas with pragmatic content maps. The atlas can be used as an information base to select the priority areas of sustainable development of the region, such as maintaining the population in highland settlements, planting perennial crops, identifying shortages of medical services, resort-tourist assessment of the environment, etc.

Atlases published since 2012 are prepared using modern GIS technologies but are presented in traditional printed form. Today, the increased interest in Internet information has put new demands on cartography. Currently, work is underway on the Kvemo Kartli region atlas, where the visualisation of natural resources and socio-economic potential should be carried out using modern cartographic

methodology in the form of a web atlas. We regularly publish articles on the use of the cartographic method in various fields, in addition to compiling and publishing geographical atlases. General geographic 3-dimensional digital maps of Georgia (1:500000) and the Caucasus (1:800000) were compiled for public schools. Maps of various topics and scales have been converted into digital format.

Conclusion

The activity of the Institute of Geography during the 90 years since its foundation (1933-2023) shows that cartography remains the priority direction of the Institute's scientific research. The Institute of Geography established a fairly rich fund to support sectoral scientific research and provide cartographic services in the educational field. It is worth mentioning that the Institute of Geography is the only institution in the country where geographical atlases of various contents and purposes are compiled and prepared for publication. The work will be carried out by a team of cartographers, each member of which possesses the latest technological innovations along with traditional methods and enriches the atlases with maps of original design.

Competing interests

The authors declare that they have no competing interests.

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Reference

Javakhishvili, A. (2015). Biobibliography. Tbilisi.

Aslanikashvili, A. (1968). Cartography, issues of general theory. Tbilisi.

Aslanikashvili, A. (1974). Metacartography, main problems. Tbilisi. Metsniereba.

Cheishvili, O. (1977). Short Geographical Reference. Tbilisi

Kharadze, K. & Javakhishvili, Sh. (2003) Georgian travellers, geographers, explorers of nature. The Encyclopedic Reference Book. Tbilisi

Vakhushti Bagrationi Institute of Geography 50. 1984, Tbilisi

Matureli, I. (1990). Cartographic Heritage of Vakhushti Bagrationi. Tbilisi

Jorbenadze, S. (1968). The short history of Tbilisi University. Tbilisi

Appendix

1. Vakhushti Bagrationi Institute of Geography, Academy of Science of Georgian SSR (1964). *Atlas of the Georgian SSR*. Tbilisi-Moscow

2. Vakhushti Bagrationi Institute of Geography (1992). *Educational Geographical Atlas of Georgia*. Tbilisi: Ganatleba

3. Vakhushti Bagrationi Institute of Geography (1989). *Georgian Resorts and Resort Resources*. Tbilisi-Moscow

4. Vakhushti Bagrationi. *Atlas of Georgia, XVIII century. Jubilee edition* (1997). Tbilisi: Cartography Factory

5. TSU, Vakhushti Bagrationi Institute of Geography (2012). *National Atlas of Georgia*. Tbilisi: Cartography Factory

6. National Atlas of Cuba. Havana _ Moscow. Publishing House GUGK, 1970, 132 p.

7. Polarimetric atlas of the moon. Publishing house “Metsniereba”, Tbilisi, 1982, 31 p.

8. Nana Bolashvili (ed.), Andreas Dittmann (ed.), Lorenz King (ed.), Vazha Neidze (ed.). (2018). National Atlas of Georgia. Franz Steiner Verlag.

Georgian Geographical Journal

Stochastic Modeling of the Process of Realization of the Precipitation-strong wind complex in the Territory of Georgia

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Abstract

Georgia is characterised by dangerous natural meteorological events—extreme temperatures, heavy rainfall, blizzards, fog, strong and hurricane winds, etc., which create emergencies, cause significant material damage, and often cause human casualties. These events frequently occur together, compounding their effects and worsening the situation. The simultaneous occurrence of such events, in particular, strong winds and heavy rainfall, has not been studied for the territory of Georgia. This article looks at the likelihood of the most dangerous combinations of heavy rain and strong winds using probability theory, including the chances of these events happening at the same time, the chances of one event happening, the chances of both events happening if one occurs, and how these chances change over time and space in Georgia. The duration of recurrence periods of catastrophic rainfall and hurricane risk in the different physical geographical conditions of Georgia is also studied. The research utilised observational data from 21 weather stations of the National Environmental Agency, spanning from 1961 to 1990, to analyse strong winds and hurricane-related precipitations. It was identified that the maximum probability of the simultaneous occurrence of a complex of heavy rain and storms on the territory of Georgia is on the Likhi range (Mt. Sabueti) and is 15-23%; the minimum is in June and July, and the maximum is in September, while the probability of only one of the events on the Likhi range varies within 65-75% during the year. When one of the events occurs, the probability that the second event occurs in the Likhi range varies between 42–55%, with a minimum in September and a maximum in March. The highest average annual probability (15-20%) of the realisation of a storm in a complex with heavy rainfall is observed in the Likhi range – about 70 days a year. In the territory of Georgia, the recurrence period for catastrophic rainfalls and hurricanes is shortest on the Black Sea coast and Kolkheti Lowland, at 45 years. The obtained results are important for improving disaster preparedness and resilience in different regions of Georgia.

Keywords: precipitation, catastrophic precipitation, strong and hurricane winds, probability, recurrence.

Introduction

The dangerous and natural meteorological phenomena, such as extreme temperatures, heavy rains, hail, blizzards, fog, strong and hurricane winds, etc., create extraordinary situations, causing significant material damage and, often, even human casualties (World, 2023; NOAA, 2023; WMO, 2023). Some of these phenomena often co-occur, overlapping each other, thereby aggravating the situation (Ali et al., 2023; McPhillips et al., 2018; Zscheischler et al., 2018).

Such compound meteorological extreme events can involve various combinations of weather extremes, such as:

1. Heavy rainfall and strong winds: For example, intense rainfall can occur alongside strong winds, leading to widespread damage from both, flooding and wind-related destruction.
2. Heatwaves and drought: Prolonged periods of extreme heat can exacerbate drought conditions, leading to severe water shortages, increased evaporation rates, and heightened stress on ecosystems and agriculture.
3. Extreme temperature and precipitation: A sudden drop in temperature followed by heavy snow or rain can cause freezing rain events, leading to ice storms that disrupt transportation and power supplies.
4. High temperature and humidity: Heatwaves combined with high humidity levels can result in dangerous heat indices, significantly increasing the risk of heat-related illnesses and fatalities.
5. Storm surge and heavy rainfall: Coastal areas can experience storm surges from cyclones or hurricanes while receiving heavy rainfalls simultaneously, leading to severe coastal and inland flooding.

The compounded nature of these events can magnify their impacts, making them more challenging to predict, manage, and mitigate. Understanding and addressing compound meteorological extreme events are essential to enhancing disaster preparedness and resilience. Worldwide, in the context of global warming, the social and economic costs of natural disasters related to weather and climate have increased significantly over the past 50 years (NOAA, 2023). To reduce the negative consequences of these complex phenomena, it is necessary to know their probability characteristics in each area.

The study of a two-dimensional precipitation-strong wind complex, which poses the greatest threat to Georgia, is the focus of this article. The way independent weather events happen is random, so they can be analysed using the rules of adding and multiplying probabilities from probability theory (Agekyan, 1972).

The probability of the most dangerous combinations of precipitation and strong wind, the probability of simultaneous occurrence of independent events, the probability of one of the events, the probability of the occurrence of a complex if one of the events occurs, and the duration of the periods of recurrence of the risk of catastrophic precipitation and hurricane winds were studied.

The next section of the article considers the study area, method, and data used. The results are then presented and discussed. Finally, conclusions and recommendations for future research directions are presented.

Methods and Materials

Georgia is a mountainous country characterised by complex physical-geographical and landscape-climatic conditions. Characteristic radiation and circulation processes of the atmosphere contribute to the formation of a wide variety of climates. Most climate types observed on the globe are found here (Bolashvili et al., 2018). Georgia is characterised by dangerous and natural meteorological phenomena – extreme temperatures, heavy rainfall, hail, blizzards, fog, strong and hurricane winds, etc. (Elizbarashvili et al., 2017a; Elizbarashvili, 2017b; Elizbarashvili et al., 2022a; Elizbarashvili et al., 2022b).

According to the main principles of probability theory (Agekyan, 1972), the probability of the occurrence of two independent events, A and B, can be calculated using the multiplication rule of probability:

$$P(A\ and\ B) = P(A) \times P(B), \qquad (1)$$

The probability of the occurrence of at least one of the events is determined by the addition rule of probability**:**

$$P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B), \qquad (2)$$

where P*(A)* – is the probability of event *A*, and *P(B)* – is the probability of event *B*.

If we consider the complete system of events *Ai*, where i *i= 1,2,3,.....n*, then the probability of the event *Ai*, given that event *B* has occurred, is calculated according to Bayes' Theorem:

$$P(Ai \mid B) = \frac{P(Ai) \times P(\mathrm{B} \mid \mathrm{Ai})}{\sum_{j=1}^{n} P(Aj) \times P(B \mid Aj)} \qquad (3)$$

P (Ai | B) is the posterior (conditional) probability: the probability of event Ai, given that event B has occurred. P(Ai) is the prior probability of Ai – the initial belief about the probability of event Ai before observing B. P (B | Ai) is the likelihood of observing B given Ai. The denominator represents the total probability of B, summed over all possible events Aj, where j=1,2,...,n.

The probability of the most dangerous combinations of precipitation and strong wind in different physical and geographical conditions of Georgia was studied based on the formulas of the theory of probability. The duration of recurrence periods of catastrophic precipitation and hurricane wind risk in different physical and geographical conditions of Georgia was evaluated. Data from observations at 21 weather stations by the National Environmental Agency, covering the period from 1961 to 1990, on strong and hurricane winds and precipitation, were used as the starting material.

Results

Fig. 1 shows the annual course of the probability of precipitation-strong wind combinations in various physical and geographical conditions of Georgia: Samtredia (28 m), located in the central part of the Kolkheti Lowland; Tbilisi (403 m), characterising the lowland areas of eastern Georgia; and Mt. Sabueti (1,242 m), located on the climate-dividing Likhi range.

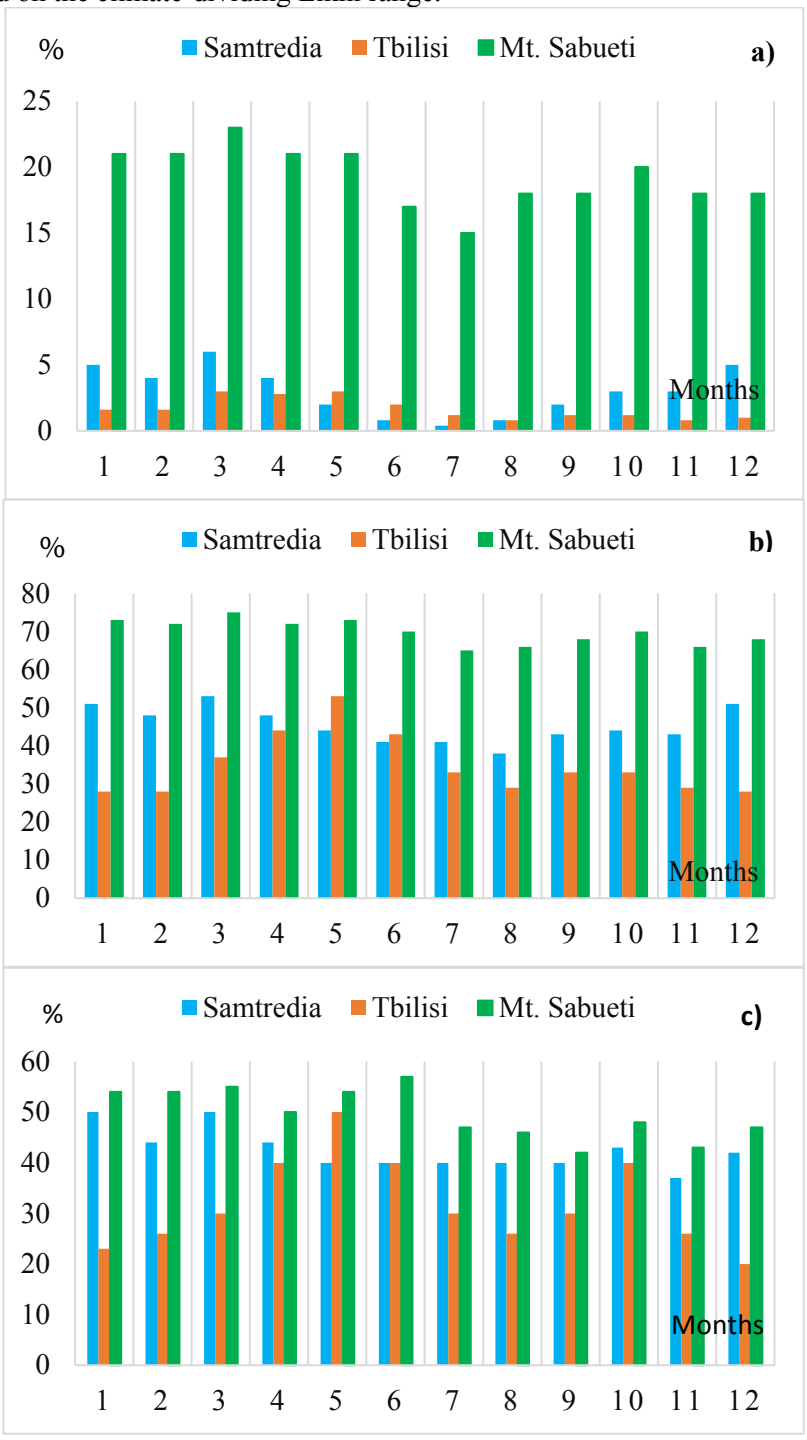

Figure 1. Annual course of the probability of the most dangerous combinations of precipitation-strong wind in various physical and geographical conditions of Georgia: a) - the probability of simultaneous

occurrence of independent events; b) - the probability of occurrence of one of the events. c) - probability of occurrence of the complex, if one of the events has occurred. 1 - Samtredia; 2 - Tbilisi; 3 – Mt Sabueti

Fig. 2 shows a map of the distribution of average annual probabilities of the occurrence of the precipitation-strong wind complex, calculated using formula (1).

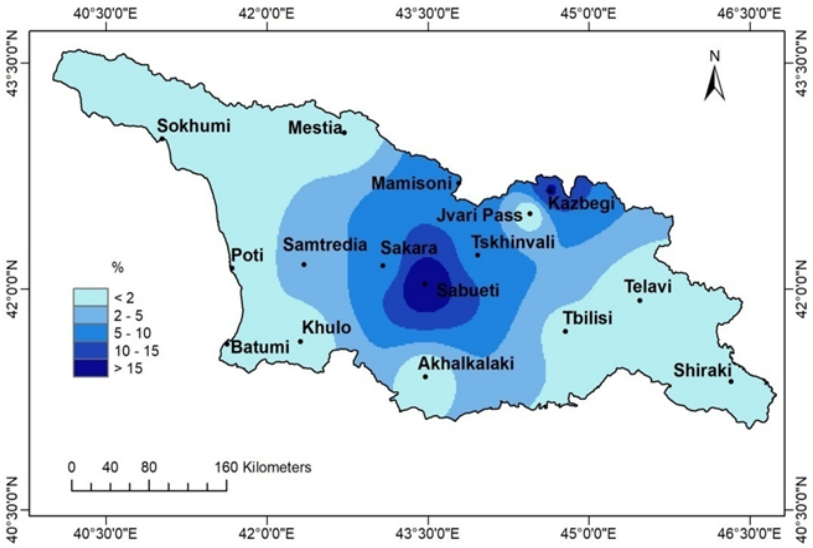

Figure 2. Geoinformation map of the distribution of average annual probabilities of the precipitation-strong wind complex (Elizbarashvili et al, 2019)

If we consider a complex of catastrophic precipitation, when more than 50 mm falls per day, and a hurricane wind, when its speed exceeds 32 meters per second, then the probability of the complex implementation decreases significantly. This is confirmed by Table 1, which presents the relevant materials for various regions of Georgia.

Table 1. Probabilities (P) of combinations of catastrophic precipitation and hurricane winds by regions: 1 - Black Sea coast and Kolkheti Lowland; 2 - Plains and foothills of eastern Georgia; 3 - Likhi and Adjara-Imereti ranges; 4 - Southern Georgian highland; 5 - Greater Caucasus

Probability	Regions of Georgia				
	1	2	3	4	5
$P(A\,B)$	0.004-0.006	0.0002-0.0016	0.0005	0.0012-0.0022	-
$P(A+B)$	1.3-1.8	0.3-11	0.6	0.8-1.3	0.9

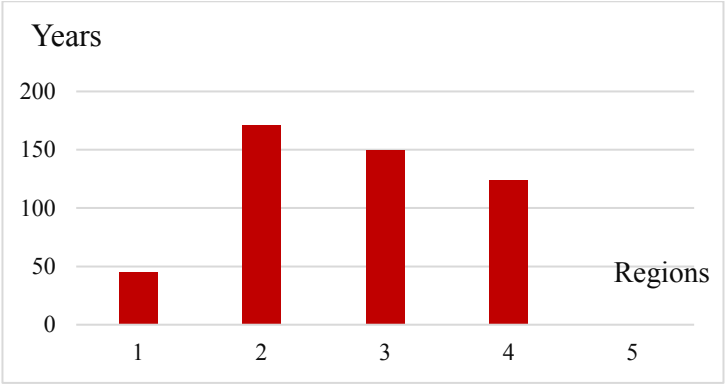

Figure 3. Recurrence of risk of catastrophic precipitation and hurricane winds by regions and years

Fig. 3 shows the minimum durations of the recurrence periods of the risk of catastrophic precipitation-hurricane wind for the entire sample in Georgia's various physical and geographical conditions.

Discussions

It follows from Fig. 1 that the probability of simultaneous occurrence of strong wind and precipitation *in*on the Kolkheti Lowland (Samtredia) during the year fluctuates on average from 0.4%.4 to 5%, with a minimum in summer and a maximum in December-January or March, while on the plains of eastern Georgia (Tbilisi) the probability of the same complex is 1-3%, with a minimum in August and

November, and a maximum in May. The probability of a precipitation-strong wind complex on the Likhi range (Mt. Sabueti) increases significantly, amounting to 15-23%, with a minimum in June and July, and a maximum in September.

The probability of occurrence of one of the events of the precipitation-strong wind $P(A\ or B)$ complex phenomena on the Kolkheti Lowland fluctuates within 38-51% during the year, with a minimum in August and a maximum in December-January, on the plains of eastern Georgia it is 28-53%, with a minimum in January-February and a maximum in May, and on the Likhi range it fluctuates within 65-75%.

When one of the events of the precipitation-strong wind complex occurs, the probability of occurrence of its second component during the year P (A | B) *)* on the Kolkheti Lowland fluctuates between 37 and 50%, with a minimum in November-July, and a maximum in December-January and March; on the plains of eastern Georgia, the probability of the corresponding event is 20-40%, with a minimum in December-August and November, and a maximum in March and May, and on the Likhi range it fluctuates between 42-55%, with a minimum in September and a maximum in March.

The highest probability of the complex occurring in a year (15-20%) is observed in the open Likhi range (about 70 days during the year). In the eastern part of the southern slope of the Greater Caucasus, the probability of the same complex is 10-15% (35-50 days). On the Black Sea coast of Georgia, the probability of the precipitation-strong wind complex occurring is 2%, and in a significant part of the territory of the southern Georgian highland and the plains of eastern Georgia, it does not exceed 1%, which corresponds to 7 and 4 days (Fig. 2).

From Table 1 it follows that the probability of the occurrence of one of the events of the catastrophic precipitation-hurricane wind complex over a large territory does not exceed 2%; the probabilities of the occurrence of a complex of phenomena are also small and change little across the territory, increasing somewhat on the Black Sea coast and the Kolkheti Lowland (0.004-0.006%).

The shortest duration of the recurrence period of the risk of catastrophic precipitation - hurricane wind is on the Black Sea coast and the Kolkheti Lowland, and it is 45 years. On the plains and in the foothills of eastern Georgia, the duration of the risk recurrence is maximum, amounting to about 170 years. On the Likhi and Adjara-Imereti ranges, the risk recurrence is about 150 years, and on the southern Georgian highland, more than 120 years. In the Greater Caucasus, the complex of catastrophic precipitation - hurricane wind has not been recorded according to available data (Fig. 3).

Conclusion

The obtained results can be used in planning activities to reduce the negative consequences of the impact of a complex of dangerous meteorological events on the territory of Georgia. The stochastic approach allows us to study the physical process of the simultaneous occurrence of two independent dangerous meteorological events and quantitatively assess the conditional probabilities of its development. The tested approach will be used in a detailed study of the processes of occurrence of the most dangerous meteorological events in Georgia's conditions.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

M.E. and E.E. conceived of the presented idea. E.E. performed the analytic calculations. M.E. took the lead in writing the manuscript. E.E. reviewed and edited the manuscript. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

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References

Ali, J., Wahl, T., Enriquez, A. R., Rashid, M. M., Morim, J., Gall, M., & Emrich, C. T. (2023). The role of compound climate and extreme weather events in creating socio-economic impacts in South Florida. *Weather and Climate Extremes, 42,* 100625. https://doi.org/10.1016/j.wace.2023.100625

Agekyan, T.A. (1972). *Fundamentals of the Theory of Errors*. Moscow: Nauka.

Bolashvili, N., Dittmann, A., King, L., Neidze, V. (Eds.) (2018). *National Atlas of Georgia*; Franz Steiner Verla: Stuttgart, Germany, 137p, ISBN 978-3-515-12183-5

Elizbarashvili M., Gaprindashvili, G., Elizbarashvili, E., Dvalashvili G., Chikhradze, N., Khuntselia, N., Rikadze, Z. (2022a) Extreme Geological and Hydrometeorological Events in the Border Regions of the Central Caucasus – Kazbegi, Dusheti, Tianeti and Mtskheta. TSU, Georgia, 200 pages.

Elizbarashvili, E., Elizbarashvili, M., Elizbarashvili, Sh., Kvirkvelia, B., Khuntselia, T. (2022b). Climatic risks created by dangerous weather phenomena in Kvemo Kartli. *Annals of Agrarian Science,* 20, 28-33

Elizbarashvili, E., Elizbarashvili, M., Tatishvilic, M., Elizbarashvili, Sh., Chelidze, N. (2019). Investigation of Simultaneous Occurrence Probabilities of Some Dangerous and Spontaneous Meteorological Phenomena for Various Physical and Geographical Conditions of Georgia Using Multiplication and Addition Theorems of Probabilities. *Annals of Agrarian Science*, 17, 197 – 203

Elizbarashvili, M., Elizbarashvili, E., Tatishvili, M., Elizbarashvili, S., Meskhia, R., Kutaladze, N., King, L., Keggenhoff, I., Khardziani, T. (2017a). Georgian climate change under global warming conditions. *Annals of Agrarian Science, 15,* 17–25

Elizbarashvili, E. (2017b). Climate of Georgia. Georgian Technical University, Institute of Hydrometeorology: Tbilisi, Georgia, 360 pages. Available online: https://www.ecohydmet.ge/geo%20climate.pdf (accessed on 6 March 2024) (in Georgian)

McPhillips, L.E., Chang, H., Chester, M.V., Depietri, Y., Friedman, E., Grimm, N.B., Kominoski, J.S., McPhearson, T., Méndez-Lázaro, P., Rosi, E.J., Shafiei Shiva, J. (2018). Defining extreme events: a cross-disciplinary review. *Earth's Future, 6 (3),* 441-455, https://doi.org/10.1002/2017EF000686

NOAA National Centers for Environmental Information (NCEI) U.S, Billion-Dollar Weather and Climate Disasters, (2023), 10.25921/stkw-7w73, https://www.ncei.noaa.gov/access/billions/

World Economic Forum, The Global Risks Report 2023, Retrieved from https://www.weforum.org/reports/global-risks-report-2023/in-full

World Meteorological Organization, Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes, (2023), Retrieved from https://public.wmo.int/en/resources/atlas-of-mortality

Zscheischler, J., Westra, S., van den Hurk, B.J.J.M., Seneviratne, S.I., Ward, P.J., Pitman, A., AghaKouchak, A., Bresch, D. N., Leonard, M., Wahl, T., Zhang, X. (2018). Future climate risk from compound events. *Nature Climate Change, 8 (6),* 469-477, https://doi.org/10.1038/s41558-018-0156-3

Georgian Geographical Journal

Impact of River Flow Regulation on Deltas in the Black Sea Basin

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Abstract

The study aimed to analyse the impacts of flow regulation and economic activity on river deltas in the Black Sea Basin (Rioni, Chorokhi, Kizilirmak, Dnieper, Dniester, and Danube). The relevance of this problem is because changes occurring in deltas significantly affect their natural resources and the prospects for their use. A comparative analysis of the deltas of the basin allows us to show the features and scale of changes occurring in them. The main methods used for this investigation were cartography, GIS modelling, and some field expedition routes. Natural conditions, delta morphology, sediment transport, flow discharge, and land use shape the features of delta transformation in these rivers. Erosion processes are observed as sediment accumulates in deltas exposed to coastal currents and waves (Rioni and Chorokhi in Georgia, Kizilirmak in Turkey). River flow regulation by reservoirs has reduced the flow of water into the delta and has decreased sediment influx. Deltas of the Dnieper and Dniester Rivers in Ukraine mostly depend on water releases from reservoirs. It is noticed that both the sea and the river influence the Danube Delta. The results obtained are useful for the construction and operation of infrastructure in deltas; the use of these areas for recreation, agriculture, and forestry; the protection of Ramsar wetlands; and the creation of new human settlements.

Keywords: river delta, Black Sea basin, flow regulation, wetlands, coast.

Introduction

Deltas, which form when rivers flow into oceans, seas, and lakes, are of great ecological and economic importance due to their geographical location and rich natural resources—land, water, and biological. However, in the last century and a half, their natural environment has been undergoing obvious degradation due to the construction of huge hydroelectric power plants and reservoirs and increasing diversion of water from rivers for irrigation, industrial, municipal, and drinking water supply, as well as economic development of the deltas. It is the regulation of river flow and intensive economic activity in their basins that lead to significant changes in the natural environment of river deltas. (Starodubtsev, 2007) This process is becoming global but manifests itself differently, including wetlands desertification (Starodubtsev & Petrenko, 2005; Starodubtsev & Truskavetsky, 2011), depending on the climate of the region, the morphological characteristics of deltas, sediment transport, the volume of runoff and the nature of its regulation, and the intensity of water use and water salinity, as well as several other factors. The conditions in which rivers flow into bodies of water (oceans, seas, estuaries, and lakes) also significantly influence processes in deltas.

The most famous in the last century were the strongest processes of degradation and desertification (we use this term not only for drylands but also for wetlands turning into deserts) in delta landscapes.

The Colorado River is located on the US-Mexico border (Glenn, 1966). Then they manifested themselves catastrophically in Central Asia and rapidly spread to other climatic zones around the world. To study these processes, large scientific schools were formed in the USA (Coleman J.M., Vorosmarty

C.J., Syvitski J.P.M.), in Eastern Europe and Central Asia (Mikhailov V.N., Kovda V.A., Borovsky V.M., Novikova N.M., etc.), as well as many prominent researchers in other regions, including in Georgia, Turkey, Ukraine, Romania, etc., whose works are mentioned in this message.

In the Black Sea basin (Fig. 1), we analyse changes in river deltas flowing into the sea and subject to strong influence of alongshore currents and waves (Rioni and Chorokhi in Georgia, Kizilirmak and Yesilirmak in Turkey), deltas formed in long estuaries (Dnieper and Dniester in Ukraine), as well as the Danube delta, which has a more complex influence of both sea and river.

Figure 1. River basins of the Black Sea: 1 – Danube, 2 – Dniester, 3 – Dnieper, 4 – Don, 5 – Kuban, 6 – Rioni, 7 – Yesilirmak, 8 – Kizilirmak, 9 – Chorokhi

Economic activities in river basins flowing into the Black Sea caused a decrease in water flow into the sea by the end of the 20th century from approximately 381 to 348 km^3, and sediment from 95 to 52.2 million m^3 (Jaoshvili, 2002; Jaoshvili, 1986). And now this process is actively continuing (Mikhailova & Jaoshvili, 1998; Mikhailova, 2009; Berkun, 2015) causing significant changes in land cover in deltas. Other factors influencing the formation of landscapes in the deltas of the Black Sea basin are the economic development of delta plains, including recreational ones, the growth of settlements, and hydraulic engineering construction on the coast and in the water area. Sometimes such factors are even environmental protection measures in the delta itself or in the entire river basin. And, of course, the active erosion and accumulative activity of the water masses of the sea remains.

Methods and Materials

The main methods used for this investigation were cartography, GIS modelling, and some field expedition routes. On the eastern coast of the Black Sea within Georgia, we are considering the deltas of two large rivers, formed in the conditions of Mediterranean-type subtropics in the south (Chorokhi River) and humid subtropics in the central part of this coast (Rioni River) (Tsereteli et al., 2011). The Chorokhi River basin (22,100 km²) is located mostly in Turkey (91%), and only the lower part of the riverbed and delta (9%) are in Georgia (Fig. 2). Dams and reservoirs classify Chorokhi as highly regulated. In total, it is planned to build 27 hydroelectric dams with reservoirs in its basin (Fig. 3), only one of which is in Georgia on the Adzharistskali tributary. Under such strong regulation by dams, the annual flow of the river decreased from 8.71 km³ (Jaoshvili, 2002; Jaoshvili, 1986) to 6,824 km³ (Sezer, 2009), and the sediment runoff, which amounted (Jaoshvili, 2003) to 4,920,000 m³/year (according to other sources, up to 5.8 million m³), decreased accordingly, but we did not find exact values in scientific publications. It was noted that of the total amount of sediment, 2,310,000 m³/year accumulated in the coastal zone, forming a delta and shelf, and 2,610,000 m³/year was carried out to the sea. It was noted that of the total amount of sediment, 2,310,000 m³/year accumulated in the coastal zone, forming a delta and shelf, and 2,610,000 m³/year was carried out to the sea. A rapid decrease in sediment runoff, visible even on satellite images, creates, according to many scientists (Jaoshvili, 1986; Berkun, 2015; Eruz et al., 2005; Hay, 1994; Mikhailova, 2009) a real threat to the ecosystems of the delta, the erosion of the sea edge, and the destruction of the beaches of the city of Batumi.

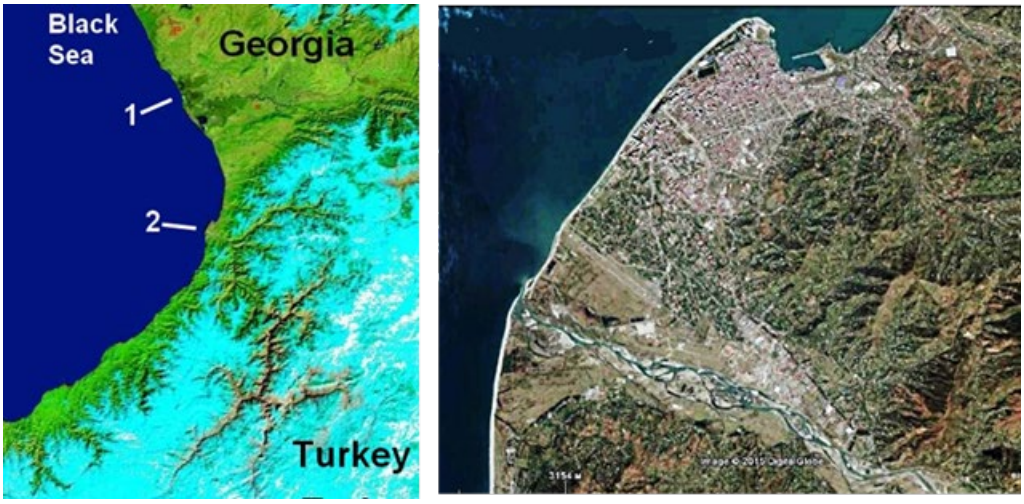

Figure.2. Basin of the Chorokhi (2) and Rioni (1) rivers in winter (left, Terra satellite image) and geomorphological features of the delta (right, Google Earth)

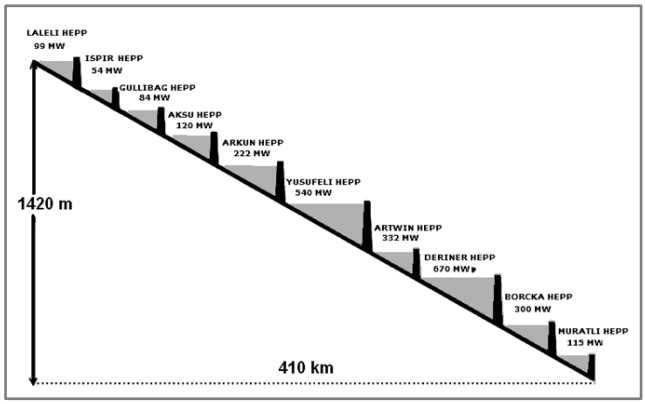

Figure. 3. Placement of dams and hydroelectric power stations on the Chorokhi River (Berkun et al., 2015)

Indeed, the southern and southeastern coast of the Black Sea is characterized by the development of erosion and coastal retreat under the influence of regulation of river flow and sediment accumulation in reservoirs (Berkun, 2015; Hay, 1994; Klaphake & Waltina, 2011; Mikhailova & Jaoshvili, 1998). The manifestation of this process in the Chorokhi River basin and the interaction of land and sea in the Chorokhi delta area became the subject of our research using remote sensing methods. At the first stage of the study, high-quality Landsat-5 and 8 images were used for the period 1980-2015 (Starodubtsev, 2014; Starodubtsev & Basarab , 2017a). And at the second stage, the entire period of operation of the Landsat 2, 4-5, 8, 9 satellites for 1975-2024 is considered, but these materials have not yet been fully analysed.

Figure 4. Sediment input into the Chorokhi River delta in 1987 (left) and 2015 (right)

Visualization and classification of images (Fig. 5) made it possible to approximately assess the processes of some drainage of this delta territory due to the regulation of the river flow and the intensification of its economic development. Thus, over the entire territory of 3,730 hectares, the area of water surface decreased from 303 to 251 hectares, the area of wetlands decreased from 594 to 237 hectares, but the area of gardens and meadows increased noticeably - from 487 to 921 hectares. The area of forests and built-up areas has not changed significantly.

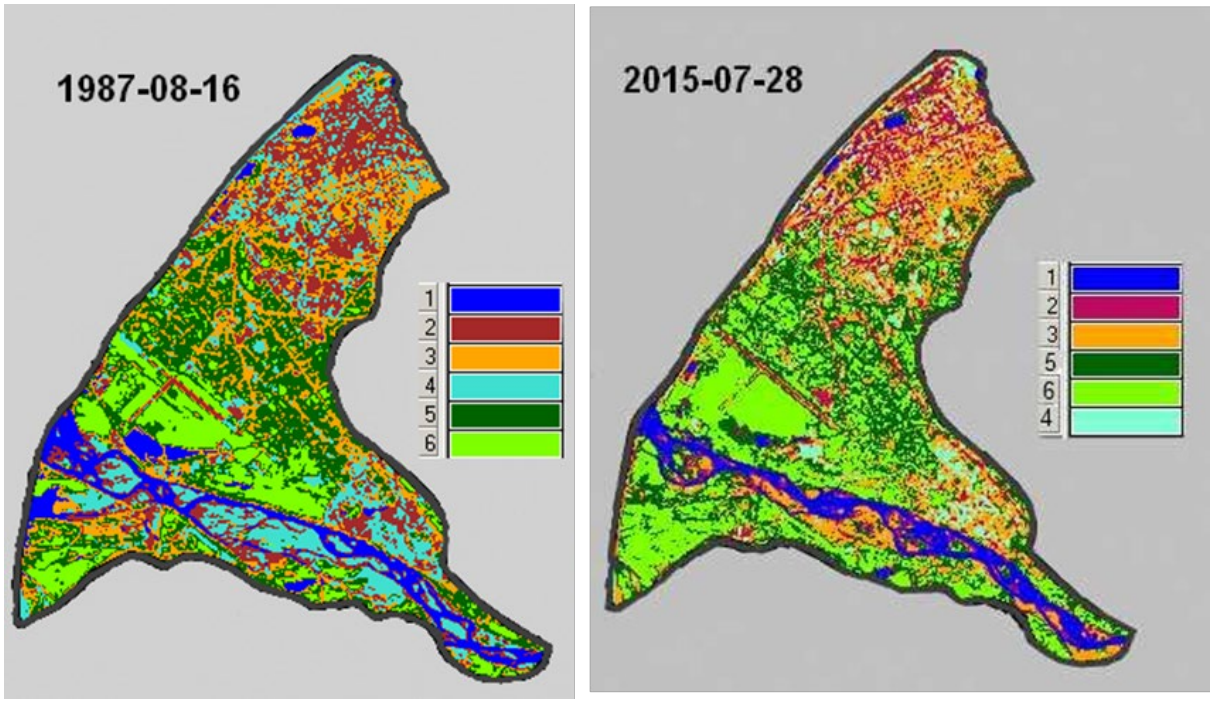

Figure 5. The Chorokhi River delta in Landsat 5 (1987) and Landsat 8 (2015) images and their classification: 1 - water surface, 2 - buildings, 3 - impervious areas, 4 - wetlands, 5 - forests and parks, 6 - meadows and gardens.

To determine changes in the shoreline of the delta, a shapefile of this delta in the Landsat-8 image in 2015 was superimposed on the Landsat-5 image in 1987. The results indicate the retreat of the coastline—that is, coastal erosion— in the river mouth and in the area between the mouth and the city of Batumi. Considering the approximate nature of the values obtained in this way, we note that in the river mouth the coastline shifted to the east over the period 1987-2015 by 120-150 m, and in the area between the mouth of the river and the city of Batumi these values were -60-90 m, respectively. Within the city of Batumi itself, the coastline displacement was mostly less than 1 pixel (30 m) and in a westerly direction. That is, a weak tendency towards sediment accumulation appeared here. This value was clarified using the Planet Earth mapping service (Fig. 6). For this purpose, the function of this service, “change of image over time”, was used, which made it possible to approximately identify the displacement of the coastline towards the sea for the period 2004-2016, amounting to 10-35 m. The same trend of increasing the width of the beach coast in Batumi was confirmed in 2018 and then in 2024.

To determine specific territories where changes occurred, as well as their areas, the “change detection” function of a specialised program was used (Fig. 7). As a result, it was revealed that in the area of the mouth of the Chorokhi River, during the period from 1987 to 2015, The areas that most protruded into the sea, covering an area of 14 hectares, were eroded, while at the same time, part of the sediments formed as a result of erosion of the riverbed accumulated at the mouth. In the area from the river mouth to the city of Batumi, a one-way directional process of bank erosion was noted over an area of 16 hectares. In the area of the city of Batumi itself, sediment accumulation occurred on an area of 20.5 hectares and the coast extended tens of meters into the sea. Sediment accumulation was also noted north of Batumi (in the bay).

Figure 6. Changes in the coastline in the city of Batumi for the period 2004-2018

To ensure the reliability of the data obtained, an attempt was made to analyse images of the Landsat space satellites for the entire period of their operation, that is, from 1976 to 2024. However, the images for the period 1976-1986 were of low quality, so the results obtained will be refined. Nevertheless, we present them in this message. In the city of Batumi for the period 1976-2000 the increase in the beach coast was 45 m over the period 2000-2024 - another 30 m, and in total for 1976-2024 - 75 m. In the middle of the space between the mouth of the Chorokhi River and Batumi, due to erosion, the coastline retreated to the east in 1976-2000 by 75 m, in 2000-2024 - by 50 m, and in total for 1976-2024 - by 125 m. At the same time, at the very mouth of Chorokhi, the processes of erosion and accumulation alternated in years of different water content.

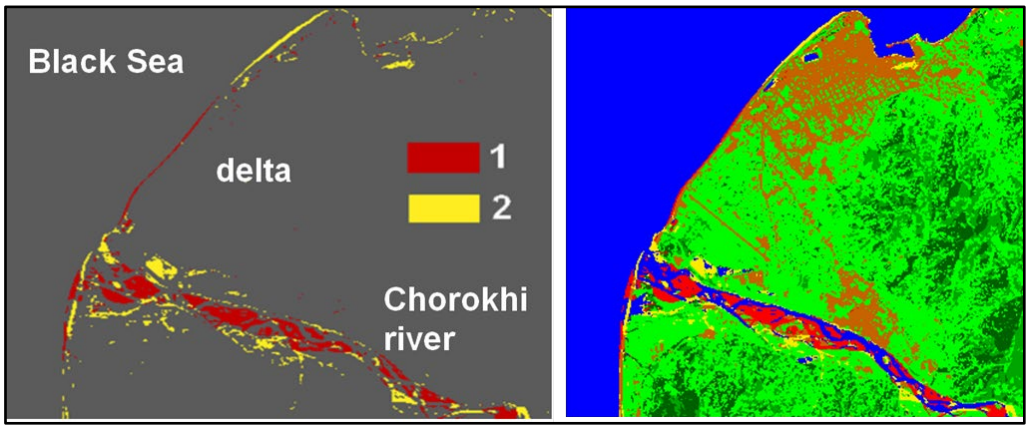

Figure 7. Changes in the coastline in the Chorokhi River delta for the period 1987-2016

Results

Rioni estuaries

The Rioni River is located in Georgia and has a length of 327 km, and a drainage area of 13,400 km^2. It begins in the Caucasus Mountains, and below the city of Kutaisi it flows through the fertile Colchis lowland with a humid subtropical climate (Fig.8) and flows into the Black Sea near the city of Poti. The annual volume of water flow is estimated at 13.37 km^3, including 9.62 km^3 of water flowing along the northern (new) channel, and 3.75 km^3 of water flowing through the southern channel (Jaoshvili, 2002). The flow of the Rioni is regulated by a cascade of small hydroelectric power stations (Lajanuri, Gumati 1 and 2, Rioni Vartsikhe hydroelectric power stations), but due to the small volume of reservoirs, they did not have a significant impact on the river's water flow. Important changes in flow occurred when in 1939 the mouth of the Rioni was artificially diverted north of the city of Poti to protect it from floods, and in 1959 part of the river's flow was returned to the old channel (Fig. 8). The river's water resources are used mainly for energy, water supply and irrigation.

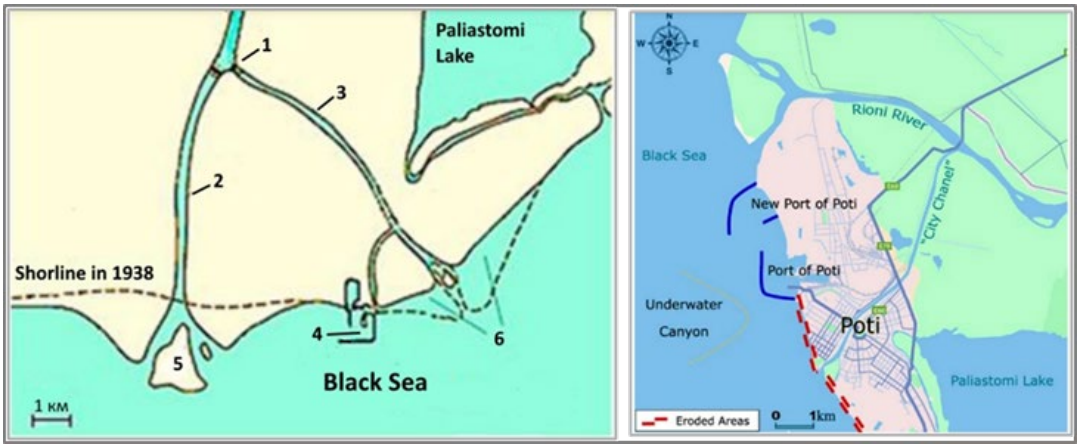

Figure 8. Artificial direction of the Rioni flow along the northern channel - left and changes in processes on the coast in connection with the creation of a new port (Saghinadze et al et., 2024)

The formation of the area between the old and new channels of the Rioni River (Rioni delta) is also significantly influenced by modern changes in the sediment flow of the river (3.54 million tonnes per year) and along-shore sediment flows of the Black Sea. The natural dynamics of sediment in the river were changed due to flow regulation, but after the reservoirs were filled with sediment, their flow began to return to the natural state (Jaoshvili, 2002). The direction of the river flow in 1939 along the northern channel to protect the city of Poti from floods had a dramatic effect on the influx of sediment at the mouth of the Rioni. As a result, the urban area began to be eroded, so part of the river flow was again returned to the old channel. In 1939, the direction of the river flow along the northern channel had a dramatic effect on the influx of sediment at the mouth of the Rioni, protecting the city of Poti from floods. As a result, the urban area began to be eroded, so part of the river flow was again returned to the old channel. And in the northern channel, the bank began to grow. The creation of the delta area here and how the river and sea interact were mostly influenced by the movement of sediment along the shore towards the centre of Colchic Lowland. But with the transfer of the Rioni flow along the northern channel, the growth of the coast here led to a shift in the sediment flow to the north (Fig. 9).

Figure 9. Sediment movement near the coast of Rioni delta (Sentinel-2, 2024-06-02)

And the process of sediment accumulation between the mouths of the Rioni and Khobi rivers has intensified in recent decades in connection with the reconstruction of port facilities here and has led to further growth of the coast. It is this process that we studied using modelling methods and remote sensing.

The remote sensing technique for the case of Rioni was based on a comparison of Landsat 2, 5 and 8 satellite images for the period 1975-2016. To compare images from different years, a shapefile (aoi) was created on the 2016 image. It was superimposed sequentially on images from 1975, 1980, 1987, 2000 and 2009, which made it possible to identify an area of the sea that was gradually replaced by land due to sediment accumulation (Fig. 10). Now such research continues for the period until 2024 using

the "change detection" computer technique. The landscapes of the Rioni delta were analysed using "unsupervised classification". The calculation of land and water surface areas within the study area (2943 hectares) showed that the size of the land for the period 1975–2016 increased by 366 hectares (Table 1). That is, the rate of land growth during this period averaged 8.93 hectares per year (according to modelling data, land growth towards the sea was 7-8 m/year). It is important to note that in recent decades the rate of land growth has slowed to 6-7 hectares/year.

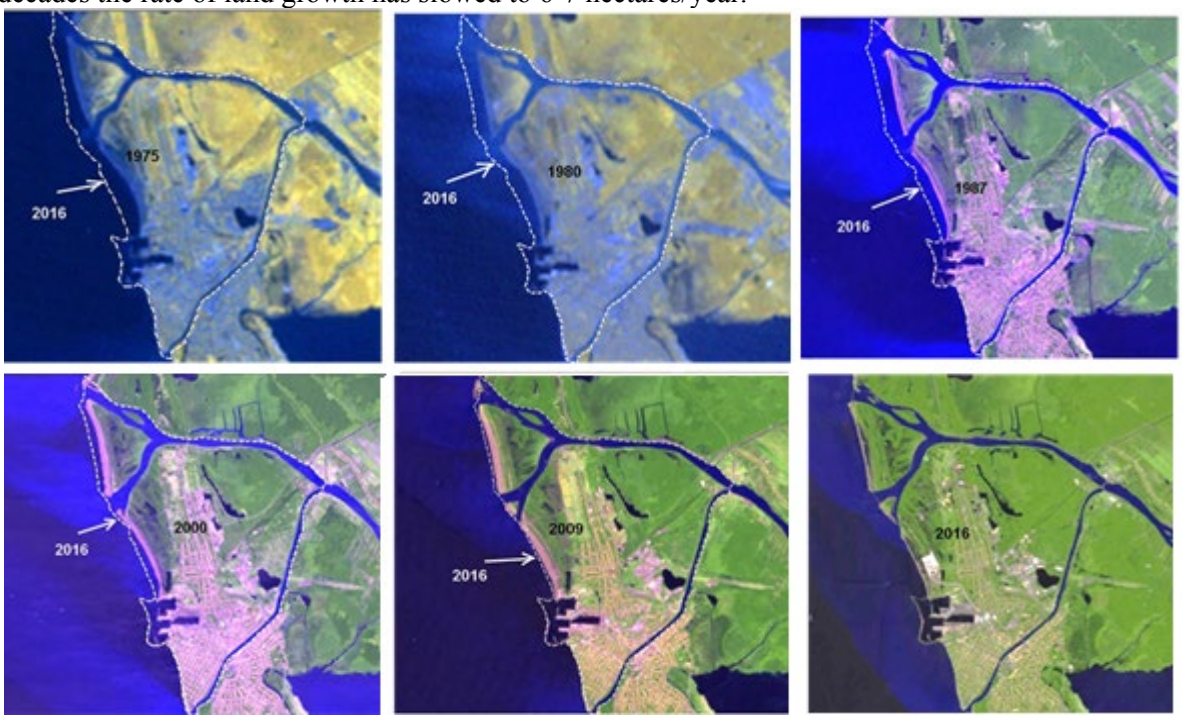

Figure 10. Changes in the delta coastline for 1975-2016

New lands formed in the coast of the delta are mainly a recreational resource. But it is also important to assess changes in land cover throughout the delta, which serves as a resource for agricultural production, environmental protection measures and the development of the city of Poti with all its infrastructure. Considering the low quality of Landsat-2 images, the assessment of changes in the structure of land cover was made only using the Landsat-5 and 8 satellites for the period 1987-2016 (Fig.11).

Table 1. Changes in the structure of land cover of the Rioni delta within the boundaries of the studied territory for the period 1987-2016, ha

Land	Land area, ha		Changes in area, ha
	1987	2016	
Water surface	**566**	**386**	**-180**
Buildings (residential, communal, industrial)	**668**	**737**	**+69**
Landscape gardening	**587**	**632**	**+45**
Forests (including floodplains)	**490**	**682**	**+192**
Wet meadows with shrubs	**399**	**279**	**-120**
Wetlands	**233**	**227**	**-6**
Total	**2943**	**2943**	_

In general, changes in the land cover of deltaic region of the Rioni River are due to the redistribution of river flow into the northern and southern channels, alongshore sediment flows into the sea and, to a lesser extent, regulation of flow by dams and reservoirs. A study of the dynamics of the delta in time and space based on remote sensing data from Landsat satellites showed that for the period from 1975 to 2016. The area of the part of the delta we studied increased by 366 hectares, and the average rate of its increase was 8.93 hectares/year. The protrusion of the delta into the sea occurs in the northern and middle part of this region, in the southern part (the city of Poti) the coastline is now relatively stable with tendency to erosion, and to the south there is coastal erosion. The obtained parameters for the increase in the Rioni delta can be used for forecasting for the coming years, especially in connection

with the construction of a new port. The new lands formed in the delta of the Rioni River are mainly a recreational resource. But throughout the delta there is an improvement in the agro-ecological condition of the lands, which serve as a resource for the development of the region.

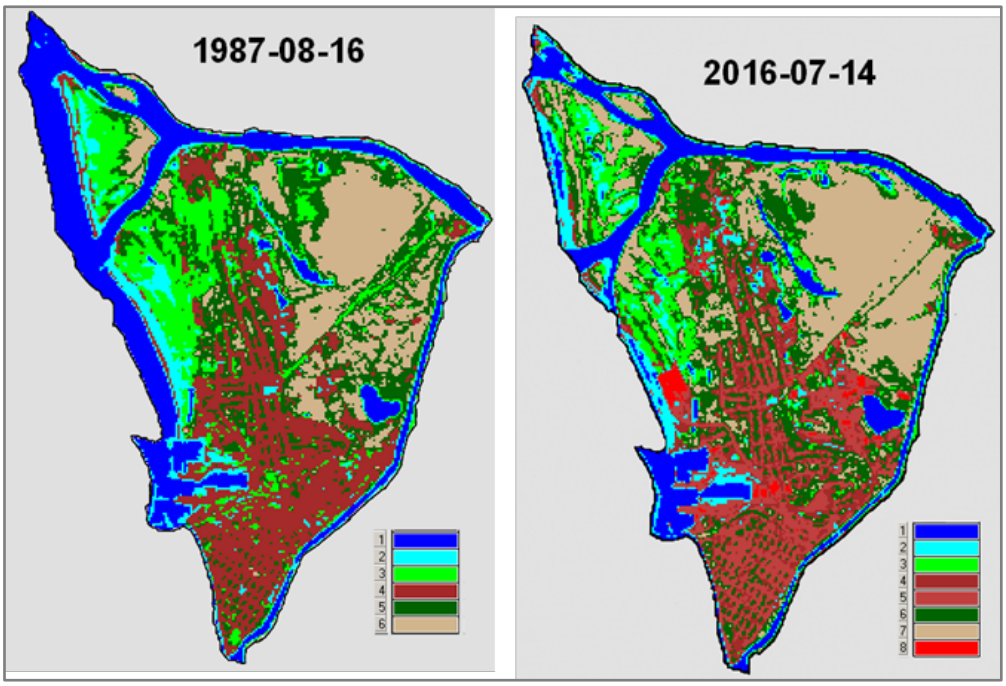

Figure 11. Changes in the structure of land cover in the Rioni River delta. (In both legends: 1 - water surface, 2 - wetlands, 3 - wet meadows. In the legend for the 1987 image: 4 - buildings, 5 - gardens and parks, 6 - forests. In the legend for the 2016 image.: 4, 5 and 8 – individual, communal and industrial buildings, 6 – landscape gardening, 7 – forests

Delta of the Kizilirmak River

River deltas on the southern coast of the Black Sea (within Turkey) are formed both under flow regulation by dams and reservoirs and under the influence of powerful waves and latitudinal longshore currents. The largest river here is the Kizilirmak, whose delta is of international importance as a wetland for waterfowl habitat. Farmland, including irrigated fields and fruit plantations, occupies the flat areas. The length of the river is 1355 km, and the drainage area is 78646 km² (Jaoshvili, 2002). It originates in the mountains in inland Anatolia; in its lower reaches, it cuts into a plateau to a depth of about 600 m and flows into the sea on a swampy plain near the city of Bafra. The river mouth has formed an underwater sandbar (Jaoshvili, 2002), which influences the modern processes of coastal erosion.

The modern delta, which is a plain dotted with a network of channels and canals, was formed over a period of about 10,000 years (Erdoğan, 1970). It lies at altitudes of 0-15 m and ends in a swampy lowland with lagoons, bordered by dunes. Today, most of the delta is used for agricultural production, including rice growing. And behind the barrier of sand dunes, the configuration of which was determined by the interaction of the influx of river sediments and alongshore sea currents, lagoons were formed that have unique environmental value (Erdoğan, 1970).

Our research includes an analytical review of published materials on the problem of degradation of delta wetlands, as well as an analysis of temporal and spatial changes in the Kizilirmak River delta based on Landsat satellite images for 1980–2016 and then until 2024. Big changes in the land cover of the delta happen because of 1) erosion and buildup of materials on the sea coast (Algan et al., 2000; Hay, 1994); 2) less river water and sediment flowing into the delta, which harms the wetland areas; 3) different ways the land is used (like for irrigation, farming, grazing, and protecting wetlands). Erosion-accumulation processes on the sea coast depend on the wave activity of the sea and along-shore currents, on the one hand, and the accumulation of river sediments, on the other. In the Kizilirmak delta, the amount of river sediment coming in dropped significantly after the Altynkaya and Derbent reservoirs were built nearby (Fig. 12). And the activity in the sea (winds, waves, currents) remained almost the same. Therefore, we compared the delta coastline in 2010 and 1980, that is, over 3 decades, as well as in 2014 (Fig. 13).

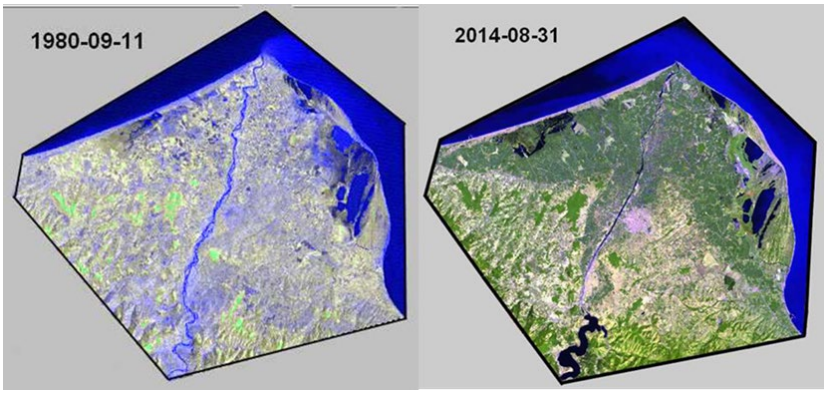

Figure 12. The Kizilirmak River delta before and after the construction of reservoirs in the lower reaches and straightening of the riverbed (Landsat images 2 and 8)

And the activity of the sea (winds, waves, currents) remained almost the same (Fig. 13). Therefore, we compared the delta coastline in 2010 and 1980, that is, over 3 decades, as well as in 2014 (Fig. 13). An approximate graphical assessment of changes in the coastline for the period 1980-2010. showed that the western coast (Fig. 13, site 4) has changed little. Erosion here appeared at a distance of 0-60 m, that is, within one pixel on the raster image. Erosion was more severe to the east of the river mouth (Fig. 13, site 1), spreading here over a distance from 60-120 m to 360-420 m (6-7 pixels). At the same time, on the eastern coast, areas of sediment accumulation were identified, where the sea retreated by 120-240 m (site 2) and from 120-180 to 240-360 m (Fig. 13, site 3). We compared these results with data from (Ozturk et al., 2015), according to which coastal erosion east of the river mouth amounted to 655 m. Moreover, special spurs (Fig. 14) weaken erosion processes here, but do not prevent them completely.

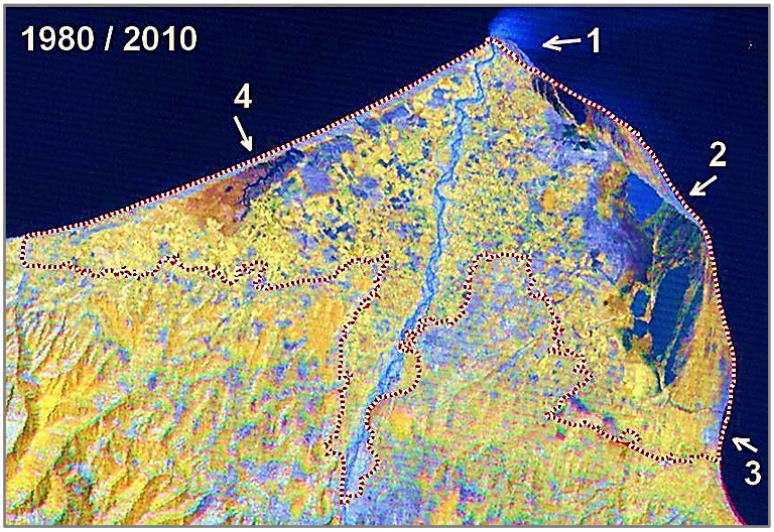

Figure 13. Changes in the delta coastline for the period 1980-2010 (1, 4 – erosion; 2, 3 - accumulation)

Conclusions: a) Reduced water and sediment flow into the Kizilirmak River delta and economic activities in it have caused noticeable changes in land cover; b) The interaction of land and sea in conditions of a decrease in the influx of river sediments caused the activation of erosion-accumulation processes in the delta. Wave activity and alongshore currents caused coastal erosion mainly east of the river mouth and local accumulation of sediment on the east coast; c) The water surface of lakes and estuaries in the delta has decreased by 1-2 thousand hectares over a 30-year period due to the transformation of water bodies into wetlands. Quantitative indicators of the decrease in wetlands in the Kizilirmak Teka delta need to be clarified by further monitoring.

Dnieper delta

The Dnieper River flows through the territory of three countries - Ukraine, Belarus and Russia. The total area of the basin is 504 thousand km^2, of which: 20% is in the Russian Federation, 23% - in the Republic of Belarus, and 57% (296,317 thousand km^2) - within Ukraine. The total length of the Dnieper is 2,201 km, within Ukraine – 1,121 km (Vishnevsky, 2011). Before the war between the Russian Federation and Ukraine, more than 20 million people lived in the Ukrainian part of the Dnieper basin,

but now this number has significantly decreased. The plowed area of the basin is 69% of its total area, that is, it is quite high.

Figure 14. Protection of the banks from erosion east of the mouth of the Kizilirmak River with special spurs created in 1999-2010 (Sentinel-2)

The degree of regulation of the flow of the Dnipro is very high. The river is regulated by a cascade of Dnieper reservoirs – Kyiv (previously – Kiev), Kaniv, Kremenchuk, Kamianske (previously - Dniprodzerzhynsk), Dnipro, Kakhovka (destroyed on 6 June 2023). Regulation of the Dnieper flow began back in 1932 with the construction of the Dnieper hydroelectric power station, but this did not noticeably affect the landscapes of the river delta. More significant changes in the water regime of the delta and its ecosystems began in 1956-1957, when the large Kakhovka reservoir, created for irrigation, energy, water supply and water transport, was filled. And then, until 1975, a whole cascade of 6 reservoirs was created with a total volume of 43.8 km^3, a useful volume of 18.5 km^3 and an area of about 7000 km^2. During the same period, large canals were built that drain water from the Dnieper (North Crimean, Kakhovsky, Dnieper-Donbass, Dnieper-Ingulets, Dnieper – Kryvy Rig), and the consumption of Dnieper water for municipal, industrial and agricultural water supply increased. The total area of the water in the reservoirs of the cascade is about 7,000 km^2 with a total water volume of 43.71 km^3 and useful volume of 18.5 km^3. There are some large canals that divert water from the Dnieper River: The Dnipro-Donbas canal, the Kakhovsky main canal, the North-Crimean canal, the Dnipro-Kryvyi Rih canal and the Dnipro-Ingulets canal.

Figure 15. Deltas of the north-western coast of the Black Sea (1 – Dnieper, 2 – Dniester, 3 – Danube) Results

The average long-term rate of the natural flow of the Dnieper previously increased downstream from 593 m^3/s at the "Nedanchichi" hydropost (the entry point for the territory of Ukraine) to 1,690 m^3/s at the mouth of the Dnieper. Now the flow rates are fully regulated by the reservoirs and in the last decade, which was low-water, amounted to 500-600 m^3/s. Average long-term natural volume of runoff in the estuary was 53.3 km^3, and now it has decreased by approximately 11 km^3, that is, it has become 20% less than the natural one. Inflow of sediments during this period also decreased from 2.6 to 0.6-0.8 million t/year, as they now accumulate mainly in the upper (Kyiv) reservoir. It is important to note that

at the top of all reservoirs of the cascade, except for the deep and narrow Dnieper one, peculiar delta-like hydromorphic landscapes began to form due to the accumulation of solid runoff, organic sediments and the development of wetland vegetation and floodplain forests. However, this process is still at the initial stage due to the small amount of solid runoff from the Dnieper in comparison, for example, with the formation of a new delta in the Kapchagai Reservoir on the Ili River in Kazakhstan, where the solid runoff exceeds 11 million tons per year (Starodubtsev, 2007c). The most active process of such delta-like landscapes formation takes place in the Kyiv Reservoir, the first in the cascade, which accumulates almost the entire solid runoff of the Dnieper - on an area of about 20000 ha. It continues in the large Kremenchutsk and Kakhovka reservoirs, and only fragmentarily in the small Kaniv and Kamianske reservoirs. These new landscapes have a very large significance for biodiversity, nature protection, recreation, hunting, sport, etc.

Figure 16. Dnieper Delta before flooding (2023-06-03)

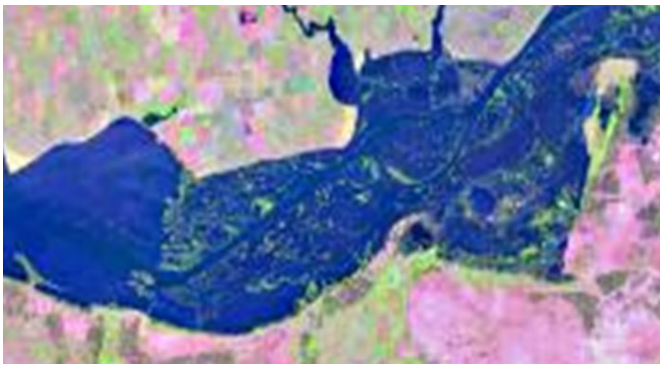

Figure 17. The Dnieper Delta is flooded on the 4th day (2023-06-09)

The Dnieper Delta is formed in a narrow long canyon and ends with the Dnieper-Bug estuary on the Black Sea coast. It begins near the village of Oleshki, stretches for more than 42 km and ends in the Dnipro-Buzka estuary. The total area of the delta is estimated at approximately 350 square kilometers. This area is very rich in biodiversity, so it is included in the list of wetlands of international importance protected by the Ramsar Convention. Before the construction of a cascade of dams and reservoirs, the delta gradually grew in the estuary towards the Black Sea, representing a collection of numerous channels, lakes, islands, swamps overgrown with reeds, and weakly expressed ramparts with shrub and tree vegetation. However, after a flow regulation the influx of water and sediment into the delta has decreased, water quality has deteriorated, and powerful flood spills, which now occur only in record-high water years, have practically ceased. The restructuring of landscapes began, accumulative processes and the protrusion of the delta into the Dnieper-Bug estuary noticeably weakened. Stagnation processes, eutrophication of lakes and streams increased. The massive construction of country houses on the levees along the large straits greatly contributed to the processes of eutrophication.

Our research is carried out in the contour from the Antonovsky automobile bridge across the Dnieper River to the estuary on an area of 37.4 thousand hectares. Schematic zoning of the delta based on ground-based route studies and analysis of Landsat satellite images for the period 1975-2013. made it possible to identify areas with different intensity of overgrowing of water bodies with hydrophylic and hydrophytic vegetation, “blooming” of water, and areas of economic use. However, in recent years, there has been a noticeable lack of water on the Dnieper and a decrease in water flows from the

Kakhovka reservoir to the delta, reaching 300-500 m^3/s in certain periods. This led to an intensification of the processes of overgrowing the delta with coastal aquatic vegetation and a significant increase in the areas of floodplains with trees and shrubs. The area of settlements, dachas and anthropogenically modified territories is also noticeably increasing, reaching more than 4 thousand hectares in 2015. The "blooming" of water in the estuaries and lakes of the delta has also increased. Such trends persisted until 2021, after which changes were caused by the war in Ukraine.

Figure 18. Dnieper Delta on the 12th day after flooding with destroyed vegetation and covered

As the delta changes, the likelihood of fires increases, destroying all unique biota. Thus, in the spring of 2016, the consequences of large fires that occurred in the autumn-winter period were revealed. The area of the fires amounted to more than 5 thousand hectares, of which on an area of 2.8 thousand hectares the vegetation was completely burned out, including trees and shrubs, and on an area of 2.2 thousand hectares - partially. Since 2022, with the outbreak of the war, the area of fires in the territories adjacent to the delta has sharply increased due to shelling and bombing.

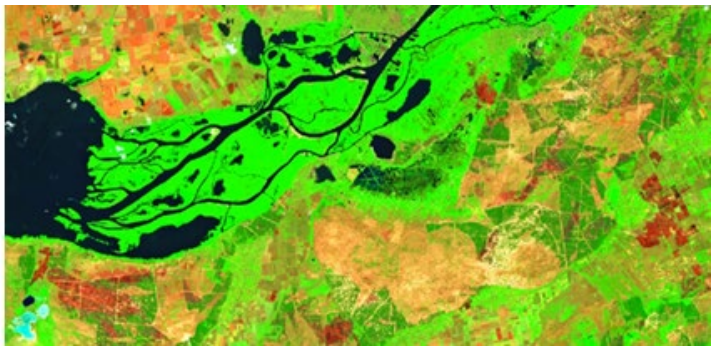

Figure 19. Gradual restoration of delta wetlands after 3 months with traces of fires from artillery

Profound changes in the Dnieper delta occurred after the destruction of the dam and power station of the Kakhovka reservoir on June 6, 2023. These changes are shown at these satellite images (Fig16-19):

Figure 20. Delta of the Danube River (Landsat-5)

Danube Delta.

The Danube River is the second largest river in Europe with a catchment area of 817,000 km². The Danube basin covers the territory of 18 countries, the largest parts of the basin are in Romania (28.9% of the area), Hungary - 11.7%, Austria - 10.3%, Serbia - 10.3%. The length of the river is 2857 km. The average annual flow of the Danube is, according to various estimates, from 203 to 210 billion m3 (57% of the annual flow of all rivers flowing into the Black Sea), and the average flow rate is 6500 m^3/s. Sediment runoff in its natural state was approximately 56-83 million tons every year, but under the influence of economic activity (water regulation and water use) it has significantly decreased (Fig. 20).

Figure 21. Our field routs in the Ukrainian part of the Danube delta

The source of the Danube is in the mountains in Germany, and then it flows along the Middle Danube lowland to the "Iron Gate" gorge in the south of the Carpathians and on to the Black Sea. The importance of the Danube basin for the European economy is extremely high. When it flows into the Black Sea, the Danube forms a giant delta with an area of 5640 km². The top of the delta is near Cape Izmailsky Chatal, 80 km from the mouth. Here, the main channel of the Danube first branches into the Kiliy estuary, which flows into the sea on the territory of Ukraine, and the Tulchyn estuary, which 17 km downstream divides into the Georgievske and Sulinske estuaries, which flow into the Black Sea in Romania. Floodplains, with a multitude of canals, lakes, and marshes, primarily cover the area. The delta was quickly pushed into the sea by a large amount of sediment before the flow of the Danube was intensively regulated by reservoirs, especially on its numerous tributaries. However, due to hydraulic construction in the basin and the ever-increasing use of Danube water in its economy, the total flow of water and especially sediment is significantly reduced. Thus, the delta's advance into the sea has slowed, and the processes of accumulation and erosion of the delta's sea edge are clear. A cross-border biosphere reserve, "Danube Delta," has been created in the Danube Delta and is included in the World Network of Biosphere Reserves. It includes the 580,000 ha Danube Delta Biosphere Reserve in Romania and the Danube Biosphere Reserve in Ukraine.

For now, our research is focused mainly on the Ukrainian part of the delta, where the process of the delta's extension into the sea continues), which, however, becomes more complicated from year to year depending on the water level of the year and the peculiarities of the influence of sea currents and waves. In general, our preliminary calculations (Starodubtsev, 2013)indicate that in the Danube delta, the area of the water surface decreases by an average of 500 ha each year due to the overgrowth of lakes and channels with air-water and water vegetation, economic development of land, and partly due to the increase in the area of the Chiliya part of the delta, which we explored by land routes (Fig.21).

The state of wetlands and their gradual agricultural development, especially in the northwestern part, significantly affects the state of wetlands. As for the sea edge of the Danube delta, it changes depending on the inflow of sediments and the influence of sea currents and waves. In the north-eastern and central parts of the delta, the delta is moving slowly into the sea, that is, mineral and organic sediments are accumulating and the area of the delta is increasing, especially its Ukrainian part. And in the northeastern part of the delta, erosion and erosion of the shore prevail.

A very serious problem for the biodiversity of the huge delta is the frequent and large-scale fires that occur due to natural phenomena, but to a greater extent due to the irresponsible (and sometimes intentional) actions of poachers and even the personnel of the biosphere reserve (Fig.22).

Such fires cause great damage both to the unique colonies of migratory birds and to all species of the delta's animal world. Fires cause irreparable damage to floodplain forests and shrubs, which take an immeasurably longer time (years) to regenerate compared to grassy vegetation.

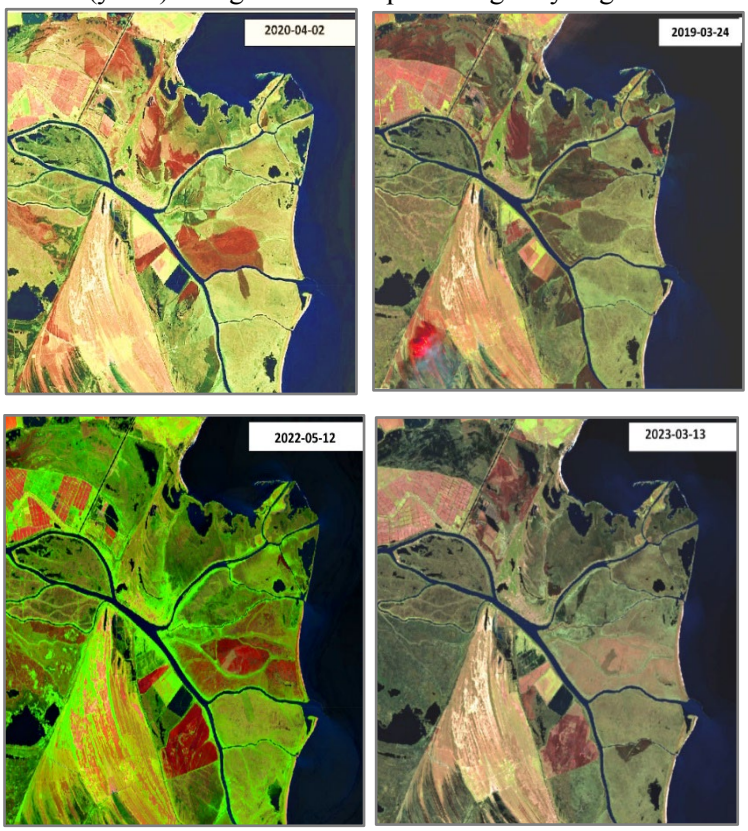

Figure 22. Fires in the northeastern part of the Danube Delta (Sentined-2 satellite images)

Conclusion

The way river flow regulation affects river deltas, and the local economy varies based on the climate, landforms, how the flow is managed, and other natural characteristics of the delta area. In the Black Sea basin, it's easy to see that changes in the deltas are mainly influenced by how they interact with the sea. In the Black Sea basin, changes in the deltas can be clearly traced, primarily depending on how they interact with the sea. On the Caucasian coast, deltas experience the influence of alongshore flows of sea water and sediments from the north, leading to coastal erosion at river mouths and sediment accumulation north of these mouths. Therefore, the erosion of the recreational zone (beach) in Batumi remains a topic of discussion now. Erosion processes are also taking place in the southern part of Poti city, but sediments are actively accumulating in the middle and northern parts of the coast. And their accumulation can create problems for the infrastructure under construction, around the new Port.

The deltas of the rivers on the Turkish coast, particularly the Kizilirmak River, are strongly influenced by the alongshore currents in the eastern direction. Their western shores have already formed high dune formations that slow down erosion processes. But in the mouths of rivers and on the eastern shores, turbulent flows intensively erode the shores, so special protective structures are already being built here to protect against erosion, although they do not fully protect against it. It is important to note that the circulating water flows along the eastern shore form alternating areas of erosion and sediment accumulation.

And this affects personally valuable extensive wetlands and the infrastructure of the coast occupied by recreational organisations and settlements.

Regulation of the flow of the rivers along the Caucasian and Turkish coasts in general optimises the water regime of the deltas and promotes their effective use in agriculture, horticulture, and recreation. However, we need to take measures to protect the valuable Ramsar wetlands.

Long estuaries form the deltas of the northern coast of the sea (Dnieper, Dniester), which do not interact with the sea. Therefore, their landscapes have sharply slowed their advance toward the sea and are experiencing stagnant phenomena. To optimise the water regime of ecosystems and support

fisheries, they need spring flushing releases from reservoirs. They currently face the devastating effects of war.

Both the river and the sea influence the Danube Delta. On a huge area of wetlands, there is a tendency to decrease the area under water (lakes, channels) and increase under vegetation at a rate of about 500 hectares per hour. The northwestern part of the delta is being developed for agriculture. On the seacoast of the delta, mineral and organic deposits mainly accumulate in the northern (Ukrainian) and middle parts, but erosion occurs in the southern part.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

V.S. made the biggest contribution, conceived of the presented idea, and took the lead in writing the manuscript. M. K. characterized Chorokhi and Rioni deltas. M. L. characterized Dnieper and Danube deltas. V. B. performed the cartographic part. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

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Reference

Bayram, A., & Kenanoglu, M. (2016). Variation of total suspended solids versus turbidity and Secchi disk depth in the Borçka Dam Reservoir, Çoruh River Basin. *Lake Reserv Manag, Vol 32*, 209-221.

Berkun, M., Aras E., & Akdemir, U. O. (2015). Water runoff, sediment transport and related impacts in the southeastern Black Sea rivers. *Environmental Engineering and Management Journal, 14(4)*, 781-791.

Erdoğan, A. (1970). *Geomorphology of the Kızılırmak Valley: Between Bafra Burnu and Delice Junction*. Ankara: Ankara Üniversitesi Basımevi.

Eruz, C., Kose, E., Guneroglu, A., Basar, E., Sivri, N., Feyzioglu, A. M., & Toraman, C. (2005). Suspended Solids Dynamics in the Eastern Black Sea rivers (in Turkish). *Turk Sucul Yasam Dergisi, 4*, 235-239.

Gagoshidze, Sh,, Kodua, M., Saghinadze, I., & Kadaria, I. (2017). *River hydro construction and geomorphological processes in the Black Sea coast of Georgia*. Tbilisi: 1st ed. Technical University.

Glenn, E.P., Lee C., Felger, R., & Zengel, S. (1966). Effect of water management on the wetlands of the Colorado River delta. *Conservation Biology 10(4),* 1175-1186.

Hay, B. J. (1994). Sediment and water discharge rates of Turkish Black Sea rivers before and after hydropower dam construction. *Environmental Geology, 23*, 276-283.

Jaoshvili, Sh. (1986). *Rivers of the Black Sea* (In Russian). Tbilisi: Sabtchota Sakartvelo.

Jaoshvili, Sh. (2002). *The rivers of the Black Sea*. Technical reports 71. Kopenhagen: European Environment Agency, 1-58.

Kiknadze, A. G. (1976). Dynamic systems and sediment budget in streams along the Black Sea coast of Georgia. In *Dynamics of seacoasts* (In Russian) (pp. 68–70). Tbilisi: Metsniereba.

Klaphake, A., & Scheumann, W. (2011). Coruh River Basin: Hydropower development and transboundary cooperation. In Springer eBooks (pp. 251–261). https://doi.org/10.1007/978-3-642-19636-2_14.

Makatsaria, A. (1973). Causes and possible measures to eliminate coastal erosion near the city of Poti. *Works of Geographer Communities of Georgia*. Tbilisi: Metsniereba.

Mikhailova, M, V. (2009). Water and sediment runoff at the mouths of rivers flowing into the Black Sea. *Environmental Research. Engineering and Management, Vol. 48*, 5-10.

Mikhailova, M. V., & Jaoshvili, Sh. V. (1998). Hydrology-morphological processes in the mouth area of the Rioni and their anthropogenic change (In Russian). *Water Resources, Vol. 25*, 152-160.

Ozturk, D., Beyazit, I., & Kilic, F. (2015). Spatiotemporal Analysis of Shoreline Changes of the Kizilirmak Delta. *Journal of Coastal Research 31(6),* 1389-1402. doi: https://doi.org/10.2112/JCOASTRES-D-14-00159.1

Saghinadze, I. (2013). Calculation of the coastal currents of the Black Sea in the area of Poti. *Journal of Georgian Engineering News, 2(66),* 101-104.

Saghinadze, I., & Kodua, M. (2019). A Mathematical Model of Sediment Transport of the Poti Coastal Zone. *International Journal of Engineering Research and Technology, 12(12)*, 3032-3037.

Saghinadze, I., Kodua, M., & Pkhakadze, M. (2024). The Influence of the New Breakwater of Poti Port on Litho-dynamics of the Coastline. *International Journal of Engineering Trends and Technology 72(5),* 227-231.

Sezer, U. (2009). Coruh river development plan. *International Workshop on Transboundary Water Resources Management*. Tbilisi: KS (DSI).

Starodubtsev V. M. (2013). Changes in the Danube Delta According to Remote Sensing Data by Landsat Satellite. *Arid Ecosystems, 4(3)*, 258-262.

Starodubtsev V, M. (2014). Flow regulation impact on land cover changes in river deltas of the Black Sea basin. Retrieved from http://www.sworld.com.ua/index.php/ru/conference/the-content-of-conferences/archives-of-individual-conferences/june-20

Starodubtsev V, M., & Petrenko, L. R. (2005). *Soil desertification in the river deltas (Part 1)*. Kyiv: Nora-Druk.

Starodubtsev V, M., & Truskavetsky S, R. (2011). Desertification processes in the Ili River delta under anthropogenic pressure. *Water Resources, 38,* 253-256.

Starodubtsev, V. M. (2007). Degradation Processes in Deltas of the Rivers with Flow Regulation. *Basin Water Management. Intern. Congress on River Basin Management,* 828-843. Retrieved from http://www2.dsi.gov.tr/english/congress2007/chapter2/66.pdf

Starodubtsev, V. M. (2017). Changes in land cover in the Rioni River delta. *Scientific World, 49*, 98-108. Retrieved from http://www.sworld.education/ntsw/49-2.pdf

Starodubtsev, V. M., & Basarab R, M. (2017). Changes in the Chorokhi River delta under the influence of economic activity. *Scientific works of SWorld, 2(48)*, 106-115.

Starodubtsev, V. M., & Rudchenko L, M. (2017a). Changes in land cover of the Kizilirmak River delta. *SWorld Journal*. Retrieved from http://wwww.sworld.education/index.php/ru/geography-ua217/physical-economic-and-social-geography-ua217/29304-ua217-047.

Starodubtsev, V. M., & Rudchenko, L. M. (2017b). Changes in land cover of the Yeshilirmak river delta. Bioresources and environmental management. *NUBiP of Ukraine, 9(3-4),* 8. Retrieved from http://journals.nubip.edu.ua/index.php/Bio/article/view/8986/8262

Starodubtsev, V. M., & Struk, V. (2013). *Danube delta: view from space*. Kherson: Oldi plus.

Tsereteli, E., Gobejishvili, R., Bolashvili, N., Geladze, V., & Gaprindashvili, G. (2011). Crisis intensification of Geoecological Situation of The Caucasus Black Sea Coast and The Strategy of Risk Reduction. *Procedia - Social and Behavioral Sciences, 19,* 709-715. https://doi.org/10.1016/j.sbspro.2011.05.189

Georgian Geographical Journal

Main Geographical Factors of Settlement Patterns and Natural Resource Use in Mountain Region: The Kvemo (Lower) Svaneti (Lentekhi Municipality) Case

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Abstract

The environmental exploitation of a region requires the study of its natural conditions and resources, as well as its geography and the related historical processes. In turn, the study of environmental conditions sheds light on material and non-material culture and traditions, as well as the patterns of natural resource use and settlement preferences. This research aims to evaluate natural resources in Kvemo (Lower) Svaneti (Lentekhi Municipality), identify the types of the natural-territorial complexes (landscapes), create a geo-informational database for the region, and establish the structure of the land resources and land use. The key outcome of this research is figuring out the landscape resources in the region, which was done by creating a geo-informative system for Kvemo Svaneti (Lentekhi Municipality) landscapes using GIS technology, based on materials from the 2023 expedition, aerial and satellite images, and topographic maps. A large-scale landscape map (1:50,000) of Kvemo Svaneti (Lentekhi Municipality) was created using GIS technology. The process identified 15 units of lower-level landscapes. According to the research findings, geographical conditions and the character of natural resource use in the region significantly influence landscape transformations, settlement preferences and farming. 43% of the territory is situated over 1000 m above sea level. Overall, Kvemo Svaneti is one of the sparsely populated regions, with 83% of its population living in small villages, each with up to 200 dwellers. The number of abandoned villages has increased (Lamanashuri, Ghobi, Tsana, and Koruldashi villages). In some villages (Bavari, Benieri, Buleshi, Zeskho, Mananuri, Kheria, etc.), the number of permanent dwellers ranges from 2 to 11. TLivestock farming is the primary form of agriculture in these areas, with pastures and haylands accounting for 92.4% of the total agricultural land. Traditional practices contribute to the development of animal farming. The upper hypsometric threshold of crop farming is 900 m.

Keywords: Natural resources, landscape map, Kvemo (Lower) Svaneti region (Lentekhi Municipality), settlement patterns

Introduction

The geographical peculiarities of mountain regions significantly influence the structure and location of settlements and the development of socioeconomic processes in mountainous landscapes. The northern highlands of Georgia, including Kvemo (Lower) Svaneti (Lentekhi Municipality), are among the highest elevations in the country. The dominant type of agriculture is traditional animal husbandry, with occasional farmlands in intermountain depressions and fluvial terraces. The region also has a developed forestry and recreational tourism industry. The informativeness of large-scale landscape maps is critical for analysing natural resources, agricultural activities, and their relationships with nature. Based on Kvemo (Lower) Svaneti (Lentekhi Municipality), large-scale landscape research created by authors shows that 15 landscape types are located in the Lentekhi Municipality area, with mountainous landscapes being the majority. The landscapes of Lentekhi Municipality's large-scale map (1:100,000) reflect the variety of individual components and their agricultural usage. As the result of landscape research, the Lentekhi Landscape geodatabase was created with ArcMap 10.8. The research revealed that both natural (geodynamic processes) and anthropogenic factors (overgrazing, deforestation) played a crucial role in the dynamics of landscapes. Kvemo (Lower) Svaneti (Lentekhi Municipality) is one of the sparsely populated regions of Georgia.

Most of the villages are situated in a linear pattern on the terraces along the Tskhenistskali, Kheledula, and Laskadula river gorges. Small villages with up to 200 people represent most (83%) of the settlement

areas, with Kheledi being the largest with 258 people. The number of abandoned and desolate villages has increased in the highlands and the high slopes of gorges (e.g., villages Lamanashuri, Ghobi, Tsana, and Koruldashi).

The number of settlements in Lentekhi Municipality according to height above sea level has been calculated.

We display the natural features of the landscape at different heights and assess their importance for farming, climate, and tourism.

Methods and Materials

The research has been conducted using stationary, semi-stationary, and field methodology (expeditionary, comparative, and statistical methods). The research draws on scientific literature about Kvemo Svaneti and cartographic maps, including "Landscape Map of Georgia" (Saneblidze et al., 1970) and "Transcaucasus Medium-Sized Landscape Map" (Ukleba et al., 1983), as well as topographic maps (scale: 1:50 000, 1:100 000) and statistical data. An important component of the resources is the field expedition conducted in 2023. We created an electronic landscape map (ArcGIS Pro) for the Lentekhi Municipality based on the expedition findings and several thematic maps. Both natural and socioeconomic factors influence the landscapes of Kvemo Svaneti. The region's peculiar landscape structure and the characteristic use of natural resources are determined by its natural conditions and specific geographical location.

Kvemo Svaneti is in the northwestern part of Georgia, on the northern slopes of the Svaneti Range (along the Caucasus ridge) and the southern slopes of the Greater Caucasus Ridge, in the Tskhenistskali River basin, its hypsometric levels ranging from 450 m (the Tskhenistskali gorge) to 4547 m (the Ailama hill on the Greater Caucasus). It is bordered by Chkhorotsku and Martvili Municipalities in the west, Mestia Municipality and the Kabardino-Balkarian Republic (the Russian Federation) in the north, Ambolauri Municipality in the east, and Tsageri Municipality in the south (Salukvadze et al., 2021; Salukvadze & Chaladze, 2024). There is one administrative unit in Kvemo Svaneti, Lentekhi Municipality (area 1344 sq. km), represented by 1 township, 8 rural districts (communities), and 60 villages. The population amounts to 4386 people (the level of population density is quite low, 3.3 per sq. km). 29.3% of the population of Lentekhi Municipality lives in urban areas and 70.7% in villages (Lentekhi Municipality priority…, 2024).

Results

The territory of Kvemo Svaneti is mainly confined to the middle and lower basins of the Tskhenistskali River, which are drained by Tskhenistskali and its tributaries: Kheledula, Laskadura, Zseskho, Gobishuri, Leusheri, Khopuri, and others. In the north, the region is locked by the Svaneti and the Greater Caucasus ranges; in the west and southwest, it is bordered by the Egrisi range, while in the east and southeast, it is bound by the Lechkhumi range. These ranges, and their extensions, occupy the main part of the Kvemo Svaneti territory. Kvemo Svaneti is a mountainous region with high- and medium-altitude mountain reliefs, and 43% of its territory is over 1000 m above sea level.

The region has a complex geological structure, which plays a major role in the diversity of its landscapes. The lower part—riverbanks and terraces— is built of Quaternary alluvial deposits. The southern slopes of the Egrisi and Lechkhumi ranges are largely built of Bajocian porphyrites and tufa deposits. The relief is comparatively steep and rocky. The axial parts of the Egrisi, Lechkhumi, and Svaneti ranges are mostly built of Jurassic rocks, occasionally combined with flysch sequences and non-karstic limestone. These rock layers are linked to strong mountain streams found in the Lechkhumi and Svaneti ranges, while the southern sides of the Greater Caucasus are mostly made up of older Paleozoic granitoids and crystalline rocks (Tatashidze et al., 2000).

Kvemo Svaneti has deposits of arsenic (not mined), quartz, barite, copper (the Zeskho ore), marble (Choluri village), lead-zinc (Rtskhmeluri village ore), and coarse sand-gravel (Kheledi-Khacheshi ore) (Khazaradze & Salukvadze, 2022). The Lentekhi region is rich in chemically diverse mineral waters. Mineral springs can be found all over the Kvemo Svaneti territory, and their number exceeds 20 (Lentekhi Municipality Vision and..., 2024).

Lentekhi Municipality has abundant water resources (drinking water springs and rivers). Tskhenistskali is the main river of the municipality. Its tributaries are Kheledula, Laskadula, Koruldashi, Ghobishuri, Zeskho, Khopuri, and other big or small rivers, together totalling 40. The region has remarkable hydropower potential and rich drinking water supplies.

Hydropower is the region's most important natural resource. Tskhenistskali stands out for its high discharge rate and a long high-water period, which significantly increases the estimated economic efficiency of hydropower arrangements on the river. A large (64%) part of the area is covered by forests, which is an important asset in Svaneti's natural capital (Kharaishvili, G., 1988; Lentekhi Municipality priority, 2024).

The climate is elevation-dependent because of the mountain relief, ranging from humid subtropical to

continental. The lower area is characterised by humidity, cold winters, and long, cool summers. Long, warm summers are characteristic of a brief section of the Tskhenistskali gorge. The average annual temperature in mountain forests (up to 1900–2000 m) ranges between 3.2 and 9.4: 3.20 in Korulda (1943 m above sea level) and 9.40 in Lentekhi (760 m above sea level). Hence, the average temperature is 6.9-1.80 in January and 12.9-200 in July. The lowest and highest recorded temperatures are -330, -260, and -320-390, respectively. Annual precipitation ranges between 1250 and 1400 mm; above the forest zone, there is a humid mountain climate with cold winters and short, cool summers. The snow cover duration is 80 days in Lentekhi and 170 days in Koruldashi (Meladze & Meladze, 2012).

The region has a broad hypsometric spectrum, which accounts for its diverse climate. We can distinguish the following types of climate (Mumladze & Lomidze, 2018).

· Humid climate with cold winters and long cool summers;
· Humid climate with long cold winters and short summers;
· Humid high mountain climate with no real summer;
· Humid mountain climate with abundant snow and glaciers.

According to agro-climatic zoning, the following sub-zones of the moderate belt are distinguished in Kvemo Svaneti: moderately warm, humid; moderately cold, with high humidity; and moderately humid, with moderate-to-high humidity. In agro-climatic terms, Kvemo Svaneti belongs to the moderately humid district of western Georgia's western Caucasus sub-region (Gagua, 2018).

In the lower zone, intensive vegetation starts from April 4-10-19 and continues to the end of October and beginning of November (Table 1). In years with early-fall and late-spring frosts, the vegetation period can be one month shorter (Meladze & Meladze, 2012; Elizbarashvili et al., 2004; Elizbarashvili & Elizbarashvili, 2021).

Table 1. Agro-climate characteristics of the Kvemo Svaneti Region (Lentekhi municipality)

Object	M. above sea level (m)	The sum of active temperatures ($10^{0>}$)	Absolute minimum temperature (average) (C^0)	Moisture rate	Annual sum of atmospheric Precipitation (mm)	Duration of frost-free days
Lentekhi	**760**	**3030**	**-26**	**8.6**	**1250**	**189**
Koruldashi	**1940**	**1070**	**-33**	**6.2**	**1390**	**130**

In the lower part of the region, there are narrow strips of alluvial soil along riverbanks, first grey-brown and further typical grey-brown forest soils, while at a higher hypsometric level, under the canopy of dark conifers, there are podsolic ashen grey soils. Mountain forest-meadow soils are frequent in the high mountain zones, between 2000 and 2250 m above sea level. At a higher elevation, they are replaced by mountain-meadow soils and even higher—by primitive soils.

The region stands out for its diverse flora and is characterised by a structure typical of the Colchian Floral Province. The Kvemo Svaneti's natural flora is mainly represented by oak, hornbeam (Carpinus caucasicus), beech, and pine. The region's flora includes fir, spruce, chestnut, alder, and birch. Colchic flora, represented by Colchic holly and ruscus (butcher's broom), can be found in the region's westernmost part. Alder forests are common on the riversides up to the upper zone, as well as in highly humid landslide geosystems. Former agricultural sites often contributed to the spread of fir trees. Beech forests are mostly found at mid-altitude, being occasionally replaced by dark conifers. Dark conifers are widely spread in the Murgouli, Koruldashi, and Devashi gorges; the largest stock is in the Kheledula River gorge. Dark conifers are often mixed with birch trees. High mountain forest areas are common from 1700 m to 2000 m, reaching 2350 m. They are represented by Litvinov birches, high mountain sycamores, and, occasionally, beech forests. Here, mixed forests mostly include birches, rowans, and goat willows. Tall herbs, such as rhododendrons and occasionally junipers, vacciniums, and other shrubs, represent the higher sub-Alpine zone. This zone reaches 2650-2700 m and is gradually replaced by the Alpine zone, which in turn is followed by subnivean and nivean zones.

The forests have climate-curative, soil-protecting, and water-conservation functions and therefore belong to landscapes with high ecological value (Salukvadze et al., 2022).

The dark conifer forest landscapes at mid-elevation are scarcely populated and are distinguished by their natural resource potential. They also have significant touristic and recreational potential: the Buashi climatic-balneological resort and the Ailama mountaineering camp are set up in this landscape zone.

Settlement types vary in the conditions of the extensive elevation range of the populated area (1430 m) and highly heterogeneous reliefs. Most of the villages are situated in a linear pattern on the terraces along the main river gorges of Tskhenistskali, Kheledula, and Laskadula. High mountain villages at the top of the vertical scale of settled areas are not large. The number of abandoned and desolate villages

has increased in the highlands and the high slopes of gorges (e.g., villages Lamanashuri, Ghobi, Tsana, and Koruldashi). In some of them (Bavari, Benieri, Buleshi, Zeskho, Mananuri, Kheria, etc.), the number of permanent dwellers ranges from 2 to 11. The Tskhenistskali middle basin gorge has an elevation range of 540 to 640 metres. Rtskhmeluri, Gvimbrala, Kvedreshi, and Tsiplkakia are the villages with the lowest altitude (540 m), while Makhashi has the highest altitude (1560 m). Overall, Kvemo Savneti is one of the sparsely populated regions, as most of the settlements (83%) are small villages (up to 200 dwellers). The largest village (258 people) is Kheledi.

According to the altitudinal scale, 17 villages, which make up 28.3% of the total Kvemo Svaneti villages, are situated between 540 and 1000 m above sea level, 33 villages (55%) are found between 1040 and 1500 m, and 10 villages (16.7%) are between 1560 and 1970 m (Fig. 1).

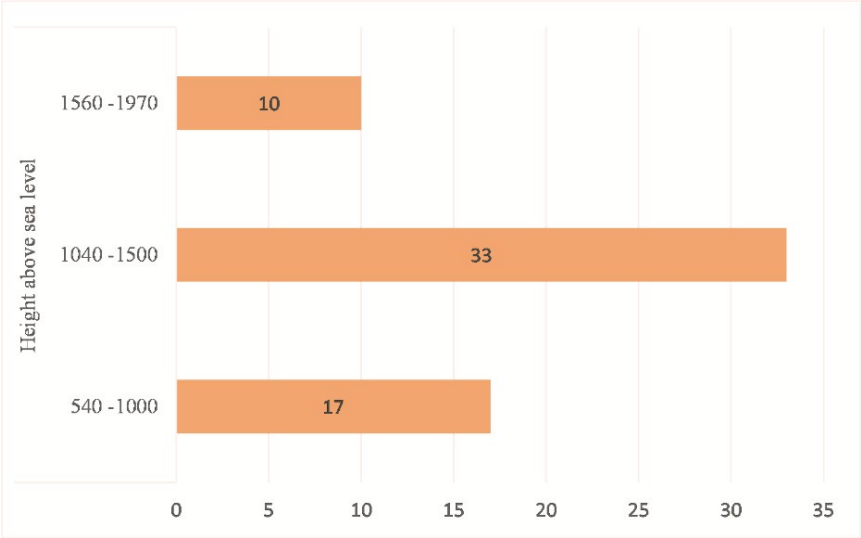

Figure 1. Number of settlements in Lentekhi Municipality according to height above sea level

Scarcity of cultivated lands and large settlement areas, underdeveloped transportation networks and industry (arsenic is no longer mined in Tsana village), and underutilised recreational resources result in a low level of agriculture and unfavourable conditions, which is associated with a low level of settlements. It should be noted that migrations in the last two decades have had a significant adverse effect on the region's settlement—specifically, migration from the highlands to small towns, then to the cities or abroad (to Spain, Germany, Italy, Greece, and Russia), which was also confirmed by responses to the socioeconomic questionnaire specially designed for the field expedition.

Apart from severe natural conditions, the settlement curve in the highlands is also influenced by natural disasters—avalanches, landslides, lahars, floods, etc. Natural disasters lead to a decrease in population in Svaneti. Between 1988 and 1991, avalanches and landslides left dozens of families without roofs, forcing them to resettle primarily in the western regions of Georgia. As a result, the level of the Highland population sharply declined.

The following trend has been revealed in the migration of the rural population: young people most often abandon villages with scarce usable lands, limited agricultural opportunities, low income, and poor standards of living (as compared to modern standards). According to the 2002 General Population Census, the population in Lentekhi Municipality totalled 6984, while according to the most recent census (2014), the figure decreased to 4386, which marks a 37.1% decline.

There can be individual as well as group resettlements, the latter being associated with natural disasters. For example, due to avalanches, several families in Kakhura village, Liskadura gorge, migrated to a different part of the same village as well as to the neighbouring village Melura.

Land resources are distributed across different zones. The following altitudinal zones can be distinguished above sea level: 500-1000 m—with natural croplands, developed livestock farming, and vegetable, potato, and grain harvesting; 1000-1500 m—with pastures and arable/hay farming; 1500-2000 m—with hay farming; above 2000 m—with lands unfit for agriculture.

The region's relatively severe climate and complex relief account for the shortage of arable lands, which in turn limits opportunities for intensive and comprehensive development of agriculture. The locals mostly grow maize and potatoes and have gardens. The most common fruit trees are apples, pears, and plums. Grapes are less common and are mainly grown in the lower zone, 800 m above sea level.

According to the 2022 data, the total land resources equal 105.758 ha, of which 1.560 ha (1.1%) are arable land, perennial plants make up only 140 ha (0.2%), haylands ha (4.1%), and pastures ha (11.7%). A large area is covered with forests, bushes, and shrubbery (83.215 ha), which is more than a half (61.9%) of the total area. Other types of land cover a total of 28.642 ha (see Fig. 2):

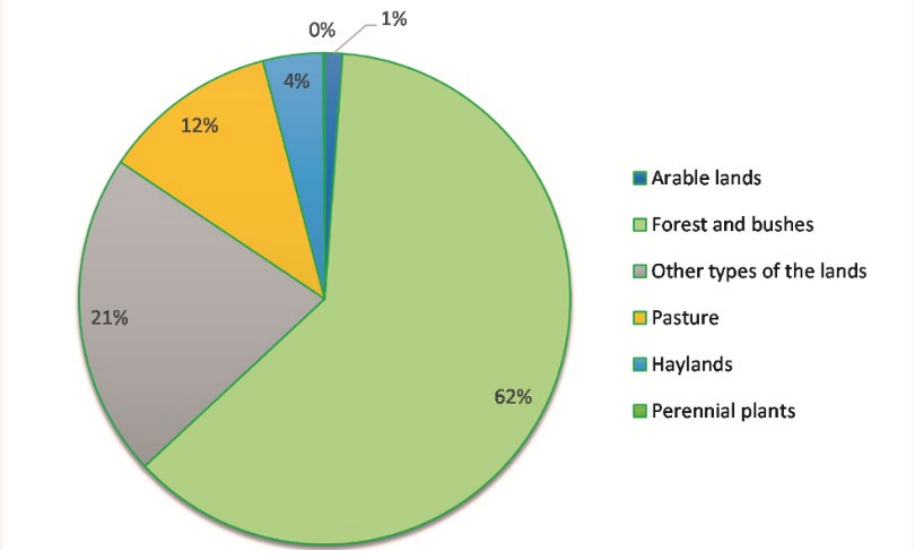

Figure 2. The Structure of Lentekhi Municipality land resources in % (2022)

The main agricultural and settlement zone is situated 1000-2000 m above sea level, which is approximately 1/3 of the total area of the region.

Due to severe soil erosion resulting from unsustainable use of land resources, unregulated use of pastures, and other socioeconomic reasons, a significant area of land has been wasted or become less fit for intensive cultivation.

Different species of perennial plants are spread over the following areas (Fig. 3): grapes—32 ha; acinaceous fruit trees—87 ha; and juglandaceae—21 ha. Of grape species, white Jvarisa grapes commonly grow in the lower zone (villages Kheledi and the Kheledula gorge), and Kachichi is spread in the higher zone (the Tskhenistskali gorge). Gardening is underdeveloped in the municipality due to overgrown trees and low prices on fruit. Gardening is more common for highland villages of the region. If we invest in building a processing plant, the branch will flourish. Fruits grown in this region are fully organic and, by taste, are not inferior to fruits grown in other regions.

52% (11,691 ha) of agricultural lands are state-owned, while 48% (10,821 ha) are private property.

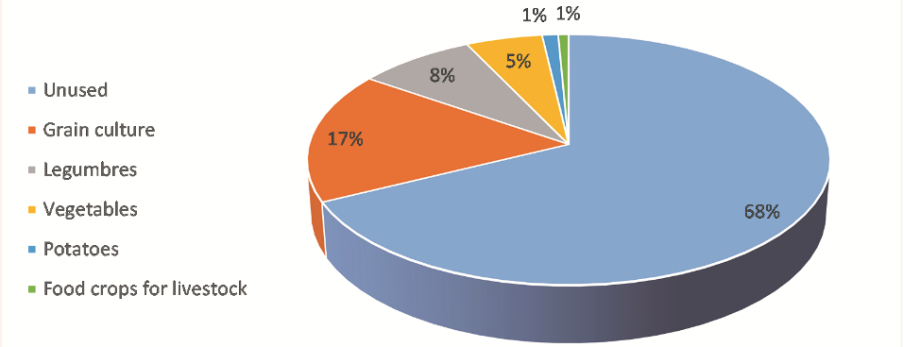

Figure 3. The structure of agricultural plots in Lentekhi municipality

Severe winters and the geography of the region do not allow the development of multi-branch and multifunctional agriculture (Fig. 4). Market access is a problem for local farmers. On the other hand, the natural environment and agricultural lands are preconditions for developing livestock farming, potato farming, and apiculture. Lower-zone villages of Lentekhi Municipality (Rtskhmelura, Gvimbrala, Nanari, and Khopuri) have a market gardening potential as well. The most marketable crop in the region is the potato. It is quite popular and highly demanded on the market. Potatoes are mainly transported to the Kutaisi market or sold to local traders.

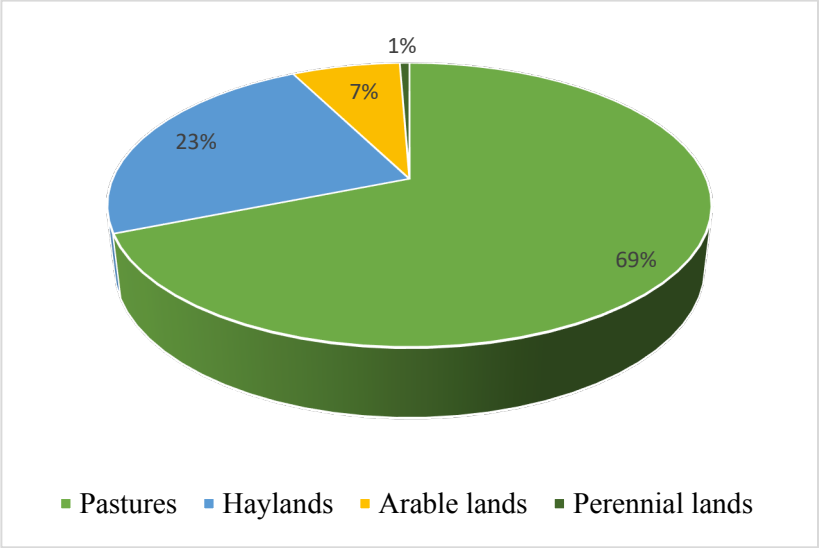

Figure 4. Structure of agricultural crops in Lentekhi municipality

The following changes occurred in agricultural land areas between 1972 and 2022 (Fig. 5):

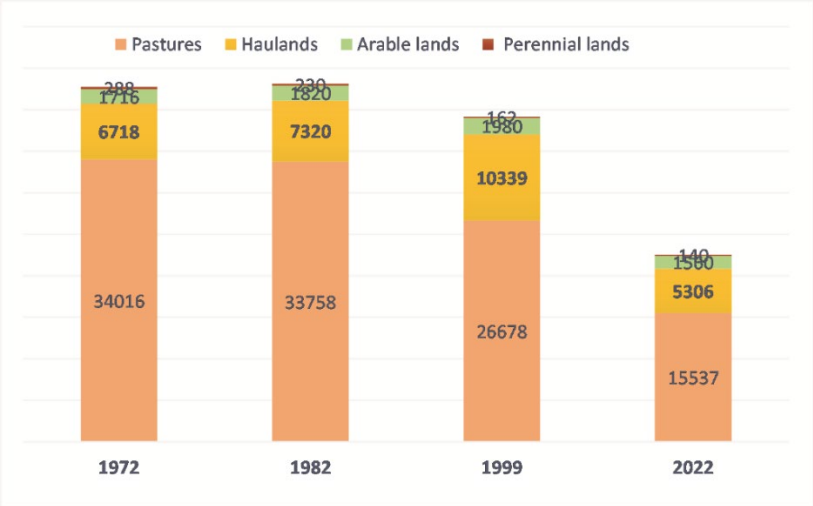

Figure 5. Land Use Changes in Lentekhi Municipality (1972-2022)

The total area of pastures insignificantly declined during the period; however, the 2022 figure is 2.3 times lower as compared to 1972. Hayland areas gradually grew at the expense of pastures; however, the 2022 figure is twice as low as in 1999. The area of arable land insignificantly (by 264 ha) grew between 1972 and 1999 but decreased by 420 ha relative to 1999. Perennial plantations had a declining trend during the period, with a 140 ha decrease recorded in 2022.

Because of natural, socioeconomic, and historical factors, as well as by virtue of the traditional practices, animal farming has always been a leading branch of agriculture in the region. It is a traditional branch in Lentekhi Municipality and has always been the main source of income for local farmers. The following table shows livestock counts in the municipality (Table 2).

Table 2. Livestock counts in Lentekhi Municipality as of 2018.

Cattle	5191
Swine	500
Goats and sheep	50

Cattle breeding plays a leading role in the region. The locals own 5191 cattle heads, including 2500 cows. Other home-farmed cattle in the municipality include 500 heads of swine and 50 goats and sheep. The total number of poultry is 10,000 (Lentekhi Municipality Vision &..., 2024).

Cattle numbers have sharply decreased in the last few decades due to low production capacity, home-made manufacturing of dairy products, and challenges related to market access. Given the region's remarkable potential for cattle breeding—hayfields, pastures, basic traditions, and experience—the existing cattle count would significantly increase if all available resources were used. The increase in

turn would result in higher volumes of meat and dairy products, which are always in high demand. Furthermore, locals use cattle, specifically oxen, as draught animals. Thus, animal farming has much greater potential for development. Only in the summer do farmers move their cattle to highland pastures. In other seasons, the locals use nearby pastures or fodder (in winter).

Beekeeping has been a traditional practice in Svaneti. The high quality of honey was determined by the abundance and diversity of trees and sub-Alpine and Alpine plants in Lentekhi Municipality, which speaks of the high potential of the branch in the region. Currently, there are 230 beekeepers in the municipality, with a total of 1800 hives.

A significant part of the forest area in Lentekhi Municipality survives pristine. Forests in the region are distinguished by biodiversity and multifunctionality. Apart from their role in industry, forests protect soil and regulate climate and water. They also are the source of firewood and timber for the population.

For now, industry remains rather underdeveloped in the region, being mainly represented by wood processing (6 small and 1 medium-sized mill). Another prominent branch of industry is food processing— mostly the processing of fruit and agricultural products.

The region's geography, scenery, climate, fresh air, abundance of fir and deciduous forests, cultural monuments, mineral waters, and other natural resources create unique conditions for tourism (auto-tourism, hiking, hunting, ecotourism, etc.). Of special note are the climatic-balneological resorts Muashi and Zeskho, which have the potential to become ski resorts. As a result, Zeskho will be able to receive visitors all year round and, importantly, contribute to the socioeconomic growth of the region. Koruldashi village, likewise, has all necessary conditions for the development of a ski resort.

The municipality also has balneological potential, as it is rich in spring waters that are favourable for rheumatic diseases and arthritis. There used to be recreational facilities in the region, which no longer exist.

The current structure and performance of the landscapes are directly associated with geological factors, as well as the type and scale of human activities.

In the region, landform-shaping factors include the prominent hypsometric curve, the diverse lithological structure, and orographical units. Exogenic processes—mechanical and chemical weathering and accumulation, landslides, mudflows, etc.—play a major role, as they account for the meso- and micro-relief diversity. In mountainous regions, their intensity primarily depends on factors such as absolute height, relief exposition, and declension.

We carried out comprehensive studies of landscapes in the territory of the region. We estimate each distinguished landscape type based on its natural conditions and potential resource usage. In the territory of Lentekhi Municipality, we distinguished 15 types of landscapes (Fig. 6): The Lentekhi Municipality Landscapes:

1. Medium mountains, erosive-denudative, built with Bayosian porphyrites, clays, and sandstones. In some places (in the lower part), beech and hornbeam-beech forests coexist with beech-chestnut forests, characterised by deciduous undergrowth and elements of evergreen undergrowth on brown forest soils. It includes the extreme eastern part of the Egrisi ridge and the slopes of the extreme western end of the Lechkhumi ridge. It is located near the villages of Naghomari, Kverdeshi, and Rtkhmeluri.
2. Medium mountains, built of Liassic shales and sandstones, with beech, chestnut-beech, and beech-hornbeam forest, in some places with dark evergreen forest elements and scattered evergreen undergrowth, on brown forest soils. The landscape extends to the Tskhenistskali River to the left and the Khledula River to the right, south of Lentekhi.
3. Medium mountains with erosive-accumulative relief, built of Leasian shales and sandstones with Quaternary fluvioglacial deposits, with beech-chestnut-hornbeam and oak forests and their derivatives, with deciduous undergrowth and shrubs, partly with agricultural fields and populated areas. The landscape extends to the river. The landscape encompasses both the right side of Tskhenistskali and the river itself. The landscape can be found on the left slope of Kheledula, as well as in the extreme lower part of Laskadura, specifically in the areas of Lentekhi, Kakhura, Tsanashi, Lesema, and Babili.
4. Middle mountains, erosive-accumulative relief, built of Liassic shales and sandstones and Quaternary alluvium, clays, and conglomerates; oak and oak-hornbeam; and on the northern slopes with hornbeam-beech, beech-chestnut, and beech forest; evergreen undergrowth; agricultural fields; and pastures on alluvial and brown forest soils. Extends to the river The Kheledula valley stretches from Tsanashi to Tskhumaldi.
5. Middle mountains, built up of Quaternary layers, Liassic clay shales and sandstones, and middle mountains, with oak and oak-hornbeam forests and their derivatives, strongly transformed as a result of human activity. It spreads in the eastern part of the Kvemo Svaneti depression, from the river Cholshura to the river Kheshkuri. On the right slope of Tskhenistskali, in the areas of the villages Tekali and Sakdari.

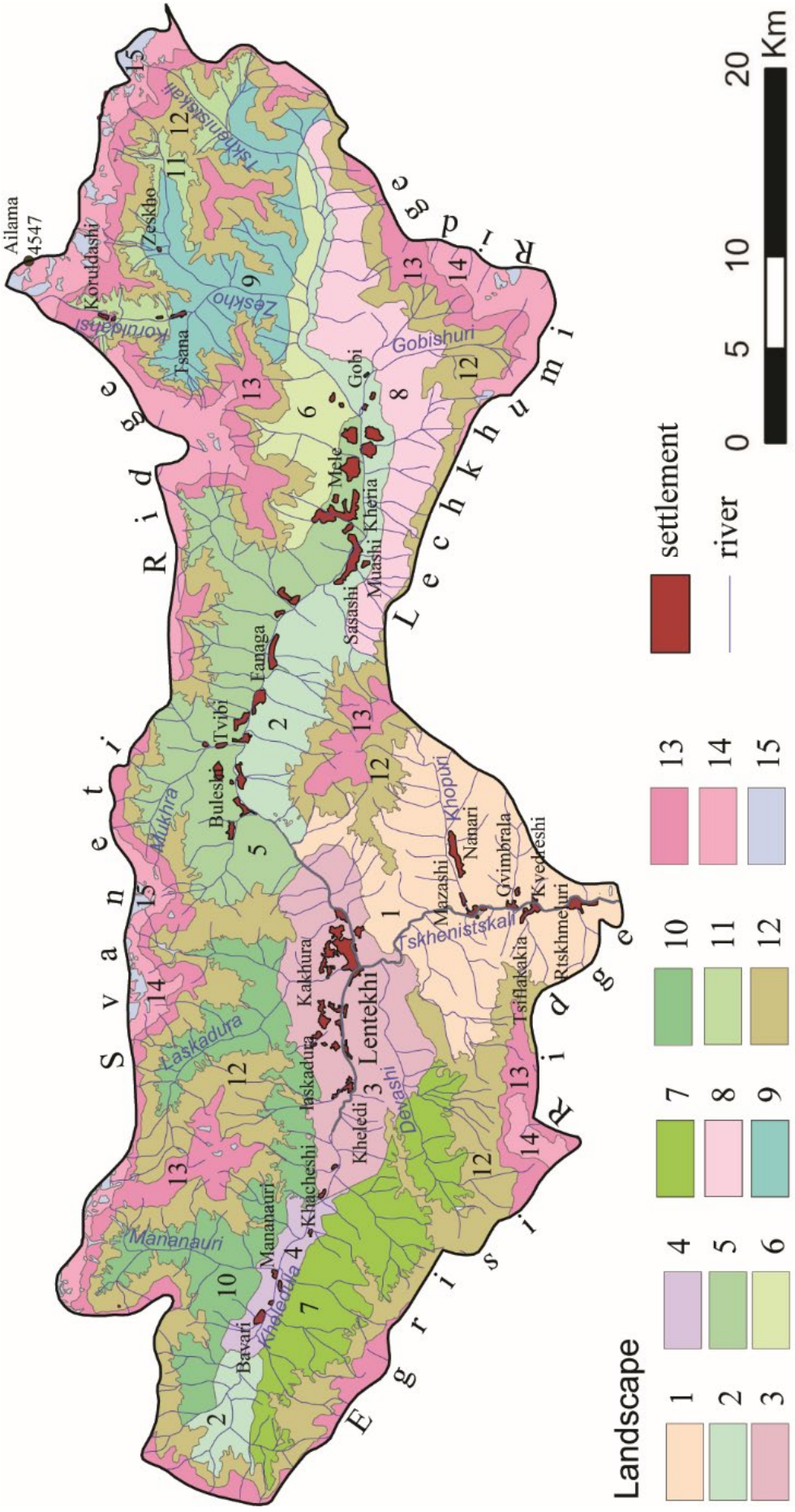

Figure 6. Lentekhi Municipality Landscapes

6. Middle mountains, with an excess of terraces, beech, birch, and alder forests—in some places with oak— on brown forest soils. It extends to the river on the right slope of the Tskhenistskali River, to the east of the mouth of the Koruldashi River.
7. Middle mountains, with beech-coniferous and coniferous forest. The landscape is characterised by deciduous and occasionally evergreen undergrowth, brown forest, and dark grey podzolic soils. The landscape extends to the Devashi River valley, on the eastern slopes of the Egrisi ridge and the southern exposure of the Shvi ridge, and the river in the valleys of the right tributaries of Kheledula.
8. Middle mountains, built with Triassic shales and Liassic layers, and beech-fir forest extend the landscape to the river Tshenistskali, from Lentekhi to the Murgouli river, on the slopes of the northern exposure of the Lechkhumi ridge. This is the northern exposure of the Lechkhumi ridge.
9. Middle mountains, Built with Jurassic layers, steep and rocky slopes with coniferous and birch-coniferous forests, deciduous undergrowth, brown forest and dark grey podzolic soil. The landscape extends to the river in Koruldashi and Zeskho valleys, above sea level (1400-2100 m).
10. High mountains, built of Liassic shales and sandstones, with birch and beech-birch forest, with dense vegetation on mountain forest-meadow soils. The landscape extends to the slopes of the southern exposure of the Svaneti Ridge in its western part, along the rivers in the valleys of Khledula, Skiliri, and Lascadura.
11. High mountains, built with crystalline rocks and Jurassic layers, with birch forest and mountain-forest-meadow soils. It extends to the extreme eastern part of the Svaneti range and the southern slopes of the main Caucasus range, in the upper parts of the rivers Koruldashi, Zeskho, and Tskhenistskali.
12. High mountains, Built of Jurassic sandstones, shales and crystalline rocks, with subalpine meadows, with fragments of crooked birch and with subalpine shrubs, on the mountain-meadow soils. It extends to the southern exposure of the Svaneti ridge and the slopes of the main Caucasus ridge (Ailama peak), above sea level at 2650 m, also on the ridges of Egrisi and Lechkhumi.
13. High mountain alpine meadows, in some places with the participation of rhododendrons, are shrubs. It is spread in a continuous strip on the south of the Greater Caucasus range, the Lechkhumi ridge, as well as on the south of the Svaneti ridge and on the slopes of the northern exposure of the Egris ridge, from approximately 2650 m to 3000 m above sea level.
14. High mountain subnival landscapes are spread on the crests of the Greater Caucasus range, Lechkhumi, Svaneti, and Egris ranges, at 2950-3500 m above sea level.
15. Glacial-nival landscapes northeast of Lentekhi on the Greater Caucasus, with glaciers and eternal snow.

Discussions

The goal of the research is to assess natural resources, identify separate natural-territorial complexes (landscapes) as landscape types, and create a geo-informational database. For that purpose we had scientific fieldwork in Lentekhi Municipality (in 2023). We observed the natural and anthropogenic factors in the landscapes, which had undergone changes due to human activities. The materials obtained in the field immensely helped us to reveal the natural and anthropogenic landscapes of the region and define their boundaries. We distinguished landscapes and created a geo-information system of the landscapes of Lentekhi, Lentekhi Municipality.

Conclusion

Thus, geographical factors, including relief, climate, and soil, significantly influence the structure of natural resource use and the settlement patterns in the Kvemo Svaneti region.

43% of the total territory, drained by deep-set rivers, is over 1000 m above sea level. The terraces along the Tskhenistskali, Kheledula, and Laskadula river gorges host most of the villages in a linear pattern. Most (83%) of the settlement areas are represented by small (up to 200 people) villages, the largest one being Kheledi (258 people). 28.3% of Kvemo Svaneti villages are situated from 540 m to 1000 m above sea level, 55% are between 1040 and 1500 m, and 16.7% are between 1560 and 1970 m.

By their natural conditions, Kvemo Svaneti landscapes are especially fit for livestock farming, crop farming, and recreational tourism.

The biggest part (92.4%) of agricultural lands is pastures and haylands. Only 7.1% of agricultural lands are arable, with perennial crops accounting for only 0.2%. Arable lands are found up to 800 m above sea level. Annual sunshine duration is more than 2200 hours. The region is rich in mineral waters and forest areas (64%), which determine its touristic and recreational potential.

As a result of the physicogeographical study of Kvemo Svaneti (Lentekhi Municipality), a large-scale (1:100,000) map of Lentekhi Municipality was created, with 15 landscape sub-types. The types of landscapes identified reveal the natural diversity and potential of the region. The majority (76.7%) of

the region consists of mountainous landscapes. Of the landscape types identified, some are fit for agricultural activities, some for forest resource management, and some for recreational purposes.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

E.S. led the writing of the article, distinguished the separate landscapes of the Kvemo Svaneti Region as landscape types, and compiled a large-scale landscape map and a diagram: Number of settlements in Lentekhi Municipality, according to height above sea level: The structure of Lentekhi Municipality land resources in % (2022); the structure of agricultural plots in Lentekhi municipality; Structure of agricultural crops in Lentekhi municipality: Land Use Changes in Lentekhi Municipality (1972–2022). T. C. compiled a geoinformational database of Kvemo Svaneti (Lentekhi Municipality) landscapes in GIS and provided an electronic version of the landscape map of Kvemo Svaneti (Lentekhi Municipality).

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Reference

Gagua, G. (2018). Agroclimatic Zoning of Georgia, Tbilisi.

Elizbarashvili, E. Papinashvili, L. & Kartvelishvili, L. (2004). *Scientific-Applied Reference Book of Georgia*, *Part 1: Separate Climatic Characters*. Tbilisi: Bakur Sulakauri Pablishing.

Elizbarashvili, E. & Elizbarashvili, Sh. (2021. Atmospheric precipitation. In: Climate of Georgia, 8. Racha – Lechkhumi, Kvemo Svaneti. Scientific Reviewed proceedings of the Institute of hydrometeorology of the Georgian Technical University # 130, 41-48. Tbilisi: Publishing House Technical University, (in Georgian)

Khazaradze, R. & Salukvadze, E. (2022). *Mineral Resources*. In: Bolashvili, & N., Neidze, V. (eds) *The Physical Geography of Georgia*. Geography of the Physical Environment. Springer, Cham. https://doi.org/10.1007/978-3-030-90753-2_4

Kharaishvili, G. (1988). Water protection and soil protection role of mountain forests. *The role of forests in nature conservation Georgia*, Tbilisi: Tsodna.

Lentekhi Municipality priority document. 2023--2026. (2024) https://lentekhi.gov.ge

Lentekhi Municipality Vision and Mission 2021-2024. (2024) https://lentekhi.gov.ge

Meladze, G. & Meladze, M. (2012). *The Racha-Lechkhumi-Kvemo Svaneti Region. In: Agroclimatic Resources of Western Regions of Georgia,* Tbilisi: Universali

Mumladze, D. & Lomidze, N. (2018). Climate types, map in: National Atlas of Georgia, Editor N. Bolashvili, A. Dittman, L. King & V. Neidze. Franc Steiner Verlag, Stuttgart. 56

Salukvadze, E. (2021). Protected Areas and Natural Landscapes – An Essential Factor for Sustainable Development of Ecotourism in Mountainous Regions. *Georgian Geographical Journal.* https://doi.org/10.52340/ggj.2021.259

Salukvadze, E. Chaladze, T. & Gogidze, K. (2021). The Natural Resources Potential and Pecularities of Their Exploitation in Mountainous Regions (The Case of Kvemo Racha, Georgia) *Georgian Geographical Journal*. https://doi.org/10.52340/ggj.2021.258

Salukvadze, E. Tsitsagi, M. (2022). Environment Protection. In: Bolashvili, N., Neidze, V. (eds) The Physical Geography of Georgia. Geography of the Physical Environment. Springer, Cham. https://doi.org/10.1007/978-3-030-90753-2_18

Salukvadze, E. & Chaladze, T. (2024). The Natural Resource Potential of landscapes in the Lechkhumi Region (Tsageri Municipality). *Georgian Geographical Journal*. https://doi.org/10.52340/ggj.2024.04.01.08

Saneblidze, M., Ukleba, D., & Jakeli, Ch. (1970). Landscape Map of Georgia (1:600,000)], Tbilisi-Moscow: Main Department of Geodesy and Cartography/Russia, Moscow (in Georgian).

Tatashidze, Z. Ts'ereteli, E., & Khazaradze, R. (2000). Elemental natural processes. In: Geography of Georgia, Part I, Physical Geography of Georgia, Tbilisi: Metsniereba, 69-83.

Ukleba, D. Budagov, B. Museibov, M. Sokhadze, E., & Bagdasarov, Al. (1983). Landšaftnaja karta Zakavkazija, Glavnyi departament geodezii i kartografii map of the South Caucasus, (1:600,000)], Main Department of Geodesy and Cartography. Russia, Moscow.

Georgian Geographical Journal

Demographic Situation in Modern Abkhazia - Fact or fiction?

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Abstract

In the period after the armed conflict in Abkhazia (14.08.1992-27.09.1993), there is no reliable information about demographic data. The first official information about the population - published by the Department of State Statistics (in 2019 was renamed the State Committee) of unrecognized Republic of Abkhazia appeared in 2005. Since 2010, the statistical abstract "Abkhazia in Figures" has been regularly published, which, unlike the 2005 edition, no longer has classified as - "for official use". The demographic situation of modern Abkhazia is discussed on the basis of official Abkhaz sources. The article also uses data from foreign, Abkhaz experts and various international organizations, which significantly differ from official data. Even such a general indicator as the total number of population is unclear. The opinion was expressed that the official data does not reflect the reality. The theory of demographic transition and the estimated crude mortality rate were used to calculate the population size. According to calculations, the population is in the range of 140-160 thousand.

Keywords: Abkhazia, population, demographic transition, birth, death, migration.

Introduction

According to the 1989 Soviet census, population of Abkhazia made up 525 061, including 239 872 ethnic Georgians (45.7%), 93 267 – Abkhazians (17.8%), 76 541 – Armenians (14.6%), 74 914 Russians (14.3%) and other nationalities 40 467 (7.7%) (Saqartvelos mosakhleobis erovnuli…,1991), among which the Greeks and Ukrainians stood out in numbers.

The military operations in Abkhazia began in 1992. The opposing side of Georgia was represented by Abkhaz, North Caucasian mercenaries and units of the Russian regular army. It can be said that it was conflict disguised by diplomatic rhetoric between Georgia and its former metropolis Russia (Gachechiladze, 2011).

The exact number of those killed during the ethnic cleansing is disputed. According to the Georgian government's Committee on Human Rights and Interethnic Relations, 4000 individuals from the Georgian side, both civilians and combatants, were killed, 10000 were wounded, and 1000 are missing. The Abkhazian Committee for Human Rights gives the following casualty figures for the "duration of the war," which they set as August 14, 1992 through September 30, 1993: 4040 killed (2220 combatants, 1820 civilians); approximately 8000 wounded; 122 missing in action (Georgia Abkhazia: Violations ..., 1995), more than 20 thousand became refugees (Apkhazeti udzvelesi droidan…, 2007). Other sources, emphasizing ethnic cleansing, cite the figure for deaths as between 25 000 and 30 000 (Derloguian, 1998). Nearly 250 thousand Georgians were forced to escape blood freezing horrifying humiliations, tortures, shootings. Apart for ethnic Georgians, nearly 100 thousand persons of other ethnic origin escaped from Abkhazia, including ethnic Russians, Greeks, Armenians, Estonians. Even thousands of Abkhazians left native land, unwilling to be the part of the Fascist Regime (Alexidze, 2009).

Although there are no active hostilities today, ethnic cleansing and genocide continue to this day through various methods. As a result of the tragic events that took place in Abkhazia, the number of population sharply decreased, and the ethnic composition changed radically.

Methods and Materials

Primary sources of data are: scientific works and articles published in the Abkhaz, Georgian and foreign press. Official data from National Statistics Office of Georgia and The State Statistics Committee of the unrecognized Republic of Abkhazia, about natural movement and the population censuses conducted in different years. Based on research interests, for study and analyze of relevant materials, methods of historical-comparative, descriptive, statistical analysis and expert assessment are used.

Results

Population dynamics

The last information about the population of Abkhazia was published by the Social and Economic Information Committee of Georgia (currently National Statistics Office of Georgia) in 1993. After that the official publication, which contained information about the population, was published by the State Statistics Committee of unrecognized Republic of Abkhazia only in 2005 - with a stamp „for official use" (Abkhazia in numbers, 2005). This publication is based on the results of the 2003 population census. According to the latter, the population of Abkhazia made up 214.0 thousand inhabitants (see Table 1) and the number of ethnic Abkhazians amounted 94.6 thousand.

Table 1. Dynamics of population by nationality. Data source (National Statistics Office of Georgia; (Abkhazia in numbers, 2005; Abkhazian statistical yearbook, 2023)

Ethnic group	in Thousands				Percent			
	1989	2003	2011	2023	1989	2003	2011	2023
Abkhaz	93.3	94.6	122.2	125.4	17.8	44.2	50.8	51.4
Georgian	239.9	44.0	46.5	46.9	45.7	20.6	19.3	19.2
Armenian	76.5	44.9	41.9	41.4	14.6	21.0	17.4	17.0
Russian	74.9	23.4	22.1	22.3	14.3	10.9	9.2	9.1
Other	40.5	7.1	8.105	8.047	7.7	3.3	3.4	3.3
Total	525.1	214.0	240.7	244.0	100.0	100.0	100.0	100.0

In post-war Abkhazia, the 2003 population census was carried out unsatisfactorily. As a result of justified criticism, the event received the official name "Population registration 2003" (Yamskov, 2010).

According to experts, during the 2003 population registration there was a double count of the population in both rural and urban settlements (Yamskov, 2009). As a result, the population of Abkhazia and Abkhazian nationality increased artificially. The data of the mentioned event was taken as a basis, which means that in subsequent years, the total number of the population was determined by mechanical addition-subtraction of the current registration of population (birth, death, migration).

The shortcomings of the „Population registration 2003", were not taken into account during the 2011 population census, moreover, apparently with the double-enumerated population, resided in Russia were also registered as residents of Abkhazia (Piirsalu, 2018). As of the 2011 census, the population of Abkhazia made up 240.7 thousand. The number of ethnic Abkhazians in the total population amounted to 122.2 thousand. In the period 2003-2011, the population of Abkhaz nationality increased by 27.6 thousand (29.2%), which corresponds to an average increase of 3.2% per year. The recorded fact is practically impossible (see Figure 1). During the years of the demographic explosion (1950-1960), the average annual increase of the African population was 2.2%. We also note that during the intercensal period (1959-1989) over 30 years, the number of Abkhazians increased by only 32.1 thousand people.

Before the 2011 census, according to official data, the population of Abkhazia in 2003-2010 increased slightly by 2.7 thousand people, in 2007-2008 the population even decreased (see Figure 2). According to the mentioned data, the population in 2010 made up 216.7 thousand (Abkhazia in numbers, 2010).

After the 2011 census, due to the differences between the population figures, State Committee of the unrecognized Republic of Abkhazia on Statistics, recalculated the data for the period between 2003-2011. From 2003 to 2010 the mentioned procedure was probably carried out by interpolation, annually were added 3 338 people.

According to the latest data, as of January 1, 2023, the number of populations amounted to 244.0 thousand inhabitants. The share of Abkhazians increased and amounted to 51.4%. The share of all other nationalities has decreased (Table 1).

Figure 1. Percent change by main nationalities in the period between the censuses in 2003-2011. Source: Abkhazia in numbers, (2005); Abkhazian statistical yearbook, (2023).

Paradoxes of Abkhazian statistics

It is hard to find a country in the world where official statistics and expert assessments differed so much from each other. The reason for such sharp differences in assessments can be explained by the interest of the Abkhaz government to present the desired as reality.

The United Nations Development Programme (UNDP) estimated the total population of Abkhazia to be in the region of 180 000-220 000 in 1998 (World directory of minorities…, 2008).

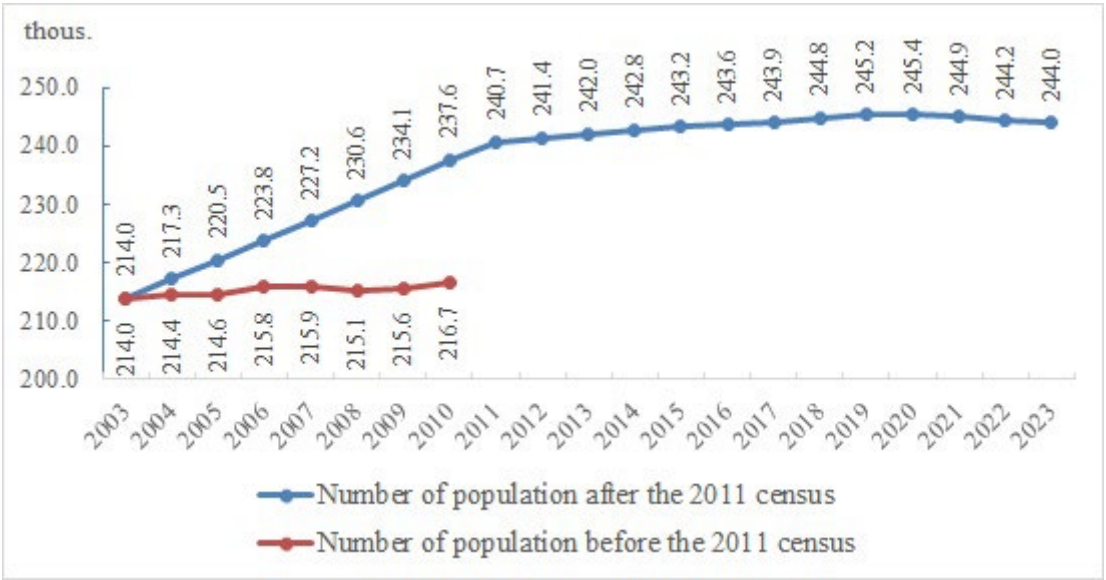

Figure 2. Number of population before and after 2011 census. Source: Abkhazia in numbers, 2005; Abkhazian statistical yearbook, 2023

According to the estimation of the official sources of Georgia, the population of Abkhazia in 2002 made up 180 thousand and at the beginning of 2005, 178 thousand (Statistical yearbook of Georgia, 2005). According to one of the georgian expert - „The actual population of Abkhazia should not exceed 170 thousand“ (Archvadze, 2005).

In 2005 the President of Abkhazia S. Bagafsh stated that less than 70 thousand Abkhazians lived in the republic (Bagapsh Speaks of Abkhazia's Economy, 2005). Speaking at MGIMO (Moscow State Institute of International Relations) in 2010, he said that 120 thousand Abkhazians live in Abkhazia (President of Abkhazia, 2010).

In January 2005 the electoral roll, probably a more reliable guide to the numbers of those at least of voting age, comprised 129 127 individuals, suggesting an overall population between 157 000 and 190 000 (Abkhazia today, 2006). According to the mentioned source, Abkhaz are thought to constitute some 35 per cent of the total population of the republic (World directory of minorities…, 2008).

In 2006, Abkhazian officials stated in an interview with Crisis Group that 320,000 people lived in the republic, including 110,000 Abkhazians (Abkhazia today. 2006).

According to the authors of the Encyclopedia Britannica, in 2007 population of Abkhazia made up 180 thousand people (Encyclopedia Britannica. Abkhazia).

In the report published in 2015 under the auspices of the Unrepresented Nations and Peoples Organization (UNPO), which is based on the data of the Ministry of Foreign Affairs of the unrecognized republic, noted that -„Abkhazia has a permanent population of around 200 000" (The Unrepresented Nations and Peoples Organisation, 2015). During the 2019 presidential election, the number of voters in Abkhazia made up 127 232 (Results of the elections of the President of the Republic of Abkhazia on September 9, 2019).

In any period, the number of population can fluctuate because only as a result of natural increase (difference between births and deaths) and net migration (the number of immigrants minus the number of emigrants). In 2003-2011, the officially published total population does not correspond to the total population obtained from natural increase of population and migration data. For example, according to official data, the population of Abkhazia at the beginning of 2004 made up 214 281 people, if we add and subtract the indicators of natural increase and migration in 2004, the result obtained at the beginning of 2005 differs from the officially published one.

Attempts to increase number of populations

The de-facto government of Abkhazia is interested in increasing the population of Abkhaz nationality. Achieving the mentioned goal by natural increase is unrealistic. One of the ways out of the situation authorities consider the repatriation of the population who left the region as a result of the conflict. The direct descendants of those refugees who left the territory of historical residence of Abkhazians (Abaza) as a result of the Russian-Caucasian and Russian-Turkish wars and other events of the 19th century are considered to be repatriates (Konstitucionny zakon Respubliki Abkhazia)

In 1993, the Law on Repatriation was adopted and the State Committee for Repatriation was approved, which, as a result of reorganization in 2018, was transformed into a ministry. 7856 repatriates were registered in Abkhazia for 23 years (1993-2016). Among them 4 427 people from Turkey, 550 from Syria, 126 from Egypt and Jordan. According to the head of the State Committee for Repatriation of Abkhazia, only 3 000-3 200 repatriates lived here in 2016 (23 years ago, 2016). Between the years 2017 and 2022 the number of repatriates who came for permanent residence in Abkhazia amounted to 1138 people. By 2022, 3117 repatriates lived in Abkhazia (Abkhazian statistical yearbook; 2023). A significant part of repatriates are people from Turkey, Syria and Jordan. Despite the efforts of the government of the unrecognized Republic of Abkhazia, many repatriates left Abkhazia due to the unfavorable socio-economic situation. From a demographic point of view, the results of the campaign to attract the population through repatriation are practically negligible.

A ban on abortion in Abkhazia was introduced in early 2016 (Law of the Republic of Abkhazia). The main purpose of the ban on abortion in Abkhazia was to increase the fertility. Over the past eight years, there have been no significant changes, in the field of fertility, on the contrary, the birth rate has decreased. Women continue to terminate unwanted pregnancies by travelling to neighbouring countries or performing illegal abortions in Abkhazia.

According to Resolution of the Cabinet of Ministers of occupied Abkhazia N170, dated December 28, 2021, for 2022 was developed a short-term target program - "Demographic Development", the main goal of which was to increasing the number of children of Abkhaz nationality among the total number of births (Demographic Development for 2022). The latter should be assessed as discrimination against other nationalities living in Abkhazia.

On July 12, 2021, the Parliament of occupied Abkhazia adopted the law "On the demographic policy of the Republic of Abkhazia" in the 1st reading. The objectives of demographic policy are: improving the standard of living of the population; increase in fertility; reduction of mortality;

strengthening family traditions and relationships; return of Abkhazians to the country. Despite the measures taken, the desired result was not achieved.

Natural movement

There is scant information concerning the natural movement of Abkhazia's population. In the post-war period, we find the mentioned data in a report, which was prepared by staff of the statistical service, at the request of one of the Abkhazian journalists, according to which in 1994 1470 children were born in Abkhazia and 1730 people died (Sharia, 2016). The author of the article explains the excess of the number of deaths compared to the quantity of births with the fact that most of the latter received severe wounds during the ongoing hostilities in Abkhazia, which eventually became the cause of their death most of the deceased were seriously injured during the ongoing fighting in Abkhazia, which ultimately became the cause of their death. As for the fertility, the conception of the largest part of those born in 1994 mainly coincided with the war period. Subsequently, the absolute number of births in the period of 1995-1999 was: 1611, 1551, 1396, 1432 and 1169 newborns. According to the official data in 2002 the crude birth rate made up 7.2‰, which was approximately 2 times less than the identical indicator in 1991(14.3‰). According to official data, the birth rate in 2002-2009 showed tendency to increase (see Table 2).

Table 2. Natural movement of the population 2002-2022. Source: Abkhazia in numbers (2005, 2011, 2016, 2019); Abkhazian statistical yearbook, (2021, 2023)

Years	Absolute data			Per mille		
	Number of births	Number of deaths	Natural change	Crude birth rate	Crude death rate	Natural change
2002	1557	1059	498	7.2	4.9	2.3
2003	1816	1142	674	8.5	5.3	3.2
2004	1919	1233	686	8.9	5.8	3.1
2005	1669	1533	136	7.7	7.1	0.6
2006	1715	1493	222	7.9	6.9	1.0
2007	1772	1761	11	8.2	8.2	0.0
2008	1990	1553	437	9.2	7.2	2.0
2009	2207	1699	508	10.2	7.8	2.4
2010	2156	1699	457	9.9	7.8	2.1
2011	2143	1645	498	8.9	6.8	2.1
2012	2258	1723	535	9.3	7.1	2.2
2013	2017	1561	456	8.3	6.4	1.9
2014	2004	1467	537	8.2	6.0	2.2
2015	1927	1654	273	7.9	6.8	1.1
2016	1768	1465	303	7.2	6.0	1.2
2017	1711	1262	449	7.0	5.2	1.8
2018	1430	1282	148	5.8	5.2	0.6
2019	1274	1240	34	5.2	5.1	0.1
2020	1295	1411	-116	5.3	5.8	-0.5
2021	1110	1785	-675	4.5	7.3	-2.8
2022	997	1532	-535	4.1	6.3	-2.2

In 2009, its maximum value was recorded (10.2‰), which was much lower than the level of simple reproduction of the population (15‰), after which the crude birth rate (except for 2011-2012 and 2019-2020) permanently decreased. In 2022, only 997 children were born in Abkhazia, the crude birth rate made up 4.1‰.

According to the information published by the Central Intelligence Agency (CIA), which includes data about 228 countries, no country has such a low birth rate (The World Factbook, 2022). If the above-mentioned fertility level is maintained for a long time, each subsequent generation in Abkhazia will be approximately 73% less than the previous generation. Based on the mentioned fact, a catastrophic situation has been created in Abkhazia in the field of fertility. Probably the extremely low

value of the crude birth rate is related to the problems of registration of births, as well as the unrealistically high number of the population.

The current mortality rate is surprising because of its low values. In 2002, its indicator made up 4.9‰, which was one of the lowest rates worldwide (2002 World Population Data Sheet).

A country is categorized as an "aged" society when the share of persons aged 65 years and over more than 7 per cent of the total population, in such countries the mortality rates are high. In 2003 the share of people of this age group in Abkhazia amounted to 16.9% (Abkhazia in numbers, 2005), which was one of the highest rates in Europe. In 2002-2007 the mortality rate showed an increasing trend. By 2007 the highest value - 8.2‰ was recorded, after that, the mortality rate was mainly characterized by a downward trend.

In 2002-2022, despite some fluctuations, the main vector of direction of rate of natural change showed a decreasing trend. Since 2020, its negative values have been fixed (Table 2), which is mainly the result of the Covid-19 pandemic.

Today a very difficult demographic situation has been created in Abkhazia. According to one of the Abkhaz specialists - the course of demographic processes in the republic is affected by traffic injuries, car accidents, suicides, low fertility, increased mortality, changes in age and sex composition, late marriages, unsatisfactory health status of the population and drug addiction (Khashba, 2023). At a meeting of the Center for Social and Economic Research, one of the former Abkhaz deputies stated - „Abkhazians are endangered nation, which requires a special protection regime (Challenges and answers, 2023).

Migration

The problem of migration is very significant for Abkhaz society. Due to the incompleteness of migration records from the 90s of the last century until 2003, it is impossible to restore a complete picture of migration processes (Khashba, 2015).

The negative balance of external migration in Abkhazia in 2003-2007 changed positively in 2008-2019 (except for 2014). In the early years of the Covid-19 pandemic, emigration exceeded immigration. In 2022, the migration balance was still positive (see Figure 3).

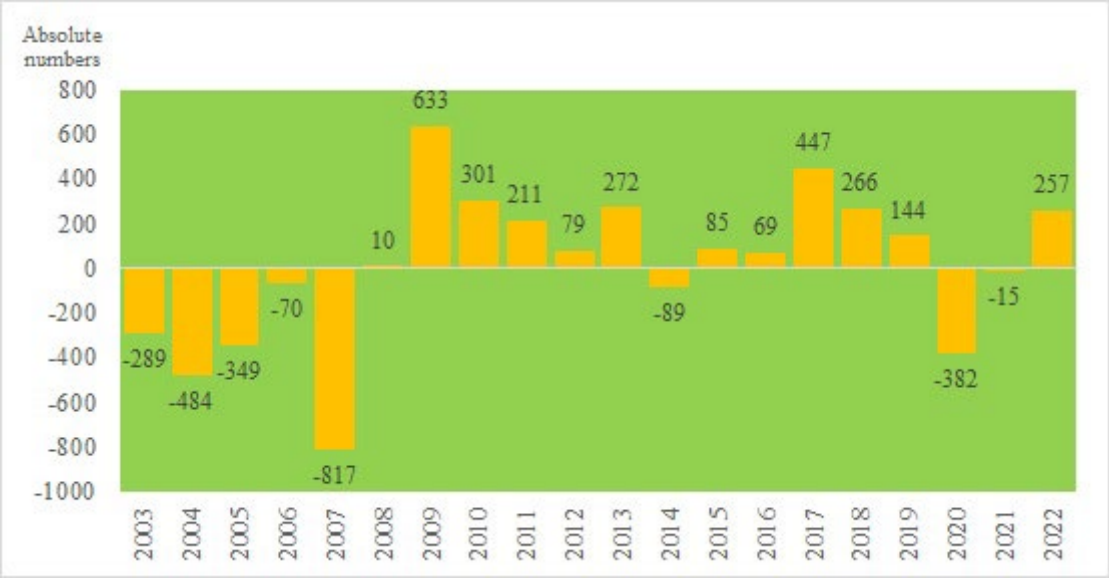

Figure 3. Dynamics of migration balance in 2003-2022. Source: Abkhazia in numbers 2010; - Abkhazian statistical yearbook 2021, 2022

Intensive migration processes from villages to cities are observed in Abkhazia. In 2003, the share of the rural population was 55.1% (Abkhazia in numbers, 2005), in 2023 this figure was equal to 49.8% (Abkhazian statistical yearbook, 2022). The main reasons for migration from rural areas to urban areas are more employment opportunities, the desire to get a better education, better living conditions. According to Abkhaz experts, a third of school graduates go to study further outside Abkhazia, and not all return. If this trend continues exactly as it is now, the size of each next

generation in Abkhazia will be one third less than the size of the previous one (Sharia, 2022; Demographic Abyss, 2022).

The increasing number of illegal migrants from Central Asia, Armenia and other countries is a serious problem in Abkhazia.

An attempt to calculate the number of the population

Officially published information about the population size of Abkhazia is clearly far from reality. We will use the theory of demographic transition to determine the estimated number of the population. For the calculation, it is necessary to determine the expected level of the crude mortality rate that corresponds to the current phase of the demographic transition. We focus on the mortality rate because, that unlike the birth rate, this is an indicator which - except in extreme situations - does not undergo sharp changes. If the total number of deaths and the value of the crude mortality rate are known, it is not difficult to calculate the population size (Meladze & Tsuladze, 1997). This calculation does not pretend to be absolutely accurate, although the latter is closer to reality than the officially published numbers.

Since the 1960's Abkhazia and Georgia have been in the third phase of the demographic transition, which is characterized by an increasing in death rate as a result of demographic aging (see Figure 4). The dynamics of the coefficients shows that they are close to each other.

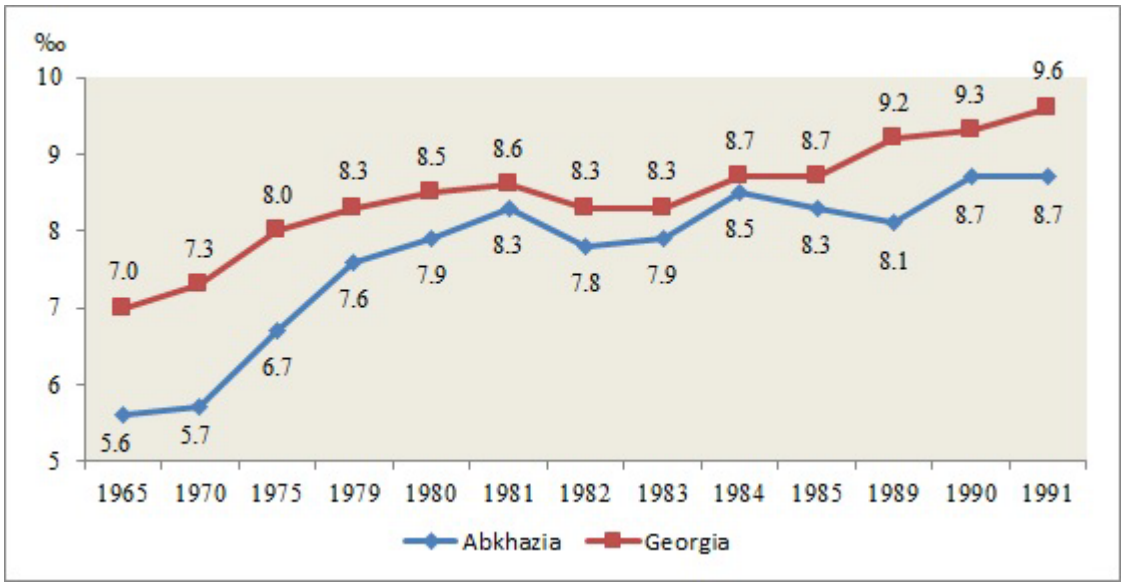

Figure 4. Dynamics of crude mortality rates in Abkhazia and Georgia in 1965-1991. Source: 1965-1985 - Abkhazia in numbers, 1986. 1989-1991 – calculated by author, based on National Statistics Office of Georgia materials

In the middle of the 1990's, Georgia begins to move into the fourth phase of the demographic transition (Meladze & Tsuladze, 1997). In this phase, the crude mortality rate continues to increase, reaching approximately 13-14‰ at the end of the phase. Abkhazia's mortality rates, officially published since 2002, are clearly far from reality (see Figure 5).

Analysis of the figure shows that in 2002-2022 there are enormous differences between the mortality rates of Georgia and Abkhazia, in most cases Abkhazia's rates are 2 or more times lower than those recorded in Georgia. The fact that the mortality rates in Abkhazia in the 1980s were higher than in 2002-2022 (with a few exceptions in 2007, 2009 and 2010), contradicts the knowledge of demographic science. We do not use mortality data for 2020–2022 due to the COVID-19 pandemic for our calculations.

In Abkhazia between 2005 and 2016 the number of deaths is more or less close to reality. The average annual number of deaths in these years is 1604. Based on the development of the demographic system and relevant analysis, the estimated crude mortality rate in modern Abkhazia is at least in the range of 10-11.5‰. Accordingly, the population of Abkhazia should be equal to 140-160 thousand.

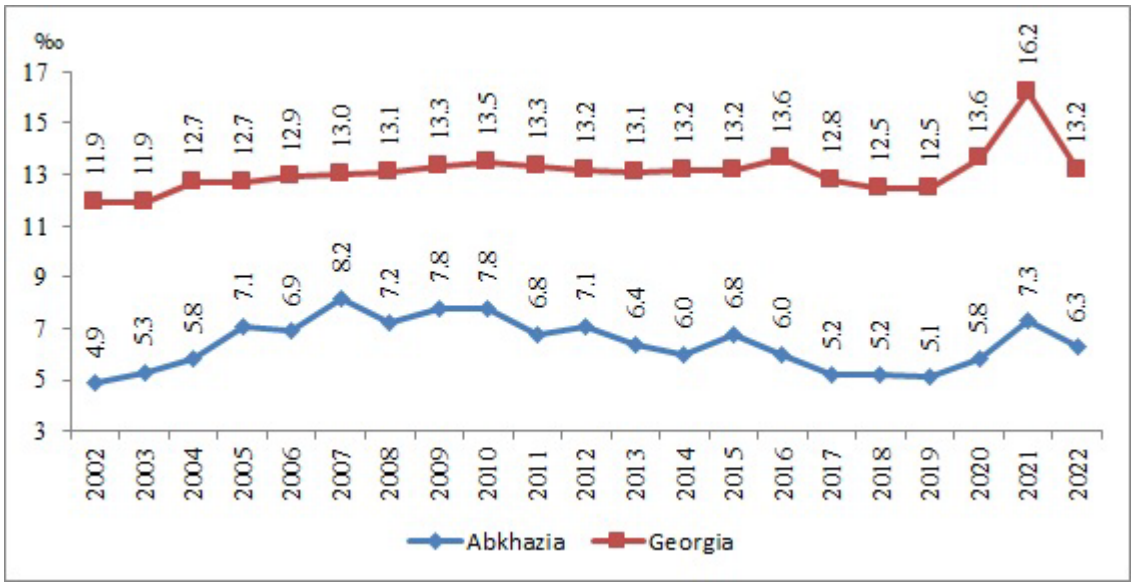

Figure 5. Dynamics of crude death rates in Georgia and Abkhazia in 2002-2022. Source: Abkhazia in numbers 2005, 2011, 2016, 019; Abkhazian statistical yearbook, 2023; National Statistics Office of Georgia

Conclusion

- Officially published statistical and demographic information about occupied Abkhazia does not reflect reality.

-It is necessary to conduct a population census in Abkhazia, which has not been carried out since 2011.

- State statistics committee of the de facto Republic of Abkhazia publishes only general data about natural movement of population and migration. Data required for demographic analysis, such as total fertility rate, age specific fertility rate, age specific mortality rate, life tables etc., are not known to the public, which complicates the assessment of the current situation.

-In the near future fertility will decrease, in the field of mortality the opposite process is expected.

-The growth of the population from 93-95 thousand to 120 thousand in 1993-2012 is less realistic.

-The process of demographic aging of the population is progressing, which will create serious socio-economic problems in the future.

-According to our calculations, population size in modern Abkhazia among 140-160 thousand.

Competing interests

The authors declare that they have no competing interests.

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Reference

Abkhazia Today. Europe Report N°176 – 15 September 2006. P. 9. Retrieved from https://www.files.ethz.ch/isn/23764/176_abkhazia_today.pdf (April 14, 2024).

Abkhazia in numbers 1985. (1986). Sukhumi. P. 7 (in Russian).

Abkhazia in numbers 2005. (2005). Sukhum. P. 13; 16 (in Russian).

Abkhazia in numbers 2010. (2011). Sukhum. P. 14; 31-32 (in Russian).

Abkhazia in numbers 2015. (2016). Sukhum. P. 34-35 (in Russian).

Abkhazia in numbers 2018. (2019). Sukhum. P. 2-3 (in Russian).

Abkhazian statistical yearbook 2020. (2021). Sukhum, P. 28; 29 (in Russian).

Abkhazian statistical yearbook 2021. (2022). Sukhum, P. 27; (in Russian).

Abkhazian statistical yearbook 2022. (2023). Sukhum, P. 15; 22, 26, 27 (in Russian).

Abkhazia from ancient times to the present day. (2007). Tbilisi. P. 400 (in Georgian).

Alexidze, L. (2009). The failure of the UN security council in settlement of the conflict in Abkhazia, Georgia, undermines the fundamentals of the international legal order. Journal of International Low. N1, 101-118.

Archvadze J. (2005). Demographic echo of the conflict in Abkhazia. Saqartvelos Respublika, N95, 23 April.

Bagapsh Speaks of Abkhazia's Economy, Demographic Situation. Civil Georgia, Tbilisi, 10. X. 2005. Retrieved from https://civil.ge/archives/109010 (April 14, 2024).

Challenges and answers: demographic security was discussed at CSER (Center for Socio-Economic Research). 21.06.2024. Retrieved from https://sputnik-abkhazia.ru/20230721/vyzovy-i-otvety-demograficheskuyu-bezopasnost-obsudili-v-tssei-1047057675.html (June 16. 2024).

Constitutional Law of the Republic of Abkhazia. Article 1. Repatriates (compatriots) On repatriates (as amended on November 8, 2005, No. 1167-c-XIV). Retrieved from https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://parlamentra.org/upload/iblock/008/008418d339b0ec3fe495b3ff1b5d982b.doc&ved=2ahUKEwiXi5DkvfyLAxXaVPEDHeGWIAQQFnoECB0QAQ&usg=AOvVaw1Sxbwodovlxxv6FtgXrTfg

Demographic Abyss: How Abkhazia Can Achieve a Baby Boom. (2022). Retrieved from https://sputnik-abkhazia.ru/20220729/demograficheskaya-bezdna-kak-abkhazii-dobitsya-bebi-buma-1040592212.html (March 12, 2024).

Derloguian, G. (1998). The Tale of Two Resorts: Abkhazia and Adjaria Before and Since the Soviet Collapse. In Beverly Crawford and Ronnie D Lipschutz (eds.), The Myth of 'Ethnic Conflict': Politics, Economics, and Cultural Violence. Berkeley: University of California. 261-292.

Encyclopedia Britannica. Abkhazia. Retrieved from https://www.britannica.com/EBchecked/topic/1358/Abkhazia (April 15, 2024).

Gachechiladze, R. (2011). My XX century. Vol. 2. Bakur Sulakauri Publishing House.

Georgia Abkhazia: Violations of the Laws of War and Russia's Role in the Conflict", Human Rights Watch Arms Project, March 1995, Vol. 7, No. 7, p. 5. Retrieved from https://www.hrw.org/legacy/reports/1995/Georgia2.htm#P117_4464 (Februaty 10, 2024).

Geostat (1991). National composition of the population of Georgia - statistical collection. Tbilisi. P. 6-7.

Khashba A. (2023). Analysis of the demographic situation in Abkhazia. Report at the round table on the demographic situation in Abkhazia. March 15, 2023. Retrieved from https://csi.apsny.land/ru/analitika/item/374-analiz-demograficheskoj-situatsii-v-abkhazii-khashba-a-sh (April 8, 2024).

Khashba A. (2015). Ethnodemographic processes in modern Abkhazia. Abstract dissertations for an academic degree candidate of historical science. Retrieved from http://apsnyteka.org/3625-Khashba_A_Stati.html (March 24, 2024).

Law of the Republic of Abkhazia on Health Care. P. 33. Retrieved from http://www.presidentofabkhazia.org/upload/iblock/c55/14-%D0%97%D0%B0%D0%BA%D0%BE%D0%BD%20%D0%A0%D0%90%20%D0%9E%20%D0%B7%D0%B4%D1%80%D0%B0%D0%B2%D0%BE%D0%BE%D1%85%D1%80%D0%B0%D0%BD%D0%B5%D0%BD%D0%B8%D0%B8.pdf (May 14, 2024) (In Russian).

Meladze G., Tsuladze G. (1997). Population of Georgia and demographic processes. Pako: 1-104.

Piirsalu, J. Abkhazia Is Tired and Disappointed (2018). https://icds.ee/abkhazia-is-tired-and-disappointed/.

President of Abkhazia Sergei Bagapsh: "It is necessary to distinguish between the government and the people of Georgia. (2010). Retrieved from https://mgimo.ru/about/news/main/143689/ (April 14,2024).

Resolution on approval of the interdepartmental target program "Demographic Development" for 2022 (). Retrieved from https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://mso.apsny.land/images/razvitie.pdf&ved=2ahUKEwjMneKD5I2HAxWJSfEDHVwBDeEQFnoECCEQAQ&usg=AOvVaw1GZOQkT-ExKrR1WeeEpAtV (June 21, 2024).

Results of the elections of the President of the Republic of Abkhazia on September 9, 2019. Retrieved from https://cik-ra.org/news/itogi-vyborov-prezidenta-respubliki-abkhaziya-9-sentyabrya-2019/ (February 17, 2024).

Sharia, V. Abkhaziya, V. Abkhazia in a demographic pit. 29.07.2022. Retrieved from https://www.ekhokavkaza.com/a/31965779.html (June 21. 2024).

Sharia V. (2016). Fertility and mortality in Abkhazia: how in actually? https://www.ekhokavkaza.com/a/28126912.html.

Statistical yearbook of Georgia 2005, (2005). Department of Statistics under Ministry of Economic Development of Georgia.

The Unrepresented Nations and Peoples Organisation. Research layout and editing: UNPO Secretariat and UNPO USA (Washington DC) Report 2015. p. 5. Retrieved from https://unpo.org/downloads/2344.pdf (May 15, 2024).

The World Factbook (2022 archive). Country comparisions – Birth rate // https://www.cia.gov/the-world-factbook/about/archives/2022/field/birth-rate/country-comparison

World directory of minorities and indigenous peoples: Georgia – Abkhaz (2008). Minority Rights Group International. Retrieved from https://www.refworld.org/reference/countryrep/mrgi/2008/en/64817 (May 4, 2024)

Yamskov A. (2010). Problems if evaluating numbers of ethnic abkhazians and Georgians in Abkhazia in the middle 2000's. *Vestnik MGIMO Universiteta*, *3* (12), 18-26. (in Russian).

Yamskov, A. (2009). Special features of the changes in the ethnodemographic situation in Abkhazia in the post-soviet period. *The Caucasus and* Globalization, 3 (2-3), 166-177.

23 Years ago, a state committee for repatriation was created in Abkhazia. Abkhazia Inform March 23, 2016 Interview. Retrieved from http://abkhazinform.com/intervyu/item/3388-23-goda-nazad-v-abkhazii-byl-sozdan-goskomitet-po-repatriatsii. (April 18, 2024). (In Russian).

2002 World Population Data Sheet of the Population Reference Bureau. https://www.google.com/search?client=firefox-b-d&sca_esv=4c59d14f8f776101&q=World+population+data+sheet+2002+pdf+download&sa=X&ved=2ahUKEwjw7vn_zsSFAxXsRvEDHSK3CBgQ1QJ6BAg2EAE&biw=1366&bih=643&dpr=1

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Transformation of Social Spaces: International Labor Migration from Georgia

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Abstract

The concept of space has a multifaceted meaning in geographical science, ranging from the physical location of a place to its political, socio-economic and cultural dimensions. Migration creates new social space while transforming the social, economic, political, institutional, psychological or physical environment. Our research aims to explore how international mobility transforms and restructures the social spaces of Georgian labor migrants at their immigration destination. This change has been examined across multiple dimensions: the socio-economic transformation and economic disparity, migration trends and patterns, transnational connections and social networks, household structure and gender roles, as well as cultural, linguistic, ethnic, religious and institutional affiliation. The primary objective is to determine the types of spaces that can emerge because of Georgian labor migration, considering it as a dynamic process that fundamentally shapes the nature of transformation. Our study employs qualitative research methods, utilizing semi-structured in-depth interviews conducted both in person and online. The desk research method is employed to analyze secondary data, whereas discourse analysis method has been used for interviews. The research spans the period from 2010 to 2024. The target groups are Georgian migrants residing in the USA and in some EU countries. The survey's main findings highlighted the heterogeneity of immigrant social spaces and the active participation of Georgian migrants through various activities within these spaces, namely: the space where labor activity is transformed (downgraded) professionally, the diasporic space consisting of Georgian congregations in Georgian Orthodox churches, the ethnic-religious and recreation space with the solemn celebration of national or religious holidays, the cultural-educational space with Sunday schools and Georgian cultural centers and the virtual communication space with family members left behind. The results acquired will contribute novel insights to the research on Georgian labor migration, which remains relatively limited.

Keywords: Transformation of social space, transnational family, Georgian labor immigrant women, qualitative research, USA

Introduction

The concept of space is crucial and fundamental in geographical science. Spatial thinking is a basic ability that geographers use to comprehend the arrangement of objects across terrain (Rubenstein, 2010). This concept encompasses a range of events or activities occurring within a significant geographical area, adding a spatial aspect to it. Geography began by looking at how people moving (either for a short time or permanently) affects social and economic changes, including things like language, culture, and how people adapt to new places (Fouberg et al., 2015). The concept of space has a multifaceted meaning, ranging from the physical location of a place to its political, socio-economic, and cultural dimensions. Examples of such dimensions include, for instance, the post-Soviet space, the tourist-recreational space, the emigration/immigration and diasporic space, the virtual space, etc.

However, practitioners in many professions may interpret each name differently. Consequently, each of these terms requires its own distinct explanation (Liszewski, 2006). Migration creates a new social space while potentially transforming the physical, economic, political, institutional, social, or psychological environment. Human geography, with other social sciences, surveys the formation of transformed identities in various locations, which serve as points of destination for mobile populations. Human geography examines the shifting patterns of human activities across space as well as their self-identification with particular places and regions (Domosh et al., 2013). This science studies the dynamic processes of population development across spatial and temporal dimensions, with a particular focus on migration. Mobility, which directly indicates the population's movement across areas or countries, exemplifies the relationship between human geography and migration.

From this perspective, this article discusses the problem of labour migration from Georgia and its impact on migrants' perceptions and adaptations to the immigration space. Over the past 30 years, this international move has presented significant challenges for both the migrants and their family members, greatly shaping their shifted reality.

Problem Statement, Research Goal and Objectives

The post-Cold War transformation established an entirely novel political, socio-economic, cultural, and psychological landscape. Numerous Eastern European and post-Soviet states began this era with surprising optimism and aspirations. They were establishing a new democratic state, confident in the rapid success of the nation and its society. However, neither people nor governments anticipated that the transition phase encompassing the entire post-Soviet space would be so unclear, difficult, and prolonged (Castles & Miller, 2003). To escape the current situation, individuals sought alternative paths, resulting in many discovering a new reality—the realm of emigration. The process involved adjusting to a new geographical area, establishing new socio-economic spaces, and adapting accordingly.

Our research aims to explore how international mobility transforms and restructures the social spaces of Georgian labour migrants in their immigration destinations. These changes have been examined across multiple dimensions: socio-economic transformation and economic disparity; migration trends and patterns; transnational connections and social networks; household structure and gender roles; as well as cultural, linguistic, ethnic, religious, and institutional affiliation.

The primary objective is to determine the types of spaces that can emerge because of migration, considering it as a dynamic process that fundamentally shapes the nature of transformation. Bringing up the topic in this manner is particularly crucial in the context of irregular female labour migration from Georgia, as the migrants' existing legal state already leads to violations of their labour rights, restricted communication and cultural interaction, and a highly subjective perception of the transformed spaces.

The paper tries to answer the following key questions: Is a migration space homogenous, or do multiple migration spaces exist? What types of spaces can be generated because of migrants' transfer as a dynamic process? What are these spaces/subspaces, and which of them embody the essence of migration as a transition? Liszewski (2006) defines space as an infinite and unrestricted expanse where all physical phenomena occur. This definition encompasses several processes. The focus of our research examines the position of migration within this context as a dynamic social phenomenon, the significance it embodies, and the role of the migrant in this process.

Methods and Materials

Our study employs qualitative research methods, utilising semi-structured, in-depth interviews conducted both in person and online. We refer to statistical methods and GIS technology for visualising quantitative data. The desk research method is used to analyse secondary data, whereas the discourse analysis method is utilised for interviews. The target groups are current Georgian immigrants of both genders residing in the USA and EU countries and returning female migrants from Europe. The selection of these target groups was influenced by the extensive network of Georgian labour migrants in both the US and EU countries, as well as the diverse migration experiences of current immigrants and returnees.

Our research encompasses the period from 2010 to 2024, when the authors initiated a pilot study including adult offspring of migrant mothers in Georgia. The research continued directly with Georgian immigrants of both genders in the USA. Female respondents are engaged as homemakers or carers, whereas males are employed as taxi or truck drivers. In 2015, under the auspices of the Fulbright

program, extensive research was conducted by the primary author to examine transnational migration in both the East Coast and Western states of the USA. In 2016, the co-authors conducted a project on transnational families in Georgia. The subsequent phase of the 2020-2022 survey encompassed Georgian migrant women residing in Europe, with whom comprehensive online interviews were conducted. In 2023 and 2024, we encountered returned migrant women who operate their small family enterprises in Georgia. The total number of respondents exceeds 70.

All respondents were over 18 years old. The IRB (Institutional Review Board) approval was issued by Rutgers University (USA). All in-depth interviews were audio-recorded while ensuring complete confidentiality. The record and the paper do not disclose the participants' names. We secured oral consent from the respondents prior to the interview, after informing them of the study's objectives.

The discussion plan for both gender groups encompassed enquiries regarding their adaptation to the new environment, initial qualifications and professional transformation in the host country, the quality of familial connections, economic advantages, and social challenges; additionally, the strategy for their repatriation was a focal point of interest.

We employed snowball sampling for recruiting the respondents. Most of them complied with our request to engage in the research with empathy and goodwill. We conducted the interviews in Georgian.

Theoretical Background

Geographers analyse the spatial distribution of individuals and activities, seeking to understand the reasons for their specific arrangements across different spaces (Rubenstein, 2010). They possess a strong interest in comprehending the characteristics of terrestrial space and the interactions between individuals and their environments within this context. Geography fundamentally examines "why and where". Another aspect related to this interest is its "significance" (Johonson et al., 2015). In the context of transnational labour migration, our article examines the importance of a specific location—the country of destination—for Georgian immigrants.

The presented survey is based on the theoretical framework developed by Liszewski (2006) and Feist et al. (2013). The first author categorises geographical spaces into three types. These types are associated with the movement of individuals or groups for purposes of recreation, leisure, and travel. The author examines the approach to spatial division and "occupation of space" in the tourism industry, highlighting the concepts of “imaginative,” “access-restricted,” and “real” spaces (Liszewski, 2006). Different motivations drive migration and tourism, which naturally vary in duration. However, if we acknowledge that both social phenomena involve the movement of individuals within a physical space (such as relocating to a new home or adjusting to a different environment temporarily), we can possibly extend this pattern of the spatial division concept to the realm of migration as well.

Feist's and his colleagues' idea of social space is directly linked to the concept of transnational migration. The theoretical framework of "transnationalism", established by Glick Schiller et al. (1995), was posited as an alternative to the prevalent notion of assimilation (Johnsson, 2016). Immigrants are perceived not as displaced individuals but as individuals who link across international borders and reside simultaneously in more than one state (Glick-Schiller et al., 1995).

Migrants establish transnational links by their engagement in socio-economic, cultural, or political processes with their family members left behind. These connections do not diminish over time; rather, they intensify and have an institutional structure. Feist et al. (2013) observe that such relationships ultimately create transnational social spaces, characterised by organised networks spanning at least two nations. It is a robust but dynamic category that, crucially, does not align with state boundaries. Participants in such a social space include both individuals and groups (e.g., diasporas), as well as organisations (p. 14). While there is no definitive theory of transnationalism, the concept of transnational social spaces facilitates migration interactions and activities beyond international borders (p. 53). Social ties encompass not only familial and personal connections but also functional systems, including socio-cultural, economic, and political dimensions. When the social connections of migrants and less mobile individuals interlink regularly and reliably, one might refer to transnational social spaces. Feist et al. argue that "transnational lives themselves may become a strategy of survival and betterment" (p. 55). Our empirical analysis demonstrates the extent to which the structure of Georgian labour mobility aligns with the concept of transnational social spaces.

Results

During the Soviet era, Georgians were characterised by limited mobility. As per the 1979 census, 96.5% of this ethnic group's population resided permanently in their homeland, a figure that remained

largely stable in the 1989 census, reflecting only a 1.5% decline (Gachechiladze, 1997). Presently, among Georgia's overall population of 3.7 million, over 800,000 individuals have emigrated, with 51% being women and 49% men (Migration Strategy, 2020, 8). The tendency to leave the country is growing, and Georgia maintains a negative net migration rate (Geostat, 2025; Geostat: Emigration from Georgia, 2024; IDFI, 2024) with the exceptions of two years, when 23,000 Georgian nationals returned from abroad due to the consequences of the Covid-19 pandemic in 2020 and then in 2022, the following inflow of Slavic asylum seekers resulting from the Russo-Ukrainian War[1] (Migration Profile: Georgia, 2023, 2) (Table 1 and Fig. 1).

Table 1. Georgia's Population Net Migration (number and rate) Source: Geostat, 2025.

Years	Net Migration	Per thousand, ‰
2013	-2,606	-0.7
2014	-6,543	-1.8
2015	-3,408	-0.9
2016	-8,060	-2,2
2017	-2,212	-0.6
2018	-10,783	-2.9
2019	-8,243	-2,2
2020	15,732	4.2
2021	-25,966	-7.0
2022	54,509	14.7
2023	-39,207	-10.6

In addition to the spatial change, Georgian labour emigration is characterised by structural (professional) transformation of migrants, temporary separation of nuclear family members for an undefined duration, reliance on remittances from emigrants, and the prevalence of single-parent households. Frequently, another or older family member(s) assume the parental position (Iashvili et al., 2014). Fuller-Thomson (2005) refers to this particular family structure as a "skipped generation household" (p. 331). Our research focuses on two distinct spaces—the host state and the country of origin where the migrants' transnational household engages in their simultaneous activities. Transnational migration from Georgia should be considered as a phenomenon that extends outside the context of its borders. Since the early 1990s, labour migration between affluent and developing nations to sustain families has become a persistent issue. Ho & Bedford (2008) define transnational migration as a familial strategy for risk mitigation. In developing countries, during crises, family members decide to engage one of their members in migration to enhance or stabilise income levels. Transnational migrants possess multiple residences in geographically distinct locations, thereby sustaining enduring economic and emotional connections to their household (p. 43). Consequently, our nation, as a component of the aforementioned realm, is not an exception. However, although the presence of Georgians abroad as labour migrants is temporary, on the one hand, the irregular status of most of them and, on the other hand, the less attractive environment for the continuation of labour activities in the homeland make the prospect of migrants' return completely uncertain (Migration profile, 2023).

As mentioned above, Liszewski identifies three categories of space, the first of which is the „imaginative" space. It is constructed by the potential migrant's cognition based on previously observed, read, communicated, or other information. The readiness of the human intellect is influenced by specific motivations, which are essentially the push and pull factors that drive migration. One of our respondents remarks that

> *What you anticipate beforehand is always euphoria... Regardless of the accuracy of the information provided, you remain convinced that your circumstances would improve in that*

[1] Despite the absolute number of emigrants in 2022 (125 269 individuals) surpassing that of the previous year (99 974 individuals) in 2021, the influx of population due to the war between Russia and Ukraine resulted in a positive migration balance in Georgia (Geostat, 2025).

location; however, when confronted with reality, one realises that the aspirations brought forth collapse, yet retreat is no longer an option. ***Male, in his late 40s. Monroe (NY), USA, 2010.***

Several respondents indicated that they believed they possessed comprehensive knowledge of their immigrant family member; however, those did not align with reality:

My year-long stay in Cyprus with my mom for work has significantly transformed me. I wish you understood how I previously wasted her remittances; I didn't have regrets and was unaware at the time... Currently, my father and I consistently endeavour to avoid wasting cash irrationally. ***Female in her early 20s. Tbilisi, Georgia, 2010.***

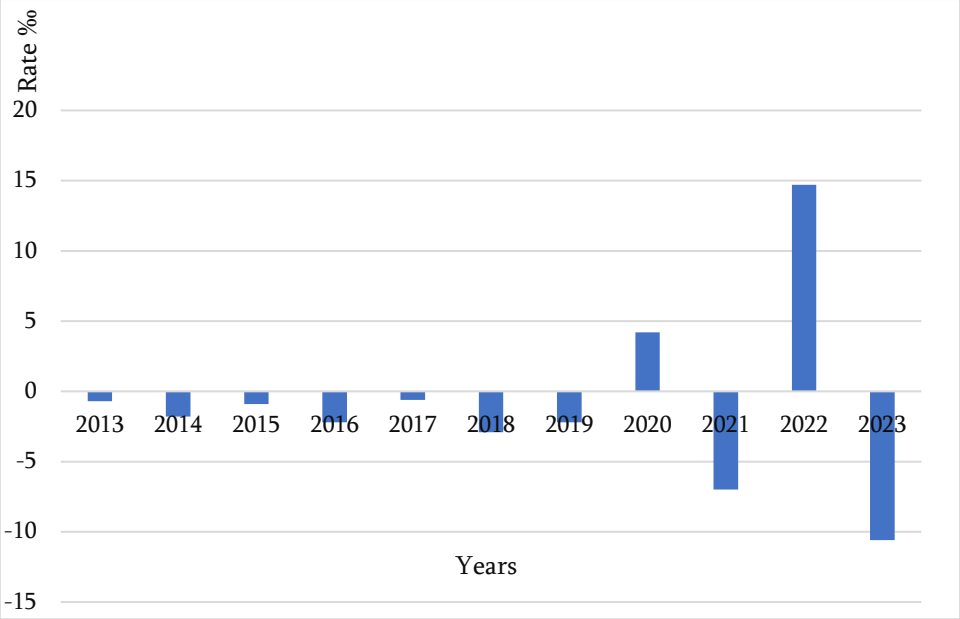

Figure 1. Georgia's Population Net Migration Rate (‰)

Liszewski (2006, p. 9) identifies two subspaces inside the imaginary realm: virtual and perceived. The first is a comparatively recent term that denotes "artificial reality". The significance of the virtual space notion has been shaped by the information and communication technology established over the past two decades and the worldwide Internet network.

Georgian transnational migrants establish a distinct virtual environment with family members remaining in their homeland, facilitated through social networks. It is not unusual for some migrant mothers to participate in assignment preparation via social networks. According to one of our return research participants:

In Greece, there exists a designated period of afternoon inactivity, during which everyone rests. I have been assisting my children's education via the Internet for that couple of hours. Without this opportunity, I would not have remained there for three years. ***Female in her mid-40s. Kutaisi, Georgia, 2022.***

The second is the perceived subspace, denoting the impression formed by prior observations and experiences. In other words, it assesses the impact of the actual circumstances as perceived by the individual. The experiences of each migrant serve as both personal assets and valuable information for prospective migrants, aiding them in constructing an imagined reality. Our abovementioned respondent, with previous experience as a carer in Greece, mentioned her repeat leaving:

I am aware that I am heading into exploitative labour and humiliation again, but my family still requires it for survival. ***Female in her early 40s. Kutaisi, Georgia, 2019.***

Fortunately, this woman is one of those rare exceptions who successfully attained the minimum objective and rejoined her family after three years:

My children required my presence now as much as they needed me to depart at that time. I am pleased to have accomplished it. ***Female in her mid-40s. Kutaisi, Georgia, 2022.***

Adaptation to the immigration environment is defined by criteria such as the migrant's view of current events (positive/negative, optimistic/pessimistic), self-esteem, health perception, and problem-solving abilities (Durglishvili, 1997).

Georgian migrants residing in America exhibit a markedly favourable disposition towards the current order in the country. The rule of law is frequently acknowledged as a source of significant comfort:

> *The rule of law is paramount; I wish I had witnessed this in my country. The officer issued me a ticket for violating traffic regulations. In such instances, I refrain from engaging in disputes with them; they do not impede me in any kind. Most significantly, I am aware that both I and the American guy are equal under the law.* ***Male in his early 50s. New York, NY, USA. 2015.***
>
> *What contributes to my comfort in this environment? I am more mobilised and organised than ever before. I possess self-respect, maintain employment, and exhibit calmness. Health issues? Indeed, there exists a similar situation, although I would encounter the same and additional issues in Georgia.* ***Female in her early 60s. New York (NY), USA, 2015.***

Georgian migrants returning from Europe describe their time there as "planned and safe", with the vast majority believing they learnt essential skills for organised employment (Badurashvili, 2012). The perceived immigration space for return migrants is associated with the development of skills such as rapid problem-solving, independent decision-making, effective time management, and a responsible work ethic. They also report increased energy, determination, and punctuality (Tukhashvili, 2012).

The aforementioned sorts of space and their interaction are virtually limitless, as migration is a process of global magnitude involving millions of participants, but not in all cases. The emigration space may not be uniformly available to all individuals, and at times, it may prove to be “access restricted” (Liszewski, 2016), which can be categorised into sub-spaces constrained by natural, political, economic, and socio-cultural reasons (p. 16). A parallel can be established with the migration context. The aforementioned variables, in certain instances, restrict the entry of migrants into the emigration domain.

The majority of Georgian migrants choose the Atlantic coastal plain states and cities for settlement, specifically New York City, Washington D.C., New Jersey, Pennsylvania, and Maryland. Despite being situated at similar latitudes (approximately between 40° and 43°) as Georgia, the meteorological conditions in these states are significantly distinct. While the Greater Caucasus Range diminishes the influence of the cold latitudes, in North America arctic air often descends southward through the lowlands in winter, resulting in severe cold in the northeastern United States (Bradshaw et al., 2012). However, our respondents do not perceive these natural conditions as a restricted factor. As for the research participants residing in San Francisco, California, within a Mediterranean climate zone, they reported exceptionally comfortable climatic circumstances, similar to the subtropical climate of Georgia:

> *The temperature here ranges from 20°C to 25°C throughout the year. The climate is pleasant. There is a daily breeze ... so, you always need a light jacket to have with you; you are neither hot nor cold. The fog surrounds the vicinity of the Golden Bridge daily at noon… it is a fascinating picture that never fails to engage my attention. Hydrangeas also bloom here, evoking memories of Adjara... a female* ***in her late 50s. San Francisco (CA), USA, 2015.***

Liszewski (2006, 14) considers the visa regime as an official limiting political factor. Since 2011, Georgia has participated in the readmission and visa liberalisation agreement with the European Union, facilitating the return of its citizens residing abroad unlawfully (Visa Facilitation, 2011; Ministry of Internal Affairs, 2013; Migration Profile, 2021). However, the aforementioned agreement simplifies entry into the European Union for some groups of persons. Despite the agreement permitting only tourist visas, Georgian female migrants continue to secure temporary low-skilled employment as care providers in private residences. One of our responders, a proprietor of a family hotel in Georgia, stated:

> *I reside here during the summer season, and in winter I travel to Italy. All revenue generated there is reinvested in our tourism industry. It significantly benefits my family. I own this itinerary after the commencement of visa-free travel to Europe.* ***Female in her late 60s. Gordi, Georgia, 2024.***

According to the Ministry of Internal Affairs of Georgia, more than one thousand Georgian nationals have been readmitted from Europe in the last three months of 2023. Of the total 1074 individuals, 696 citizens were readmitted from Germany, while France accounted for 136 deportees.

The list proceeds with Switzerland, Greece, Poland, Spain, and Italy. Germany, currently at the forefront, has lately committed to intensifying its initiatives aimed at addressing irregular migration, resulting in anticipated increases in deportations from the EU in the future (Over a thousand Georgians, 2023).

Despite the strict visa regulations implemented by the USA, Georgian respondents perceive the American environment as the friendliest upon entry into the country. They perceive America as a welcoming nation for immigrants, characterised by minimal bureaucracy and accessible employment opportunities for irregular individuals. The local population exhibits a varied attitude towards immigrant workers, particularly those with irregular status, such as the majority of Georgians. Based on multiple studies, Ilias & Fennely (2008) note that about sixty percent of Americans perceive irregular migration as a significantly more pressing issue than legal migration. Another survey indicates that 61% of Americans favour granting legal status to temporary migrants instead of deporting them to mitigate irregular migration. Some experts argue that "Americans may typically harbour negative sentiments toward illegal immigrants yet exhibit sympathy for individuals they are personally acquainted with" (pp. 744-745).

The economic development of the immigration region considerably influences the attractiveness for migrants (pull factor). The impact of the economic variable is especially apparent in the American context, where distance is not a critical consideration for Georgian migrants and appealing economic incentives take priority. Our research revealed that more than half of our research participants residing in the USA chose America due to greater pay, while others were influenced by their network of acquaintances in the destination country. However, the opportunities for utilising the professional abilities of migrants are somewhat constrained. With few exceptions, the educational qualifications that Georgian emigrants possessed prior to their departure for foreign countries remained unrealised for European and American markets (Iashvili et al., 2016). Consequently, specialists refer to emigration from Georgia as "brain waste" rather than "brain drain" (Badurashvili, 2012). Merely 3% of repatriated migrants reported possessing qualifications obtained abroad (Tukhashvili, 2012).

The limiting social component is the lack of language proficiency, which constitutes a deficiency in social capital, hindering Georgian immigrants' adaptation to a foreign environment. I. Badurashvili (2012) notes that whereas 57% of respondents believe it is easier for an immigrant skilled in the language to secure employment, only 10% enrolled in language study courses.

We highlight an additional aspect – ethno-religious constraining space encountered by a segment of Georgian immigrants in the USA. Orthodox Jews constitute a significant portion of the population in the town of Monroe, New York. Interactions with host communities require considerable effort from newcomers. Employers rigorously safeguard and often prioritise their ethno-religious norms, which they insist on maintaining during labour relations, presenting challenges for Georgian immigrants. This is particularly applicable to women, who frequently serve as carers, housekeepers, or cleaners. We regard such a setting as a restrictive space.

*Table 2. Money Transfers from the USA, Selected EU and Post-Soviet Countries and Israel in Georgia (Inflow, Share in Total Volume) * Money transfers until September 2024. Source: Money Transfers, 2024. National Bank of Georgia. www.nbg.gov.ge*

Years	Total		USA	Greece	Italy	Germany	Russia	Kazakhstan	Israel	Other countries
	Thousand USD	Share %	%	%	%	%	%	%	%	%
2017	1,387,250.0	100	10.24	10.23	10.72	2.46	32.83	0.99	8.59	23.96
2018	1,579,664.9	100	10.1	10.82	12.21	2.62	28.94	1.02	9.59	24.71
2019	1,733,317.7	100	10.29	11.11	13.8	2.87	24/7	1.54	9.38	26.31
2020	1,885,981.9	100	11.58	11.62	15.78	3.93	19.3	1.04	8.31	28.42
2021	2,349,563.7	100	12.1	10.22	16.42	4.82	17.51	2.63	7.95	28.37
2022	4,372,409.0	100	7.48	5.12	9.87	3.76	47.29	3.43	4.55	18.18
2023	4,146,593.6	100	11.1	5.93	12.61	5.6	36.86	4.8	5.19	17.92
2024*	2,245,012.4		16.37	7.6	16.66	7.58	18.26	3.81	7.22	

The real emigration space is complex. It is a synthesis of geographical, socio-economic, political, religious, or ethno-cultural subspaces.

The primary incentive of Georgian migrants for establishing economic space is the financial support of family members staying in their country of origin. The main domain for immigrants is the realm of labour, which constitutes their principal activity and where they allocate the majority of their time. Figure 3 illustrates the key countries that consistently generate the most remittances. Families dependent on remittances is a characteristic aspect of Georgia's migration trend. Table 2 and figure 2 show the proportion of remittances from top countries in the overall transfers to Georgia. The high rate of money transfers in 2022 and 2023 from Russia relates to the mass arrival of its citizens due to the Russia-Ukraine war and, accordingly, the transfer of their own funds to our country. These figures only partially reflect the sums remitted by Georgian immigrants to their family members. Remittances from Italy, the USA, Israel, and Kazakhstan have risen (National Bank of Georgia, 2024). Since 2019, total money transfers from EU countries (excluding 2022 and 2023) substantially surpass those from the post-Soviet states (Table 3).

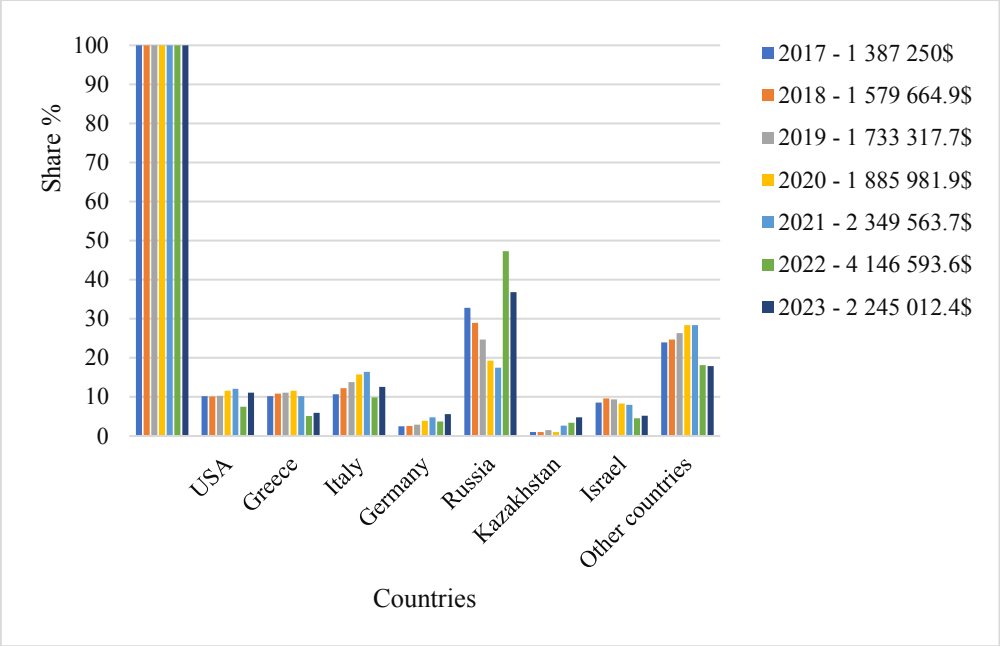

Figure 2. Money Transfers to Georgia from top remittances-sending Countries (share in total volume, %), Source: National Bank of Georgia. www.nbg.gov.ge

The emigration processes from Georgia are influenced by macro, meso, and micro factors: firstly, the global demand for low-skilled labour; secondly, migrant networks that encourage and maintain migration to specific geographical areas; and thirdly, the individual or collective decisions made by a migrant or her family members aimed at improving household welfare through enhanced earning opportunities. In numerous instances, the role of a migrant has become increasingly relevant for women, partially due to prevailing macro trends in Western nations, such as population ageing and women's active participation in the skilled labour market. The process is often referred to as the feminisation of migration (Iashvili et al., 2024).

Liszewski (2006) argues that the establishment of an authentic tourist-recreational area primarily implies the "occupation" of geographical space. This is especially true in migration studies. Migrants inhabit not only the geographical territory of the host nation but also infiltrate the analogous domains of the indigenous population with their socio-cultural, religious, and psychological values. The perception of this coexistence by local people is a subject of interest for numerous study disciplines. Over the past two decades, Georgian immigrants have successfully established Georgian cultural spaces in America in the form of cultural centres such as the Dancing Crane Company (Dancing Crane, 2023), the Georgian Theatre of New York (Georgian Theatre, 2023), Pesvebi (Roots) (Pesvebi, 2023), etc., which serve as hubs for Georgian traditional arts in Brooklyn and aim at assisting young professionals in promoting Georgian culture in the United States.

Since 2005, an increasing number of Georgian Orthodox churches have been operational in America. Georgian congregations were progressively established in New York, Pennsylvania, Washington, Chicago, and Los Angeles (Georgian Orthodox Church, 2024; St Nino mission, 2024), creating

confessional-communication spaces. All these churches possess large, active, and expanding congregations. As one of our research participants recalls:

> *During the Covid-19 pandemic, our parish members helped each other greatly. We are a family … well, it was like that before, but our attitude became more cordial during this crisis. We managed to stream every week's liturgy online. Only the priest, two singers and I, one person as a parish member, remained in the church. Because people from distant states were unable to attend, we [the mobile group] delivered Easter gifts to their homes.* ***Female in her mid-50s, Tbilisi-New York (online), 2023.***

The Sunday schools also operate alongside these churches, teaching the second generation of Georgians born in America their native language.

Table 3. Share of Money Transfers in Total Volume in Georgia According to the Country Groups (inflow, %), Source: National Bank of Georgia. www.nbg.gov.ge

Years	Total %	EU Countries	CIS Countries	Other Countries
2015	100	29.69	44.56	25.75
2016	100	30.55	38.02	31.43
2017	100	29.85	36.37	33.78
2018	100	33.81	33.16	33.04
2019	100	37.34	30.70	31.96
2020	100	40.48	25.18	34.34
2021	100	40.67	26.95	32.38
2022	100	24.44	58.03	17.53
2023	100	31.53	45.36	23.13
2024	100	41.86	26.48	31.66

The Georgian parish offers a recreational space as well, where all Orthodox Christian and national festivals are celebrated with formal gatherings or picnics outside the city.

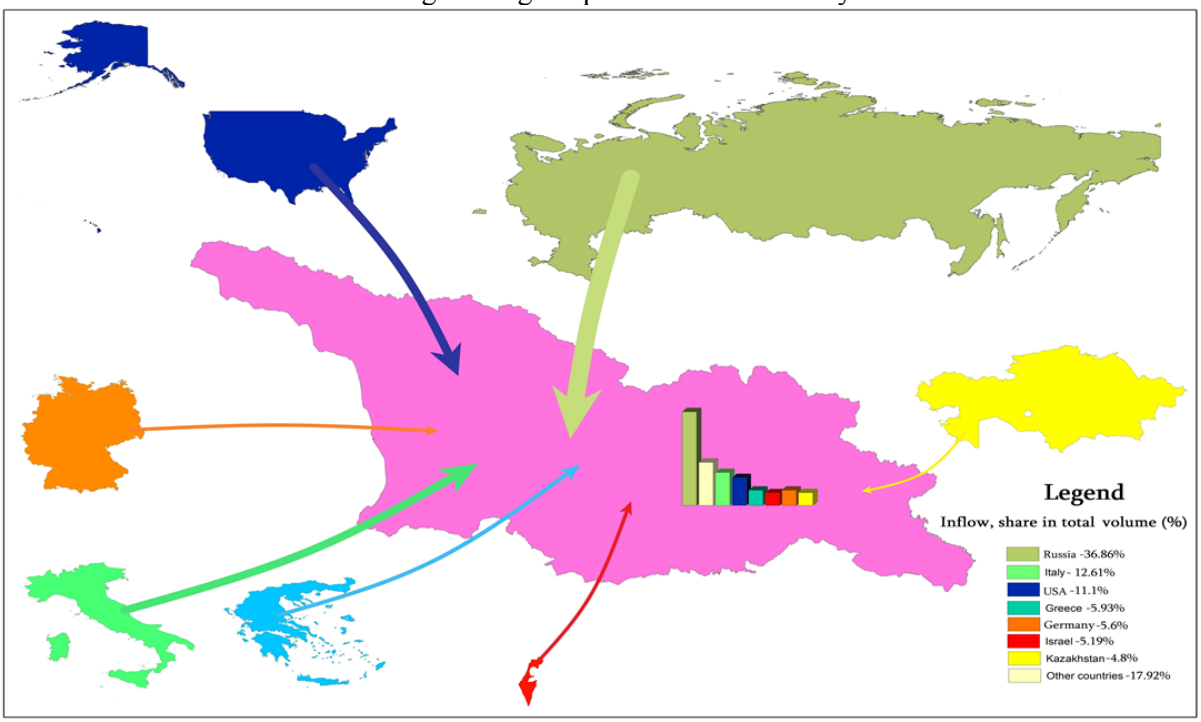

Figure 3. Map of top money transfers to Georgia in 2023 (inflow, share in total volume, %). Source: Own work based on National Bank of Georgia. www.nbg.gov.ge

Nonetheless, Georgian immigrants often find themselves lacking in certain areas. Most often, it is a familial and educational environment for professional advancement. This deficiency primarily results

from their irregular status, limited financial resources, and, as previously noted, insufficient language skills. A minimal number of our respondents succeeded in acquiring or enhancing professional abilities. This segment comprises migrants who presently possess lawful immigrant status in the US or are US citizens. Their spaces of action are considerably more heterogeneous; unlike their undocumented compatriots, they possess the ability to visit their homeland.

The prolonged disconnection from family adversely affects both the migrant and the relatives remaining behind. The irregular status of Georgian migrants prevents collaboration with official authorities and the execution of employment contracts with employers; hence, it perpetuates the risk of significant rights violations. According to experts, Georgian female migrants work an average of 58 hours per week (Badurashvili, 2012).

According to the latest survey (Migrant women, 2024), the majority of female Georgian immigrants experience a decline in professional status in the host country. They find employment as nurses in healthcare facilities, caretakers in households, or domestic workers not involved in elder care. In case of equivalent compensation, they would choose to work in Georgia (p. 24). This last point is critical. Despite a significant enhancement in the quality of material interactions, the prolonged separation of married couples creates substantial issues in both marital dynamics and the dependency between parents and children. The division of the family is frequently perceived as a social cost among the transnational household members (Iashvili et al., 2024). Undocumented status also contributes to the presence of Georgians in the host country and the uncertainty surrounding their repatriation. Half of our respondents declared that family members anticipate her/his homecoming, while one-third contended that the family has accepted her/his absence; some others asserted that household members still require financial support from overseas.

We believe that the ambiguity regarding the issue of return, coupled with the "guaranteed" employment of migrants in the host nation and the "guaranteed" remittances to their homeland, would result in a prolonged remigration process. The greatest concern for returned migrants is the reality they encounter in their homeland upon remigration. Experts note that migrants experience culture shock when the disparity between their acquired social and cultural experiences during immigration and the realities they must adapt to in their hometown becomes evident (Badurashvili, 2012; Feminism of Migration, 2022; Mataradze et al., 2024). Furthermore, the current lack of adequate possibilities for socio-economic reintegration in the country of origin compels re-migrants to desire to return back to the immigration country (Socioeconomic Stability, 2023). Consequently, the formulation of a robust emigration strategy is an essential imperative for Georgia.

Conclusion

The varied and strong transnational spaces established by Georgian migrants indicate that the framework of modern Georgian labour migration aligns with Feist and his colleagues' concept of transnational social spaces. Our endeavour to generalise Liszewski's approach, from tourism to migration studies, also showed the heterogeneous structure of the immigration landscape for Georgian migrants. The immigrants indicate that their "imagined" reality diverges from the actual environment, significantly hindering their adaptation process. The "access-restricted" space stems from the irregular status of the majority of Georgian migrants, which limits their participation in educational and professional endeavours. The economic sphere serves as the primary domain for immigrants, despite the potential for professional regression. In this context, remittances from both the USA and other European nations are increasingly being sent to Georgia.

Despite numerous challenges, Georgian immigrants successfully established ethnic, cultural, and confessional spaces, including Orthodox Christian churches, Sunday schools, and Georgian cultural institutions. These areas serve as supplementary communication and leisure venues for first-generation immigrants while providing an educational environment for second-generation young Georgians.

For the majority of migrant mothers lacking a familial support system in the host nation, virtual communication is essential for maintaining emotional connections with family members, particularly with their children.

The return plan lacks clarity. In the absence of a robust migration policy by the Georgian government, which should be a guarantor for dignified repatriation, the lengthy stay of Georgian migrants in host countries would be prolonged even more, adversely impacting the already diminished gene pool of our nation.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

The first author recorded the interviews in the USA. The other two engaged in the research by conducting in-depth interviews in Georgia and online, offering valuable input. Interviews were transcribed by all participants and translated into English by the first and third authors. The visual content was produced by the second author. All authors contributed to the composition of the article, with the final edition completed by the first author.

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Reference

Badurashvili, I. (2012). Integration of migrants from Georgia in countries of temporary residence and upon return to Georgia: What differences do Georgian migrants face in the process of adaptation to a new social environment? Research report.

Bradshaw, M., White, G.W., Dymond, J.P. & Chaco, E. (2012). *Contemporary World Regional Geography.* McGraw Hill.

Castles, S., & Miller, J. M. (2003). *The Age of Migration: International population movements in the modern world.* 3rd edition. New York: The Guilford Press.

Dancing Crane Georgian Cultural Centre. (2023). https://www.dancingcrane.org/

Domosh, M., Neumann, P. R., Price, L. P., & Jordan-Bychkov, T. (2013). The Human Mosaic: A Cultural Approach to Human Geography. 12th edition. New York: W.H. Freeman and Company.

Durglishvili, N. (1997). *Social Change and the Georgian Family*. UNDP-Georgia. Tbilisi.

Faist, Th., Fauser, M. & Reisenauer, E. (2008). Migrants as Transnational Development Agents: An Inquiry into the Newest Round of the Migration-Development Nexus. Population, Space and Place, 14(1).

Feminisation of Migration from Georgia. (2022). IOM Mission to Georgia.

Fouberg, E.H., Murphy, A.B., & de Blij, H.J. (2015). *Human Geography: People, Place and Culture.* 10th Edition. Prentice Hall.

Fuller-Thomson, E. (2005). Canadian First Nation Grandparents Raising Grandchildren: A Portrait in Resilience. *Ageing and Human Development*, 60(4).

Gachechiladze, R. (1997). *Population Migration in Georgia and Its Socio-Economic Consequences* UNDP-Georgia. Tbilisi.

Georgian Orthodox Church in North America (2009-Present) – Religious Group. (2024). The Association of Religion Data Archives. https://www.thearda.com/us-religion/group-profiles/groups?D=367

Georgian Theatre of New York. (2023). https://www.dancingcrane.org/georgian-theater-of-ny

Geostat (National Statistics Office of Georgia). (2025). Migration. https://www.geostat.ge/en/modules/categories/322/migration

Geostat: Emigration from Georgia Nearly Doubled in 2023. (2024). Civil.ge. https://civil.ge/archives/601581

Glick Schiller, N. G., Basch, L. & Szanton Blanc, C. (1995). From Immigrant to Transmigrant: Theorising Transnational Migration. *Anthropological Quarterly*, 68 (1), 48-63. http://www.jstor.org/stable/3317464

Ho, E. & Bedford, R. (2008). Asian Transnational Families in New Zealand: Dynamics and Challenges. *International Migration*, 46(4).

Iashvili, I., Gvenetadze, T., Mikautadze, D., Davituliani, Ts., & Dogonadze, T. (2014). Split Families and Family Members Left Behind: Migration from Georgia. *Humanities and Social Sciences Review*, 3(2), pp.345-356. https://universitypublications.net/hssr/0302/pdf/SPQ350.pdf

Iashvili, I., VonReichert, Ch., & Gvenetadze, T. (2016). "For the Sake of the Family": Contemporary Georgian Migration in the USA. *International Journal of Arts and Science,* 09(02), pp. 623-638. https://www.universitypublications.net/ijas/0902/pdf/V6Z340.pdf

Iashvili, I., Gogsadze, G., & Gvenetadze, T. (2024). The Main Challenges of Gender-Based International Labour Mobility: Transnational Migrant Families from Georgia. *Journal of Eurasian Studies*. https://doi.org/10.1177/18793665241266263

IDFI (Institute for Development of Freedom of Information). (2024). Statistics of Migration of Georgian Citizens. https://idfi.ge/en/statistics-of-migration-of-georgian-citizens

Ilias, Sh., & Fennely, K., et al. (2008). American Attitudes Toward Guest Worker Policies. *International Migration Review*, 42(4).

Johnsson, R. (2016). Revisiting Transnationalism. https://www.academia.edu/31451973/Revisiting_Transnationalism

Johnson, D.L., Haarmann, V. & Johnson, M.L. (2015). *World Regional Geography: A Development Approach.* Boston: Pearson.

Liszewski, S. (2006). Tourism Spaces and their Transformation in the Contemporary World. *Tourism*, 16(2).

Mataradze, T., Turkiashvili, Sh., Elikashvili, E. (2024). From Migration to Reintegration: Examining the Post-Return Experiences of Georgian Women. Georgian Scientists, 6(3). https://doi.org/10.52340/gs.2024.06.03.14

Migrant Women as Learners: Individual Pathways and Prospects. (2024). European Training Foundation. https://www.etf.europa.eu/sites/default/files/2024-07/Migrant%20women_cross-country.pdf

Migration Profile: Georgia. (2023). https://migrants-refugees.va/wp-content/uploads/2023/06/2023-CP-Georgia-EN.pdf

Migration Profile of Georgia. (2021). State Commission on Migration Issues. https://migration.comission.ge/files/mmp21_eng_web3c.pdf

Migration Strategy of Georgia 2021-2030. (2020). State Commission on Migration Issues. https://migration.comission.ge/files/ms30_eng_web2.pdf

Ministry of Internal Affairs. (2013). Supporting the Implementation of EU Readmission and Visa Facilitation Agreements (REVIS). https://police.ge/en/ministry/structure-and-offices/international-relations-department/donor-coordination/proeqtebis-shesakheb/ongoing-projects/supporting-the-implementation-of-eu-readmission-and-visa-facilitation-agreements-revis

National Bank of Georgia. (2024). Money Transfers. https://nbg.gov.ge/en/statistics/interactive

Over a Thousand Georgians Deported from Europe in Third Quarter of 2023. (2023). Civil Georgia. https://civil.ge/archives/565109

Pesvebi Georgian Cultural Centre. (2023). https://www.pesvebiny.org/

Portes, A. (1997). Globalisation from Below: The Rise of Transnational Communities. Princeton University. http://www.transcomm.ox.ac.uk/working%20papres/portes.pdf

Rubenstein, J.M. (2010). *Contemporary Human Geography*. 1st edition. Prentice Hall: New York.
Socioeconomic stability for Georgian labour migrant women. (2023). Women Engage for a Common Future (WECF) – Georgia. EU, Sweden, UNDP. https://georgia.un.org/sites/default/files/2023-12/lmw_eng_web4.pdf

St Nino Mission. (2024). https://www.oca.org/parishes/oca-ny-brosnm

Tukhashvili, M. (2012). *Socio-economic Problems of Return Migration in Georgia*. Universal: Tbilisi. https://www.researchgate.net/publication/290379135_Socio-economic_Problems_of_Return_Migration_in_Georgia

Visa facilitation and readmission Georgia's visa liberalisation prospects with the EU. (2011). European Initiative Liberal Academy Tbilisi. https://ei-lat.ge/en/uvizo-mimosvlis-perspeqtivebi/

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Prospects of Tourism Development in Zemo Racha and Their Reflection Among the Local Society

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Abstract

Racha is one of Georgia's stagnant historical-geographic regions, with its socio-economic problems caused by several complex natural and social factors. One of the most significant problems of the region is the critical drop in its population. One potential solution to the trend of depopulation, considering the experience of worldwide depressed mountain rural regions, could be the development of tourism. However, international experience also shows that rapid, campaign-style tourism programmes that are not based on in-depth scientific research of possible consequences might negatively impact the local community's situation – change the local community's socio-cultural system, create or deepen economic inequality, harm historical settlement and material culture, and so on. International experience demonstrates that this happens when tourist facilities are built spontaneously, and investments are implemented without considering the interests of the local community. The purpose of this study was to explore the local community's view on tourism development in the Oni Municipality of Racha. To achieve this goal, the research team used methods of surveying and interviewing the local population. The primary tool of the research was a mixed-format questionnaire containing both closed and open-ended questions. The research covered resorts and resort areas located in the Oni region, as well as settlements in prospective recreational zones. In August 2023, due to the tragedy in the Shovi resort, where a landslide caused the loss of more than 30 people and made the area unsuitable for future recreational and tourism use, it led to a considerable decrease in the number of tourists visiting Racha. However, the research shows that despite this, the locals have high hopes for the development of tourism in the municipality. This is evidenced by the opening of numerous new guesthouses. Until recently, the tourist region of Zemo Racha (resorts: Shovi, Utsera, Sortuani) was primarily focused on healing and wellness. Currently, the development of the Utsera resort is underway. An additional study of the tourist resources has shown that it is possible to establish a mountain skiing complex in Mravaldzali. The recently established national park in the municipality should stimulate the growth of ecological, adventure, and speleotourism. However, it should be noted that the local population we interviewed has limited knowledge of the national park's functions. According to the respondent's opinions, agritourism holds significant potential in the region, with several facilities already operating over the long term in the Oni Municipality.

Keywords: Problems of mountain areas, Racha, Oni, Tourism, Resorts of Racha, National Park of Racha.

Introduction

Racha is one of the most challenging among Georgia's historical-geographical provinces. It is located between the main range of the Caucasus Mountains and its branches, which makes it distant from the central economic zone of the country. A large part of the territory is mountainous and highland, with only a small amount of arable land for cultivation that is relatively scarce. There is a variety of mineral resources, but their reserves are limited, which makes

extraction mostly unprofitable. There is a high unemployment rate among the locals; their incomes are limited. The population is also experiencing a critical decline (Kohler et al., 2017; Jaoshvili, 1961; Stülb & Dzhvarsheishvili, 2023).

One of the realistic ways to stop depopulation in Racha is to enhance tourism activities and improve local community incomes from the tourism sector. Zemo Racha, which is represented by the Oni municipality, holds great potential in terms of both natural and anthropogenic tourism resources. In terms of tourism expansion, it is one of the leading municipalities in the region and is a major tourist attraction centre in the country (Nadareishvili & Dzidzikashvili, 2023; Gogitidze & Nadareishvili, 2022; Gogitidze et al., 2023). Tourism development here began in the thirties of the 20th century, when the Shovi resort began operating here (Tutberidze, 2021). The significance of the Zemo Racha tourist region was determined by the natural beauty of the Central Caucasus, the region's healthy climate, and its hydro-mineral resources, widely distributed across the whole area of the region, but the springs of Shovi and Utsera were distinguished by their healing properties. Shovi, a climate-balneological resort, is located at 1,600 meters above sea level in the valley of the Chanchakhi River and surrounded by coniferous and deciduous forests. Shovi's main therapeutic factor is a healthy climate and the exceptionally long duration of sunshine (2,050 hours per year) (Kobakhidze, 1971). Including 16 mineral springs of various profiles. The catastrophic natural disaster that happened in August 2023 destroyed the resort's infrastructure, making it impossible for the resort to continue operating. The balneological-climatic resort of Utsera began operating relatively later; it's located in the Rioni River valley at 1,150 meters above sea level. Its main resort resource consists of three types of carbonated mineral waters, which are used for baths or for drinking to treat pulmonary, allergies, and gastroenterological diseases. The local population calls these waters by various names, such as "Kalci" water, which was bottled during the Soviet era; "Black Water"; "Napertskala"; and the most popular one, "Gverita". Utsera's resort infrastructure is currently represented by the following facilities: the four-star hotel "Manino", a 25-room hotel in the former boarding house building, and 16 operated guesthouses. The total capacity of the accommodation facilities is up to 300 places. The Radisson chain hotel is being built on the grounds of the old sanatorium.

Close to Oni is the climate-balneological resort Sortuani, whose carbonated mineral water is used to treat arthrological, neurological, and gynaecological diseases (Legislative Herald of Georgia, 2005). There is no resort infrastructure here, but it does have some small recreational facilities that locals make use of, just like mineral water. Potential centres for health and wellness tourism include the resort areas of Bari, Skhephuri, Kvedi Lake, and Dzeglebi.

There are plenty of resources in the municipality for the development of different tourism directions: for hiking and adventure tourism – lakes (Udziro, Sakhazo), waterfalls (Tskhmori, Kvagakhetkila), caves (Usholta), and mountains (Tsonara, Katitsvera); for cultural and educational tourism – churches (Mravaldzali, St. Gabriel Archangel, the Saviour, Upper Bari Archangel, St. George of Sori), the Oni synagogue, the regional studies museum, as well as villages with historical buildings and unique defensive structures (Ghebi, Chiora). Regarding ecological tourism – the newly established Racha National Park (Chichinadze, 2021; Khakhubia et al., 2024) – for gastronomic and ethnographic tourism – traditional Rachian cuisine and festivals.

Furthermore, over the last several decades, Zemo Racha has undergone a considerable population decline (Khomeriki et al., 2022). In this regard, it is exceptional among the regions of the country. In recent decades, one of the most real ways to retain the local population is tourism development, job creation in the tourism and hospitality industry and providing employment for local people. On-site research and surveys of the local population have shown that despite the decrease in the number of visitors during the 2024 season due to the August 2023 disaster in Shovi, both the local administration and the community have great hope about tourism development in the municipality. This is also confirmed by the recent opening of many new guesthouses.

The aim of the presented research is to explore the opinions, attitudes, and interests of the local community regarding the development of tourism in the Oni municipality, as well as the local population's stance regarding tourism development.

Figure1. Shovi resort after the landslide

Research area

Racha, a historical-geographical province, is located in the northeastern part of Racha, a historical-geographical province, is located in the northeastern part of western Georgia. Administratively, it belongs to the Racha-Lechkhumi and Kvemo Svaneti region, also known as the northern border of Georgia (Socio-Economic Geography of Georgia, 2003). To the east, it borders with the Tskhinvali region; to the west, it borders with the municipality of Ambrolauri and the municipality of Lentekhi and the Russian Federation (Kabardino-Balkarian and North Ossetia-Alania Respublics); and to the south, it borders with Imereti. Racha includes the municipalities of Oni and Ambrolauri. Currently, the area of the research is Mountainous Racha - Oni Municipality. Due to its economic-geographical location, natural and socio-economic conditions, it was an isolated region for many centuries (Neidze, 2007; Jaoshvili, 1996; Mghvdeladze, 2007). For centuries, the region has been considered a powerful centre of Bronze and Iron Age culture. It was well known for its mining and metal production. The extraction and processing of iron were so important in the daily lives of the inhabitants of Tsedisi and neighbouring villages that the region came to be known as the "Sarkineti - Iron region", and those who practised this craft were known as "iron men". Administratively, it belongs to the Racha-Lechkhumi and Kvemo Svaneti region, also known as the northern wall of Georgia (Socio-Economic Geography of Georgia, 2003). To the east, it borders with Tskhinvali region, to the west, it borders with municipality of Ambrolauri and municipality of Lentekhi and Russian Federation (Kabardino-Balkarian and North Ossetia - Alania Respublics) and to the south it borders with Imereti. Racha includes the municipalities of Oni and Ambrolauri. Currently, the area of the research is Mountainous Racha - Oni Municipality. Due to its economic-geographical location, natural and socio-economic conditions, it was an isolated region for many centuries (Neidze, 2007; Jaoshvili, 1996; Mghvdeladze, 2007). For centuries, the region has been considered as a powerful center of Bronze and Iron Age culture.

Methods and Materials

The research was conducted to study the opinions of individuals employed in the tourism sector on the continued development of tourism in Oni municipality. A meeting took place with Oni City Hall representatives, staff from the tourism information centre and approximately 20 respondents engaged in tourism activities were interviewed. The main method for this research selected was personal

interviewing. The study covered resorts, resort areas, and settlements within prospective recreational areas. During the field research, essential photo and video records were collected, and illustrative materials were created in the form of diagrams and maps, which are presented in the article.
The involvement of people from various villages and the range of collected materials significantly boosted the trustworthiness of the research. A more or less realistic picture of operating a tourism business has been formed. The analysis of this research provides possibilities for developing tourism in the region. In the context of the research, interviews were conducted with residents from different villages of Oni Municipality who are actively involved in the tourism business. The survey included participants in the tourism business from the villages of Utsera, Ghari, Zudali, Mravaldzali, Ghebi, Chiora, Glola and the city of Oni.

Results

The data analysis from the field research shows that 77 percent of the respondents were women, indicating that tourism-related activities in the region, especially in the family guesthouse and hospitality sector, are mainly driven by women. This trend can be explained by social and cultural factors, as women have traditionally significant role in managing family businesses and hospitality. At the same time, Men's comparatively low participation may suggest that they are more involved in agriculture or other economic activities that require more physical effort and significant time investment. The observed dynamics suggest that gender distribution within the tourism sector reflects both the structure of the regional labor market and the traditional division of roles.

The respondents' ages ranges from 30 to 71, which allows for the identification of several age groups: 30.8 percent of respondents are aged 30-40, 46.2 percent are in the 41-60 age group and just 23.1 percent respondents are aged between 61 and 71 (Fig. 2). The data analysis from the field research shows that 77 percent of the respondents were women, indicating that tourism-related activities in the region, especially in the family guesthouse and hospitality sector, are mainly driven by women. This trend can be explained by social and cultural factors, as women have traditionally had a significant role in managing family businesses and hospitality. At the same time, men's comparatively low participation may suggest that they are more involved in agriculture or other economic activities that require more physical effort and significant time investment. The observed dynamics suggest that gender distribution within the tourism sector reflects both the structure of the regional labour market and the traditional division of roles.

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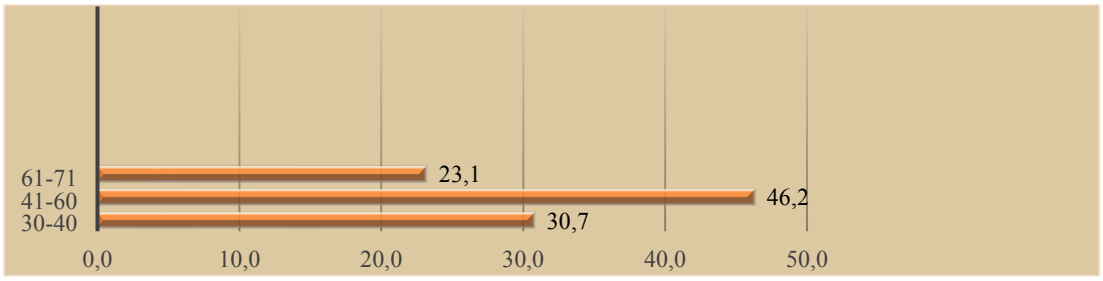

Figure 2. Distribution of respondents by age groups in percentage

Analysing the age distribution of respondents indicates that a significant majority of the respondents (46.2 percent) are in the middle-aged range (41-60 years), who are actively involved in both economic and social spheres. This age group represents one of the most important segments for tourism development, as they have the required experience, resources and motivation which contributes to the sustainable growth of the sector.

The second significant group includes respondents between the ages of 30 and 40 (30.8 percent), who, due to their younger age, might bring more initiative, innovative mindset and energy. Increasing involvement and investment within this age group, both in terms of resources and knowledge, could become a vital aspect of a long-term growth strategy.

The older age group (61-71 years) represents 23.1 percent of the respondents. Despite their small numbers, this group is vital in maintaining the region’s cultural heritage and transferring their

experience and knowledge. Their participation in the tourism sector forms a stable platform, which is of crucial importance for the preservation of traditional forms of local subculture.

In the tourism research process, both permanent and temporary residents' views are considered, providing an opportunity for a comprehensive and deep analysis of the community. Their varied experiences are diverse, which provides an opportunity for revealing a more complex picture of a deeper understanding of the field of tourism.

According to the research data, 85 percent of the respondents are permanent residents, which suggests that their views directly reflect both the ongoing and future challenges faced by the region. The opinions of this group significantly define the main aspects of tourism development.

As well, the views of temporary residents (15 percent) are equally significant. Although this group are less involved in the daily life of the region, they are comparatively more mobile and have international experience. Their viewpoint is equally important throughout the research process. Due to their different viewpoints, they may focus on aspects that are less visible from the permanent residents; for example, temporary residents with international experience focus on the need for multilingual staff, the development of modern tourist routes and activities, and the accessibility of internet and digital services. Which would provide the region with the opportunity to integrate more successfully into the international tourism market. This kind of approach will assist the region in better adapting to the demands of the international tourism market and integrating more effectively into global trends.

Every participant in the survey (100 percent) expressed a positive view regarding the development of tourism in Racha, which is highly important for the region's economic growth. This collective support demonstrates the local community's willingness and interest in becoming actively involved in tourism activities. Furthermore, they express a willingness to take advantage of support provided by both public and private organisations, highlighting the importance of local initiatives and investments. This kind of attitude creates a strong basis for the sustainable and successful development of tourism in the region, which could become a key factor of long-term socio-economic progress.

Based on the conducted survey, a few main trends and priority issues concerning tourism development were identified by the respondents. 76.9 percent of them highlighted the lack of financial resources, and the same percentage of respondents noted the need for staff training/retraining, while 92.3 percent identified infrastructure improvement as a key priority. All respondents (100 percent) consider it necessary that it is vital to guarantee the prevention of dangerous natural occurrences. 69.2 percent of them consider the establishment of a unified information database about Racha's tourism offers to be an important step. Only 7.7 percent indicated the need for stronger state support, and incentive actions from the state are necessary, and the same percentage (7.7 percent) emphasised the importance of increasing public awareness. (Fig. 3).

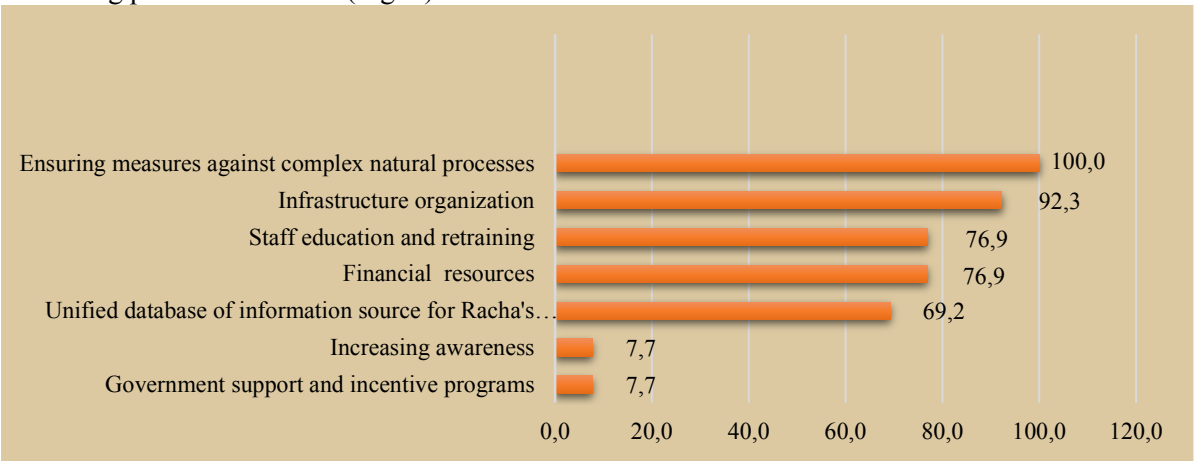

Figure 3. Priorities of respondents for measures in tourism development in Zemo Racha (percentage)

Based on the survey, 76.9 percent of respondents think that one of the main challenges for tourism development in Racha is the lack of financial resources. This indicates that capital investment is crucial not only for infrastructure projects but also for the development of tourism services. This factor indicates that it is necessary to attract either local or foreign investments. 76.9 percent of respondents indicated that professional training/retraining of staff is a key requirement for tourism development in Racha. This fact underlines the need to raise the professional standards of employees in the region's

service sector. The improvement in tourist service quality is closely linked to the competence of personnel, which will strongly affect the region's image and the increase in tourist flows.

It should be noted that there is a labour deficit in the villages, caused by the outmigration of the younger generation. This issue is especially significant during the winter period. Without keeping the youth in the region, stable economic development and the complete realisation of tourism potential cannot happen.

For tourism development, 92.3 percent of respondents identified the necessity of improving infrastructure. For the development of tourism in the region, it is critically important to improve the basic infrastructure: roads that are currently only partially organised, such as the Sachkhere-Shkmeri highway, which have made access to Oni easier; however, internal village roads are disorganised, and public transportation is limited (in the villages, transportation operates only once a week, which reduces tourists' mobility and makes it essential for them to use their vehicles). Improvements in living conditions are necessary (many villages are still without gas, which creates a major barrier to winter tourism), and communication access (connectivity problems in highland villages reduce the region's attractiveness to tourists, since modern travellers need access to both the internet and mobile communication). It is evident that there are insufficient shops and medical centres. Racha cannot become competitive without the development of the service sector as well as the tourism services.

The municipality is located in a zone characterised by complex exogenous processes, which poses a real threat (Gongadze et al., 2024). All of the respondents (100 percent) highlighted the importance of protecting the population from complex natural processes (such as landslides, floods, etc.). In order to prevent different natural challenges, relevant steps should be taken in the region and provide it with preventive equipment.

69.2 percent of respondents noted the need to establish a centralised information database regarding tourism offers in Racha. This will improve the availability of information about the region for tourists and make it easier for them to plan their trips. There was already such a precedent in Racha several years ago when, under a USAID program, an information database called the 'Tourism Cluster“ was established, which encompassed accommodation facilities, and the 'Food Cluster,“ which united restaurant owners, honey and ham producers and others. But with the end of the programme, these websites stopped functioning.

Based on the survey data, just one respondent highlighted the necessity of state support and the need for incentive programmes. This answer could be interpreted as showing that the majority of respondents pay relatively lower attention to state involvement. Additionally, it should be noted that the other respondents mainly consider the role of the state in the context of financial assistance and infrastructure development. This indicates that, in the respondents' view, the government’s involvement should be primarily centred around these specific aspects. Only one respondent highlighted the importance of raising awareness of tourism in Zemo Racha. However, its importance is clear, as recognition directly impacts tourist flows, regional promotion and marketing, all of which are essential for the long-term growth of tourism in the region.

It is important to note that all surveyed respondents (100 percent) are actively involved in the tourism service sector. They can offer tourists guesthouses, involvement in agricultural activities, sightseeing of natural and cultural monuments and other activities. Based on the analysis of the collected data, we described the types of tourism presented in Zemo Racha and analysed the level of service diversification.

Among the respondents were those who returned from the capital city to Racha during the COVID-19 pandemic. They are now considered permanent residents and plan to get involved in tourism activities, which reflect a slight positive influence of the pandemic on migratory processes and the diversification of the region's economy (Gogsadze et al., 2022; Tsitsagi et al., 2023; Bokeria & Tutberidze, 2023).

As evidence from Fig.4 all respondents, without exception, offer to tourists guesthouse services. This indicates that guesthouses represent the central segment of tourism in the region. Guesthouses play a vital socio-economic role in Racha's tourism, promoting both tourism infrastructure development and employment. The existence of a variety of natural and cultural monuments in the region strengthens tourists’ attractiveness and underscores the value of its cultural heritage.

84.6 percent of the respondents offer tourists to explore natural and cultural attractions. This shows that cultural and ecological tourism is one of the primary directions in Zemo Racha, which will help attract visitors to the region.

Among the respondents, 69.2 percent offer tourists local cuisine, while 53.8 percent provide them with the opportunity to taste homemade wine. This shows that both gastronomic tourism and wine culture also play a significant role in attracting tourists. Tasting wine is closely linked to the region's winemaking traditions, which strengthen uniqueness of Racha's cultural heritage.

61.5 percent of respondents offer tourists the introduction of local traditions. This indicates that the region is paying attention to the development of ethnic tourism, which, in turn, helps promote local heritage, traditions, and lifestyle.

46 percent of respondents offer to tourists horseback riding. As part of adventure tourism, horseback riding services help strengthening the possibilities for active tourism in the Racha region.

46 percent of respondents offer to tourists to participate in agricultural activities. This reflects the potential for developing agritourism, allowing tourists to understand agricultural processes, enjoy local produce, and participate in farming directly.

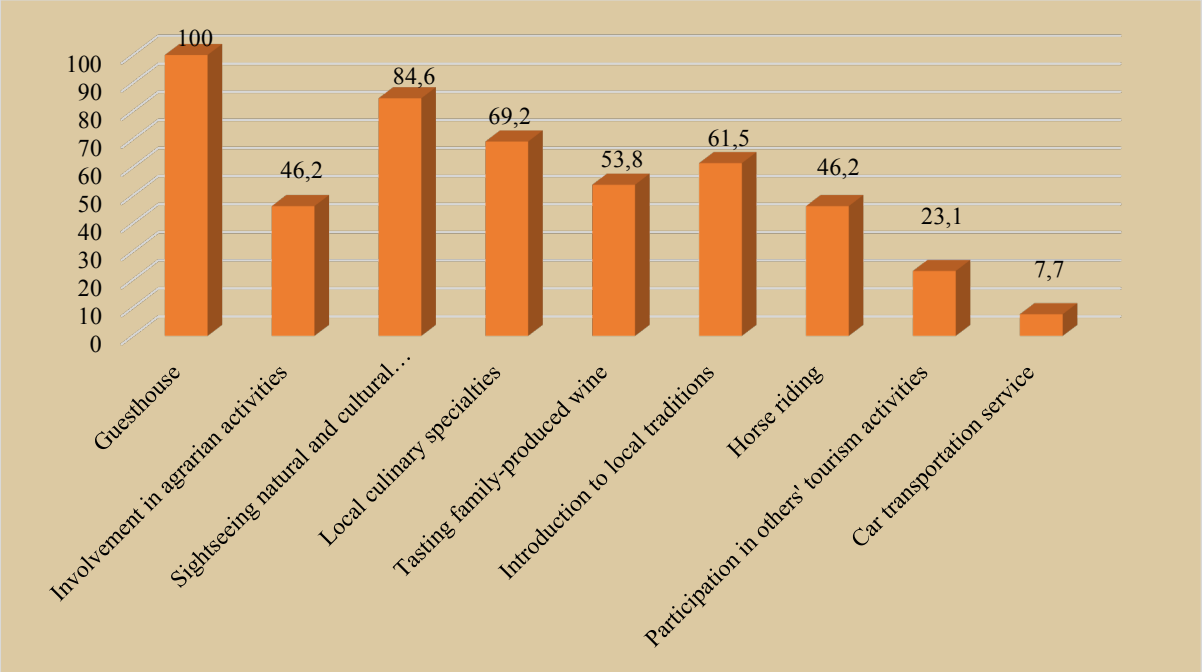

Figure 4. Suggestions of respondents engaged in various tourism activities in Zemo Racha (percentage)

23 percent of respondents indicate that they are involved in the activities of other people's tourism businesses. This illustrates the trend of creating collaborative networks in tourism, which helps local tourist destinations expand their range of services and increase their tourism potential.

8 percent of respondents noted the offering of car services, indicating that the transportation infrastructure and its development are still represented at a low level, which in turn is caused by imperfect infrastructural conditions.

This information shows that the region is not only focused on traditional hospitality, but also includes elements of wellness, eco-tourism, agritourism, gastronomic, cultural, and adventure tourism, fostering the multifaceted development of the region and fully realizing its tourism potential.

The analysis of respondents' answers, regarding their economic dependence on tourism confirms that tourism plays an important role in diversifying the income of the local population.

From the respondents' answers, it becomes clear that tourism, as an additional source of economic activity, increases financial stability, indicating the region's yet to be explored tourism potential.

The research clearly demonstrated significance of tourism and importance of tourism dependence for local population. Specifically, 7.6 percent of respondents indicated that their entire income (100 percent) comes from tourism. 15 percent of respondents noted that over half of their income (70 percent-80 percent) is earned through tourism activities. In the case of 53 percent of respondents, their earnings from tourism were less than one-third of their total income. 7.6 percent of respondents reported that one-third of their income comes from tourism. Moreover, 15 percent of respondents did not respond to this question.

The findings of the study indicate that the Zemo Racha community has different levels of dependence on tourism (Fig.5).

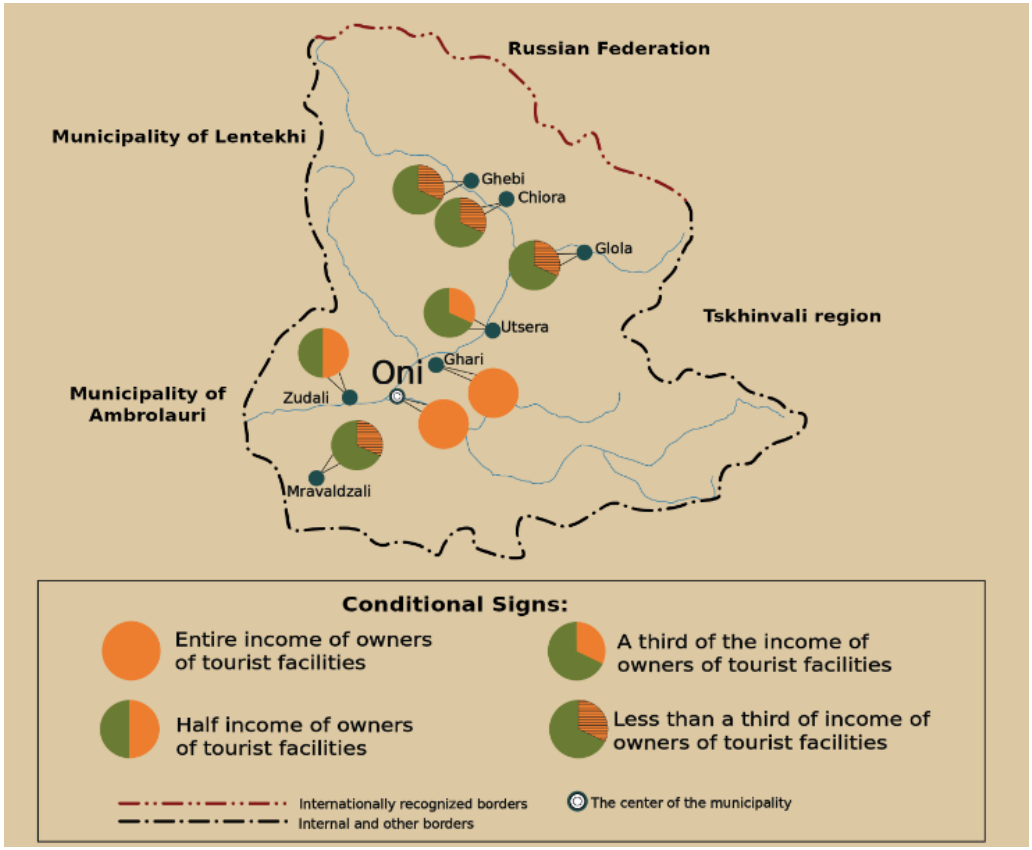

Figure 5. The share of tourism in the total annual income of owners of tourist facilities (The results of the interviewing)

- High level of dependency

Only 23 percent of respondents have incomes that are directly dependent on tourism services. Respondents from this group agree that the development of tourism is important for their financial stability and prosperity. Such a stance from this group of respondents is natural, as they gain direct benefits from tourism activities.

- Low level of dependency

This group of respondents accounts for 7 percent of the total respondents. They earn one-third of their income from tourism, indicating that they are partially dependent on tourism, while their main source of income is from other activities.

- Limited dependency

The results of the study demonstrated that 54 percent of respondents receive less than a third of their income from tourism, meaning that for the majority, tourism is an additional source, not the main one. The members of this group, as an additional activity, are involved in agriculture, and some of them are also employed in publicly funded sectors. As a result, they have relatively low interest in tourism development, however, they recognize the benefits and considerable potential of the tourism sector for the economy of the region.

- Unclear attitude

15 per cent of respondents did not answer this question. They preferred not to reveal their own earnings from tourism, which may be due to the low amount of such income or other motivations.

The data above indicates that tourism development in the region is not only a key driver of economic growth but also an alternative source of income for the local population, which could significantly increase with proper infrastructure and service improvements.

It is also notable that 61 percent of respondents reported that they receive financial and organisational support in their tourism activities from the government and/or international or local organisations. This

suggests the accessibility of resources and funding, which play a crucial role in supporting tourism development.

39 percent of the respondents indicated that they did not receive similar assistance. This may be due to a lack of information about various grant and funding opportunities, a general sense of distrust among respondents or an absence of interest in participating in projects. It is also possible to suggest that their applications were not accepted. The majority of respondents who received grants (around 62.5 percent) mentioned that their support came from the government program "Enterprise Georgia". Clearly, this programme plays a crucial role in supporting tourism and developing businesses in the Racha region. The popularity of this programme can be explained by the fact that it is a large-scale government initiative focused on providing support to small and medium-sized enterprises in multiple regions of the country. It is important for the Racha region to be informed about opportunities for grants and financial assistance, as this will promote sustainable tourism development.

92 percent of respondents who reported the negative effects of the Shovi tragedy (see Fig. 5) on tourism indicate that natural disasters have a direct impact on the tourism industry and the economic situation of the local population in the region. The significant drop in tourist numbers, caused by the fear and sense of insecurity stemming from the tragedy, illustrates how natural disasters influence not just tourism dynamics but also the challenges associated with maintaining the region's tourism reputation.

Discussions

Most of the interviewed respondents share the opinion that tourism is the most important part of the development of the economy of Zemo Racha, and its further development is very important for the region. However, its effective development is associated with many challenges. Lack of financial resources, lack of qualified personnel, insufficient infrastructure, and difficult natural conditions were identified as the main barriers to tourism development in the region. This is only a small part of the challenges mentioned by the locals, which require special attention. To fully utilise the tourism potential of Zemo Racha, it is necessary not only to improve the infrastructure but also to raise the awareness of the region, both at the national and global levels. With the help of targeted marketing strategies and information campaigns, it is possible to effectively present the region's unique tourism resources to the public. In addition, considering the specifics of the domestic and international tourism markets will help Racha to strengthen its position on the global tourism map, which will increase the number of tourists and contribute to the development of sustainable tourism in the region.

Until now, the tourism region of Zemo Racha had a pronounced healing and healing direction (resorts: Shovi, Utsera, Sortuan); now, in parallel with the further development of Utsera, the possibility of creating a mountain-ski complex (Mravaldzali) was revealed because of an additional study of tourist resources. In addition, there are settlements and places in Zemo Racha that have significant tourist potential and are already popular among individual tourists (the village of Gona with a special natural beauty; the village of Glola, which was the base of the Shovi resort in terms of providing employees and accommodation facilities). Now it receives tourists).

The recently created national park on the territory of the municipality should give impetus to the development of ecological, adventure and speleotourism. However, it should be noted here that there is a lack of knowledge about the functions of the national park among the population. The agro-tourism direction in the region also has a perspective, several facilities of which have been operating in the municipality of Oni for a long time. An important prerequisite for the development of gastronomic tourism could be the catalogue of Racha dishes prepared by the employees of the Tourism Information Centre.

Conclusion

✓ The majority of the population considers the field of tourism to be the main direction of further socio-economic development of Zemo Racha;

✓ The tragedy that took place in Shovi affected not only the future of Shovi, but also the tourism development of the entire Racha region; For the prevention of various natural challenges in the region, it is necessary to take appropriate measures and provide it with preventive devices;

✓ The incomes of 23 percent of the respondents directly depend on tourist services, a third of the income of 7 percent comes from tourism, i.e. partially depends on tourism, and the income of 54 percent

is less than a third of all incomes from tourism, these data reveal the importance of tourism for the economy of the region.

✓ All research participants offer accommodation to tourists in a family hotel. In addition, various respondents' suggestions are visiting cultural and natural monuments, tasting local dishes and wine, getting to know local traditions, engaging in agricultural activities, horse riding, etc.

✓ The respondents mentioned important issues for the development of tourism: lack of financial resources, the need for personnel training/retraining, infrastructure regulation.

✓ Part of the owners of tourist facilities received financial and organizational support from the state, international or local organizations, but more efforts are needed from the state to uilization the potential of the region.

The research showed that the tourism development of Zemo Racha is not only focused on traditional hospitality, but also includes elements of health and wellness, cultural, ecological, agro, gastronomic and adventure tourism, which will contribute to the multifaceted development of the region and tourism potential.

Competing interests

The authors declare that they have no competing interests.

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Authors' contribution

N.N., M.T. and G.K. conceived of the presented idea. All of the authors performed the analytic calculations. N.N took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and manuscript.

Reference

Bokeria, M., & Tutberidze, M. (2023). Changes in Hotel Management during the COVID-19 Pandemic and Post-pandemic Periods in Georgia. *Georgian Geographical Journal*, *3(1)*. https://doi.org/10.52340/ggj.2023.01.05

Chichinadze, T. (2021). The Role of Traditional Viticulture and Winemaking in the Development of the Geopark in Racha Region; *Journal of Applied Sciences Vol.11 No.11,;* DOI: 10.4236/ojapps.2021.1111089; https://www.scirp.org/journal/paperinformation?paperid=113212];

Geography of Georgia. (2003).*Social –Economic Geography, Part II.* Tbilisi. (In Georgian language).

Georgia's Legislative Herald. (2005). Regarding the List of Georgian Resorts and Resort Locations. On the List of Resorts and Resort Destinations in Georgia. https://matsne.gov.ge/ka/document/view/94798?publication=0]. (In Georgian language).

Gogsadze, G., Pavliashvili, N., Tsitsagi, M., & Kvirkvelia, N. (2022). Challenges of the COVID-19 pandemic confront Georgia's tourism industry. *In Springer eBooks (pp. 1779–1797)*. https://doi.org/10.1007/978-3-030-94350-9_95

Gogitidze, G., Nadareishvili, N. (2022). Wellness tourism opportunities in the mountainous zone of Adjara. *From a series of monographs " Globalization and current challenges in business" Publishing house "technical university", pp.409-412* ISBN 978-9941-28-893-7 https://doi.org/10.36073/978-9941-28-893-7 .(In Georgian language).

Gogitidze, G., Nadareishvili, N., Harun, R., Arion, I. D., & Muresan, I. C. (2022). Exploring Residents' Perceptions towards Tourism Development—A Case Study of the Adjara Mountain Area. *Sustainability*, *15(1), 492*. https://doi.org/10.3390/su15010492

Gongadze, M., Lominadze, G., Khomeriki, G., Kavlashvili, G. (2024). Analysis of Spontaneous Exodynamic Processes in the Dghviora River Basin Taking into Consideration the Perspectives of Shovi-Glola (Georgia) Tourist Agglomeration. *Georgian Geographical Journal*, *4(1).* https://doi.org/10.52340/ggj.2024.04.01.04

Jaoshvili, V. (1961). Population and Cities of Racha-Lechkhumi. *Book: Proceedings of the Institute of Geography, Volume 15 - Economic Geography Series. "Racha-Lechkhumi". pp. 81-115.* (In Georgian language).

Jaoshvili, V. (1996). General Characteristics of Settlement and Classification of Rural Settlements. *Book:* Population of Georgia*. 'Metsniereba' (Science), Tbilisi, pp. 356-389*. (In Georgian language).

Khakhubia, N., Nadareishvili, N., Gogitidze, G. (2024). The importance of the protected area in the development of sustainable tourism in the mountainous region. *Proceeding book. essa iv. International Eurasian symposium on social sciences and arts. Istanbul /* TURKIYE. P. 334-338. ISBN: 978-605-73444-8-9 https://essasymposium.org/tr/wp-content/uploads/sites/2/2024/09/tttttt.pdf

Khomeriki, G., Meladze, G., Nadareishvili, N., Tutberidze, M., Kvirkvelia, N., Dzhvarsheishvili, S.,Tavadze, G., & Bokeria, M. (2022). Demographic Issues of Social-Economic Development of Eastern Georgia: Population as a Demographic Potential. *Georgian Geographical Journal*, *2(1).* https://doi.org/10.52340/ggj.2022.752

Kobakhidze, E. (1971). Georgia's Resort Industry and Tourism. *Science Publishing House*, Tbilisi. (In Georgian).

Kohler, T., Elizbarashvili, N., Meladze, G., Svanadze, D., & Meessen, H. (2017). The Demogeographic Crisis in Racha, Georgia: Depopulation in the Central Caucasus Mountains. *Mountain Research and Development, Vol. 37, No. 4*

Mgvdeladze, B. (2007). Socio-Economic Problems of Lower Racha. *Publishing Center Kutaisi LLC 'Khomli en' Press.* Kutaisi (In Georgian language).

Nadareishvili, N., Dzidzikashvili, N. (2023). Smart" Tourism as an Innovative Direction of Tourism Development. *Scientific Journal* Economics*, №8-10, pp. 146-154.* Iverioni Publishing House. DOI:10.36962/ECS105/8-10/2023-146. (In Georgian language).

Neidze, V. (2003). Rural Settlement. *In the book: Geography of Georgia*, *Part 2. Socio-Economic Geography. pp. 63-66.* Tbilisi, (In Georgian language).

Stülb, M., & Dzhvarsheishvili, S. (2023). International Mobility as a Perspective for Young Graduates from Georgia: Analysing Employability for the German Job Market. *Georgian Geographical Journal*, *3(2).* https://doi.org/10.52340/ggj.2023.03.02.13

Tsitsagi, M., Dzhvarsheishvili, S., Kvirkvelia, N. & Shakhnazarovi, A. (2023). Two Years of Pandemic (Georgian Perspectives). *Georgian Geographical Journal*, *3(1).* https://doi.org/10.52340/ggj.2023.01.06

Tutberidze, M. (2021). The Georgian resorts as a basis for wellness tourism development. *Georgian Geographical Journal*, *1*(1). https://doi.org/10.52340/ggj.2021.261

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Examining the Impact of Natural Disasters on Tourism in Highland Destinations: Insights from Shovi

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Abstract

The tourism industry is profoundly influenced by various external factors, including pandemics, natural disasters, geopolitical tensions, economic crises, and climate change. Each of these factors presents unique challenges, necessitating tailored risk management strategies. This study investigates the impact of natural hazards on highland destinations, using the Shovi landslide that occurred in August 2023 in Georgia as a case study. Given the vulnerability of highland regions to natural disasters, a comprehensive analysis is essential. This research employs a triangulation methodology that combines a systematic literature review, statistical data analysis, and an online questionnaire to assess tourists' perceptions of safety and their behavioural responses following the landslide. Findings indicate that natural disasters have multidimensional impacts—financial, infrastructural, human, and environmental—significantly affecting the tourism industry. The study highlights the necessity of effective management and mitigation strategies to bolster tourism resilience in the region. By situating the Shovi landslide within the broader context of highland tourism, this research contributes to the academic discourse on disaster impacts and recovery. It identifies critical gaps in the literature and offers empirical evidence for developing crisis management frameworks tailored to highland destinations. This study aims to advance understanding of the interplay between natural disasters and tourism dynamics, providing a foundation for future scholarly inquiry in this field.

Keywords: tourism, natural disasters, crisis management, highland destinations, Shovi landslide, Georgia, Racha.

Introduction

Tourism is widely recognised as one of the most dynamic sectors of the global economy. Yet it remains highly susceptible to various external factors, including pandemics, economic fluctuations, political instability, and natural disasters. Among these, natural disasters present a particularly formidable challenge, especially for highland destinations, where unique geographic and climatic conditions often amplify the risks. The increasing frequency and unpredictability of such hazards highlight the urgent need for a nuanced understanding of their impacts on tourism, particularly in regions that are both environmentally fragile and economically dependent on the sector (Becken, 2017). While much of the existing research on tourism and disaster management focuses on coastal or urban destinations, highland regions face distinctive challenges due to their topography, isolation, and dependence on tourism as a primary economic driver (Prideaux et al., 2003). The Shovi landslide of August 2023 in Georgia's Racha region serves as a timely case study, illustrating the vulnerabilities of highland tourism to natural disasters. It underscores the necessity of developing comprehensive disaster management strategies that not only address immediate recovery but also build long-term resilience.

Georgia, a country renowned for its dramatic mountainous landscapes, is increasingly becoming a popular destination for domestic and international tourists. Approximately 65% to 70% of the country is covered by mountains, offering exceptional opportunities for tourism—ranging from hiking and

mountaineering to skiing and cultural exploration (Kalandadze, 2020). Destinations such as Kazbegi, Mestia, and Gudauri have seen significant growth in recent years, positioning Georgia as an emerging player in the global mountain tourism market. However, these regions are also highly vulnerable to a range of natural disasters, including avalanches, snowstorms, earthquakes, and landslides. The steep slopes, heavy rainfall, and seismic activity of Georgia's highlands create an environment where landslides, in particular, pose a persistent threat to both infrastructure and human lives (Chelidze, 2019). The Shovi landslide is a stark reminder of how such events can disrupt local economies, damage infrastructure, and, most critically, undermine the region's tourism industry.

Highland tourism destinations, such as Shovi, are particularly vulnerable to natural hazards due to their remote location and dependence on tourism for economic stability (McCool et al., 2015). The inherent risks of these regions—ranging from landslides to earthquakes—can have devastating consequences for the tourism infrastructure and the communities that rely on tourism for their livelihoods. A single disaster event can precipitate a rapid decline in tourist arrivals, financial instability for local businesses, and significant damage to essential infrastructure. The cyclical relationship between natural hazards and tourism dynamics underscores the need for destination managers to incorporate Disaster Risk Reduction (DRR) strategies into their planning processes (Faulkner, 2001). Additionally, the economic and social consequences of such disasters extend far beyond physical damage. Psychological factors, including tourists' perceptions of safety, play a crucial role in shaping recovery efforts. Studies have shown that even after the infrastructure is rebuilt, tourists may continue to avoid destinations perceived as unsafe, leading to longer-term declines in visitation (Ritchie, 2008). These behavioural shifts highlight the complexity of post-disaster recovery and the importance of not only rebuilding physical infrastructure but also restoring confidence in the destination.

This research aims to explore the broader implications of natural disasters for highland tourism, with a focus on the Shovi landslide as a case study. By adopting a triangulation methodology that includes a systematic literature review, statistical data analysis, and an online survey of tourists' perceptions, this study seeks to provide a comprehensive analysis of the immediate and long-term effects of the disaster on tourism. This approach allows for an in-depth exploration of the economic, social, and psychological dimensions of disaster impacts on tourism, offering valuable insights into how destinations can better manage risks and recover from such events. The findings will contribute to a deeper understanding of the vulnerabilities of highland tourism and highlight the need for effective risk management strategies that can enhance resilience in these fragile regions.

The literature on natural disasters and tourism has grown extensively over the years, with much research focusing on disaster management and recovery frameworks (Becken & Hughey, 2013; Hall & Page, 2016). However, most of this work has focused on coastal and urban destinations, which present different challenges compared to highland regions (Prideaux et al., 2003). While disaster risk management (DRM) frameworks have been developed for more accessible areas, highland destinations require tailored approaches that address their unique geographic and logistical challenges. Recent studies have emphasized the role of resilience-building in tourism destinations, advocating for the development of disaster risk reduction strategies that integrate local communities and stakeholders into the recovery process (Pennington-Gray, 2018; Ritchie & Jiang, 2019). Yet, there remains a gap in the literature regarding the application of such frameworks to highland regions, where the risks are often compounded by their isolation and dependence on tourism. This study seeks to fill this gap by providing a focused analysis of disaster impacts on highland tourism, using the Shovi landslide as a case study, and offering practical recommendations for destination managers and policymakers.

In the context of global environmental change and the increasing frequency of extreme weather events, this research is especially timely. As climate change exacerbates the occurrence and severity of natural disasters (Pforr, 2009), understanding the interplay between natural hazards and tourism dynamics becomes even more crucial. This study aims to offer empirical evidence from a highland region, contributing to the broader academic discourse on disaster risk management and tourism. Furthermore, by developing a framework for tourism resilience and recovery, this research will provide actionable insights for policymakers and destination managers, helping them create more effective disaster preparedness and recovery strategies. By improving our understanding of the vulnerabilities faced by highland tourism destinations like Shovi, this study not only fills a critical gap in the literature but also provides a foundation for future research on the sustainability of tourism in an increasingly uncertain world.

Methodological Approach

The research design incorporates three interrelated components: a systematic literature review, structured interviews with experts (N=10), and an online survey of tourists (N=412). The systematic literature review provides the theoretical foundation for the study, situating it within existing scholarly debates on the interplay between natural disasters and highland tourism. It examines relevant theoretical and empirical studies, focusing on disaster risk reduction, crisis management, and resilience in tourism contexts, while also drawing on global tourism crisis management frameworks applicable to Georgia's highland destinations.

The primary objective of the online survey with Georgian tourists was to gather insights into their perceptions of destination safety and their behavioural patterns. To ensure a comprehensive perspective, the survey employed both open and closed-ended questions. The questionnaire was administered via Google Forms. To prevent multiple submissions from a single individual and ensure the uniqueness of each response, the survey was linked to Gmail accounts and limited to one response per account. A total of 412 respondents completed the survey.

To gather expert opinions on functional mitigation strategies for Georgia, we conducted structured interviews. These interviews included both open-ended questions and a 5-point Likert scale. Experts were selected through purposive sampling from both the tourism and natural science sectors. The questionnaire was sent to 35 experts, and 10 responded, completing and returning the survey.

Data analysis was conducted using Excel, MAXQDA, and SPSS.

By integrating these methods, the study addresses the research problem from multiple angles, ensuring a comprehensive assessment of the landslide's implications for the tourism sector in Shovi. This robust methodological approach aims to produce findings that are both academically rigorous and practically applicable, offering valuable insights for disaster management and sustainable tourism development in highland destinations.

Disaster Risk Reduction and Crisis Management in Tourism

The field of Disaster Risk Reduction (DRR) in tourism has evolved significantly over the past two decades, largely driven by the increasing frequency and intensity of natural disasters, a trend exacerbated by climate change. DRR frameworks emphasise proactive risk assessments, infrastructure resilience, and effective emergency communication to mitigate the impacts of disasters on tourism (Becken & Hughey, 2013). These strategies must be integrated into long-term planning by tourism destinations to ensure both visitor safety and the continuity of tourism services post-disaster.

The research agenda on disaster management (DM) in tourism began to take shape in the 1990s, addressing topics such as the role of tourism in disaster planning (Murphy & Bayley, 1989), the intersection of disaster recovery and media response (Milo & Yoder, 1991), and the development of tourism-specific disaster planning strategies (Drabek, 1995), alongside broader crisis management processes (Young & Montgomery, 1997). These pioneering studies provided the foundation for subsequent frameworks and practices in tourism disaster management. Faulkner's (2001) comprehensive disaster management framework underscores the key phases of preparedness, response, recovery, and mitigation. Although initially developed for coastal destinations, this framework has been adapted for various disaster contexts, including those specific to highland regions. Faulkner stresses the importance of pre-disaster strategies that focus on reducing vulnerabilities, such as strengthening infrastructure and raising awareness within local communities. Furthermore, Ritchie (2004) highlights the significance of the recovery phase, which goes beyond physical rebuilding to also include the restoration of tourists' confidence through transparent communication and targeted marketing that focuses on the safety measures taken.

In highland tourism, where infrastructure is often underdeveloped and access is more restricted compared to urban or coastal areas, DRR and crisis management frameworks must be tailored to local conditions (Hall & Page, 2016). Common threats such as landslides, avalanches, and seismic activity pose significant risks to both physical infrastructure and tourists' perceptions of safety. Given these unique challenges, adapting DRR and crisis management strategies to the specific vulnerabilities of highland regions is critical.

Highland regions are increasingly vulnerable to natural disasters, particularly landslides, floods, and earthquakes, as a result of the intensifying effects of climate change. The unique geographical features of these areas—steep slopes, erosion-prone soils, and isolated communities—amplify the impacts of these hazards (Prideaux et al., 2003). Studies from various highland tourism destinations, including

Nepal, the Andes, and the Alps, have documented how natural disasters disrupt local economies, damage critical infrastructure, and alter tourist behaviour (McCool et al., 2015; Chelidze, 2019).

Natural disasters have significant and far-reaching implications for tourism. Firstly, they damage tourism infrastructure, making destinations temporarily inaccessible (Huang & Min, 2002). Secondly, disasters disrupt transportation networks and influence source markets by altering consumer perceptions of safety (Prideaux, Laws, & Faulkner, 2003). The media play a crucial role in amplifying these impacts, creating a "ripple effect" that spreads the negative consequences of disasters both geographically and across sectors (Handmer & Dovers, 2007). This ripple effect can delay recovery by fostering negative perceptions, which hinder the inflow of tourists and foreign exchange, thus prolonging the recovery process (Ritchie, 2004). As a result, the "response" and "recovery" stages of disaster management have been focal points in tourism research (Mair et al., 2016).

Landslides, in particular, are a recurrent risk in mountainous regions and present both immediate and long-term challenges to tourism. Beyond the physical damage they cause, landslides significantly affect tourists' perceptions of safety and the destination's overall appeal. McCool et al. (2015) argue that tourists' risk perceptions are shaped not only by the immediate aftermath of a disaster but also by the effectiveness of the destination's response. In highland areas, where recovery is often slow due to difficult terrain and damaged infrastructure, restoring tourist confidence becomes particularly critical.

Landslides, defined as the downslope movement of soil or rock due to instability, are common natural hazards in mountainous regions. Such events often result from a combination of steep slopes, semi-permeable glide layers beneath the soil, and significant water content, which increases the weight of the soil mass (Sunarta et al 2018). Landslides are most likely to occur in areas with slopes between 15° and 45° and high rainfall intensity. Beyond these natural factors, human activities such as deforestation, agricultural expansion, urbanization, mining, and road construction can exacerbate the risks of landslides, further disrupting the landscape and increasing vulnerability (FAO, 2013).

Resilience in Tourism: Strategies for Disaster Management and Sustainable Recovery

In the tourism industry, the environment—both natural and human-made—is foundational to the success of many destinations. Natural landscapes, such as mountains, forests, and coastlines, are central to tourism products, making their preservation crucial for sustaining tourism. The initial relationship between tourism and the environment can be characterised as one of "coexistence", where both systems support and benefit from each other. However, this delicate balance is often disrupted by natural disasters which pose significant threats to both tourism infrastructure and the local economy.

The concept of resilience, which originated in the fields of ecology and engineering (Berbés-Blázquez & Scott, 2017), refers to the ability of a system to return to its normal state following a disturbance. In the context of tourism, resilience can be understood as the capacity of destinations to recover from the impact of natural disasters and environmental changes. Research has shown that the resilience of tourism destinations depends on the resilience of all subsystems within the destination, including infrastructure, local communities, and economic structures (Hall et al., 2018).

Community-based approaches are integral to effective disaster recovery, particularly in areas where tourism is a key economic driver. Empowering local communities not only accelerates recovery but also ensures that tourism can support livelihoods during the rebuilding phase (Faulkner, 2001; Prideaux et al., 2003). Engaging local communities in the recovery process ensures that their needs are addressed, and that tourism development is aligned with local priorities, enhancing the long-term sustainability of the sector.

Government agencies and tourism boards play pivotal roles in disaster recovery. Effective coordination between local businesses, government entities, and international organizations is often crucial for a successful recovery process. Studies have demonstrated that post-disaster marketing emphasizing resilience and ongoing development efforts can effectively attract tourists back to affected regions (Ritchie, 2008). By focusing on restoring critical infrastructure and enhancing the destination's resilience, government entities, and tourism boards can mitigate the long-term negative impacts of disasters on the tourism industry.

The World Bank's guide on maintaining tourism resilience during disasters outlines five key aspects of disaster management in the tourism industry: (1) Risk Understanding, which involves identifying and assessing potential disaster risks that threaten tourism destinations; (2) Planning and Prioritization, which focuses on strategically planning and prioritizing sustainable tourism development to minimize negative impacts; (3) Mitigation and Preparedness, which includes both structural (infrastructure) and non-structural (communication systems, disaster risk financing)

measures to prepare for disasters; (4) Response and Recovery, which aims to minimize disruptions and maintain competitiveness post-disaster; and (5) Long-Term Resilience, which involves planning for the sustainability of tourism through climate change mitigation and other long-term strategies (World Bank, 2020).

Crisis management in the tourism sector generally follows two primary approaches: reactive and proactive. The reactive approach to crisis management focuses on rehabilitating the consequences of a disaster that has already occurred, whereas the proactive approach envisages the implementation of activities that will contribute to mitigating the consequences of the disaster and facilitating rehabilitation (Nair & Dileep, 2020). According to Kyoo-Man Ha, disaster management in the tourism industry is analyzed from four different perspectives: tourists, the tourism industry, regional governments, and international organizations. The author believes that each party should reorganize its management strategies from a reactive response to a proactive approach (Ha, 2023). Other authors share this opinion, believing that proactively reducing disaster risks and minimizing negative effects is more effective than a passive response to disasters (Becken & Hughey, 2013; Todman-Lewis, 2017; Stoffelen & Loannides, 2022).

Integrating resilience-building strategies into tourism development and disaster management planning is essential for destinations that are increasingly vulnerable to environmental threats. By adopting a proactive approach that includes improving infrastructure, empowering local communities, and developing comprehensive disaster recovery plans, destinations can better withstand the shocks of natural disasters. Ensuring the long-term sustainability of the tourism industry requires a coordinated effort that addresses both immediate and long-term challenges, from disaster preparedness to climate change adaptation.

Shovi Landslide

On August 3, 2023, a devastating landslide struck the Shovi mountain resort in Oni Municipality, located in the Racha region of Georgia. According to a report from the National Environmental Agency, the glacial landslide in the Buba River Valley destroyed large portions of the Shovi resort. The landslide, which involved approximately 4 million cubic meters of solid material—comprising glacier fragments, tree debris, and vegetation—resulted in the accumulation of around 1 million cubic meters within the resort area itself. An additional 0.8-1.0 million cubic meters of debris were spread across the floodplains of the Chanchakha and Rion rivers, while up to 0.5 million cubic meters were recorded in the Buba River transit zone. Moreover, around 1.5 million cubic meters of dynamic material have accumulated at the bottom of the landslide zone, increasing the ongoing risk (National Environmental Agency, 2024).

An evaluation by the Institute of Earth Sciences and the National Seismic Monitoring Center at Ilia State University revealed that if an early warning system had been in place, the landslide could have been detected up to two hours in advance, providing sufficient time to warn the population and facilitate evacuations (Civil Georgia, 2024). This tragic event, which claimed the lives of 33 people, has left a lasting impact on Shovi, once a thriving vacation destination nestled in the Greater Caucasus Mountains at an elevation of 1,600 meters above sea level. The resort, with a history spanning nearly a century, has now been overshadowed by the tragedy, and recovery efforts remain conspicuously absent (RFE/RL, 2023 August 3).

Since the disaster, there has been little to no effort to revitalize the resort or restore tourism in the area. The region remains widely regarded as unsafe, with no significant initiatives to repair its infrastructure, clean up the site, or rebuild facilities. Tourism, which was never on a mass scale, has almost completely ceased. Online information still primarily reflects the tragic event, reinforcing the perception of Shovi as a disaster site rather than a potential destination. As a result, it is unlikely that Shovi will regain its former appeal in the near future. The absence of government or organizational initiatives to address safety concerns and invest in recovery efforts has left the region without the necessary momentum to re-establish itself as a viable tourism destination.

This lack of proactive crisis management, combined with the failure to invest in rehabilitation and marketing, has effectively stalled the resort's recovery. Without efforts to rebuild infrastructure, improve safety, and engage in targeted promotion, Shovi’s future as a tourism hub remains uncertain. The ongoing focus on the disaster online has made it difficult to reframe the region’s image, leaving little hope for a swift or successful recovery.

Results

Online Survey Results

An online survey was conducted to investigate the attitudes and behaviours of Georgian tourists concerning the safety of their travel destinations. The survey consisted of both open-ended and closed-ended questions. The open-ended questions aimed to elicit detailed, descriptive answers, allowing respondents to express their views freely. In addition to the closed-ended questions, which were designed to measure respondents' clear positions on specific issues, the open-ended questions served to clarify and expand upon the quantitative data, offering deeper insights into the respondents' perceptions.

Data coding and classification techniques were employed to analyse the open-ended responses systematically. This allowed for the organization of the open-ended answers into meaningful categories.

A total of 412 individuals participated in the survey. Of these, 32.8% were male, and 67.2% were female. The age distribution of the respondents was as follows: 37.6% were aged 18-28 years, 50.5% were aged 29-39 years, 8.5% were aged 40-50 years, and 3.2% were aged 51-61 years.

From the answers to the open question about what factors were taken into account in the process of selecting a destination and why the respondents chose a particular destination, the following categories were identified: 1. affordability; 2. diversity and attractiveness of the destination; 3. convenient location; 4. security; 5. destination infrastructure and level of digital development; 6. popularity of the destination; 7. weather/climate; 8. impact of the visa regime; 9. consideration of reviews and recommendations; 10. other (see Figure 1).

"First of all, I specify the purpose of the trip: attending a specific event, gaining new experiences, relaxing, having fun, etc. Accordingly, I choose the location considering the following factors: 1. Budget and affordability; 2. Security and health services; 3. Accessibility of transport; 4. Season and travel period; 5. Recommendations from experienced travellers; 6. Immigration procedures." (Female, 29-30 years old)

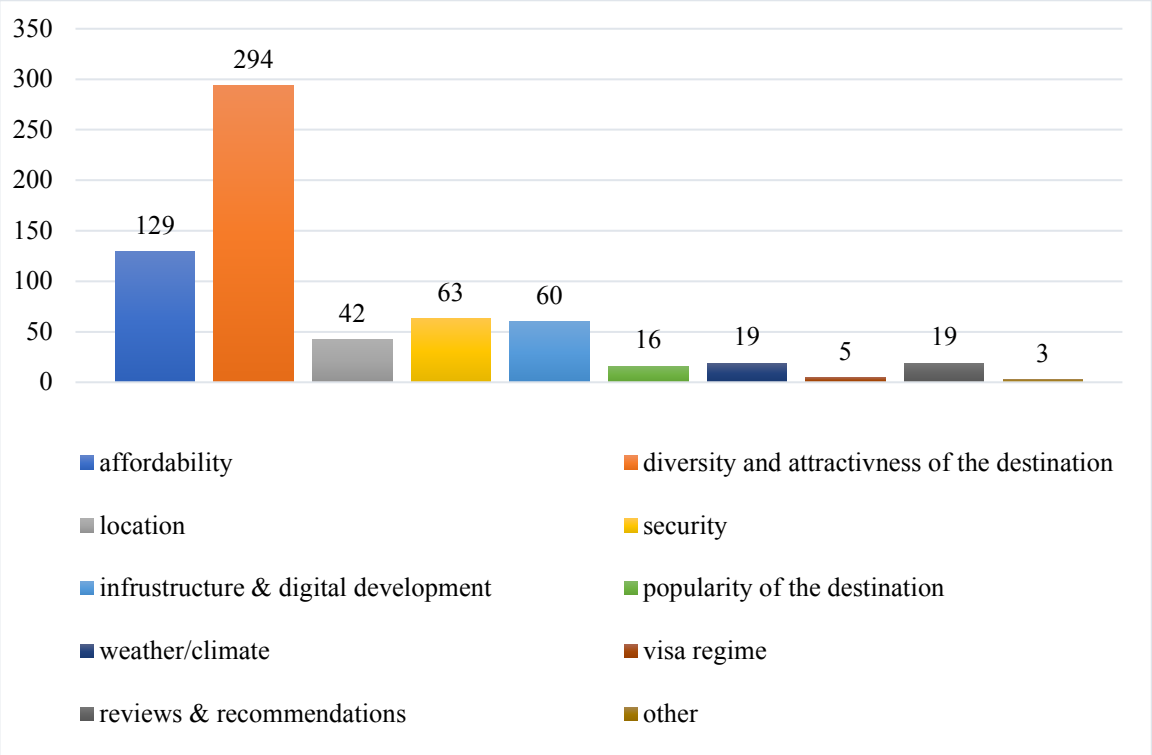

Figure 1. The Main Factors Considered in the Destination Selection Process

The next question addressed the factors considered when selecting accommodations. This was a closed-ended question with multiple response options. The distribution of responses is presented in Figure 2. Price and location emerged as the most important factors for visitors, while services, security policies, and accommodation mechanisms were considered less significant.

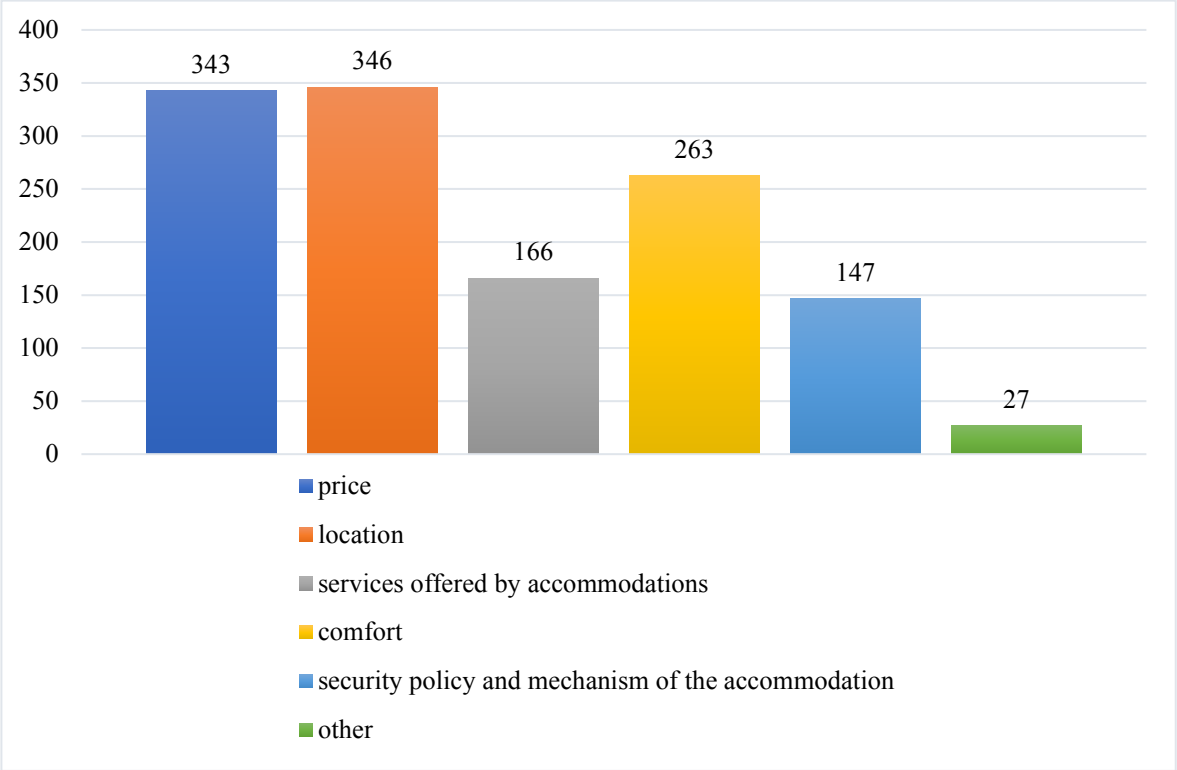

Figure 2. The Main Factors Considered in the Accommodation Selection Process

The respondents were asked to identify the primary factor influencing their accommodation selection. The results indicate that location and price were the most important determinants, followed by convenience, the services provided by the accommodation, and its security policies and mechanisms. Notably, security considerations emerged as the least influential factor in the decision-making process.

In the subsequent open-ended question, respondents were asked to identify the circumstances that made them feel unsafe while travelling for tourism. Upon analyzing the responses, the following key categories were identified: 1. Local population; 2. Favourable location of the destination and accommodation; 3. Low crime levels; 4. Safe transportation and adequate infrastructure; 5. Access to reliable internet and information; 6. Protection against natural disasters; 7. Personal security measures; 8. Travel insurance; 9. Sufficient financial resources; 10. Accompaniment by trusted individuals; 11. Availability of appropriate equipment; 12. Safe accommodation. These responses suggest that travellers' perceptions of safety are shaped by a combination of **personal factors (trusted companions, financial resources)**, **environmental factors (crime, infrastructure)**, and **preparedness (security policies, travel insurance)**. This highlights the multifaceted nature of safety in tourism and suggests that effective destination management should address these various aspects to improve visitor confidence.

The following open-ended question focused on factors contributing to safety during guests' stays at the accommodation. Through a systematic process of coding and classification, several key categories emerged, reflecting the diverse elements that influence perceived safety in these settings. These categories can be grouped into both tangible and intangible aspects of safety.

Reputation and Rating of the Accommodation: Many respondents emphasized the importance of previous guest reviews and ratings as a measure of trustworthiness and safety, suggesting that reputation plays a key role in influencing decisions.

Location: The proximity to potentially hazardous areas, such as disaster-prone zones, was highlighted as a critical factor in ensuring safety. Respondents noted that being situated in a safe, easily accessible location contributed significantly to their sense of security.

Video Monitoring: The presence of video surveillance was frequently mentioned as a visible sign of security, indicating that respondents value measures that enhance physical safety and provide a sense of constant monitoring.

Security Service: The availability of trained security personnel on-site was another priority, with respondents indicating that a visible and accessible security presence reassured them about their safety during their stay.

Security Plans and Systems: Respondents highlighted the importance of clear, well-communicated emergency plans and security systems, such as fire alarms or evacuation routes, that demonstrate preparedness for unforeseen events.

Hygiene: Cleanliness, while traditionally associated with comfort, was also cited as a crucial factor in safety, particularly with regard to preventing health hazards and ensuring that the accommodation meets sanitary standards.

Safe Doors and Windows: The structural integrity of doors and windows, particularly in terms of secure locking mechanisms, was mentioned as an important safeguard for both physical security and peace of mind.

Solid Building Structure and Quality Inventory: Respondents noted that a well-constructed building with durable materials, along with high-quality inventory, significantly contributed to the overall safety and security of the accommodation.

Host/Staff of the Accommodation: The attitude and responsiveness of the host or staff were highlighted as key to ensuring safety. Attentive and proactive staff, especially in emergencies, was seen as an essential part of the safety infrastructure.

Comfort: While comfort was often associated with the overall quality of the stay, many respondents linked it to safety, particularly in terms of providing a stress-free environment where guests felt at ease.

Reliable Communication System: A dependable communication system, including access to local emergency services and a reliable Wi-Fi connection, was emphasized as crucial for both practical and emotional security.

Security Guarantee for Personal Belongings: Many respondents expressed the importance of secure storage options for personal items, such as lockers or safes, to ensure the safety of valuables during their stay.

Other Factors: Several additional considerations were identified, including the presence of a 24-hour reception, the availability of first aid services, the location's distance from disaster-prone areas, quality certifications, and the ability to make reliable bookings—all of which were seen as integral to enhancing the overall safety of the accommodation.

In the eighth question, respondents were asked to rate their perceived safety while travelling to Georgia for tourism purposes using a 5-point Likert scale, where 1 represented "I don't feel safe at all" and 5 indicated "I feel very safe." In the ninth open-ended question, respondents were asked to elaborate on their answers from the eighth question, providing further insights into the factors influencing their sense of safety.

The tenth question, also using a 5-point Likert scale (with 1 meaning "I am not prepared at all" and 5 meaning "I am fully prepared"), evaluated respondents' self-assessed readiness to protect themselves in the event of a natural disaster during their trip to Georgia. This question aimed to measure individual preparedness in response to potential environmental hazards.

Interestingly, while respondents generally expressed a sense of safety while travelling in Georgia, their responses to the tenth question indicated that they largely felt unprepared for natural disasters. This highlights a significant contrast between tourists' perceived safety in the country and their personal readiness to respond to emergencies, suggesting a gap in crisis preparedness and awareness among travellers. (See Table 1 for a detailed comparison of responses.)

Table 1. Perceived Safety and Personal Preparedness for Natural Disasters While Traveling to Georgia for Tourism

	How safe do you feel when travelling to Georgia for tourist purposes?	When travelling to Georgia for tourism purposes, assess your personal preparedness to protect yourself in case of natural disasters
1 score	1.9%	32.3%
2 score	4.1%	22.3%
3 score	23.1%	30.3%
4 score	40.8%	9.2%
5 score	30.1%	5.8%

According to the respondents, a sense of homeliness and familiarity with the local situation were identified as the key factors contributing to feelings of security in Georgia. However, those who

reported a lower sense of security primarily cited issues related to infrastructure, particularly in the mountainous regions, as well as concerns about transportation. Additionally, many respondents expressed worries about the country's lack of preparedness for natural disasters, which further contributed to their perception of insecurity.

"Throughout Georgia, I have visited all parts (Svaneti, Pshavi, Khevsureti, Tusheti, Ajara, Samtskhe-Javakheti, Pankisi Valley, etc.) with no problems. Locals everywhere were friendly and helpful when you had a problem." (Male, 29-39 years old)

One of the primary challenges in mitigating the long-term effects of natural disasters on the tourism industry is the restoration of the destination's "image" as a safe and desirable place to visit. In the context of this research, we sought to understand respondents' attitudes toward Shovi, a post-crisis destination, without directly referencing the 2023 tragedy. To gauge this, two questions were posed: "If you had the opportunity, would you visit Shovi for tourism purposes next season?" and "Please explain the reason for your answer."

The responses revealed a mixed outlook on Shovi's tourism potential. 23.3% of respondents expressed a willingness to visit Shovi in the next season, indicating some level of confidence in the destination's appeal despite its challenges. However, 41% of respondents stated that they would not visit, reflecting concerns that may be related to safety, infrastructure, or lingering perceptions of the area. A significant portion, 35.7%, selected "don't know," suggesting uncertainty or lack of clear information regarding the current state of the destination (see Figure 3).

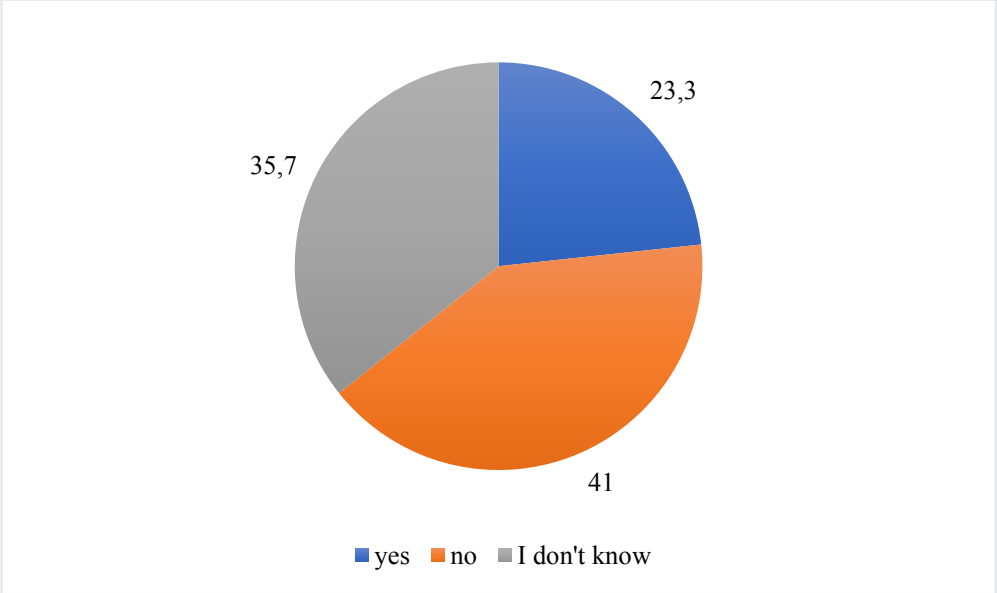

Figure 3. Willingness to Visit Shovi Next Season

The explanations provided by respondents who expressed a willingness to visit Shovi revealed that, for them, a single natural disaster was not seen as a deterrent to travel. On the contrary, they perceived visiting the destination as an opportunity to show solidarity with the local community and to demonstrate their interest in the region's recovery. These respondents emphasized that, in their view, tourism could play a role in the post-crisis revitalization of the area, highlighting a sense of responsibility and support for Shovi's future.

"I have a feeling of solidarity with the victim Racha. However, I think the probability of doing the same thing a second time is low." (Male, 51-61 years old)

The primary reasons for respondents choosing "no" or "I don't know" were negative associations tied to the 2023 tragedy in Shovi. The majority of respondents indicated that they were psychologically unprepared to visit a location that had recently been the site of such a traumatic event. A smaller portion of respondents cited concerns about the lack of physical security guarantees as a deterrent, rather than psychological readiness. Additionally, a few respondents clarified that their decision was not influenced by the tragedy itself, but rather by a general disinterest in mountainous and extreme destinations.

"I think that after the tragedy, proper actions were not taken to prevent a similar incident in the future. If a natural disaster occurs, Georgia does not have the appropriate system/management, transport and equipment for emergency response. I have no confidence in my country in this regard. Despite my great desire, I do not feel safe travelling to Georgia." (Female, 18-28 years old)

"From a moral point of view, it is a bit strange for me to rest in a place where such a tragedy happened. Maybe it will take a little more time to heal this wound."(Male, 18-28 years old)

The next question aimed to identify the stakeholders that respondents believed were responsible for ensuring tourist safety during natural disasters. Participants were allowed to select multiple options, including the government (state), the owner/manager of a tourist business, employees of a tourist business, tourists themselves, and others. The government (state) and the owner/manager of the tourist business were most frequently cited as key responsible parties.

When asked to identify the single most responsible stakeholder for tourist safety during natural disasters, the government (state) emerged as the clear leader. A substantial majority of respondents viewed the government as having the greatest responsibility for ensuring safety in crises. The owner/manager of the tourist business was ranked second though the percentage of respondents selecting this option was significantly lower, indicating that while the owner/manager is seen as important, their role is considered secondary to that of the government.

Structured Interview with Experts

The purpose of the expert survey was to analyse strategic approaches to mitigating the impact of natural disasters on the tourism industry and to identify relevant strategies for Georgia.

Experts identified several preventive strategic approaches to reduce the impact of natural processes on the tourism sector. These included: anti-avalanche systems, anti-landslide measures, continuous monitoring of forest fires, provision of appropriate technical equipment, international cooperation, staff training, the implementation of early warning systems, public awareness campaigns, involvement of geologists in the study of tourist destinations, analysis of long-term meteorological data for these destinations, investigation of anthropogenic impacts, and timely communication with the tourism industry.

Regarding the response phase, the respondents highlighted the following strategies: operational actions by rescue services, prompt and efficient responses from relevant tourism industry agencies (e.g., information distribution), implementation of aerial firefighting measures in the case of forest fires, the use of artificial avalanches when necessary, collaboration with the National Environment Agency, increasing the involvement of local authorities and residents in planning tourist facilities, creating risk maps, identifying hazardous zones, and conducting relevant training programmes.

For the recovery and rehabilitation phase, experts proposed the following strategies: implementing appropriate infrastructure measures, conducting targeted marketing campaigns by tourism industry agencies, reinforcing slopes in landslide-prone areas, performing hazard assessments with regular monitoring, and training qualified personnel.

When asked about the activities tourism-related companies and organizations should undertake to address the risks of potential natural disasters, respondents emphasized the need for tourism industry representatives to stay in contact with agencies responsible for risk monitoring and management. They should be informed about potentially vulnerable destinations and likely natural events and undergo training on related topics.

Discussion

The tourism industry cannot directly control natural hazards, yet effective collaboration among stakeholders can significantly mitigate the impact of such events on the sector. Crisis management in tourism requires the involvement of various actors, including government agencies, tourism businesses, tourists, the local population, the financial sector, and non-governmental organizations. Each of these stakeholders plays a crucial role in reducing the negative effects of natural disasters and ensuring the resilience of the tourism industry.

Research on post-crisis tourism rehabilitation consistently highlights the critical role of marketing in restoring the reputation of disaster-affected destinations. After a natural disaster, destinations are often perceived as unsafe, and their credibility suffers. This loss of trust leads to a decline in tourist demand, which can have long-lasting economic consequences. To restore the destination's image and reassure potential visitors, governments and tourism industry representatives must engage in targeted marketing campaigns that emphasize the safety and recovery efforts undertaken by the region (Aznar-Crespo, Aledo, & Melgarejo-Moreno, 2020; Estevão & Costa, 2021; Ha, 2023; Machado & Almeida, 2019; Todman-Lewis, 2017). In the context of Georgia, where the tourism sector is an essential component of the economy, these strategies become even more vital in rebuilding both the physical infrastructure and the emotional trust of tourists.

The survey conducted for this study offers valuable insights into Georgian tourists' attitudes toward safety and disaster preparedness. While many respondents indicated that safety was a consideration in destination and accommodation choices, it was not their primary criterion. Factors such as affordability, location, and the attractiveness of the destination outweighed security concerns. This finding aligns with broader trends in tourism where, despite the increasing prevalence of natural hazards, tourists tend to prioritize other factors, such as cost and convenience, over safety (Estevão & Costa, 2021).

Interestingly, while respondents rated their trip as generally safe, their self-assessed preparedness for natural disasters was notably low. A significant proportion of respondents reported feeling unprepared to handle a natural disaster should one occur during their visit. For instance, one participant noted:

"I don't feel safe at all because, unfortunately, I have to be an expert on everything myself to travel safely. Be it meteorological knowledge or other specific knowledge required for tourism facilities and entertainment activities. If you can't figure it all out yourself, you won't be able to rely on the hosts. Even if we look at Shovi, I'm sure that the people there, including the directors and owners of the facilities, did not even know that such a thing could theoretically happen. When you start a business, you need to know everything about your facility and the environmental conditions and be prepared." (Male, 18-28 years old)

The importance of restoring the "image" of a destination post-crisis is confirmed by the survey results, particularly in the case of Shovi. Although the 2023 tragedy in Shovi was not explicitly mentioned in the survey, the event's lingering psychological impact was evident. A large portion of respondents indicated they would be reluctant to visit Shovi in the next tourist season, citing concerns over safety and lingering trauma from the disaster. This is consistent with previous research which shows that tourists often associate post-crisis destinations with psychological discomfort, even when safety measures are in place (Machado & Almeida, 2019). However, a smaller group of respondents saw visiting Shovi as an opportunity to show solidarity and support for the local community in its recovery. This sentiment reflects a growing trend where tourists view their travel choices as a form of ethical support for regions recovering from crises.

For Shovi, the challenge lies in overcoming these psychological barriers through effective communication. With the right marketing campaigns—focused not only on physical rehabilitation but also on messaging that emphasizes solidarity and the destination's resilience—tourists may be more inclined to visit and contribute to the area's economic recovery.

The survey also sheds light on the broader issue of tourist safety and preparedness. The disconnect between tourists' perceptions of safety and their actual preparedness for natural disasters highlights a gap in both awareness and infrastructure. While many tourists felt generally secure in Georgia, the survey results indicated a lack of confidence in their ability to respond to potential crises. This discrepancy suggests that there is a need for greater emphasis on crisis education and preparedness for visitors. Tourists should be provided with clear, accessible information about what to do in case of natural disasters, as well as the safety measures in place at their accommodation and throughout the destination.

In terms of stakeholder responsibilities, the survey results confirm that the government (state) is viewed as the most important actor in ensuring tourist safety during natural disasters, with the owner/manager of the tourist business considered second in importance. This finding supports the view that public authorities must take the lead in crisis preparedness, with tourism businesses playing a supporting role in implementing safety measures and providing guests with information. However, it is clear from the survey that tourists also need to take responsibility for their own safety, especially in terms of preparedness. This suggests that tourism policies should not only focus on improving safety infrastructure but also on educating tourists about how to prepare for natural disasters while travelling.

Conclusion

In conclusion, while natural disasters are beyond the control of the tourism industry, a proactive and collaborative approach can significantly mitigate their impact. The findings from this survey highlight the critical role of effective communication, safety measures, and marketing in the post-crisis rehabilitation of tourist destinations. In the case of Georgia, particularly in regions like Shovi, the restoration of the destination's reputation will require a dual effort: physical infrastructure recovery combined with strategic messaging that emphasises solidarity, safety, and recovery.

The survey also reveals a significant gap in tourists' preparedness for natural disasters. While many respondents felt generally safe during their travels in Georgia, their perceived lack of personal

readiness to respond to emergencies points to the need for improved awareness and crisis management education. Efforts to enhance tourist preparedness should be a priority, alongside strengthening safety measures at destinations and accommodations.

The rehabilitation of a destination's "image" after a crisis is critical, as the survey shows that the aftermath of the 2023 tragedy in Shovi has had a lasting impact on potential visitors' perceptions. Many respondents expressed reluctance to visit Shovi in the next tourist season, associating the area with psychological discomfort rather than an opportunity for solidarity. However, with the right marketing campaigns that focus on recovery, resilience, and the positive role of tourism in supporting post-crisis recovery, these perceptions can be shifted.

Ultimately, a comprehensive, multi-stakeholder approach that integrates risk reduction, crisis response, and post-crisis rehabilitation will be essential to ensuring Georgia's tourism sector becomes more resilient to natural disasters. By addressing the gaps in tourist preparedness and rebuilding the image of post-crisis destinations, Georgia can foster long-term sustainability and safety within its tourism industry.

In addition to the findings from the survey, it is essential to consider a comprehensive framework for managing the impact of natural disasters on tourism. These strategies can be categorised into three main approaches: preventive, response, and recovery-rehabilitation. Each of these approaches plays a critical role in enhancing the resilience of tourism destinations and ensuring the long-term sustainability of the sector.

As part of the preventive strategic approach, it is essential to implement the following actions:

Identification of dangers and risks of natural disasters

Creation and distribution of a relevant database to interested parties

Creation of maps depicting natural processes and risks

Constant monitoring of vulnerable areas and updating of information

Implementation of an early warning system

Reasonable artificial intervention with respect to specific natural processes (for example, artificially triggering an avalanche during an avalanche hazard to prevent sudden damage in the future)

Strengthening of areas vulnerable to specific natural processes (for example, strengthening of landslide-prone zones)

Conducting educational and informational campaigns in order to raise awareness and qualification

Provision of rescue services with appropriate equipment and qualified personnel

Formation of insurance culture

Developing a crisis management and mitigation plan

Within the framework of the strategic response approach, it is essential to implement the following actions:

- Effective distribution and management of resources
- Coordinated cooperation between various rescue, administrative services, and stakeholders
- Ensuring rapid exchange of reliable information
- Formation and effective use of qualified volunteer groups

Within the framework of the strategic approach to recovery and rehabilitation, it is essential to implement the following actions:

- Provide support to affected communities
- Restore damaged infrastructure
- Take appropriate steps for the rehabilitation of tourism businesses through insurance and financial institutions.
- Conduct active marketing campaigns to promote the safety of the destination

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

The authors of the article jointly agreed on the topic and methodology of the article. As the systematic review methodology requires, both authors were actively involved in the research process. Abstract, introduction and discussion are provided by Tatiana Sitchinava, and results and conclusion are written by Mariam Sharia.

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Reference

Aznar-Crespo, P., Aledo, A., & Melgarejo-Moreno, J. (2020). Social vulnerability to natural hazards in tourist destinations of developed regions. *Science of the Total Environment*, 710, 135870. https://doi.org/10.1016/j.scitotenv.2019.135870

Becken, S., & Khazai, B. (2017). Resilience, tourism and disaster. In R. W. Butler (Ed.), *Tourism and resilience* (pp. 96–104). CABI. https://doi.org/10.1079/9781780648330.0096

Becken, S. (2017). *Tourism and the environment: Resource efficiency, vulnerability and environmental management*. Channel View Publications.

Becken, S., & Hughey, K. F. D. (2013). Linking tourism into emergency management structures to enhance disaster risk reduction. *Tourism Management, 36*, 77-85. https://doi.org/10.1016/j.tourman.2012.11.006

Berbés-Blázquez, M., & Scott, D. (2017). The development of resilience thinking. In R. W. Butler (Ed.), *Tourism and resilience* (pp. 9–22). CABI. https://doi.org/10.1079/9781780648330.0009

Brown, N. A., Rovins, J. E., Feldmann-Jensen, S., Orchiston, C., & Johnston, D. (2017). Exploring disaster resilience within the hotel sector: A systematic review of literature. *International Journal of Disaster Risk Reduction, 22*, 362–370. https://doi.org/10.1016/j.ijdrr.2017.02.005

Chelidze, T. (2019). Natural hazards in Georgia: Seismic and gravitational processes. *Bulletin of the Georgian National Academy of Sciences, 13*(4), 84-90.

Chen, M.-H. (2011). The response of hotel performance to international tourism development and crisis events. *International Journal of Hospitality Management, 30*(1), 200-212. https://doi.org/10.1016/j.ijhm.2010.06.005

Civil Georgia. (2024, August 5). Institute of Earth Sciences: Early warning system could have averted Shovi landslide disaster. *Civil.ge*. Retrieved from https://civil.ge/archives/618915

Coppola, D. P. (2015). *Introduction to international disaster management* (3rd ed.). Oxford: Butterworth-Heinemann.

Drabek, T. (1995). Disaster planning and response by tourist business executives. *Cornell Hotel and Restaurant Administration Quarterly, 36*(3), 86–96. https://doi.org/10.1177/001088049503600325

Estevão, C., & Costa, C. (2020). Natural disaster management in tourist destinations: A systematic literature review. *European Journal of Tourism Research*.

FAO. (2013). *Climate-smart agriculture sourcebook: Volume 2 - Module 2: Climate-smart agriculture and food security*. Food and Agriculture Organization of the United Nations. https://www.fao.org/4/i3245e/i3245e02.pdf

Faulkner, B. (2001). Towards a framework for tourism disaster management. *Tourism Management, 22*(2), 135-147. https://doi.org/10.1016/S0261-5177(00)00048-0

Ha, K. M. (2023). *Improving disaster management in international tourism*. Springer Nature Switzerland AG.

Hall, C. M., Prayag, G., & Amore, A. (2018). *Tourism and resilience: Individual, organisational and destination perspectives*. Channel View Publications.

Hall, C. M., & Page, S. J. (2016). *The geography of tourism and recreation: Environment, place and space* (4th ed.). Routledge.

Handmer, J., & Dovers, S. (2007). *Handbook of disaster and emergency policies and institutions*. Earthscan.

Huang, J.-H., & Min, J. C.-H. (2002). Earthquake devastation and recovery in tourism: The Taiwan case. *Tourism Management, 23*(2), 145–154. https://doi.org/10.1016/S0261-5177(01)00051-6

Kalandadze, K. (2020). Mountain tourism in Georgia: Challenges and development trends. *Journal of Mountain Tourism Research, 8*(1), 29-43.

Machado, L. P., & Almeida, A. (2019, May). Tourism, natural disasters and destination image. In *Contributions to Economics* (pp. 1-18). https://doi.org/10.1007/978-3-030-02662-2_14

McCool, S. F., Freimund, W. A., & Breen, C. M. (2015). Tourism in highland regions: Climate change and sustainable responses. *Mountain Research and Development, 35*(4), 391-397. https://doi.org/10.1659/MRD-JOURNAL-D-15-00057.1

Mair, J., Ritchie, B. W., & Walters, G. (2016). Towards a research agenda for post-disaster and post-crisis recovery strategies for tourist destinations: A narrative review. *Current Issues in Tourism, 19*(1), 1–26. https://doi.org/10.1080/13683500.2014.932758

Milo, K. J., & Yoder, S. L. (1991). Recovery from natural disaster: Travel writers and tourist destinations. *Journal of Travel Research, 30*(1), 36–39. https://doi.org/10.1177/004728759103000107

Murphy, P. E., & Bayley, R. (1989). Tourism and disaster planning. *Geographical Review, 79*(1), 36–46.

Nair, B. B., & Dileep, M. R. (2020). A study on the role of tourism in destination's disaster and resilience management. *Journal of Environmental Management and Tourism, 11*(6), 1496-1507. https://doi.org/10.14505/jemt.11.6(46).20

National Environmental Agency. (2024). Evaluation report on the natural phenomenon developed in the Buba River Valley, on August 3, 2023.

Pescaroli, G., & Alexander, D. (2015). A definition of cascading disasters and cascading effects: Going beyond the "toppling dominos" metaphor. *Planet @ Risk Global Forum Davos, 3*(1), 58–67.

Pennington-Gray, L. (2018). Reflections to move forward: Where destination crisis management research needs to go. *Tourism Management Perspectives, 25*, 136-139.

Prideaux, B., Laws, E., & Faulkner, B. (2003). Events in Indonesia: Exploring the limits to formal tourism trends forecasting methods in complex crisis situations. *Tourism Management, 24*(5), 475–487. https://doi.org/10.1016/S0261-5177(02)00115-2

Prideaux, B., Coghlan, A., & Falco-Mammone, F. (2003). Responding to natural disasters: The case of the tropical rainforest tourism industry of North Queensland following Cyclone Larry. *Journal of Travel & Tourism Marketing, 20*(1), 13-23. https://doi.org/10.1300/J073v20n01_02

Pforr, C. (2009). Crisis management in tourism: A review of the emergent literature. In *Crisis Management in the Tourism Industry: Beating the Odds* (pp. 37-52).

RFE/RL. (2023, August 3). Shovi landslide disaster in Georgia kills at least 33. *Radio Free Europe/Radio Liberty*. Retrieved from https://www.rferl.org/a/shovi-landslide-disaster-georgia/33065959.html

Ritchie, B. W., & Jiang, Y. (2019). A review of research on tourism risk, crisis, and disaster management: Launching the Annals of Tourism Research curated collection on tourism risk, crisis and disaster management. *Annals of Tourism Research, 79*, Article 102812. https://doi.org/10.1016/j.annals.2019.102812

Ritchie, B. W. (2008). Tourism disaster planning and management: From response and recovery to reduction and readiness. *Current Issues in Tourism, 11*(4), 315-348. https://doi.org/10.1080/13683500802140372

Ritchie, B. W. (2004). Chaos, crises and disasters: A strategic approach to crisis management in the tourism industry. *Tourism Management, 25*, 669–683. https://doi.org/10.1016/j.tourman.2003.09.004

Sunarta, I. N., Susila, K. D., & Kariasa, I. N. (2018). Landslide hazard analysis and damage assessment for tourism destination at Candikuning Village, Tabanan Regency, Bali, Indonesia. *IOP Conference Series: Earth and Environmental Science, 123*, 012006. https://doi.org/10.1088/1755-1315/123/1/012006

Todman-Lewis, C. (2017). *Strategies for crisis preparedness of tourist destinations* (Doctoral dissertation, Walden University).

Young, W. B., & Montgomery, R. J. (1997). Crisis management and its impact on destination marketing. *Journal of Convention & Exhibition Management, 1*(1), 3–18. https://doi.org/10.1300/J143v01n01_02

World Bank. (2020). *Resilient tourism: Competitiveness in the face of disasters*. Washington, DC: World Bank.

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Administrative-Territorial Organisation of the States in the Caucasus Region in the 20th Century and the Beginning of the 21st Century

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Abstract

Eurasia comprises numerous self-sufficient and, in many ways, important regions. One of the most polyethnic, polyconfessional and, as a result, culturally varied Caucasus, on the border of Europe and Asia, is one such place. The region is divided into two political-geographic parts: “North Caucasus” and “South Caucasus”. These terms represent the modern geopolitical transformation of the Russian terms "кавказ" and "закавказье," which were formed in the 19th century. It is important that these two terms did not occupy the whole area of the Caucasus and separate about ¼ part of the territory from the region; according to modern political geography, this land is part of the Middle East. Though, according to the various physical-geographic, historical-geographic and ethno-geographic sources, this land is part of the Caucasus. Eldar Ismailov, an Azerbaijani scientist, and Vladimer Papava, a Georgian scientist, defined the Caucasus region and developed a theory that divides it into three parts. The determination of the internal political-geographic structure during the close past and the modern time is the main goal of this article.

Keywords: North Caucasus, Central, Caucasus, South Caucasus, Region, Province

Introduction

Despite numerous cultures in the Caucasus and the political-geographic separation of the region, the various physical-geographic, historical-geographic, and ethnic facts, as well as the political and economic facts, help us to determine it as the entire region. Even though political geography owns the main role when we speak about the state and the internal regional frontiers. The political geography of the Caucasus changed in the 20th and the beginnings of the 21st centuries. The basis for these changes was formed in the very beginning of the 19th century when Russia’s state adamantly based itself in the North and South Caucasus. Despite many successful conflicts, the Russian Empire could not occupy the entire ethnic and historical-geographic region of the Caucasus, so it was divided among three empires at the beginning of the 20th century. The Russian geopolitical terms “кавказ” and “закавказье” occupied only Russia’s territory of the Caucasus. “The North Caucasus” and “the South Caucasus”, which replaced those two terms, also occupy only Russia’s Caucasian territory and the Caucasian territory liberated from this state. As a result, the Caucasian lands of the Persian Empire/Iran and the Ottoman Empire/Türkiye remained out of the native region (Ismaylov & Papava, 2007). They occupy the historical “Adarbadagan”, which name is one of the steps in the forming of the toponymy “Azerbaijan”, whereas the land is unofficially known as “the South Azerbaijan” or “Iran’s Azerbaijan”. They also occupy the historical Georgian and the Armenian lands, a part of which remained in the Ottoman Empire at first, and then an even larger part was given to the Republic of Türkiye by 1921 year’s agreements in Kars and Moscow (Metreveli, The History of Caucasus – part 1, 2023).

The February Revolution in 1917 in Russia led to the formation or restoration of new states in the Caucasus. Their administrative and territorial organisation was based on the laws of the Russian Empire. The multicultural region became the centre for the different interests and the mutual and the internal conflicts, which were successfully used by Soviet Russia, and the Caucasus remained divided among three states once again in 1921. The administrative and territorial organisation of the Soviet

Caucasus remained under the influence of the Russian imperial order for a long time and was gradually rearranged in the new Soviet system. This Soviet system became the base for the modern administrative-territorial organisation when the Caucasus comprised six states, in 1991. This research aims to identify the situation that best illustrates the structure of the Caucasus as a complete geographic region, along with its historical context and modern political organisation.

Methods and Materials

The main sources for the theory of this article are Eldar Ismailov's and Vladimer Papava's monograph: "Central Caucasus: Essays on Geopolitical Economy" and two-volume edition of the Georgian National Academy of Science: The History of Caucasus. Besides, the various important issues like the frontiers of the states and regions or their changing during the years have the own Georgian and foreign sources. The analysis of the maps is widely used in the article too (Gachechiladze, 2023).

Results

Frontiers

The geography of the frontiers in the Caucasus Region (fig. 1), including the internationally admitted ones, is complex and varied. The dispute and the conflicts about the state frontiers form the important problems for the countries of the Caucasus. As for the borders of the entire region, they may be drawn as on the physical-geographic as on the political-geographic lines. These lines coincided with each other or not on the various parts of the entire border.

The western border of the Caucasus Region is situated along the coast of the Azov and the Black seas from the town of Yeysk in the north to the Trabzon city in the south. Though, the different source widens this part of the frontier from the estuary of the Don River in the north to the Ordu city in the south. According to the opinion of the author, Trabzon City may be included in the Caucasus Region, as the physical-geographic, historical-geographic, and ethnic facts give us such a possibility. On the other hand, there is room for debate regarding the relocation of the borders to the Don River and the Ordu city. Besides, the writing sources do not confirm these borders.

The eastern border starts at the estuary of the Kuma River in the Caspian Sea and continues along the coast until the Talish Mountains and the Iranian part of the Mughan Plain. Various sources suggest that the western part of the Alborz Mountains moves this frontier to the southeast. Physical-geographic and historical-geographic facts allow the entire territory of the Mughan Plain to enter the Caucasus Region. It is important that this plain was the land which had been used for the controlling of the Caucasus by the various empires that owned Iran during many centuries. In contrast, the Alborz Mountains and their inhabitants lack a direct physical, historical, or ethnic connection to the Caucasus Region and its people. This moved border is not confirmed by the writing sources.

The northern border of the Caucasus Region starts at the town of Yeysk on the coast of the Azov Sea and continues to the east by the Eya, Yegorlik, West Manich and East Manich rivers; also, the Manich Lake and the lower basin of the Kuma River till the Caspian Sea. According to the different source, the frontier is slightly moved to the north and draws the border line on the lower basin of the Don River, the Manich River, the Kuma-Manich Depression and the lower basin of the Kuma River. Numerous maps show us that only the autonomous republics of "the North Caucasus"—the"members of the Russian Federation, comprise this region. But this idea banishes "the Krasnodar Kray" – the basin of the Kuban River – and "the Stavropol Kray" – the basin of the Kuma River – from the Caucasus Region.

The southern border is situated along the East Pontus Mountains, the Armenian Highlands, and the Anti-Caucasus Mountains east of Lake Van; the region also comprises the Karadag Ridge and the Iranian part of the Mughan Plain. Though the southern frontier of the Caucasus is problematical (there are not such clear physical-geographic lines in this direction as in others,) another physical-geographic fact is important. The entire basins of the Mtkvari (Kura,) Aras and Chorokhi rivers are parts of the Caucasus, whereas the basin of the Euphrates River is not, though the East Euphrates or Murat River starts in the Anti-Caucasus Mountains too.

It is important that the physical map in "the Geopolitical Atlas of the Caucasus" [Relief, page 12] formed by Jean Radvanyi and Nikoloz Beruchashvili mainly coincide with the frontiers told in "the History of the Caucasus" with one important difference. This map does not comprise the Caucasian territories of the Republic of Türkiye and the Islamic Republic of Iran (Radvanyi & Beruchashvili, 2009).

Figure 1. The Physical-Geographic Map of the Caucasus Region (Caucasus, 2018)

According the written information, the Caucasus Region mainly comprises Georgia, Azerbaijan and Armenia; the administrative-territorial parts of the Russian Federation: the Adygea, Karachay-Cherkessia, Kabardino-Balkaria, North Ossetia, Ingushetia, Chechnya and the Dagestan autonomous republics, the Krasnodar and the Stavropol krays; the ostans of the Islamic Republic of Iran: West Azerbaijan, East Azerbaijan, Ardebil and Gilan; the Ills of the Republıc of Türkiye: Artvin, Rize, Trabzon, Ardahan, Kars, Igdir and the northern part of Erzurum. Though, there can be the different ideas about the Caucasian territories of Russia, Iran and Türkiye (fig. 2).

Figure 2. Territory of the Caucasus Region and Its Sovereign States

The state frontiers in the Caucasus are as complex and varied as the borders of the entire region. They are based as much on the orographic as on the hydrographical objects. The de jure and the de facto frontiers have been often changed during the 20th-21st centuries, which forms the important

internal and the foreign problems. The republics of Turkey, Armenia, and Azerbaijan, as well as the Russian Federation, are neighbours of Georgia. The length of Georgia's frontier with Türkiye comprises 240.8 km, with Armenia – 194.4 km, with Azerbaijan – 402.2 km, and with Russia – 915 km. The neighbours of Azerbaijan are not only Georgia but also the Russian Federation, the republics of Armenia and Türkiye, and the Islamic Republic of Iran. The length of Azerbaijan's frontier with Russia is 390.3 kilometres, with Türkiye – 9 km, with Armenia – 1007.1 km, and with Iran – 765 km. Türkiye and Iran are the neighbours of Armenia, with Georgia and Azerbaijan. Armenia shares a frontier of 311 km with Türkiye and 44 km with Iran. Türkiye and Iran share a long state frontier that measures 499 kilometres. Interestingly, Türkiye's section of the Caucasian frontier with Iran is quite short, located only within the territory of the Igdir Ill. In contrast, the entire frontier between Iran and Türkiye is located in the Caucasus Region, specifically within the territory of West Azerbaijan Ostan (Goishvili & Chkheidze, 2001).

Krasnodar Krai, Karachay-Cherkessia, Kabardino-Balkaria, North Ossetia, Ingushetia, Chechnya, and the Dagestan autonomous republics are the bordering territories of the Russian Federation in the Caucasus. All of them are the neighbours of Georgia's one or more administrative territorial regions, and only Dagestan A.R. is the neighbour of Azerbaijan's two unofficial administrative regions. The Krasnodar Krai has the frontier with the occupied Abkhazia Autonomous Republic, Georgia. The Karachay-Cherkessia A.R. has the frontier with the Abkhazia A.R. and the Samegrelo – Upper Svaneti Region, whereas the Kabardino-Balkaria A.R. has the frontier with the Samegrelo – Upper Svaneti region and the Racha-Lechkhumi and Lower Svaneti regions. North Ossetia has the frontier with the Racha-Lechkhumi and Lower Svaneti Region, the Occupied Tskhinvali Region and the Mtskheta-Mtianeti Region. The Ingushetia A.R. has the frontier with the Mtskheta-Mtianeti Region; the Chechnya A.R. has the frontier with the Mtskheta-Mtianeti and the Kakheti regions, whereas the Dagestan A.R. has the frontier with only the Kakheti Region.

The administrative-territorial districts (provinces) of Azerbaijan are collected in wider "economic regions". Russia's Dagestan Autonomous Republic has the frontier with two of them: Shaki-Zaqatala and Quba-Khachmaz.

The Kvemo Kartli, Samtskhe-Javakheti regions and the Adjara Autonomous Republic are the bordering territories of Georgia too. These regions and Kakheti have a state border with the various regions of Azerbaijan, Armenia, and Türkiye. Kakheti bordered the Shaki-Zaqatala and the Ganja-Dashkasan economic regions of the Azerbaijan Republic; Kvemo Kartli – with the Kazakh-Tovuz economic region. The Kvemo Kartli Region also shares a border with the Tavush, Lori, and Shirak "marzes" (regions) of the Armenian Republic. Samtskhe-Javakheti is bordered by the Shirak Marz too. This region of Georgia also has the frontier with Türkiye's Ardahan Ill. The Adjara Autonomous Republic has the frontier with the Ardahan and Artvin provinces, both bordering regions of Türkiye with Georgia.

The republics of Armenia and Turkey, and the Islamic Republic of Iran, are the neighbours of the Azerbaijan Republic, along with Georgia and Russia. 8 economic regions of Azerbaijan have borders with the various regions of these states. Four economic units, namely the Kazakh-Tovuz, Ganja-Dashkasan, East Zangezur regions, and the Nakhchivan Autonomous Republic, share a state border with six marzes of Armenia: Tavush, Gegharkunik, Vayots Dzor, Syunik, Ararat, and Armavir. The Nakhchivan A.R. has the shortest border with the Republic of Türkiye. The same autonomous republic, also the East Zangezur, Karabakh, Mil-Mughan, Shirvan-Salyian and the Lankeran-Astara economic regions, have the state frontier with the ostans of the Islamic Republic of Iran: West Azerbaijan, East Azerbaijan, Ardebil and Gilan.

Four marzes of the Republic of Armenia—Shirak, Aragatsotn, Armavir, and Ararat—share a state border with various provinces of the Republic of Türkiye. Shirak has the border with the Ardahan and Kars ills, Aragatsotn – with only the Kars ill, Armavir – with the Kars and the Igdir ills, Ararat – with only the Igdir ill. The Syunik Marz of the Armenian Republic has a state border with the East Azerbaijan Ostan of the Islamic Republic of Iran.

4 ills of the Republic of Türkiye: Igdir, Agri, Van and Hakkari have the state frontier with the only ostan of the Islamic Republic of Iran, West Azerbaijan. Among these regions, Türkiye's Igdir and Iran's West Azerbaijan are part of the Caucasus.

The establishment of state frontiers and internal borders became a long-term process. It lasted for about two centuries and became painful for the various states of the Caucasus Region. Regrettably, we have not yet completed this challenging process.

Administrative-Territorial Organisation of the Caucasus Region in the Beginnings of the 20th Century

At the beginning of the 20th century, the Russian, Ottoman, and Persian empires divided the Caucasus Region. “The Caucasian Viceroyalty” of the Russian Empire comprised 13 various governorates, oblasts and the okrugs. Besides, the Caucasus Region comprised the Stavropol Governorate, which was not part of “the Caucasian Viceroyalty”, and also the Trabzon and the Erzurum vilayets of the Ottoman Empire, as well as the Azerbaijan and the Gilan khanates of the Persian Empire (Metreveli, The History of Caucasus – part 2, 2023).

The large administrative-territorial regions of Russia—the governorates and the oblasts (regions)—were divided into smaller provinces: the uezds, okrugs, districts, and "otdels". They were also subdivided into “the police districts”. “The North Caucasus” comprised the Stavropol and the Black Sea governorates and the Kuban, Ter, and Dagestan oblasts. It's crucial to note that the modern Abkhazia Autonomous Republic occupied the south-eastern region of the Black Sea Governorate, stretching from the Bzipi River basin to the Psou River, as depicted on the 1913 Map of the Black Sea Province.

Formated in 1847, the Stavropol Governorate (fig. 3) underwent internal territorial changes from 1910 to 1917. The governorate comprised 5 uezds and 2 districts until the collapse of the Russian Empire: the Alexanderevskoe, Medvejye, Blagodranoe, and Stavropol uezds and the Sviato Krest uezd, which had the same names, as well as the Turkmen and Achikul districts.

Figure 3. Stavropol Governorate in 1913 (Stavropol Governorate, 1913)

In 1896, the Black Sea Governorate came into existence. Novorossiysk City was its centre. Novorossiysk, Tuapse, and Sochi were the three okrugs that divided the region. The Sochi Okrug comprised the northwestern part of the modern Abkhazia Autonomous Republic.

In 1860, the Kuban Oblast came into existence. The city of Ekaterinodar (modern Krasnodar) was its centre. In the beginning of the 20th century, the region comprised seven "otdels": Bataplashin, Yeysk, Ekaterinodar, Kavkasky, Labin, Maykop, and Temryuk. “The Temryuk Otdel” was renamed as “Taman” in 1910. Only 3ut of 5 owned the towns as the centres at that period: Ekaterinodar, Labin and Maykop. The centres of the Bataplashin, Yeysk, Kavkasky and Taman otdels were only the stations: Bataplashin (the modern Cherkessk,) Umman, Kavkasky and Slavyansk (the modern Slavyansk on the Kuban) (Kuban Region, 1913).

In 1860, the Terek Oblast came into existence. Vladikavkaz City was the centre of this region. The oblast comprised five okrugs and three otdels at the beginning of the 20th century: the Vladikavkaz, Grozny, Nalchik, Pyatigorsk, and Khasavyurt okrugs; the Kizlar, Mozdok, and Sunja otdels. 5 territories owned the towns as the centres at that period: Vladikavkaz, Grozny, Pyatigorsk, Kizlar and

Mozdok. The centres of the Nalchik and Khasavyurt okrugs as well as the Sunja Otdel were the stations. It is important that Nalchik and Khasavyurt are the towns of the Russian Federation today, whereas Sunja is a village (Map of the Terek Region, 1913).

The Dagestan Oblast was formed in 1860. The town of Temir-Khan-Shura (now Buynaksk) was its centre. At the beginning of the 20th century, the region comprised nine okrugs: Avarskiy, Andiyskiy, Gunibskiy, Darginskiy, Kazikumukhskiy, Kaytago-Tabasaranskiy, Kyurinskiy, Samurskiy, and Temir-Khan-Shurinskiy. Their centres were the villages: Khunzakh, Botlikh, Gunib, Levashi, Kumukh, Madzhalis, Kasumkent, Akhty, and the town of Temir-Khan-Shura (Map of the Dagestan Region, 1913).

"The Central Caucasus" comprised the Tbilisi, Kutaisi, Yerevan, Elizavetpol and Baku governorates, the Zaqatala and Sokhumi okrugs, and partly the Batumi Oblast. The Russian Empire began the conquest of "the Central Caucasus" in 1801, gradually forming its parts over a long period of time. This ultimately led to the formation of the Tbilisi Governorate in 1846. It comprised 9 uezds in the beginning of the 20th century: Tbilisi, Borchalo, Akhalkalaki, Akhaltsikhe, Gori, Dusheti, Tianeti, Telavi and Sighnaghi. The centres of 7 Uezds were the cities or towns with the same names, whereas Tbilisi was also the capital of the entire "Caucasian Viceroyalty." Only the centres of the Borchalo and the Tianeti uezds were the villages, Shulaveri and Tianeti. The Zaqatala Okrug, the province under the military power, was part of the Tbilisi Governorate until 1903. This province was separated from the governorate and formed as the individual territory into "the Caucasian Viceroyalty".

The Kutaisi Governorate was formed in 1847, and the region comprised 7 uezds at the beginning of the 20th century: Kutaisi, Shorapani, Racha, Lechkhumi, Senaki, Zugdidi and Ozurgeti. The centres of the Kutaisi, Senaki, Zugdidi and Ozurgeti uezds were the towns with the same names. The centres of the Shorapani, Racha, and Lechkhumi Uezds were the villages: Kvirila (the future Chiatura), Oni, and Tsageri. According to one map, the town of Shorapani was the capital of the Shorapani Uezd in 1914. The Sokhumi Okrug, the province under military power like Zaqatala, was part of the Kutaisi Governorate until 1903. Then, it broke away from the region and became its own independent territory.

The Batumi Oblast was part of "the Central Caucasus" more or less. It comprised the Batumi and Artvini okrugs, with the centres of the same names. This oblast was part of the Kutaisi Governorate till 1903 and then separated from it. The Kars and the Moscow agreements between Soviet Russia and Kemalist Türkiye, 1921, drew the modern line between "the Central" and "the South Caucasus". According to these agreements, the largest part of the Batumi Okrug (the modern Adjara Autonomous Republic) remained in the central part of the region, whereas the entire Artvini Okrug with the south-western part of the Batumi Okrug became the parts of "the South" (Georgia at the end of the 19th century, 2012; Sanadze, Beradze, & Thopuria, 2009).

The Yerevan Governorate (Erivan Province, 1913) was formed in 1849, whereas the region comprised seven uezds at the beginning of the 20th century: Alexandropol, Nakhchivan, Novo Baiazet, Surmalin, Sharuro-Daralagez, Yerevan, and Echmiadzin. 5 of them had the centres in the face of the towns with the same names. Only the centres of the Surmalin and Sharuro-Daralagez uezds, Igdir and Bash-Norashen, were the villages. In 1921, Türkiye received only the Surmalin Uezd, while the majority of this governorate remained in the Central Caucasus. Later, that territory formed the Igdir Ily.

The Elizavetpol (the Ganja-city) Governorate was formed in 1867, whereas the region comprised eight uezds at the beginning of the 20th century: Aresh, Jevanshir, Elizavetpol, Zangezur, Kazakh, Jebraiyl, Nukha, and Shusha. It is important that the centre of Jebraiyl Uezd moved to Karyagino in 1905; as a result, the name of the province was changed too. Only 3 uezds owned the towns as the capitals: Elizavetpol, Nukha and Shusha. The centres of the Aresh, Jevanshir, Zangezur, Kazakh and Karyagino provinces were the villages: Agdash, Terter, Gerusy, Kazakh and Karyagino.

The Baku Governorate was formed in 1859, whereas the region comprised six uezds at the beginning of the 20th century: Baku, Geokchay, Javad, Kuba, Shemakha, and Lenkoran. The capitals of all 6 provinces were the towns of Baku, Geokchay, Salyan, Kuba, Shemakha and Lenkoran (Ethnographic map of the Baku Governorate, 1901) (fig. 4).

Figure 4. The Caucasus Region and the Caucasian Viceroyalty in the Beginning of the 20th Century

"The South Caucasus" mainly comprised 5 large administrative-territorial regions in the beginning of the 20th century: the Kars Oblast of the Russian Empire, the Trabzon and the Erzurum Vilayets of the Ottoman Empire, the Azerbaijan and the Gilan khanates of the Persian Empire.

The Kars Oblast (fig. 5) was formed in 1878 and comprised 4 okrugs in the beginning of the 20th century: Ardagan, Oltis, Kars and Kagizman. The centres of all four were the towns by the same names. This part of the Russian Empire became the territory of the Kemalist Türkiye in 1921, as the result it went to "the South Caucasus."

Figure 5. Kars Oblast in 1913 (Administrative map of Kars Oblast, 1913)

The administrative-territorial organisation of the Ottoman Empire was changed during "the Tanzimat," the reforms in the state, 1864. The large territorial units – "Eyalets" were replaced by smaller regions – "Vilayets." They were divided into "the Sanjaks" which were subdivided into "the Kazas." The Ottoman Empire kept only two vilayets in the Caucasus after the Russia-Ottoman War in 1877-1878, Trabzon (fig. 6) and Erzurum (fig.7). The Trabzon Vilayet comprised 4 "sanjaks" in the beginning of the 20th century: Trabzon, Lazistan, Gumushhane and Samsun. The cities and towns of Trabzon, Rize, Gumushhane and Samsun were their centres. The Erzurum Vilayet comprised 3 sanjaks in the beginning of the 20th century: Erzurum, Erzincan and Bayezid. The towns with the same names were the centres of these provinces.

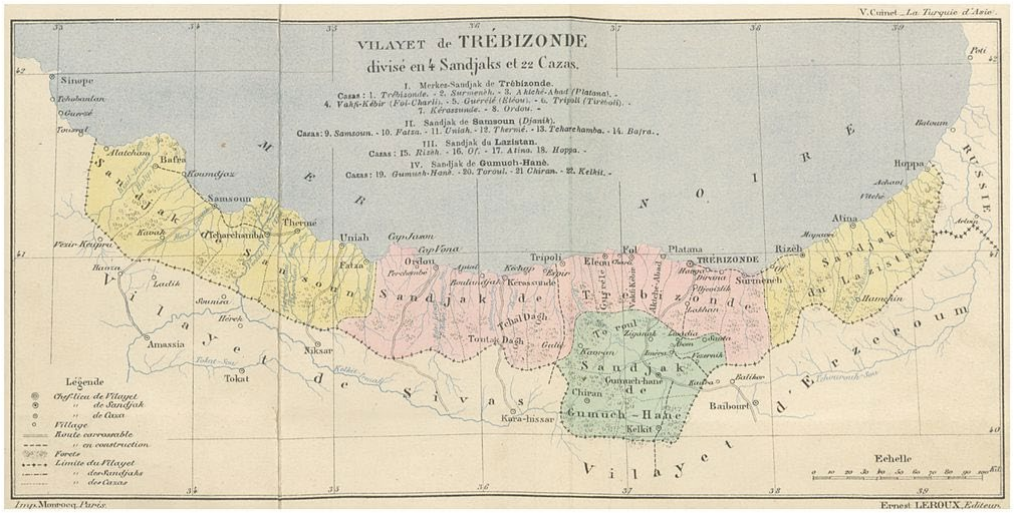

Figure 6. Trabzon Vilayet (Cuinet, Vilayet of Trebizond, 1890)

"The South Azerbaijan" or "Iran's Azerbaijan" was one of the largest khanates of the Persian Empire, but the information about the administrative-territorial system of this state in the beginning of the 20th century is very poor. We know just two important administrative changes about the northern Iran. "The Qajar Dynasty" made the Tabriz-city, the capital of "the South Azerbaijan," the ruling centre for the successors of their throne in beginning of the 19th century. But we do not know if this reform continued the existing during the second half of the century and especially in the beginning of the 20th or not. It is important that the Russian Empire and the United Kingdom formed the agreement which finished the forming of "the Antanta" in 1907. According to this agreement, the northern Iran, including "the South Azerbaijan" and the Gilan regions, went under the influence of the Russian Empire.

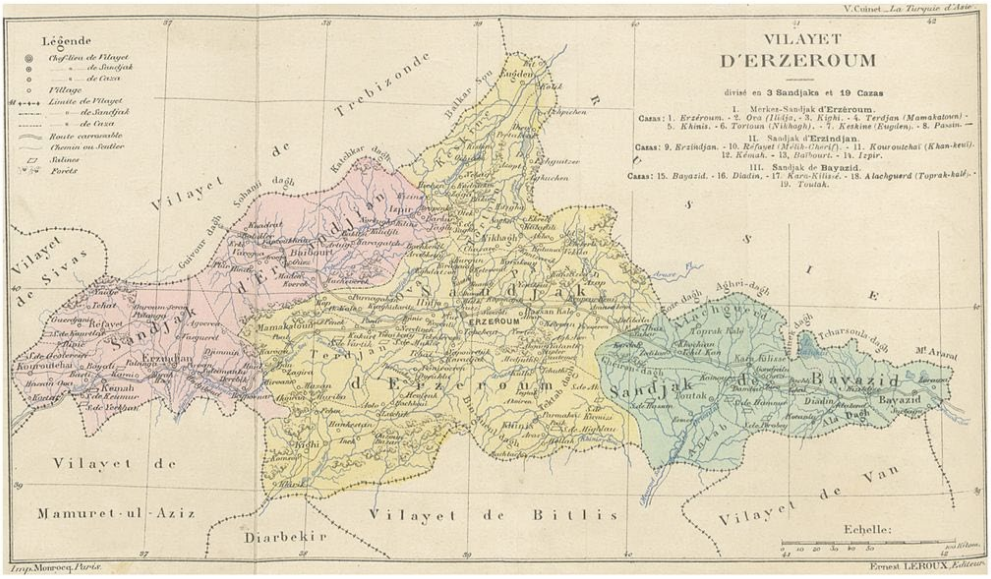

Figure 7. Erzurum Vilayet (Cuinet, Erzurum Vilayet, 1890)

Caucasus from the Empire till the Soviet Epoch

The two new states were formed in "the North Caucasus" after the collapse of the Russian Empire in 1917: "the Mountainous Republic of the Northern Caucasus" and "the Kuban People's Republic." “The Mountainous Republic” declared independence in 1917, according to the collapse of the Russian Empire, and existed till 1919. This confederative state primarily occupied the territories of the former Dagestan and Terek oblasts. The town of Temir-Khan-Shura was its capital. The confederation was composed of seven ethnic countries: Dagestan, Ingushetia, Chechnya, Alania, Circassia (which also included Adygea), Karachay-Balkaria, and Nogai. “The Mountainous Republic of the Northern Caucasus” had the claim for Abkhazia, the part of Georgia’s First Republic, too (Hille, 2010).

“The Kuban People’s Republic” existed during 1918–1920 on the main territory of the former Kuban Oblast and the Black Sea Governorate. The Ekaterinodar city was its capital. The state comprised the former otdels and okrugs of these regions: Bataplashin, Yeysk, Ekaterinodar, Kavkasky, Labin, Maykop, Taman, Novorossiysk, Tuapse and Sochi. Though, the south-eastern part of the former Sochi Okrug, from the basin of the Bzipi River to the Psou River, returned to the Georgian state.

“The Soviet Russia” conquered “the Kuban” and “the Mountainous” republics during 1919-1920. The second state was temporarily replaced by “the North Caucasian Emirate” (1919-1920,) but the Russian state defeated and occupied this country too.

The collapse of the Russian statehood in the Caucasus started after the revolutions in 1917. “The South Caucasian Federation” declared independence in April 1918, though this confederation was separated into the Georgia, Armenia and Azerbaija sovereign states in May of the same year. It is important that the Ottoman Empire occupied a large part of “the Central” and “the South Caucasus” with the Brest-Litovsk peace agreement formed on March 3, 1918. But it had to leave the territory soon because of the failure in WW1 (Kazemzadeh, 2016).

“The First Republic of Georgia” (fig. 8) declared independence from “the South Caucasian Federation” on May 26, 1918. The state comprised the former Tbilisi Governorate, Kutaisi Governorate, Batumi Oblast, Sokhumi and Zaqatala okrugs, as well as the historical Georgian land of the former Kars Oblast. The Tbilisi city was the capital of the state.

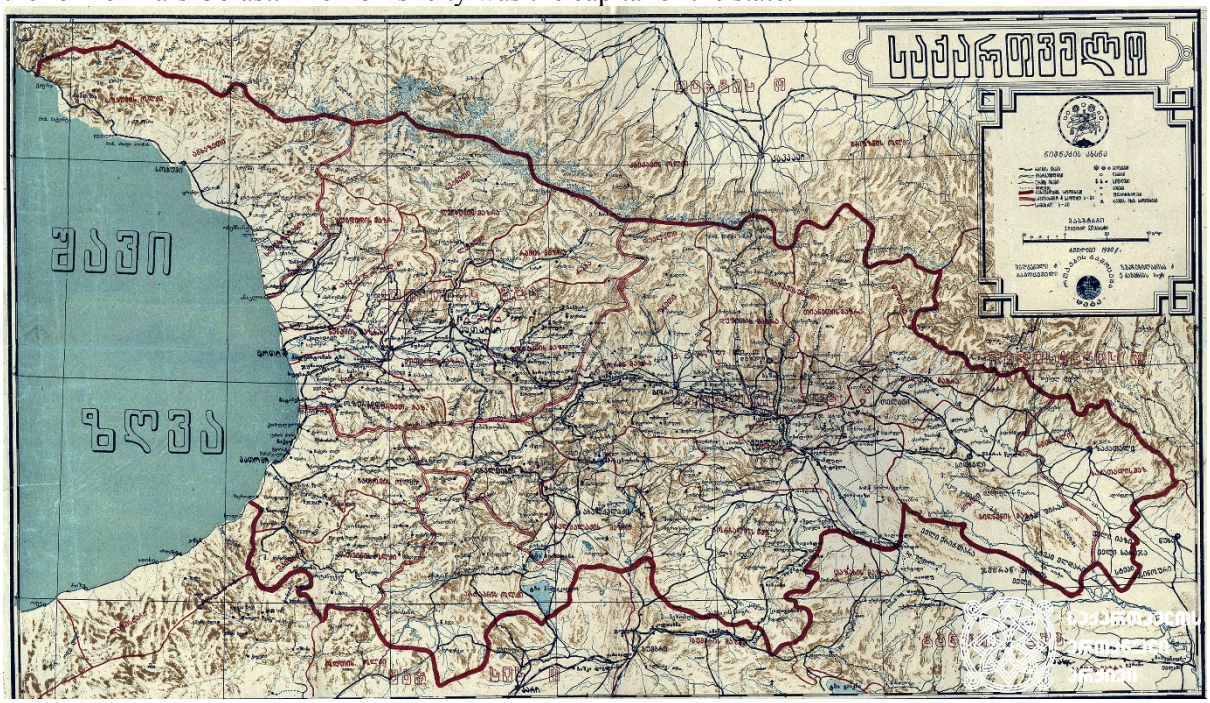

Figure 8. The Territories Demanded by the First Republic of Georgia in 1920 (The Map of the Territories Demanded by Georgia in 1920, 2024)

The administrative-territorial organisation of Georgia was the same as during the imperial epoch with some differences. The East Georgia, or “the Tbilisi Governorate”, comprised the Tbilisi, Borchalo, Akhalkalaki, Akhaltsikhe, Gori, Dusheti, Tianeti, Telavi, and Sighnaghi uezds. The West Georgia, or “the Kutaisi Governorate”, comprised the Kutaisi, Shorapani, Racha, Lechkhumi, Senaki, Zugdidi and Ozurgeti uezds. The Artaani and Oltisi okrugs were in the south of the state, though Georgia could not control the Oltisi Okrug. The Abkhazia (the former Sokhumi Okrug,) Zaqatala, and “the Muslim Georgia” (the former Batumi Oblast) regions were in the bordering parts of the state. The

government of "the First Republic" was planning to form the autonomous republics on these lands, but it could not fulfil the plan. It is important that the basin of the Bzipi River returned to the Georgian state during the period of the first republic.

The territorial formation of "the First Republic of Armenia" (fig. 9) became the complex process. The aggression of the Ottoman Empire and the Caucasian interests of the United Kingdom were hindering it. Additionally, Armenia was involved in military conflicts with its two closest neighbours, Georgia and Azerbaijan. The territory of the state gained its main form in 1919 when Armenia occupied the former Yerevan Governorate and the historical Armenian land of the former Kars Oblast. This land comprised the uezds and the okrugs of the collapsed empire: Alexandropol, Nakhchivan, Novo Baiazet, Surmalin, Sharuro-Daralagez, Yerevan, Echmiadzin, Kars and Kagizman. Besides, "the First Republic of Armenia" occupied the part of "the Nagorno-Karabakh" by the Armenia-Azerbaijan War. This land comprised the parts of the former Elizavetpol, Jevanshir and Zangezur uezds in the former Elizavetpol Governorate (Administrative map of Elisabethpol Governorate – 1913, 1913). Yerevan was the capital of "the First Republic of Armenia".

This is important: according to the Treaty of Sèvres in 1920, which the defeated Ottoman Empire formed with the winner states, Armenia should have gained about 100,000 km² of former Ottoman territory, so-called "West Armenia". But this project was not done because of some reasons, such as Armenia's occupation by Soviet Russia, the Kemalist movement in Türkiye and the alliance of the Kemalists and the Communists.

Source gallica.bnf.fr / Bibliothèque nationale de France

Figure 9. The First Republic of Armenia according to the Paris Peace Conference in 1919 (Armenian Delegation on Paris Peace Conference, 1919, 2024)

The Georgia and the Armenia states were restored in face of the republics in "the Central Caucasus," May 1918, whereas the sovereign state with the name of "Azerbaijan" – "the Azerbaijan Democratic Republic" was formed for the first time at the same period. The Ganja-city, which returned its historical name, was the capital of the state till the September of the same year as Baku was occupied by "the Bolshevik." The capital of Azerbaijan moved into this city for good after the banishing of "the Red." This is important that this state had the territorial claims to both closest neighbours, the Georgia and the Armenia democratic republics.

"The Azerbaijan Democratic Republic" occupied the former Baku and Elizavetpol governorates of the collapsed empire. Besides, it was controlling the southern part of the former Yerevan Governorate

till 1919. Azerbaijan had the claim for the Zaqatala Okrug, the territory of "the First Republic of Georgia," too. "The Azerbaijan Democratic Republic" comprised the former uezds of the collapsed empire: Baku, Kuba, Shemakha, Goychay, Javad, Lenkoran, Ganja, Kazakh, Nukha, Aresh, Jevanshir, Shusha, Garyagin and Zangezur, as well as the Sharuro-Daralagez and the Nakhchivan uezds on the territory of the former Yerevan Governorate, till 1919.

Figure 10. Administrative-territorial Organisation of the Republic of Türkiye in 1927 (Ana Vatan : [Turkey], 1927, 2024)

"The Red Army" of "the Communist" conquered the Azerbaijan and Armenia democratic republics in the April and the December of 1920. They also occupied "the First Republic of Georgia" in the February 1921.

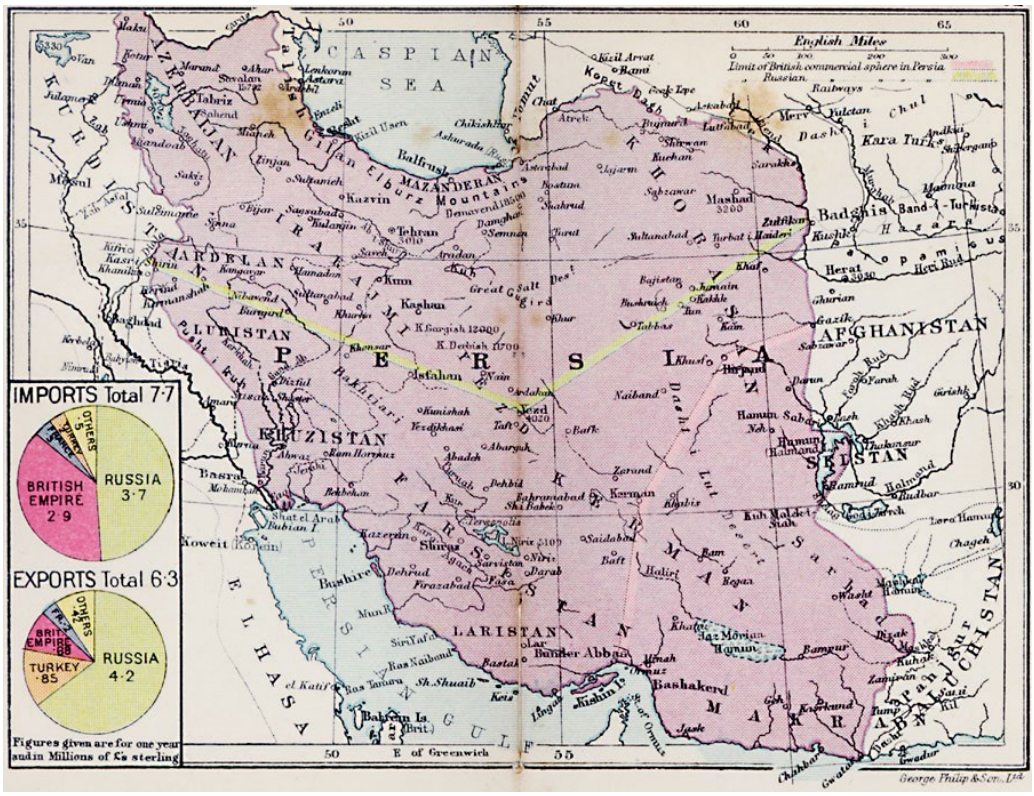

Figure 11. The Persian Empire in 1920 (Persia, 1920)

As of "the South Caucasus" during the 1920s, the earliest source about the administrative-territorial organisation of the Republic of Türkiye is dated by 1927 (fig. 10). This is the map where the topolymy is still written by the Arab script as well as the document of Türkiye's first census of the population in the same year. Both show that the Caucasian territory of this republic comprised four ills entirely and two – partly in the end of the 1920s. The whole territory of the Kars, Artvin, Rize and Trabzon ills were part of the region at that time, as well as the northern part of the Erzurum Ill and the

north-eastern part of the Bayezid (later Agri) Ily. As for Iran (Persia till 1935), (fig. 11) this state was divided into 12 "ostans" till 1950, whereas the Caucasian territory of this state comprised two of them: Azerbaijan and Gilan.

Caucasus during the Soviet Epoch

"The North Caucasus", (fig. 12) the territory of "the Russian Soviet Federative Socialist Republic," comprised the Dagestan and the Mountainous Autonomous Republics, the Kuban-Black Sea and the Terek Autonomous Oblasts in 1922. The Dagestan A.R. kept its self-government. "The Mountainous Autonomous Republic" was separated into the Karachay-Cherkessia, Kabardino-Balkaria, North Ossetia, Chechnya and the Ingushetia autonomous oblasts. The Kuban-Black Sea Oblast was separated into the Adygea A.O. and into the Krasnodar and the Stavropol krays after some administrative-territorial formations.

The numerous territorial changes as well as the changes of the administrative system had a place in "the North Caucasus" during the Soviet Epoch. The exile of the North Caucasian ethnics (the Kabardian, Chechen and the Ingush) during WW2 and their emancipation in 1957 had an important influence on these changes too. As the result, "the North Caucasus" comprised 8 administrative-territorial units at the end of the Soviet Epoch, 1989: the Krasnodar and the Stavropol krays, the Kabardino-Balkaria, North Ossetia, Chechnya-Ingushetia and the Dagestan autonomous soviet socialist republics, the Adygea and the Karachay-Cherkessia autonomous oblasts (Soviet Union Administrative Divisions, 1989, 2024)

Figure 12. The North and the Central Caucasus during the Soviet Epoch (Administrative map of Caucasus in USSR, 1952-1991, 2024)

Georgia, Armenia and Azerbaijan formed "the South Caucasian Soviet Federative Socialist Republic" after "the Red Occupation" of these countries. This state became one of four founders of "the Union of Soviet Socialist Republics" in 1923. Though, the federation of "the Central Caucasus" was separated into three individual Soviet socialist republics in 1936.

It is interesting that the administrative-territorial changes of Georgia were continuing from the 1920s till 1968 during the Soviet epoch. The country lost quite a large territory after the occupation. It was distributed among Türkiye, Armenia, Azerbaijan and Russia. According to the map dated by 1928, the administrative-territorial organisation of Georgia comprised the systems of the Russian Empire, the First Republic and the Soviet Union. The Tbilisi Uezd kept its territory in East Georgia, whereas the part of the Borchalo Uezd was given to Armenia. The town of Luxemburg (the modern Bolnisi) was the centre of the other part. The Akhalkalaki and Akhaltsikhe uezds had the same borders as during the imperial epoch, whereas the northern part of the Gori Uezd was comprised of "the South Ossetia Autonomous Oblast" at that time. This territory also occupied Akhalgori and several communes in Racha and Imereti. The Dusheti Uezd was located north of Tbilisi, but we cannot see Tianeti province on this map. Though, according to unspecified information, this territory was abolished during 1929-1930 with other uezds. The Telavi Uezd occupied the former territory of Tianeti on this map, and the Sighnaghi province was situated south-eastern from it.

West Georgia comprised the Kutaisi, Shorapani, Racha, Lechkhumi, Senaki, Zugdidi, and Ozurgeti uezds, as well as the Upper Svaneti uezd from 1921. The Abkhazia and Adjara autonomous republics were the individual territorial units in Georgia. They were the legacy of "the First Republic". Though, the Adjara A.R. had twice the smaller territory than "the Muslim Georgia", as the other part was given to the Republic of Türkiye.

The active administrative-territorial reform took place during the beginnings of the 1930s, so the imperial uezds were replaced by "the districts". The map dated 1938 is badly distinguishable, but it has the list of these districts, and we can group them according to the modern regions of Georgia.

In 1938, the modern Kakheti region comprised the Sagarejo, Gurjaani, Telavi, Kvareli, Lagodekhi, Sighnaghi, and Tsitelitskaro districts. The modern Akhmeta Municipality (district of province) was part of the Telavi District until 1951 at first and then during 1963-1964. Only in 1964 did it officially become an independent district. In 1938, the modern Mtskheta-Mtianeti Region comprised the Dusheti, Kazbegi, and Tianeti districts. The modern Kvemo Kartli Region – the Karaiazi (Gardabani,) Borchalo (Marneuli,) Aghbulaghi (Tetritskaro,) Luxemburg (Bolnisi,) Tsalka and Bashkicheti (Dmanisi) districts. In 1938, the Kaspi, Gori, and Khashuri districts formed the modern Shida Kartli Region, with the Kareli District forming as early as 1939. Gori and Khashuri divided its territory prior to that date. The modern Samtskhe-Javakheti Region comprised the same six provinces in 1938 as today: the Borjomi, Adigeni, Akhaltsikhe, Aspindza, Akhalkalaki, and Bogdanovka (Ninotsminda) districts.

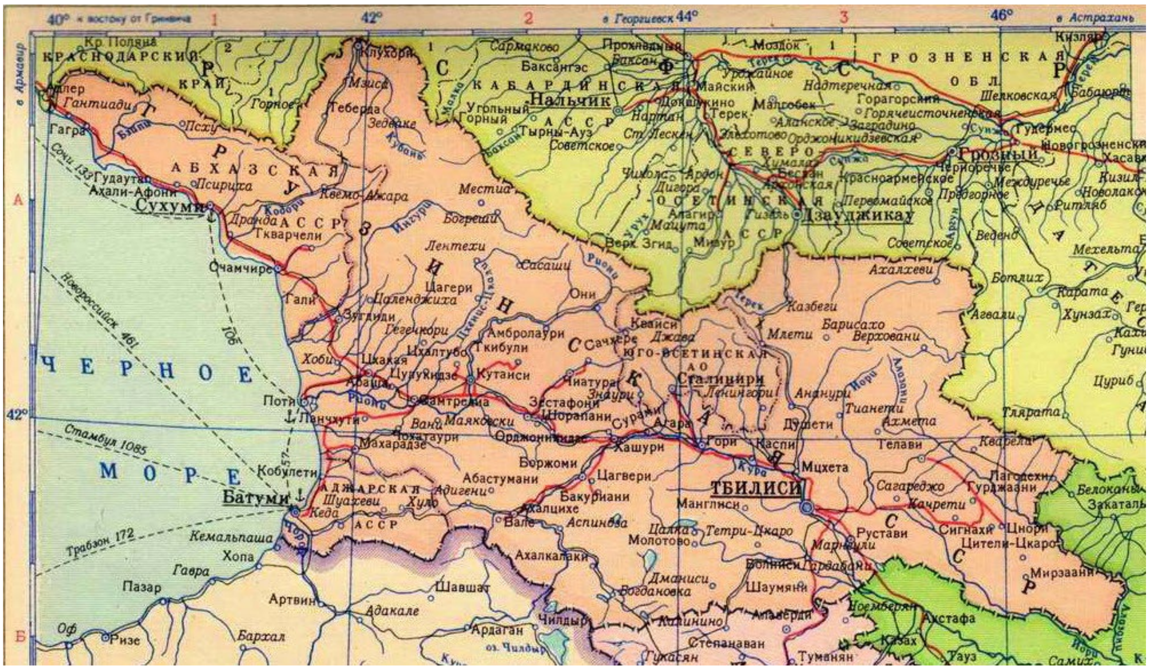

Figure 13. The Georgian Soviet Socialist Republic during 1944-1957 (Georgian SSR, 1944 - 1955, 1954)

The modern Imereti Region comprised the Orjonikidze (Kharagauli,) Zestaponi, Chiatura, Tkibuli, Chkhari, Kutaisi, Baghdati, Vani, Tsulukidze (Khoni) and Samtredia districts in 1938. The Sachkhere District separated from Chiatura and the Tskaltubo District from Kutaisi as soon as in 1939. Besides,

the territory of the Chkhari District became the Terjola Province because of Chkhari's demotion in 1950. The modern Samegrelo – Upper Svaneti Region comprised the Abasha, Gegechkori (Martvili,) Tskhakaia (Senaki,) Khobi, Poti, Zugdidi, Chkhorotsqu, Tsalenjikha and Upper Svaneti districts in 1938. Poti is the self-governing city today, whereas the largest part of its district was given to Khobi. The modern regions of Racha-Lechkhumi and Lower Svaneti, as well as Guria, comprised the same provinces in 1938 as today. The first one, the Ambrolauri, Oni, Tsageri and Lower Svaneti districts; the second one, the Lanchkhuti, Makharadze (Ozurgeti) and Chokhatauri districts.

Tbilisi was the individual district in 1938. The modern Mtskheta Municipality was part of the Tbilisi District in the 1930s. As for the autonomous regions, the Abkhazia ASSR comprised the Gali, Ochamchire, Sokhumi, Gudauta and Gagra districts in 1938. The Gulripshi District separated from Sokhumi in 1946. The Adjara ASSR comprises the Batumi, Keda and Khulo districts. The territory of the Batumi District became the Khelvachauri Province in 1968, whereas the city is self-governing today. The Shuakhevi District separated from Khulo in 1952, joined it again in 1963-1964 and separated for good in 1965. The South Ossetia Autonomous Oblast comprised 4 districts in 1938: Staliniri (Tskhinvali,) Leningori (Akhalgori,) Znauri and Java.

Important territorial changes happened in the Georgian SSR during 1944-1957 (fig. 13). Georgia received a portion of "the North Caucasian" territory following the exile of the local population. It was the Klukhor District in the west and the Akhalkhevi District in the east. The last province joined the Dusheti District in the beginnings of the 1950s. These lands were returned to the Northern Caucasians after their emancipation and the returning home.

Figure 14. The Georgian Soviet Socialist Republic in 1981 (Administrative-territorial organization of the Georgian SSR in 1981, 1981)

Changes happened in the administrative-territorial nomenclature of the Georgian SSR during the 1930s – 1950s. According to one source, the Upper Svaneti District was named Mestia as soon as 1930. The Mtskheta District separated from Tbilisi during 1930-1934 and then after 1938 for good. Aghbulaghi became Tetritskaro and Baghdati – Mayakovski in 1940. Karaiazi became Gardabani, Bashkicheti – Dmanisi and Borchalo – Marneuli in 1947. The Kvemo Svaneti District was named Lentekhi in 1957. Other changes were formed too. As a result, we see the administrative-territorial

organisation of the Georgian SSR on the map dated 1981, which can be considered the base of the administrative formation for independent Georgia (fig. 14).

Armenia like Georgia was under the influence of the Russian imperial administrative system and was divided into 9 uezds during the 1920s: Leninakan, Lori-Pambak, Dilijan, Ejmiatsin, Yerevan, Nor Bayazet, Daralagyaz, Zangezur and Meghri. It is important that 3 of them: Dilijan, Meghri and Lori-Pambak were formed after the Soviet occupation. 37 districts and the self-governing cities were established in the Armenian Soviet Socialist Republic during 1929-1937. Two more were formed during the 1970s and the 1980s.

Figure 15. Armenian Soviet Socialist Republic (Soviet Armenia, 2024)

The Shamshadin District was formed in the eastern part of the country, 1929. 24 districts were established in 1930: Kotayk, Aghbaba, Aparan, Vedi, Ghamarlu, Artik, Ashtarak, Basargechar, Goris, Gharakalisa, Dilijan, Daralagez, Ijevan, Nor Bayazet, Kafan, Martuni, Meghri, Kurdukulin, Akhta, Sisian, Stepanavan, Talin, Alaverdi and Vagharshapat. The Pashalu District was formed in the south of Armenia, 1931. 11 districts were established in 1937: Agin, Alagyoz, Duzkend, Ghukasyan, Kalinino, Gharabaghlar, Krasnoselsk, Zangibasar, Noyembrian, Sevan and Spitak. The Nairi District was formed in 1972 and the Baghramyan District, 1983. The first was established in the central part of the country, the second – in the south-western part. The Yerevan-city – the capital of Armenia was the individual district.

20 districts of the Armenian Soviet Socialist Republic changed their names as during the Soviet Epoch as after the finishing of this age, during the beginnings of the 1990s. Two of them made this twice or more times. 14 provinces changed their names during the Soviet Epoch, 7 – after its finishing during very beginnings of the 1990s. 19 districts formed during the various years never changed their names: Aparan, Ashtarak, Baghramyan, Goris, Dilijan, Ijevan, Gharabaghlar, Krasnoselsk, Martuni, Meghri, Nairi, Noyembrian, Sevan, Sisian, Spitak, Stepanavan, Talin and Shamshadin (fig. 15).

The information about the administrative-territorial organisation of the Azerbaijan SSR (fig. 16) can by highly arguable as unfortunately, the author could not find the just sources in face of the literature or the well-distinguishable maps. According to the unspecified information, this soviet socialist republic comprised 13 administrative regions. Though, we can exactly say that Azerbaijan comprised the Nakhchivan Autonomous Soviet Socialist Republic and the Nagorno-Karabakh Autonomous Oblast during the Soviet Epoch.

The Caucasian territory of the Republıc of Türkiye comprised 6 regions entirely or party in 1927. This number became 4 in 1935. The Caucasian land of “the Agri Ill” joined to “the Kars Ill” – the part of “the South Caucasus.” The Artvin and the Rize ills united and formed “the Chorokhi Ill.” As the result, the Turkish part of “the South Caucasus” had being comprised the Chorokhi, Trabzon, Kars ills

and the northern part of the Erzurum Ill. The Chorokhi Ill was separated during the 1950s, whereas the new administrative-territorial changes happened in Türkiye during the 1990s (Statistic Organization of Türkiye, the Census of the Population in 1927, 2024); (Statistic Organization of Türkiye, the Census of the Population in 1935, 2024).

The Caucasian territory of Iran comprised only two regions, Azerbaijan and Gilan, in the beginning of the 20th century. The Azerbaijan Region was divided into two parts during the 1940s where the Soviet Union formed the puppet governments. Neither of them existed for a long time. These ostans formed in "the South Azerbaijan" were named as "the West Azerbaijan" and "the East Azerbaijan" during the 1960s.

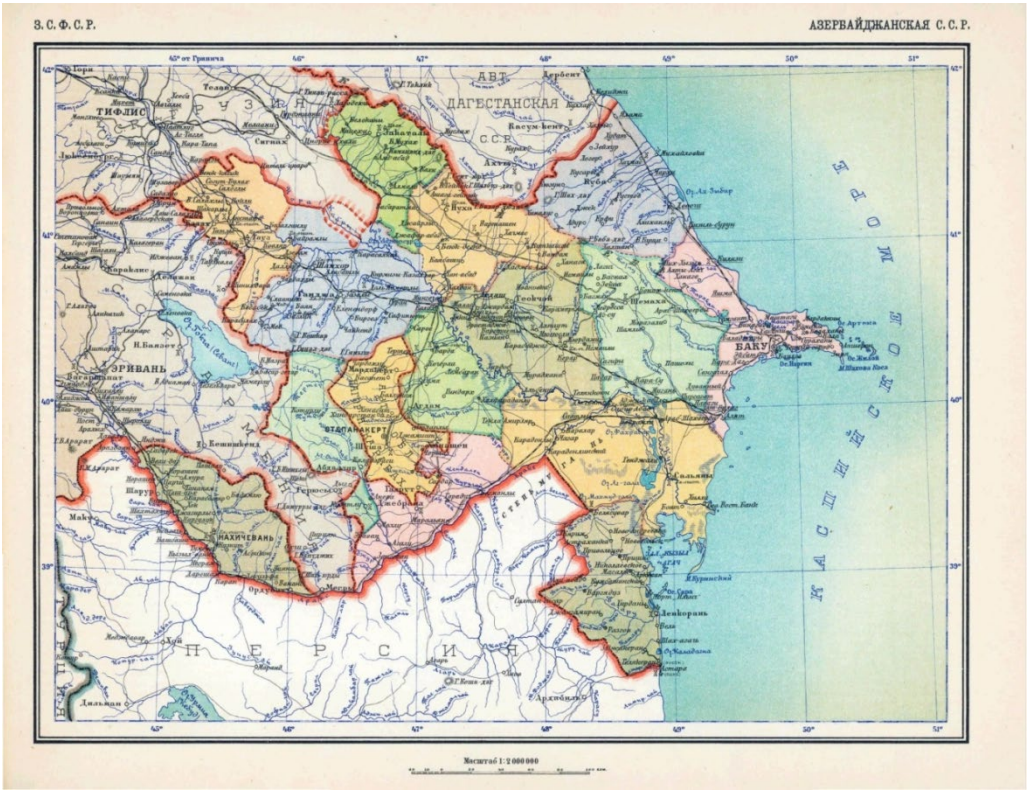

Figure 16. Azerbaijani Soviet Socialist Republic (Map of the Azerbaijan SSR, 1928)

The Modern Epoch

"The North Caucasus" became the epicentre of the great conflict after the collapse of "the Soviet Union" in 1991. Chechnya declared the independence from Russia in 1991, whereas Ingushetia separated from "the Chechnya-Ingushetia Autonomous Republic" the next year. The Chechen warriors were heroically fighting against the Russians during "Two Chechen Wars." They gained the victory in the first one, 1994-1996, but were defeated in the second, 1999-2000.

The Russian Federation organized the new administrative-territorial reforms in 2000. The state was divided into 8 unofficial "Federal Districts." They exist to monitor the consistency between the federal and the regional powers, also to ensure the governmental control over the civil service and the judiciary in the regions. "The North Caucasus" was divided between two federal districts: "the Southern" with the capital in Rostov-On-Don and "the North Caucasian" with the capital in Pyatigorks. The region comprised 9 federal subjects. The Krasnodar Kray – the capital in the Krasnodar-city and the Republic of Adygea – the capital in the Maykop-city became the parts of "the Southern Federal District." "The North Caucasian Federal District" comprised other subjects: the Stavropol Kray – the capital in the Stavropol-city, the Republic of Karachay-Cherkessia – Cherkessk, the Republic of Kabardino-Balkaria – Nalchik, the Republic of North Ossetia or Alania – Vladikavkaz, the Republic of Ingushetia – Nazran till 2002 and Magas after that, the Republic of Chechnya – Grozny and the Republic of Dagestan – Makhachkala. According to some sources, "the North Caucasus" comprises the southern parts of two more Russia's territories: the Republic of Kalmykia and the Rostov Oblast. The regions and the countries of the Russian Federation are subdivided into the districts.

"The Central Caucasus" also became the epicentre of the great conflicts in the 1990s. The internal conflicts of Georgia became the main obstacle to solve the problem of the administrative-territorial organization for good. According to the state's constitution of 1995, this problem must be decided when Georgia restores the control over its entire territory. Abkhazia and Adjara kept their autonomy into the Georgia's state. Other territory was divided into 9 non-official "regions" under the state authority. Their function is to maintain the coordination and consultation between the state and the municipality governments. These regions are Kakheti, Mtskheta-Mtianeti, Shida Kartli, Kvemo Kartli, Samtskhe-Javakheti, Imereti, Racha-Lechkhumi and Lower Svaneti, Samegrelo-Upper Svaneti and Guria. Tbilisi, the capital of the state, is independent of all regions (fig. 17).

Figure 17. The Modern Administrative-territorial Division of the North Caucasus (Walker, 2024)

The South Ossetia Autonomous Oblast was officially abolished in 1991, though "the South Ossetia Temporary Administration" was formed in 2007. Its government was situated in the village of Kurta. It has been exiled in Tbilisi since the Russia-Georgia War of 2008. This territory was officially divided into six parts: Akhalgori, Eredvi, Tigva, Kurta, Java municipalities and the Tskhinvali-city.

As for municipalities, Georgia was divided into 72 units (fig. 18), including 5 self-governing cities: Tbilisi, Rustavi, Kutaisi, Poti and Batumi, 2020. The Kakheti Region comprises 8 municipalities: Sagarejo, Akhmeta, Telavi, Gurjaani, Kvareli, Lagodekhi, Sighnaghi and Dedoplistskaro. Telavi is the administrative centre of the Kakheti. The Mtskheta-Mtianeti Region comprises 5 municipalities among which 1 – Akhalgori is occupied. Mtskheta, Dusheti, Tianeti and Kazbegi are other provinces. Mtskheta is the centre of this region. The Shida Kartli Region comprises 4 municipalities: Kaspi, Gori, Kareli and Khashuri, though some changes had been organized there when the state restored the independence. This region was officially divided into 5 municipalities in 1991-2007, before the creation of "the South Ossetia Temporary Administration." Java was the fifth municipality, whereas the territories of the former Tskhinvali and Znauri districts were the parts of Gori and Kareli municipalities. Gori is the administrative centre of the Shida Kartli. The Kvemo Kartli Region comprises 7 municipalities: Gardabani, Marneuli, Tetritskaro, Bolnisi, Tsalka, Dmanisi and the Rustavi-city. The last one is the centre of the region. The Samtskhe-Javakheti Region comprises 6 municipalities: Adigeni, Akhaltsikhe, Aspindza, Akhalkalaki, Ninotsminda and Borjomi. The Akhaltsikhe-city is the centre of the Samtskhe-Javakheti.

The Imereti Region comprises 12 municipalities: Sachkhere, Chiatura, Kharagauli, Zestaponi, Terjola, Tkibuli, Baghdati, Vani, Tskaltubo, Khoni, Samtredia and the Kutaisi-city. The last one is the

administrative centre of the Imereti Region. The Racha-Lechkhumi and Lower Svaneti Region comprises 4 municipalities: Ambrolauri, Oni, Tsageri and Lentekhi. Ambrolauri is its centre. The Samegrelo – Upper Svaneti Region comprises 9 municipalities: Abasha, Senaki, Khobi, Zugdidi, Martvili, Chkhorotsqu, Tsalenjikha, Mestia and the Poti-city. Zugdidi is the centre of this region. The Guria Region comprises 3 municipalities: Lanchkhuti, Ozurgeti and Chokhatauri. Ozurgeti is the centre.

The Abkhazia Autonomous Republic comprises 7 municipalities: Gali, Ochamchire, Gulripshi, Sokhumi, Gudauta, Gagra and Azhara. The territory of the Azhara Municipality was the only one under the Georgian control till 2008. It was officially formed in 2006. The term "Upper Abkhazeti" was established as its other name too. The Sokhumi-city is the capital of the Abkhazia A.R. though its official government is exiled in Tbilisi. The Adjara Autonomous Republic comprises 6 municipalities: Kobuleti, Khelvachauri, Keda, Shuakhevi, Khulo and the Batumi-city. Batumi is the capital of the Adjara A.R.

The significant changes were made in the naming of the municipalities and their centres after the collapse of the Soviet Union. Cities and towns returned their old names, so their territories' names also changed. Tsitelitskaro in the Kakheti became Dedoplistskaro, Leningori in the Mtskheta-Mtianeti – Akhalgori. The town of Kazbegi in the same region returned its old name Stepantsminda in 2006, but the municipality kept the former name. The former Znauri became Kornisi in the Shida Kartli. Bogdanovka returned the old Georgia name Ninotsminda in the Samtskhe-Javakheti. Three changes were made in the Imereti Region: Orjonikidze became Kharagauli, Tsulukidze – Khoni and Mayakovski – Baghdadi again. Besides, Gegechkori became Martvili, Tskhakaia – Senaki and Makharadze – Ozurgeti in Samegrelo and Guria. The names of the Tbilisi districts were changed too.

The last crucial administrative-territorial change was made in 2017, when seven self-governing cities lost this right: Telavi, Mtskheta, Gori, Akhaltsikhe, Ambrolauri, Zugdidi and Ozurgeti. All of them are the centres of the regions and the municipalities at the same time. The own government was kept by Tbilisi and those cities which are the centres of the regions, but not the municipalities, except Poti.

Figure 18. The Administrative-territorial Division of Georgia (Administrative Division, 2018)

The main administrative-territorial division of Armenia has two steps like in Georgia. The state is divided into 11 regions, 10 "marzs" and the capital Yerevan-city. The marzs are ruled by "the Marzpets" appointed by the central power. The capital is ruled by the mayor elected by the population. These marzs are Shirak, Lori, Tavush, Aragatsotn, Kotayk, Gegharkunik, Armavir, Ararat, Vayots Dzor and Syunik.

According to the administrative reforms of Armenia during the 2010s-2020s (fig. 19), the Shirak Marz is subdivided into 6 municipalities: Gyumri, Artik, Ani, Akhurian, Amasia and Ashotsk. Gyumri is the centre of the region. The Lori Marz comprises 57 municipalities. Vanadzor is the centre. The Tavush Marz has 24 municipalities with the centre in Ijevan. The Aragatsotn Marz is subdivided into 9 municipalities: Alagyaz, Aparan, Arevut, Ashtarak, Metsandzor, Shamirman, Talin and Tsaghkahovit. Ashtarak is the centre of the region. The Kotayk Marz comprises 42 municipalities with the centre in Hrazdan. The Gegharkunik Marz is subdivided into 5 municipalities: Chambarak, Gavar, Martuni, Sevan and Vardenis. Gavar is the centre of the region. The Armavir Marz comprises 7 municipalities: Araks, Armavir, Baghramyan, Khoy, Metsamor, Parakar and Vagharshapat. Armavir is the centre. The Ararat Marz has 5 municipalities: Ararat, Artashat, Masis, Vedi and Verin Dvin with the centre in Artashat. The Vayots Dzor Marz comprises 5 municipalities: Areni, Jemruk, Vayk, Yeghegis and Yeghegnadzor. The last one is the centre of the region. The Syunik Marz is subdivided into 8 municipalities: Goris, Kajaran, Kapan, Meghri, Sisian, Gorayk, Tavet and Tegh. Kapan is the centre.

Figure 19. The Administrative-territorial Division of Armenia in 2021 (Provinces of Armenia, 2024)

The administrative-territorial division of the Azerbaijan Republic (fig. 20) had one main step until 2021, when the new "Economic Regions" were formed in the state. Though this system gained two levels after that, they are less connected to each apart from the administrative-territorial stages in Georgia or Armenia. There are 67 districts and 11 cities in the Azerbaijan Republic. Besides, the Nakhchivan Autonomous Republic comprises 7 more districts and 1 city. All these provinces are distributed among 14 economic regions, which were mainly formed according to their geographic and economic similarities: Baku, Absheron-Khizi, Ganja-Dashkasan, Shaki-Zagatala, Lankeran-Astara, Quba-Khachmaz, Central Aran, Karabakh, East Zangezur, Mountainous Shirvan, Nakhchivan, Qazakh-Tovuz, Mil-Mughan, and Shirvan-Salyan.

The Baku Economic Region comprises only the capital and its district, which are the main economic centres of the state. The Absheron-Khizi Economic Region includes the Absheron and Khizi districts as well as the Sumgait city. The Quba-Khachmaz Economic Region is formed of 5 districts: Shabran, Khachmaz, Quba, Qusar and Siyazan. The Mountainous Shirvan Economic Region comprises 4 districts: Agsu, Ismaiyly, Gobustan and Shamakhi. The Shirvan-Salyan Economic Region includes 5 districts: Bilasuvar, Hajigabul, Neftchala, Salyan and the Shirvan city. The Lankeran-Astara Economic Region is made of 5 districts: Astara, Jalilabad, Lerik, Yardimli and Lankeran. The Mil-Mughan Economic Region comprises 4 districts: Beylagan, Imishli, Saatly and Sabirabad. The Central Aran Economic Region includes 7 districts: Agdash, Goychay, Kurdamir, Ujar, Yevlakh, Zardab and Mingachevir city. The Shaki-Zagatala Economic Region comprises 6 districts: Balakan, Qakh, Qabala, Oghuz, Zagatala and Shaki. The Qazakh-Tovuz Economic Region includes 5 districts: Aghstafa, Gadabay, Gazakh, Shamkir and Tovuz. The Ganja-Dashkasan Economic Region is made of 6 districts: Dashkasan, Goranboy, Goygol, Samukh, the Ganja and Naftalan cities. The Karabakh Economic Region comprises nine districts: Agjabadi, Aghdam, Barda, Fuzuli, Khojaly, Khojavend, Shusha, Tatar, and Khankendi City. The East Zangezur Economic Region includes 5 districts: Jabrayil, Kalbajar, Qubadli, Lachin and Zangilan. And finally, the Nakhchivan Economic Region comprises 8 districts of the autonomic republic: Babek, Julfa, Kangarli, Ordubad, Sadarak, Shuahbuz, Sharur and the Nakhchivan city.

The administrative-territorial changes took place in Türkiye and Iran, in the parts of "the South Caucasus", during the 1990s.

The Republic of Türkiye is unofficially divided into 7 regions, whereas the parts of "the South Caucasus" are distributed among two of them: "the Black Sea Region" and "the Eastern Anatolia Region". The Ardahan and the Igdir ill separated from the Kars Ily in 1992 and 1993. As a result, Türkiye's "South Caucasus" comprised 6 ills entirely and 1 partly: Artvin, Rize, Trabzon, Ardahan, Kars, Igdir and the northern part of Erzurum. The first three are the parts of "the Black Sea Region"; the other four – the parts of "the Eastern Anatolia Region". It is important that the ills, the provinces of the Republic of Türkiye, are subdivided into "the Ilches" or districts. As a result, the Artvin Ill comprises 9 Ilches, the Rize Ill – 12 Ilches and the Trabzon Ill – 18 Ilches. The Ardahan Ill is subdivided into 6 Ilches, the Kars Ill – into 8 Ilches, and Igdir – into 4 Ilches. The Erzurum Il is subdivided into 20 Ilches. Though it is difficult to say how many of them the parts of the Caucasus Region are. The northern part of this province may contain up to eight districts.

Figure 23. The Economic Regions of the Azerbaijan Republic in 2021 (Economic Regions of Azerbaijan, 2024)

The Ardebil Ostan separated from the East Azerbaijan region in Iran, 1993. So, Iran's "South Caucasus" comprised 4 regions or "ostans:" West Azerbaijan, East Azerbaijan, Ardebil and Gilan. The regions of the Islamic Republic of Iran are subdivided into "the Shahreatans" or the oblasts. As the result, the West Azerbaijan comprises 20 "shahrestans," the East Azerbaijan – 23 "shahrestans," Ardebil – 12 and Gilan – 17 of them.

Conclusion

The diverse Caucasian region is the land of the richest history. The history does not stand but actively moves here. The state and the internal borders move according to it even during our age. It is interesting that the administrative-territorial systems of all 6 states are similar, though there are the sharp differences too. The admitting of the new borders and the new dividing of this region would supposedly abolish the Russian imperial terminology and its legacy. The international relationships in the Caucasus are also significant. Azerbaijan, Georgia and Türkiye, the states of "the Central" and "the South Caucasus", are the closest economic partners. Besides, Azerbaijan and Türkiye are the closest political allies too. Russia, Armenia and Iran, the states of "the North", "Central" and "the South Caucasus"—are"also the closest economic and political partners to each other. These two trade alliances have the global role of two major lines from the west to the east and from the north to the south, the successors of the ancient and mediaeval trade routes. Though Armenia and Azerbaijan are adversaries, both are dependent on Georgia's sea ports and vice versa, so these ports have the important role. The Turkish private companies actively work not only in the allied Georgia and

Azerbaijan but also in the opponent Armenia. At the same time, the Russian private companies own a large part of the economy of the adversary – Georgia. The state of "the Central Caucasus" – Georgia tries to have a close cultural relationship with the republics of "the North Caucasus", the members of the Russian Federation. All these relations, also the role of the global trade routes in all parts of the region, interweave the three parts of the Caucasus into each other and confirm that the dividing of the entire region is just conditional. We do not need to go far for the rough comparison: the Caucasus Ridge, situated on about 1500 kilometres and the territories of three sovereign states, is conditionally divided into three parts. Despite this, it is still the entire mountainous system.

Competing interests

The authors declare that they have no competing interests.

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References

Administrative Division. (2018). In N. Bolashvili, A. Dittmann, L. King, & V. Neidze, *National Atlas of Georgia* (pp. 8-9). Franz Steiner Verlag.

Administrative map of Caucasus in USSR, 1952-1991. (2024, October 1). Retrieved from www.armenica.org: https://www.armenica.org/cgi-bin/armenica.cgi?=1=3==Armenia

Administrative map of Elisabethpol Governorate - 1913. (1913). In *Russia. Geographical description of the Russian Empire by provinces and regions with geographical maps* (p. 75). Saint Petersburg: Typography.

Administrative map of Kars Oblast. (1913). In *Russia. Geographical Description of the Russian Empire by Provinces and Regions with Geographical Maps* (p. 76). Saint Petersburg: Thrift Pablishing.

Administrative-territorial organization of the Georgian SSR in 1981. (1981). In *Georgian Soviet Encyclopedia, Volume 2.* Tbilisi: Printed Word Combine.

Ana Vatan : [Turkey], 1927. (2024, October 01). Retrieved from loc.gov: https://www.loc.gov/resource/g7431f.ct003172/?r=0.146,-0.119,0.991,0.614,0

Armenian Delegation on Paris Peace Conference, 1919. (2024, October 01). Retrieved from gallica.bnf.fr: https://gallica.bnf.fr/ark:/12148/bpt6k34140447/f39

Caucasus. (2018). In N. Bolashvili, A. Dittmann, L. King, & V. Neidze, *National Atlas of Georgia* (pp. 4-5). Franz Steiner Verlag.

Cuinet, V. (1890). Erzurum Vilayet. In V. Cuinet, *La Turquie d'Asie. Geographie administrative, statistique, descriptive et raisonné e de chaque province de l'Asie-Mineure.* British Library HMNTS 10077.k.18.

Cuinet, V. (1890). Vilayet of Trebizond. In V. Cuinet, *La Turquie d'Asie. Geographie administrative, statistique, descriptive et raisonné e de chaque province de l'Asie-Mineure.* British Library HMNTS 10077.k.18.

Economic Regions of Azerbaijan. (2024, 10 01). Retrieved from mapr.com: https://www.mappr.co/counties/azerbaijan/

Erivan province. (1913). In *Russia. Geographical Description of the Russian Empire by Provinces and Regions with Geographical Maps* (pp. 80-81). Saint Petersburg: Thrift Pablishing.

Ethnographic map of the Baku Governorate. (1901). In *Caucasian calendar for 1902: [57th year]*. Commander-in-Chief of the Caucasian Part in the Caucasus.

Gachechiladze, R. (2023). *Georgia in the Regional Context.* Tbilisi: Bakur Sulakauri Publishing.

Georgia at the end of 19th century. (2012). In R. Gobejishvili, *National Atlas of Georgia* (p. 161). Tbilisi.

Georgian SSR, 1944 - 1955. (1954). In M. D. USSR, *Atlas of the USSR.* Moscow.

Goishvili, B., & Chkheidze, V. (2001). *Geography of Georgia's Bordering Area.* Tbilisi: Ganatleba.

Hille, C. M. (2010). *State Building and Conflict Resolution in the Caucasus.* BRILL.

Ismaylov, E., & Papava, V. (2007). *Central Caucasus: Outlines of the Geopolitical Economy.* Tbilisi: Diogene.

Kazemzadeh, F. (2016). *Battle for the South Caucasus 1917-1921.* Tbilisi: Poezia.

Kuban Region. (1913). In *Russia. Geographical description of the Russian Empire by provinces and regions with geographical maps* (p. 70). Saint Petersburg: Thrift Pablishing.

Map of Dagestan Region. (1913). In *Russia. Geographical description of the Russian Empire by provinces and regions with geographical maps* (p. 74). Saint Petersburg: Thrift Pablishing.

Map of the Azerbaijan SSR. (1928). In A. S. Enukidze, *Atlas of the Union of Soviet Socialist Republics* (pp. 89-90). Moscow: Central Executive Committee of the USSR.

Map of the Black Sea Province. (1913). In *Russia. Geographical description of the Russian Empire by provinces and regions with geographical maps* (p. 79). Saint Petersburg: Thrift Pablishing.

Map of the Terek Region. (1913). In *Russia. Geographical description of the Russian Empire by provinces and regions with geographical maps* (p. 71). Saint Petersburg: Thrift Pablishing.

Metreveli, R. (2023). *The History of Caucasus – part 1.* Tbilisi: Artanuji.

Metreveli, R. (2023). *The History of Caucasus – part 2.* Tbilisi: Artanuji.

Persia. (1920). In *Asprey's Atlas of the World* (p. 82). London: Asprey and Co., Ltd.

Provinces of Armenia. (2024, 10 01). Retrieved from Mappr.com: https://www.mappr.co/counties/armenia/

Radvanyi, J., & Beruchashvili, N. (2009). *Geopolitical Atlas of the Caucasus.* Tbilisi: Bakur Sulakauri Publishing.

Sanadze, M., Beradze, T., & Thopuria, K. (2009). *Georgia's Historical Atlas.* Tbilisi: Saqartvelos Matsne.

Soviet Armenia. (2024, October 01). Retrieved from armenica.org: https://www.armenica.org/cgi-bin/armenica.cgi?=1=3==Armenia

Soviet Union Administrative Divisions, 1989. (2024, 10 01). Retrieved from maps.lib.utexas.edu: https://maps.lib.utexas.edu/maps/commonwealth/soviet_union_admin_1989.jpg

Statistic Organization of Türkiye. (2024, October 01). *the Census of the Population in 1927.* Retrieved from teyit.org: https://cdn.teyit.org/wp-content/uploads/2019/11/nufustahriri.pdf

Statistic Organization of Türkiye. (2024, October 01). *the Census of the Population in 1935.* Retrieved from kutuphane.tuik.gov.tr: https://kutuphane.tuik.gov.tr/pdf/0015557.pdf

Stavropol Governorate. (1913). In *Russia. Geographical Description of the Russian Empire by Provinces and Regions with Geographical Maps* (pp. 69-70). Saint Petersburg: Thrift Pablishing.

The Map of the Territories Demanded by Georgia in 1920. (2024, October 01). Retrieved from archive.gov.ge: https://archive.gov.ge/ge/sakartelos-pirveli-demokratiuli-respublika

Walker, E. W. (2024, October 1). *Eurasian Geopolitics.* Retrieved from eurasiangeopolitics.com: https://eurasiangeopolitics.com/north-caucasus-maps/

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Effect of Physical and Human Geographical Features on the Results of Elections-Comparative analysis of Different Countries

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Abstract

Electoral Geography is a new and interesting sub-direction of Human Geography. It includes finding out the tendencies that are revealed by electorate at the polling stations. Then, election results and tendencies in general, are transferred into Geographical space. The main goal of electoral geography is to reach conclusions from pondering these tendencies. These conclusions are interesting for people who work in Human Geography, also for candidates and political parties and for ordinary people, who are interested in the results of upcoming elections, results can be easily predicted if we know the tendencies of electoral geography of our country. Unfortunately, electoral geography as a science is not developed in Georgia. That is the main reason why I have decided to choose this topic for our conference. I have also decided to choose Georgia as one of the countries while conducting comparative analysis of electoral geography of different countries in this survey. Despite being young state, from the electoral map of Georgia we can find out some interesting tendencies. I think my decision will be a good donation in the process of developing Electoral Geography as a science in Georgia. My survey will not be only about the dependence of election results on Human Geographical features such as Language, Religion of the people, Culture and Ethnicity, but also on the Physical Geographical features, such as terrains and proximity to the sea. We will find out if the countries show similar or different tendencies. In this thesis we will use different research methods: Historical Analysis will be massively used, because while speaking about the electoral tendencies of different states, we need to compare election results of different years to one another. Also, we will have a general cartographical description of regions and subdivisions of countries which have been chosen. We will also analyze detailed electoral maps region-by-region, city-by-city. In survey the most important Human Geographical features of regions will be observed, such as density, Literacy rate, Average salary, Average age of the population, HDI, Ethnicity, Religion, Language…. The Method of data comparison will be used, as the aim of the research is to find out electoral tendencies of different countries, we must compare the results of elections of different years and reach interesting conclusions.

Keywords: Elections, Geography, Turkey, USA, Georgia

Introduction

Electoral geography is a new and very interesting sub-direction of the human geography field. It is a helpful indicator to predict final results, election winners or outcomes, even in the first hours of vote counting, but for correct predictions, we should know our countries' trends based on the single regions or even single polling stations. In the United States of America, we cannot imagine election nights without electoral maps anymore. Especially after 2008, all major cable networks work based on electoral geographical trends, not state by state or even county by county, to predict the final results of their elections. Then this sub-direction of human geography spread across other countries in Europe and later in developing countries, such as Turkey and Brazil. Unfortunately, electoral geography is not

popular in Georgia yet; our networks do not have specialists who can explain results from polling stations on a wider scale and, based on it, predict election results. This is a main motivation for me. I do believe that this study field should become popular in our country, especially as we are a developing nation; political parties and organisations should build their campaigns on the awareness of this science. I hope that my survey will be helpful in the process of developing this sub-direction in our country.

In this study, we will identify the major trends in electoral geography across different countries. I chose the US because it invented electoral geography and has the most accurate data. Turkey – as one of the Islamic countries where we have competitive elections – and Georgia, as it is our country, and my interest is to make this field more popular than it is right now. We will also have a comparative analysis of the trends of these countries and find out their similarities and differences. We will analyse results of different elections of selected countries, their electoral maps and trends based on geographical features, such as demographics and physical geography.

Methods and Materials

As studying electoral geography involves analysing how geographical factors affect electoral outcomes, it requires a combination of quantitative and qualitative methods, as well as different materials.

In this study we will usually use electoral data analysis, which involves statistical analyses of voting results, voter turnout and turnout of different demographic groups. Techniques include regression analysis, correlation studies and cluster analysis to identify trends based on the time and period in history. We will also use GIS (Geographic Information Systems); they are essential because of their helpful role in visualising electoral data, identifying patterns, and analysing the impact of geographical factors like urbanisation, terrain, and topography. We will also use demographic and socioeconomic analysis, as it is a main and vital part in terms of people's behaviour in front of their ballots.

Case studies – as we have three different countries in this study and different elections to study, we will use a method called case study, as we need in-depth studies of specific regions or elections to provide detailed insights into the influence of geography on election results.

Materials which are going to be used in this study are voting records, voter turnout data, polls and surveys, and demographics of different regions of the countries, as analysis of election results should be made based on these demographical data. We will also use census data and political boundary maps to find out if the boundaries are correct or if there is a factor of gerrymandering in the outcome.

We will also use secondary sources such as government reports and academic articles and books about this issue.

Results

In this survey two tables are used: Table 1 and Table 2Table 1- Table represents detailed results of 2012 parliamentary elections of Georgia. It compares outcomes of 10 biggest urban areas and 10 smallest mainly rural towns to underline the difference between results from these geographical areas. It also compares mountains and seashores to demonstrate how different people in the mountainous regions and seashore cities behave during the elections. Table 2- Table represents detailed results of 2021 local election of Georgia. It compares outcomes of big urban areas to the rural towns to demonstrate different electoral results. It also compares mountainous regions to the seashores.

Table 1. Results of 2012 Parliamentary elections in Georgia

Party	Nationwide	Heavily populated by Minorities	10 Biggest cities	10 smallest towns	Mountains	Seashore
GD	54.97%	26.6% (-28.3%)	61.7% (+6.73)	40% (-14.97%)	45% (-9.97%)	56% (+1.03%)
UNM	40.34%	70.8% (+30.5%)	36.4% (-3.9%)	54% (+13.6%)	51% (+10.6%)	41%
Others	4.69%	2.6% (-2%)	2% (-2.69%)	6% (+2.69%)	4% (+2.69%)	3% (-1.69%)

Table 2. Results of 2021 local elections of Georgia

General Results	General Results	Capital Cities	5 Biggest cities*	5 Smallest Towns*	Mountains
GD	46.7%	40.39 (-6.31%)	39% (-7,7%)	52% (-5.3%)	53% (+6.3%)
Pro-Western Opposition*	51.3%	58.01% (+6.71%)	About 60% (+8.7%)	46% (-5.3%)	43% (-8.3%)
Others*	2%	1.6% (-0.4%)	1% (-1%)	4% (+2%)	4% (+2%)

Electoral Geography, USA

In the United States of America, electoral Geography as a sub-direction of human Geography is very popular. There have not been single election night without big boards and electoral maps. Specialists analysing election results state by state and county by county on electoral maps and they conclude major tendencies. This usually happens on all major TV networks, such as CNN, MSNBC, FOX, and CBS.

President of the USA is not directly elected by the people. People in every state elects electoral college delegates and whoever wins a state it takes all electoral votes. Number of Electoral votes for every state is depend on its population and is calculated by this formula: Number of State congressional districts+ Number of Senators (2 in every state), so for example, California has 52 congressional districts based on 2020 census and 2 senators, so the biggest state of the union has 54 electoral college delegates and usually all of them goes to Democratic party.

In US we have two major parties (fig. 1). Republicans and Democrats. Majority of Republicans are conservatives, they are pro-life, so they support ban of abortion. They were against same-sex marriage, majority of them does not support strict gun control. Democrats are usually liberals, they are pro-choice, so they support abortion, they supported same-sex marriage, liberal economies and strengthening alliances around the world to defend democracy from terrorism and states such as Iran and Russia.

Today, Republicans controlled by MAGA group aspiring towards more conservatism and Democrats becoming more and more liberals, so environment becomes more polarized than it was years ago.

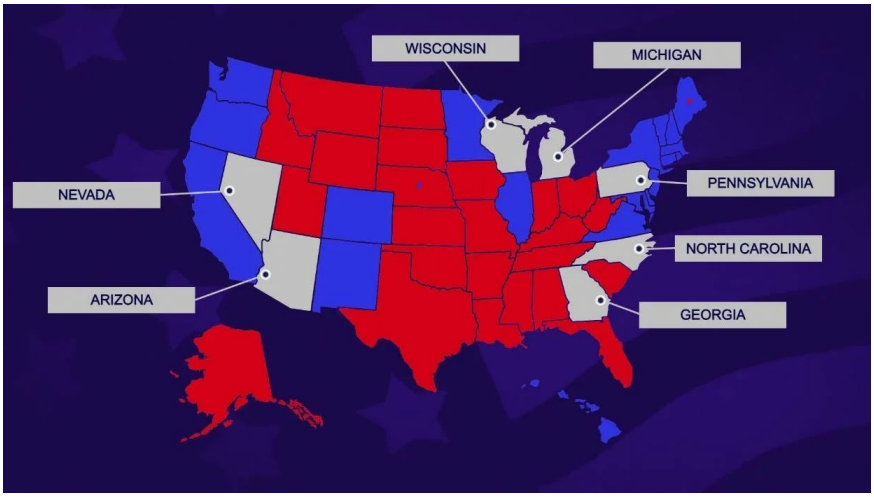

Figure 1. US electoral Geography. Red, Blue and Swing states. Source: (Burr, 2024)

As we know ideologies of political parties, now we can see geographical features of US elections and conclude some trends on it.

This is electoral map of the US presidential election. Blue states are state that always vote for Democratic nominee, Red states are leaning towards Republicans and Yellow states are so-called swing states. Neither Blue nor Red states are not enough to earn 270 electoral vote in presidential election without yellow states, so candidate cannot become president by only Blue or by only Red states.

Which states are Blue?

Blue states are the state which have a great economy, majority of their population lives through coastlines and states in which we have major urban areas or megapolises. For example, California. The biggest state in the US, won by Biden by more than 5 million votes and by Hillary Clinton by more than 4 million votes. California always votes for Democrats thanks to major population centers, such as Los-Angeles, San-Francisco and San-Diego. Let's talk about Illinois. Which is one of the biggest state in the US (fig. 2).

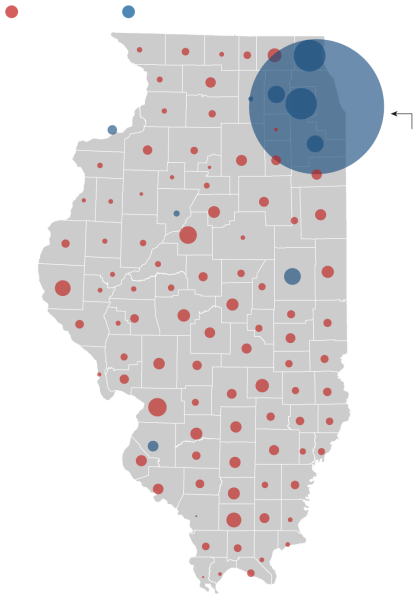

Figure 2. Illinois 2016 Presidential Election Map. source: (Bentle, 2019)

It is clear that majority of counties of Illinois has been won by Donald Trump, but Trump has been blown out of the water by Hillary Clinton. Because it is true that majority of the counties are red, but we have one huge blue county in the north-eastern part of the state and it is great city of Chicago. Hillary Clinton earned more than 70% in Chicago and that's why she won Illinois by double digit margin.

On the Other hand, Republicans are winning state in which there are no major population centers so urbanization is relatively low (fig. 3).

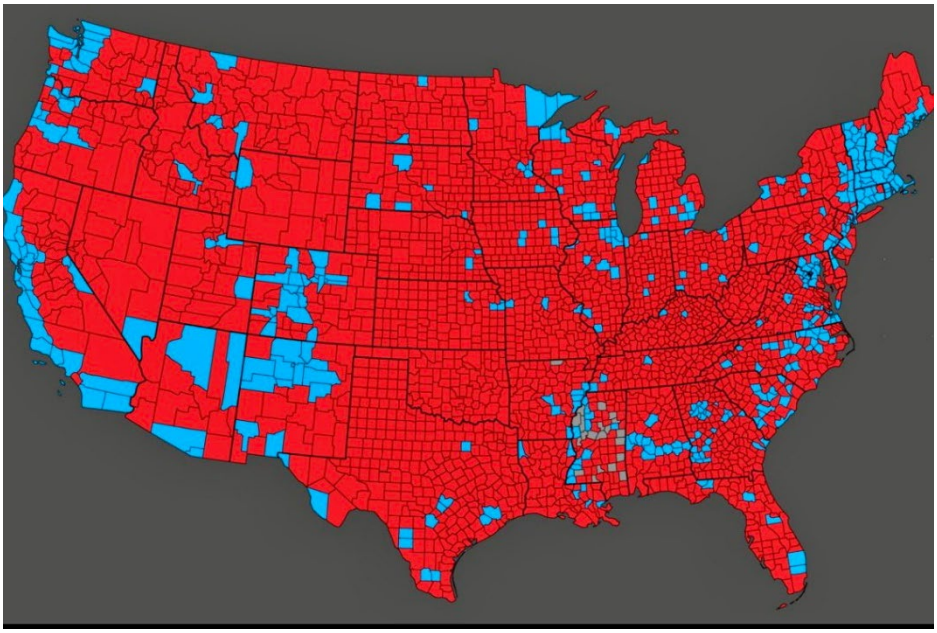

Figure 3. US electoral map county by county

But in the swing states we have a situation that number of people in a major population centers and people in rural areas are approximately same. So, in these states everything comes down to suburban electorate, they can swing to Republicans or Democrats depend on the nominees and environment, For Example, in 2016 Hillary Clinton lost because of Wisconsin and Michigan. In Michigan, Hillary won Detroit by a huge margin, but lost rural areas by double digits, so everything came down to suburban areas, where Trump won narrowly and carried this huge state. Same happened in Wisconsin (fig. 4).

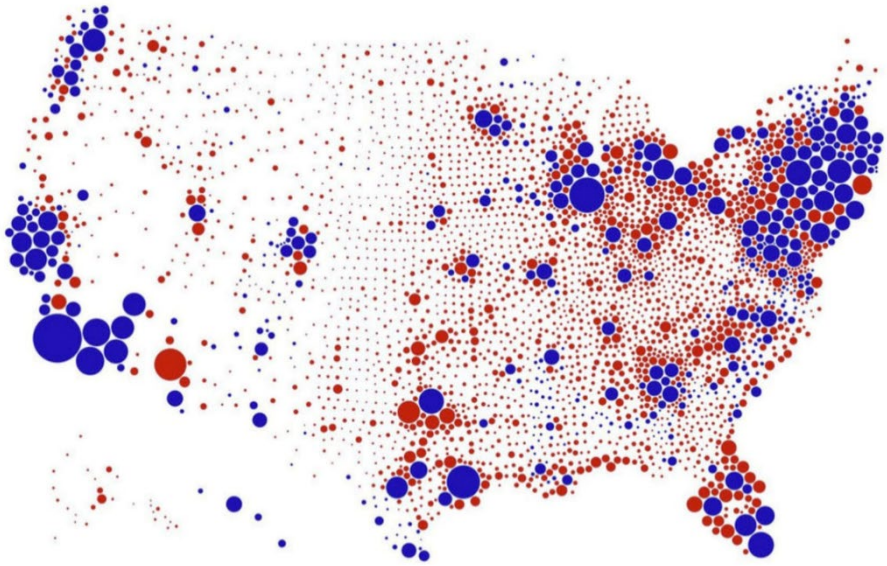

Figure 4. "Land does not vote, people do"

If we only see map N1, we will be sure that Republican nominee won the election, because 70% of the counties have been won by him, but then we should see the second map. Big cities, coastlines and urban areas voting for Democrats and in the middle of the country, which is a mountainous region Republican is ahead. In these republican counties, population is low, but counties are big by area, density is very low, they are rural counties and that's why it seems on the first map that Red won by a landslide.

After analysing electoral maps of the United State, one thing is absolutely clear: Nominees of Republican party, which are conservatives are winning in mountainous regions, rural and suburban counties and more liberals winning coastlines and big urban areas, states where we have urbanization more than 70%. After the US, we will also review Turkey and Georgia and find out if the trends are same or different.

Electoral Geography, Turkey

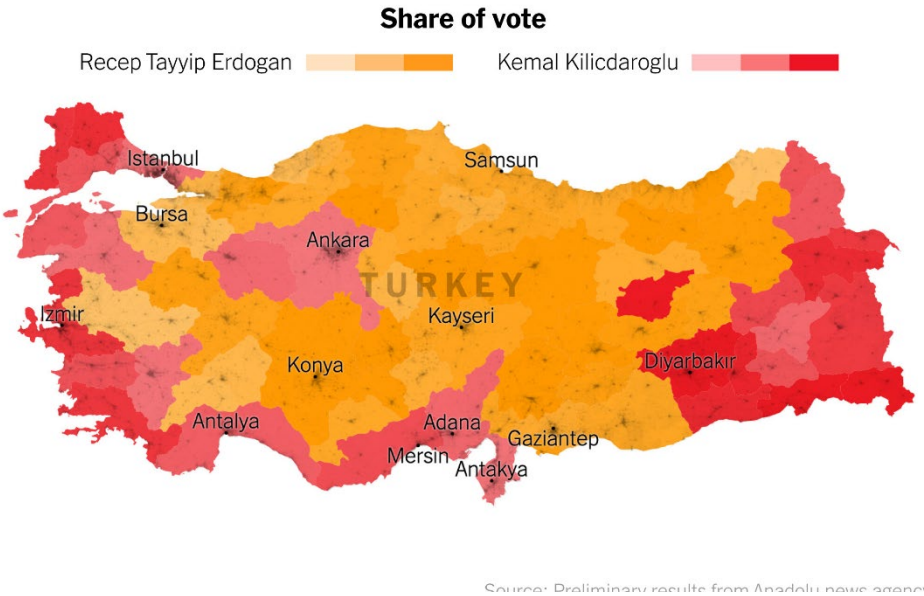

Figure 5. Results of Turkish presidential election. Source: Leatherby

While having research about Turkish electoral Geography, we have a lack of materials and data compare to the United States of America, where electoral geography as a sub-direction of human Human Geography is the most developed. But we can still make some conclusions based on Geographic Factors such as division between urban and rural areas and we can compare it to the US (fig. 5).

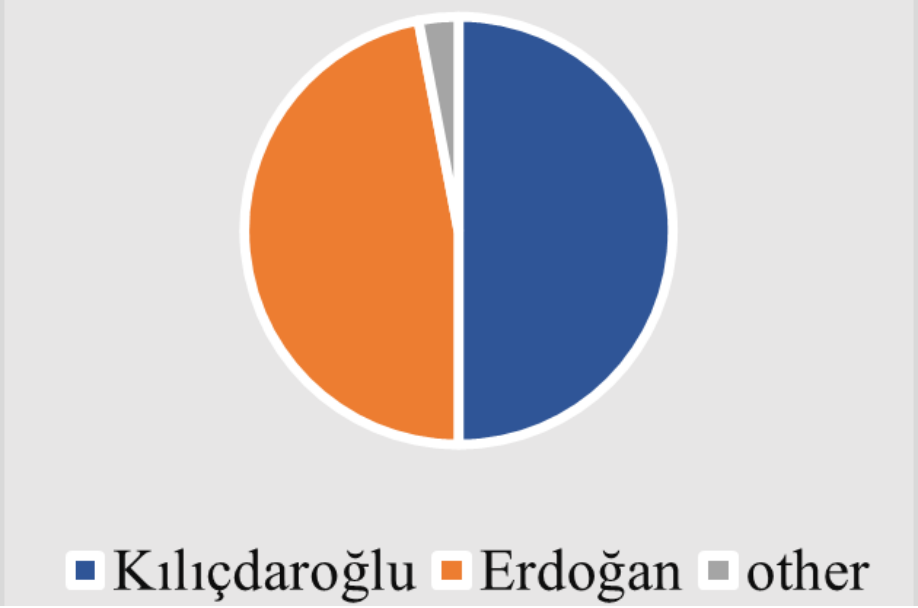

Figure 6. Daily Sabah election results in 10 biggest cities (Daily Sbah Election Results 2023, 2024)

First of all, In Turkish politic we have three major parties. One is AK parti, which is led by Erdogan. Second main opposition, CHP Party of once Mustafa Kemal Ataturk, which supports ideas of secularism and modern liberal-centrism. We should underline that CHP supports modern time secularism and defending of rights of minorities, such as LGBT rights for example, which is very unusual for Islamic Society. Istanbul was the first city of the Islamic world, where Pride Festival has been held, under mayor Erkem Imamoglu, who received 54.22% in 2019 controversial election of mayor of Istanbul. Third strong party is Pro-Kurdish regional party, which is always ahead in south-eastern party of Turkey (fig. 6).

The tendencies of The US elections are that Democratic party always wins urban areas and states where percentage of urban population is much more than rural. Now we should compare data of Turkish election to the outcomes of the US and see if tendencies are similar or different.

Kemal Kilicdaroglu, candidate of CHP, backed by liberal and centrist population, wins: Istanbul (First biggest city of the nation), Ankara (Second biggest city of the nation). Izmir (Third biggest city of the nation), Antalya (5-th biggest city of Turkey) and other big urban centers such as: Mersin, Adana, Antakya, Diyarbakir. To sum these results up in urban areas: (Results based on 10 biggest cities of Turkey).

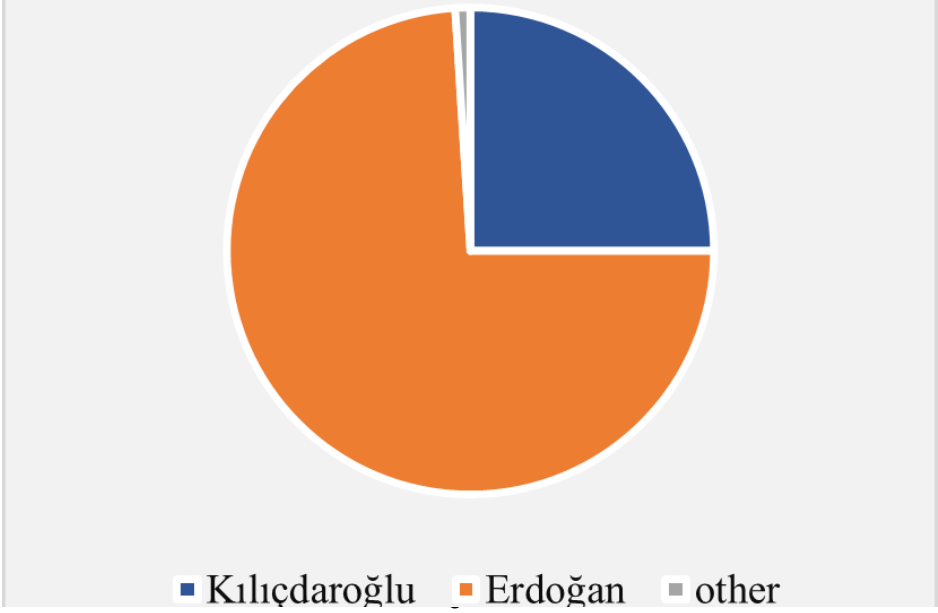

Figure 7. Daily Sabah, election results 2023 in 10smallest cities, (Daily Sbah Election Results 2023, 2024)

Now, we can sum results of 10 less populated towns of Turkey: Difference is clear. Kilicdaroglu won big cities but lost more rural areas heavily (fig. 7).

Tendencies are absolutely similar to the US. More conservative parties winning in mountainous regions and rural areas, more liberal parties winning in major urban population centers.

Electoral Geography, Georgia

Georgia was back on the political map of the world in 1991. The first competitive election in the country since it regaining independence from Soviet Empire was held in 2008, where incumbent president Mikheil Saakashvili was running against Levan Gachechiladze, who was a nominee of "National Council", Badri Patarkatsishvili was also running, he was pro-Russian candidate.

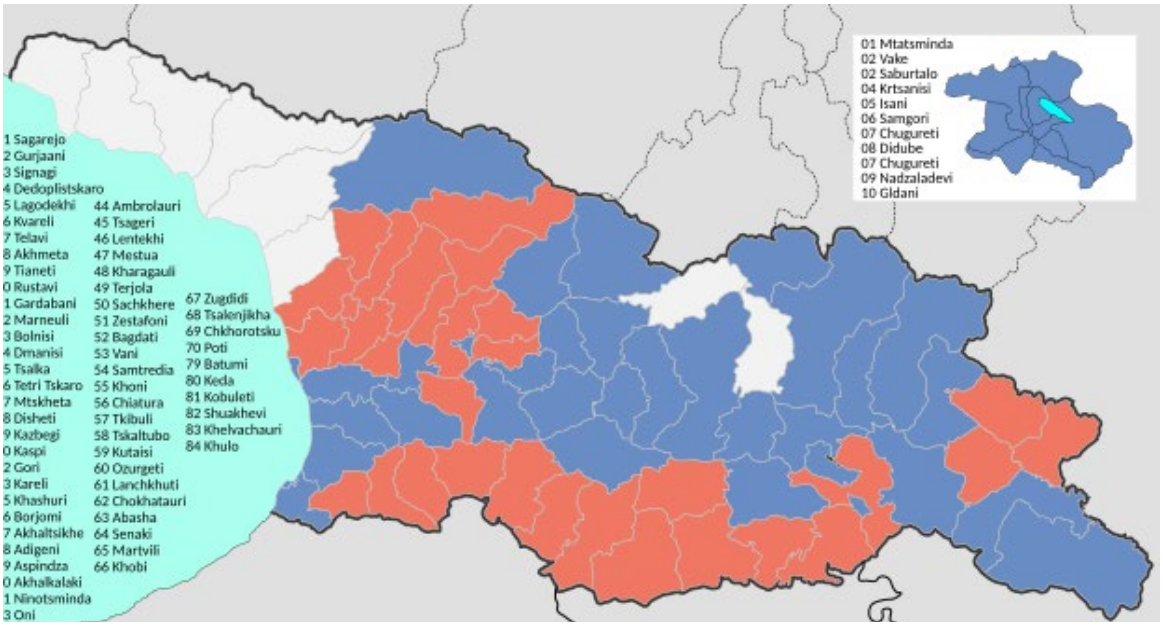

Figure 8. Map of 2012 parliamentary elections in Georgia. Source: (Livny, Babych, Mzhavanadze 2017)

It was a time when Mikheil Saakashvili was very popular in Georgia. He has won this election by avoiding runoff, received 54.7% of the votes, but if we look to the geographical features of this election, we will see that Saakashvili won because of landslide victory in regions and southern Georgia, where ethnical and religious minorities live and they always support governments heavily. But, it was the first time, when incumbent president lost Capital city, we can consider it as the first signal that Georgia was inclined towards the tendencies of different countries. Opposition candidate was supported by the biggest city of the nation.

In 2012, we have the first peaceful transfer of power since regaining independence. UNM, party of Mikheil Saakashvili was defeated by GD, party of Bidzina Ivanishvili, which was coalition of 6 different parties in 2012 (fig. 8).

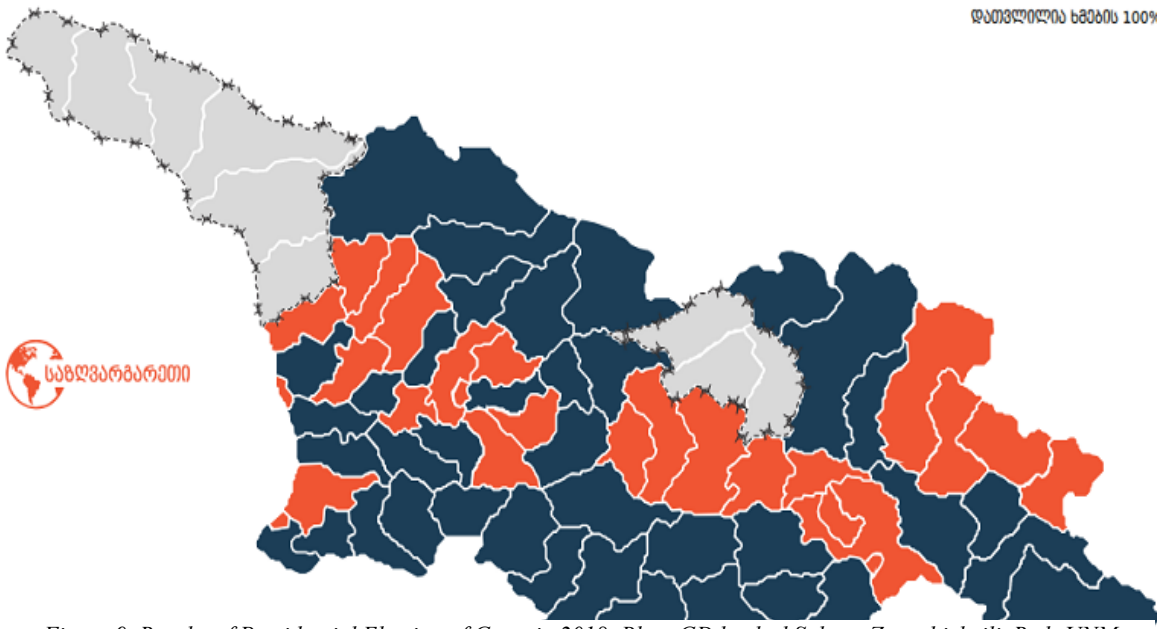

Figure 9. Results of Presidential Election of Georgia 2018: Blue- GD backed Salome Zourabichvili, Red- UNM candidate Grigol Vashadze

We will start detailed analyse of 2012 election map:

Detailed Analyses of the results of 2012 elections shows same trends as in Turkey and the US. Opposition GD, which was center-liberal party in 2012, standing for Human Rights, wins big urban cities, capital city and seashores, which are active economically. More conservative opposition UNM wins ethnical minorities and small towns, rural areas and is tie with GD in suburban areas.

The next election which will be researched in this survey is 2021 local elections of Georgia, I skipped 2020 because of untraditional environment because of pandemic.

Results of Presidential Election of Georgia 2018: Salome Zourabichvili- 38.6%, Grigol Vashadze- 37.7%. We have same trends on the map of 2018 presidential election as we had in 2012. Difference is that in 2012 Government was UNM and southern Georgia heavily populated with ethnical and religious minorities has been won by the, but now it totally changed as GD took over the power, this region has been won by GD. It proves that Southern Georgia populated by minorities vote for government and I think it has its reasons. Firs, these minorities have feeling that they are not equal citizens as ethnically Georgians, so they don't want to be opposition of government. Second, Because of different language and informational vacuum, they have no access to every information necessary, news and announcements of political figures. This has its influence on their decision. Also, Georgia is hybrid democracy and manipulation with the votes of minorities, especially who lives in the rural areas is easy for government (fig. 9).

As in 2012, Opposition wins in capital city and in major urban areas, but government backed Zourabichvili wins in villages, rural areas, mountainous regions and among ethnical minorities. Trends are exactly the same, as in 2012.

This gives us opportunity to conclude that in Georgia Opposition, which was more liberal than government in 2012 and which is more liberal than the government now, is strong in the capital city and big urban areas, but they lose because of big margins among ethnical minorities and rural areas. Therefore, Georgian trends are the same of Turkey, which has many similarities to the Electoral Geography of the United States of America.

Results of Local elections of Georgia 2021: We had reached a conclusion above, but to be sure by 100%, I decided to analyse one more election season in Georgia, local elections 2021 (I skipped 2020 because it was held under unusual circumstances, which was caused by Covid-19 Global Pandemic).

In 2021 we had local elections in Georgia. Georgian Dream received about 47% of the votes, 52% was received by Pro-Western opposition. (100-47- % of Alliance of Patriots of Georgia). But the results were different by urbanization, ethnicity and terrains:

1) Pro-western opposition ("UNM" + "Gakharia for Georgia" + "Lelo" + "Aleko Elisashvili Citizens", + "Girchi- More Freedom" + "European Georgia" + "Elene Khoshtaria-Droa", + "Girchi" + "Labour party of Georgia"
2) Others: Pro-Russian opposition parties: "Alliance of Patriots of Georgia" and "Nation"
3) 5 Biggest Cities- Tbilisi, Kutaisi, Batumi, Rustavi, Zugdidi
4) 5 Smallets towns- Kazbegi, Lentekhi, Mestia, Oni, Aspindza
5) Mountains- Mountinous regions of Georgia- Svaneti, Mtianeti.

With the election of political parties, we had mayoral races in 2021. Opposition candidate lead or tied in the second round in 4 out of 5 biggest cities of Georgia (UNM candidate leaded in Zugdidi, Batumi, Kutaisi. Tied in Rustavi and was behind in Tbilisi).

About 80% of municipalities, which has been won by GD candidates by margin to avoid runoff (50%+1), is rural and suburban, without big urban population

Detailed analyses of 2008, 2012, 2018 and 2021 election proves once more that Georgia has its trends in terms of electoral geography. There is a clear contrast between rural and urban areas, coastlines and mountains, majorities and minorities. So, it has similarities to Turkey and The United States of America.

Conclusion

In this survey, we reviewed the electoral geography of three different countries and researched major tendencies of the electorate based on their geographical environment. Research indicated that geographical division makes a huge controversy on electoral maps. Coastlines and cities with ports always lean to more liberal candidates and parties or more diversity in the political process. This has some reasons: First, coastlines usually have a more diverse population than rural areas; such diversity can lead the electorate to more progressive views. Mountainous regions are characterised by rural populations that tend to lead conservative, traditional lifestyles, which means that progressive ideas and modern culture require more time to become integrated into their daily lives. The second reason is

economy. Industries like tourism, finance, and technology often drive coastal economies. Education is the third factor, as educated individuals tend to support progressive ideas more than those without a university education. The fourth reason is urbanisation; coastlines and big cities usually have more universities and urban amenities which are attractive for young people, and these demographics always support progressive ideas and liberal political groups. In contrast, the majority of the rural population in every country are older generations which do not support globalisation, liberal policies and change of lifestyle.

Research showed us that the hypothesis of our thesis – the results of elections in the democratic countries of the world and regions of these countries directly depend on human and physical geographical features of the nation – has been proven true. Election results are largely dependent on geographical features. For example, if turnout is much higher in urban areas and coastline cities, liberal candidates have more chance to earn more support than conservatives; if turnout is higher in mountainous regions and rural areas, conservatives have more chance. We saw the 2016 US presidential election, which was won by Donald Trump because of huge turnout in rural areas and suburban men, which was considered a "rural revolt" against liberal Hillary Clinton.

Competing interests

The authors declare that they have no competing interests.

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Reference

Livny, E., Babich, Y., Mzhavanadze, G. (2017). Georgia's democracy: The Puzzle of a Red Country Turning Blue. https://iset-pi.ge/en/blog/190-georgia-s-democracy-the-puzzle-of-a-red-country-turning-blue

Leatherby, L. New-York Times, Turkey Election Maps, Why Erdogan Is Headed to Runoff https://www.nytimes.com/interactive/2023/05/15/world/europe/turkey-election-results.html

Bentle, K. (2019). In Illinois, Chicago-area, Clinton votes overtook rest of state. Chicago Times. https://www.chicagotribune.com/2016/11/09/in-illinois-chicago-area-clinton-votes-overtook-rest-of-state