


# Cartographic Heritage of the Institute of Geography

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*Georgian Geographical Journal*, 2025, 5(1), 4-8

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DOI: <https://journals.4science.ge/index.php/GGJ>

**Citation:** Liparteliani, G. Cartographic Heritage of the Institute of Geography. *Georgian Geographical Journal*. 2025, 5(1), 4-8.  
<https://doi.org/10.52340/ggj.2025.05.01.01>

## Abstract

The Vakhushiti 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 Vakhushiti 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 Tskhakaya, 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. Tshkakaia and drawer M. Kavtaradze. At that time, S. Tshkakaia 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. Tshkakaia 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. Ketskaveli 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. Aslanikashvili, 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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## **Appendix**

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