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МАКЕДОНСКО ГЕОГРАФСКО ДРУШТВО
MACEDONIAN GEOGRAPHICAL SOCIETY

ГЕОГРАФСКИ РАЗГЛЕДИ

GEOGRAPHICAL REVIEWS

КНИГА 59 TOME

СКОПЈЕ - SKOPJE
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METHODOLOGICAL CHALLENGES IN DEMOGRAPHIC RESEARCH AND CREATING POPULATION POLICIES

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ABSTRACT

This paper examines several interrelated, recurring methodological problems that limit the comparability of demographic data in North Macedonia and the wider post-Yugoslav Balkan region: changes in census methodology and in the definition of the resident population; repeated administrative-territorial reorganization of municipalities; the prolonged, multi-decade absence of census enumeration, illustrated by North Macedonia's own nineteen-year gap between the 2002 and 2021 censuses; the restricted temporal and spatial resolution of settlement-level data; and instability in the recording of ethnic structure, mother tongue and religion. These problems are situated within the Modifiable Areal Unit Problem and successive United Nations vital-statistics standards, illustrated with evidence from the municipality of Kichevo, and compared with parallel cases from Serbia, Croatia, Bosnia and Herzegovina, Romania and Czechia. The paper concludes by considering the growing role of alternative and complementary data sources and outlines a research practice better suited to longitudinal and territorially disaggregated demographic analysis in North Macedonia.

Keywords: statistical data, census comparability, territorial-administrative reorganization, ethnic structure, migration statistics, Modifiable Areal Unit Problem

INTRODUCTION

The contemporary study of population is unimaginable without the use of statistical data, and the scope and quality of the available data are of paramount importance for the results obtained. Data used in demographic research should derive from organized, institutionally coordinated collection efforts and should allow continuous monitoring of changes in the size and structure of the population, support

the analysis of demographic processes, and provide a basis for projecting future trends. For this purpose, population data need to be reliable, relevant, of appropriate coverage, applicable to the specific research question, and — perhaps most importantly for longitudinal and territorial analysis — comparable, both methodologically and spatially (Madjevikj & Ljakoska, 2018; Apostolovska Toshevska & Madjevikj, 2008).

In practice, however, comparability is precisely what is most difficult to achieve when working with historical census series for North Macedonia, or indeed for most countries of the former Yugoslavia and the wider Balkan region. This paper identifies and examines several interrelated, recurring methodological problems in demographic research in North Macedonia; some of these are the following: (1) changes in census methodology and in the definition of the resident population between census years; (2) repeated administrative-territorial reorganization, which reassigns settlements between municipalities and disrupts longitudinal analysis at the local level; (3) the prolonged, sometimes multi-decade absence of any census enumeration, illustrated most starkly by North Macedonia's own nineteen-year gap between the 2002 and 2021 censuses; (4) the restricted temporal and spatial resolution of available data, since population data at the level of the individual settlement are, as a rule, available only in census years; and (5) instability, both administratively and politically driven, in the recording of ethnic structure, migration etc.

The aim of this paper is to bring these problems together within a single methodological framework, to situate them within the formal concept of the Modifiable Areal Unit Problem (MAUP) and within the successive United Nations standards for census and vital-statistics methodology, to illustrate them with concrete evidence from North Macedonia — with particular reference to the municipality of Kichevo — and to compare the North Macedonian case with closely parallel evidence from Serbia, Croatia, Bosnia and Herzegovina, Romania, Czechia, and, more selectively, further afield. In doing so, the paper also considers the growing role of alternative and complementary data sources, and reflects on what a more methodologically self-aware demographic geography of North Macedonia might look like going forward. These are not purely academic concerns: reliable, comparable population data form the basis for population development policies and employment policies, and are equally necessary for designing and implementing policies for more balanced regional development — the distribution of activities and functions, infrastructure, and settlement systems across the territory — so that the methodological deficiencies documented in this paper translate directly into weaker foundations for the population policies built upon them.

THEORETICAL FRAMEWORK: THE PROBLEM OF SPATIAL AND METHODOLOGICAL COMPARABILITY

The difficulty of comparing demographic data across changing territorial units and across successive census methodologies is not merely an incidental technical

inconvenience specific to North Macedonia; it is a long-recognized, formally named problem in quantitative geography and demography. The Modifiable Areal Unit Problem (MAUP) refers to the fact that the spatial units used in an analysis can take many different shapes and sizes, and that this choice — rather than any underlying substantive reality — can materially affect the outcome of a statistical analysis (Openshaw & Taylor, 1979). The problem has a representational as well as an analytical dimension: Jovanović and Živković (2008) argue that thematic maps comparing demographic indicators across census years or spatial units require an explicit, two-part cartographic unification — a normative unification of the mapped indicator itself and a graphic unification of the sign values used to depict it — without which map symbols calibrated to one territorial division or time period cease to be visually or numerically comparable with those calibrated to another, a cartographic analogue of the zonation and scale effects described above.

Voss (2004) traces the intellectual lineage of this problem back to Gehlke and Biehl's (1934) pioneering study of the effect of grouping on correlation coefficients calculated from census-tract material, and to Robinson's (1950) demonstration that relationships among variables computed at different levels of aggregation can differ substantially — a paper that, in Voss's account, became required reading for generations of demographers and contributed to a broader crisis of confidence in purely quantitative geography during the 1980s. Ratkaj (2007), applying the same framework to residential segregation indices in Belgrade, notes that traditional, non-spatial segregation measures "unrealistically treat administrative borders as barriers, neglecting the influence of neighbourhood" — a critique directly applicable to the treatment of Macedonian municipal boundaries discussed in Section 5 below. Ratkaj also observes that statistical agencies often retain traditional, methodologically dated indicators specifically because changing them "could cause additional problems in the comparability of statistical data" — an institutional example of the trade-off between methodological improvement and the preservation of long time series that recurs throughout this paper.

A second, complementary strand of theoretical grounding comes from the successive United Nations standards for vital statistics. The UN Statistical Office's Principles for a Vital Statistics System (1953), and its two subsequent revisions, Principles and Recommendations for a Vital Statistics System, Revision 1 (1973) and Revision 2 (1999), together document a continuous, nearly seventy-year international effort to standardize demographic definitions precisely because, as the 1953 Statistical Commission itself put it, "even in developed countries, the international study of demographic problems is made difficult by lack of statistical comparability" (United Nations, 1953). Revision 1 (1973) already anticipated the shift toward the "resident population" concept that would later be adopted, at different points, by Serbia, North Macedonia, Czechia, and most other European states (United Nations, 1973, para. 51), while explicitly recommending that where national circumstances require departure from international standards, publications should be "accompanied by an explanation of these departures" (United Nations, 1973, para. 61) — a recommendation echoed almost verbatim in Revision 2 a quarter-century later

(United Nations, 1999) and realized in practice by, for example, the United Kingdom Office for National Statistics' dedicated "metadata" documentation of methodological breaks in its divorce statistics (ONS, 2015).

DATA SOURCES AND METHODOLOGY

The population census and vital (demographic) statistics remain the principal sources of data for demographic research in North Macedonia, as elsewhere in the region (Madjevikj & Ljakoska, 2018). Beyond these, official statistics are published by the State Statistical Office (SSO) through its MAKStat database (SSO, n.d.), by international organizations such as Eurostat and the UN Population Division, and, increasingly, through specialized institutional portals. This paper draws on that conventional statistical base together with national strategic and legal documents — including the successive laws on the territorial organization of local self-government, the Law on Balanced Regional Development, and the two national strategies for demographic development of the Republic of Macedonia (2008–2015 and 2015–2024) — the successive United Nations standards for censuses and vital statistics, and a comparative body of demographic-geographical literature from North Macedonia, Serbia, Croatia, Bosnia and Herzegovina, Romania, and elsewhere.

Field research and direct data collection, alongside published statistics, play an important complementary role in understanding population development processes (Madjevikj & Ljakoska, 2018), a point already made explicit within the authors' own research group as early as 2008, when Apostolovska Toshevska and Madjevikj, writing on the treatment of socioeconomic data in geography teaching, listed methodological and spatial comparability among the core principles that must govern any use of statistical data, and observed that "given that several territorial-administrative reorganizations of space have been carried out in Macedonia, when analysing data relating to municipalities, it is essential to take into account which settlements are included in the municipality, and any changes that have occurred" (Apostolovska Toshevska & Madjevikj, 2008). The present paper can be read as a systematic elaboration, sixteen years on, of that same methodological concern.

A closely related methodological distinction, concerns absolute versus relative demographic indicators. Madjevikj and Apostolovska Toshevska (2013) note that absolute values give only a limited, first-order picture of population size and composition, and that it is the further processing of these values into relative indicators (percentages, coefficients, indices) that yields a more realistic understanding; because conditions change frequently, such indicators require regular updating, and their quality directly determines the value of the results obtained. This is, in effect, a general statement of the comparability principle applied throughout the present paper: an indicator computed once, from a single set of absolute values, becomes progressively less reliable the longer it goes without being recalculated against updated data — precisely the situation created by prolonged inter-censal gaps of the kind discussed in Section 9.

METHODOLOGICAL CHANGES ACROSS CENSUS YEARS

The population of the territory of present-day North Macedonia has been recorded, with varying methodology, since 1948. Ljakoska et al. (2024) report the total population figures by census year, summarized in Table 1 below — the 2021 figure representing a decline of 9.19% relative to 2002. These raw totals cannot be read as a straightforward demographic time series, because the definition of "total population" itself changed between census years: the 1994 census excluded persons absent from the country for one year or more, while the 2021 census included 132,260 persons whose data were obtained from administrative sources rather than direct enumeration (Ljakoska et al., 2024).

Table 1. Population of North Macedonia by census year, 1948–2021, with inter-censal and average annual growth rates

Census year	Total population	Years since previous census	Inter-censal growth (%)	Average annual growth (%)
1948	1,152,986	—	—	—
1953	1,304,514	5	+13.14	+2.63
1961	1,406,003	8	+7.78	+0.97
1971	1,647,308	10	+17.16	+1.72
1981	1,909,136	10	+15.90	+1.59
1994	1,945,932	13	+1.93	+0.15
2002	2,022,547	8	+3.94	+0.49
2021	1,836,713	19	−9.19	−0.48

Source: compiled by the authors from Ljakoska et al. (2024). Growth rates calculated by the authors; shaded intervals (1981–1994 and 2002–2021) correspond to the methodological breaks and the prolonged inter-censal gap discussed in Sections 4 and 6.

Table 1 recasts these figures as average annual growth rates between successive censuses, which brings the effect of the two methodological breaks into sharper relief: the average annual growth rate falls from around 1.6% in both of the preceding inter-censal periods (1961–1971 and 1971–1981) to just 0.15% for 1981–1994 — the interval spanning the 1994 methodological change — before recovering to 0.49% for 1994–2002 and turning negative, at –0.48% per year, for the unusually long 2002–2021 interval discussed in Section 9.

Because a single inter-censal period can conflate a genuine change in demographic behaviour with a change in what is being counted, the sharp deceleration around 1994 cannot be read as evidence of a sudden slowdown in natural increase or migration alone.

A parallel methodological discontinuity affects the numerator of fertility measures rather than the denominator of population totals. Since 2004, children born abroad to Macedonian citizens have been recorded in SSO vital statistics as a distinct category, excluded from the total count of live births reported for the country; before that date such births were included in the national total without separate identification.

Because outmigration accelerated sharply after 2004, nearly 75,000 children were born abroad to Macedonian nationals between 2005 and 2021 alone, rising to 5,503 in 2021 — a year in which registered live births inside the country numbered 18,648. The effect is spatially uneven: in the Polog region, which accounts for 36.6% of children born abroad nationally, seven municipalities (Brvenica, Vrapchishte, Gostivar, Mavrovo-Rostushe, Plasnica, Centar Zhupa, Novo Selo) recorded more children born abroad to their residents in 2021 than children born within the municipality itself. A municipal-level fertility time series that does not account for this reclassification will therefore systematically overstate fertility decline precisely where emigration is most intense (authors' calculations, based on SSO data).

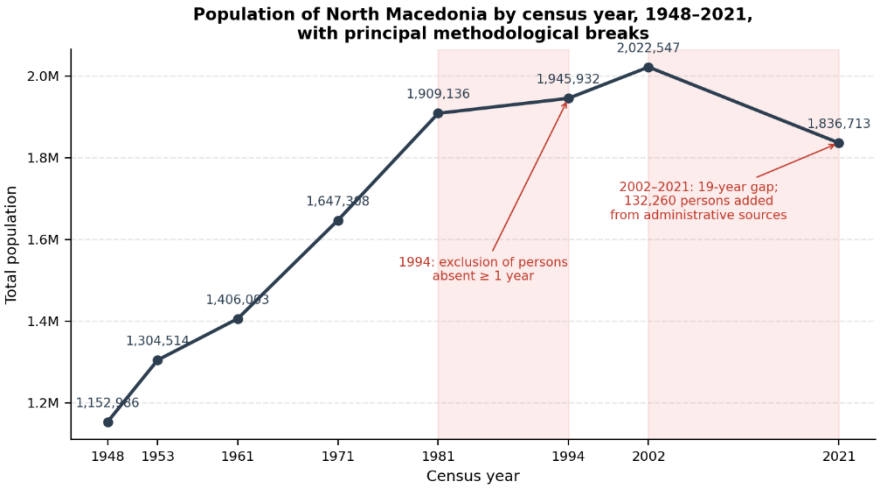


Figure 1. Population of North Macedonia by census year, 1948–2021, with principal methodological breaks. **Source**: authors' elaboration based on data in Table 1.

A comparison of the two censuses' own methodological explanations shows that the underlying definitional break lies before 2002 rather than between 2002 and 2021. Both censuses define the counted population around the same core concept of place of usual residence, with near-identical treatment of citizens temporarily abroad, foreign residents, and diplomatic and international staff (SSO, 2002; SSO, 2022). What changed between the two rounds is the degree of international regulatory anchoring rather than the underlying concept itself: the 2002 census presented this definition only as a step toward harmonization with European and international statistical practice, without reference to any binding regulatory framework, and its own methodological notes concede that "these changes do not allow a complete comparability of the data" with the previous censuses (SSO, 2002). The 2021 census, by contrast, grounds its methodology explicitly in the UNECE/Eurostat Conference of European Statisticians Recommendations for the 2020 Censuses and in five specific EU regulations governing census content, dissemination, and metadata, and states

as one of its explicit purposes the determination of changes since the 2002 census (SSO, 2022) — treating comparability with 2002 as an attainable methodological goal rather than foreclosing it, as the 2002 census's own notes foreclosed comparability with the censuses that preceded it.

This pattern recurs, with strikingly similar figures, throughout the region. In Serbia, the 2002 census applied a revised definition of permanent population, counting only persons abroad less than one year as residents, against the 1991 methodology which included all citizens working abroad regardless of duration (Djurdjev, Arsenović & Dragin, 2010). A regional study of the Raška district independently confirms this, attributing an otherwise anomalous 1991–2002 population decline "primarily to the change in census methodology and the exclusion of the majority of citizens on forced labour abroad" (Bakić & Radić, 2017).

At the international level, the United Nations distinguishes between de facto and de jure census enumeration, differing in how long an absent household member continues to be counted (UNFPA, n.d.). A systematic Eurostat/Council of Europe review of 44 European countries confirms this is a structural feature of European statistics, not a marginal ambiguity: 34 of the 44 use some version of the "usual residence" concept, 7 use only a "legally registered" concept, and Serbia alone relies exclusively on the latter (Eurostat/Council of Europe, n.d.) — the same trade-off already noted by Ratkaj (2007) for segregation indices.

Czechia's 2021 census offers a related European example: a move toward a "combined" census supplementing direct enumeration with administrative-register data, drawing citizenship and marital status directly from registers while keeping ethnicity, mother tongue and religion as census-only variables, "not available from any register because of their confidentiality and subjectivity" (Vachuška & Kurkin, 2022). North Macedonia's 2021 census followed a structurally similar path, supplementing direct enumeration with administrative data for 132,260 persons (Ljakoska et al., 2024), though without the same published transparency as to which variables derive from which source, a point taken up again in Section 10.

A related dimension of data quality concerns vital statistics. WHO's country-level cause-of-death estimates for 2000–2015 quantify the completeness of death registration for North Macedonia at 87–103% against estimated total deaths, with 9% of deaths coded to "garbage" causes (WHO, 2017). Because completeness is assessed against population estimates that ultimately derive from the census, vital-statistics quality is not independent of the census-methodology problems already discussed — the UN's own vital-statistics standards stress that "conflating incomplete vital registration data with census data of dubious quality necessarily results in poorly estimated life tables" (United Nations, 1999).

A closely related break occurred in the treatment of economic activity: Serbia's 2011 census replaced the three-way classification used previously (economically active, persons with personal income, dependent population) with a two-way active/inactive split, with the consequence that "a complete comparison of the 2011 census data with earlier censuses is not fully possible" (Vachuška & Kurkin, 2022). The authors' own research group has documented an equivalent, independent break

in North Macedonia: analysing labour-contingent formation in the Pelagonia region, Apostolovska Toshevska and Madjevikj record that "because of the methodological changes in the defining of persons that comprise the work force up to 1994, some of the comparisons related to 2002 are not made" (cited in Ljakoska et al., 2024) — a first-hand acknowledgement that intended comparisons had to be abandoned because of exactly this kind of definitional discontinuity.

A comparable discontinuity affects measures of economic activity. Under a new EU regulatory framework applied by the SSO from 2023 onward, replacing the methodology used through 2022, the working-age population used to compute activity and employment rates was redefined from persons aged 15–79 to persons aged 15–89, while the definition of employment itself was tightened: subsistence farmers producing mainly for household consumption, previously classified as employed, are now excluded unless production is intended mainly for sale or exchange, and temporarily absent workers are classified as employed only if the expected absence does not exceed three months. Because subsistence agriculture is disproportionately concentrated in the same depopulating rural municipalities discussed throughout this paper, employment and activity rates computed before and after 2023 are not strictly comparable at the local level, adding a labour-market analogue to the census-methodology discontinuities already described.

TERRITORIAL-ADMINISTRATIVE REORGANIZATION AND DATA COMPARABILITY

The administrative-territorial organization of North Macedonia's municipalities has undergone repeated change since independence: 123 municipalities under the 1996 Law on the New Administrative-Territorial Division (Official Gazette, Nos. 49/1996, 59/1996); 84 municipalities under the 2004 reorganization (Official Gazette, No. 55/2004); and, following a postponement enacted in August 2008 (Official Gazette, Nos. 98/2008, 101/2008), a final merger to 80 municipalities after the local elections of March 2013 (Ljakoska, 2016; Ljakoska & Madjevikj, 2017; Ljakoska et al., 2024).

The municipality of Kichevo illustrates the consequences of this process with particular clarity. Until 1996 the territory corresponded to a single administrative unit; the 1996 reorganization divided it into five separate municipalities — Kichevo, Drugovo, Vraneshtica, Zajas and Oslomej — administered and reported separately for seventeen years, with sharply differing ethnic composition (Macedonian-majority in Kichevo, Vraneshtica and Drugovo; Albanian-majority in Zajas and Oslomej) before the five were reunited in 2013 (Ljakoska, 2016).

Any researcher wishing to trace long-run population change for this territory — as in the analysis of rural depopulation in the former municipalities of Drugovo and Vraneshtica (Ljakoska & Iliev, 2013) — must first reassemble the data from five separate administrative sources. Table 3 illustrates the scale of this reassembly problem: for the period 1953–2002, comparable population figures for the present-day municipality of Kichevo exist only as the sum of five independently reported

former municipalities, each with a markedly different ethnic trajectory.

Table 2. Chronology of administrative-territorial reorganization of municipalities in North Macedonia, 1996–2013

Year enacted	Legal instrument	Official Gazette No.	Resulting no. of municipalities	Effective from
1996	Law on the New Administrative-Territorial Division of the Republic of Macedonia	49/1996; 59/1996	123	1996
2004	Law on Territorial Organization of Local Self-Government	55/2004	84	2004
2008	Law Amending the Law on Territorial Organization of Local Self-Government (postponement of merger)	98/2008; 101/2008	84 (merger deferred)	2013 (deferred)
2013	Merger takes effect following local elections	—	80	March 2013

Source: compiled by the authors from Ljakoska (2016), Ljakoska & Madjevikj (2017) and Ljakoska et al. (2024).

Comparable territorial fragmentation is extensively documented for Serbia. Knežević (2014) shows that Eastern Serbia's administrative-territorial division changed repeatedly between 1834 and 1961, concluding that continuous demographic monitoring across the full period is not possible using directly comparable statistical units. A companion paper (Knežević & Vojković, 2015) on delimiting a demographic study area concludes that "the key role in determining the spatial extent rests on two factors: the nature of the research and the accessibility of scientifically usable data."

The most extreme documented case of territorial fragmentation is Bosnia and Herzegovina, whose entity boundary physically splits more than 300 settlements; comparing 2013 census data with 1991 requires descending to individual census enumeration circles, which the authors describe as making full comparability "almost impossible" without such disaggregation (Lukić Tanović & Marinković, 2024).

Statistical regionalization for planning and EU-accession purposes reproduces the same tension. North Macedonia's Nomenclature of Territorial Units for Statistics (NTES), corresponding to the EU's NUTS system, establishes eight NTES 3 planning regions, with NTES 4 corresponding to the 80 municipalities and NTES 5 to the 1,776 settlements. Iliev (2018) notes that NTES 3 regions were selected "due to the highly limited availability of data for smaller administrative units" — the territorial level for an entire empirical study dictated by data availability rather than the research question. Bosnia and Herzegovina, by contrast, has not yet adopted official statistical regions at all (Mutabdžija, 2018).

Table 3. Population of the present-day municipality of Kichevo, by former municipality, census years 1953–2002

	Total	Macedonians	Albanians	Turks	Roma	Vlachs	Serbs	Bosniaks	Other
Kichevo Municipality									
1953	11167	4786	761	4781	54	4	484	0	297
1961	11838	7662	1310	2107	0	0	397	0	362
1971	16810	10493	3105	2041	17	0	306	0	848
1981	24207	13893	5446	2189	310	5	203	0	2161
1994	27543	16126	7195	2236	1401	15	99	0	471
2002	30138	16140	9202	2430	1630	76	86	7	567
2021	24768	13027	5808	2069	2001	67	54	8	1734
Municipality Drugovo									
1953	10157	9497	181	443	5	0	8	0	23
1961	8367	8108	52	217	0	0	17	0	9
1971	6431	6082	38	271	0	0	15	0	25
1981	4704	4241	77	218	0	0	11	0	157
1994	3555	3110	131	291	0	0	7	0	16
2002	3249	2784	155	292	1	0	8	0	8
2021	2748	2158	142	261	0	2	5	1	179
Municipality Vraneshtica									
1953	4146	3793	0	332	0	0	9	0	12
1961	3503	3273	5	215	0	0	4	0	6
1971	2944	2699	9	205	0	0	9	0	22
1981	2287	1998	4	125	0	0	8	0	152
1994	1650	1319	8	315	0	0	7	0	1
2002	1322	1033	10	276	0	0	2	0	1
2021	1003	689	9	221	0	0	1	3	80
Municipality Oslomej									
1953	7688	1212	6299	150	0	0	13	0	14
1961	7838	976	6815	11	0	0	12	0	24
1971	8481	622	7828	7	0	0	10	0	14
1981	9144	323	8728	0	6	0	7	0	80
1994	9136	160	8967	0	0	0	2	0	7
2002	10425	110	10257	0	0	0	0	1	57
2021	4819	39	4558	1	0	0	0	1	220
Municipality Zajas									
1953	6572	969	5544	26	9	0	10	0	14
1961	7171	874	6134	99	0	0	7	0	57
1971	8425	769	6881	21	0	0	8	0	746
1981	9805	613	9082	3	9	0	12	0	86
1994	10055	271	9465	0	0	0	2	0	7
2002	11605	211	11308	0	0	0	6	0	80
2021	6331	107	5856	1	2	1	0	0	364
The present Municipality Kichevo									
1953	39730	20257	12785	5732	68	4	524	0	360
1961	38717	20893	14316	2649	0	0	437	0	458
1971	43091	20665	17861	2545	17	0	348	0	1655
1981	50147	21068	23337	2535	325	5	241	0	2636
1994	51939	20986	25766	2842	1401	15	117	0	502
2002	56739	20278	30932	2998	1631	76	102	8	713
2021	39669	16020	16373	2553	2003	70	60	13	2577

Source: compiled by the authors from Ljakoska (2016), based on data from the State Statistical Office of the Republic of Macedonia, Census 2002, Book X, and SSO MakStat database.

At the European level, the same tension is addressed institutionally through the EU's INSPIRE Directive, which harmonizes administrative and statistical spatial-data units across member states (Bartha & Kocsis, 2011), and through functional alternatives such as France's commuting-based "aire urbaine" and Sweden's 72 functional regions, used instead of NUTS II units precisely because the latter "may conceal significant disparities" (Ferry & Vironen, 2010). The regional SEEMIG project, covering eight South-East European countries, developed a comparable common methodology for migration data production systems (Kiss, 2013).

THE RESTRICTED RESOLUTION OF SETTLEMENT-LEVEL DATA

Another problem concerns the temporal resolution at which detailed population data are available. For individual settlements, consistent data are generally available only for census years; inter-censal estimates, where published at all, are typically produced only for municipalities or statistical regions (Iliev, 2018).

A related but distinct problem concerns the definition of the settlement itself as a stable statistical unit across census years. In one documented cluster of settlements, four (Eleshec, Naselba Istok, Sveti Stefan, and Rača) do not appear as separate statistical units in the 1981, 1994, and 2021 censuses, being recorded as independent settlements only in 2002, while a fifth (Lagadin) appears only in the last two census years. From 1948 to 1994 these settlements were not recorded separately in the statistical records, their population instead calculated jointly with another settlement — Rača together with Velestovo and Dolno Konjsko in Konjsko; Eleshec and Lagadin in Elshani; Sveti Stefan in Shipokno — while some were formed only in the 1970s as a result of population movement toward more favourable, nearby locations. Where a settlement is recorded independently in some census years but merged with another settlement in others, a direct year-on-year comparison of its population is not methodologically sound unless a consistent set of spatial units is first reconstructed for the whole period. Gaps or inconsistencies in the recorded number of households can complicate this reconstruction further, even for settlements whose identity is not otherwise in dispute. At this finer spatial scale, the underlying problem is the same one already discussed for total and resident population in Section 4.

Nejašmić (2011), writing on applied population geography in Croatia, frames this as a structural dependency on the census that constrains the entire sub-discipline, and illustrates its practical cost with the total fertility rate, which cannot be used in Croatia in the same way as in countries with well-developed vital statistics because the denominator required for its calculation — the number of women of fertile age — is obtainable only from the census; he further notes, in language closely paralleling the Macedonian and Bosnian cases already discussed, that Croatia's own repeated administrative-territorial changes "seriously hamper, and for some population characteristics entirely preclude, reliable retrospective analysis." Spasenović and Devedžić (2012), analysing fertility in Belgrade, record the identical constraint for a

core fertility indicator: "the average number of children per woman is not given at municipal level in statistics; it is especially difficult to secure a longer time series of this indicator."

Studies conducted specifically at the settlement scale confirm the practical severity of the restriction. Popović (2020), examining the functional organization of rural settlements around the city of Zaječar, restricts his analysis to "the last three inter-census periods" (1981–2011) explicitly "because of data availability caused by restricted indicators... on the level of individual settlements," while Krajić (2013), analysing settlements of Srem, notes that detailed structural data from the 2011 census (by age and sex) had still not been published at the time of writing, forcing reliance on the 2002 census instead — a reminder that even where a census has been conducted, the release of settlement-level detail can lag by years.

INSTABILITY IN THE RECORDING OF ETHNIC STRUCTURE

The recording of ethnic (and, in some census years, linguistic and religious) structure, which is subject to two distinct sources of instability: changes in the census category system itself, and the subjective, self-declared character of ethnic affiliation is one of the problems worth mentioning.

The categorical scheme itself has changed across censuses. The 1948 census recorded no ethnic breakdown at all. From then through 2002, the standard classification distinguished Macedonians, Albanians, Turks, Roma, Vlachs, Serbs, and Others; the 2002 census added Bosniaks as a distinct category for the first time. The 2021 census introduced a further-disaggregated scheme: Macedonians, Albanians, Turks, Roma, Vlachs, Serbs, Bosniaks, Other, Not declared, Unknown, and Persons whose data were obtained from administrative sources. In Table 3, the last three 2021 categories — Not declared, Unknown, and Persons from administrative sources — are folded into "Other" for comparability with earlier census years.

Census data for 1953–2002 show the Macedonian population share in the present-day municipality of Kichevo falling from 50.9% to 35.7%, while the Albanian share rose from 32.2% to 54.5%, overtaking the Macedonian share for the first time in 1981 (Ljakoska, 2016). Because the five former municipalities that now constitute Kichevo differed sharply in ethnic composition, the 1996–2013 territorial fragmentation discussed in Section 5 did not merely complicate the measurement of total population but also altered the composition-weighted ethnic structure attributed to "Kichevo" as a statistical unit at each point when its boundaries changed; as Ljakoska (2016) concludes, "the changes of the municipality's boundaries greatly affect the changes of the percentage share of ethnic groups."

The same instability is visible at the national level, and extends beyond ethnic self-declaration to the two related categories of mother tongue and religion. Dimitrov (2005), comparing the 1994 and 2002 censuses nationally, finds that the recorded

Macedonian-majority share fell from 66.6% to 64.2% while the Albanian share rose by 3.5 points, with 64 of the country's 123 municipalities registering a numerical decline in at least one ethnic group. The population classified by mother tongue did not track declared nationality one-for-one, and the 2002 census introduced an entirely new category, Bosniak, with 17,018 persons who by definition could not have been recorded as such in 1994. A parallel divergence appears in the religious count, with the Muslim share rising independently of any single ethnic group's growth. Taken together, these national-level contrasts confirm that the Kichevo case is not an isolated territorial anomaly but an instance of a broader pattern in which ethnicity, mother tongue and religion are recorded as three formally distinct census questions whose answers need not move in parallel, so that any of the three can be used, depending on the analytical purpose, to tell a different quantitative story about the same intercensal period.

A second, independent source of instability is methodological change in census categories themselves. Knežević (2011) documents, for Serbia, the category "Yugoslav" rising sharply between 1961 and 1971 before collapsing by 2002, and the category "Muslim," which passed from a religious designation in 1948 through an ethnic category in 1961 to substantial replacement by "Bosniak" in 2002 — trajectories driven by shifting political circumstances rather than demographic change, with equivalent instability independently documented for "Šiptar"/Albanian in 1948–1953 (Radovanović, 1996). Trnavčević and Knežević (2023) formalize a demographic test for such "floating" categories: for Albanians in Serbia between 2002 and 2011, recorded natural increase was positive (+7,892) while recorded absolute population change was strongly negative (–55,838), evidence that census and vital-statistics data on ethnicity "cannot fully represent an objective basis for ethnodemographic studies."

Czechia's 2021 census offers a contrasting example of institutional candour on this same point: the Czech Statistical Office classifies ethnicity, mother tongue and religious belief as data obtainable only from the census form itself, explicitly "because of their confidentiality and subjectivity" (Vachuška & Kurkin, 2022) — an official acknowledgement that these variables differ in kind from most other census content.

The regulatory framework surrounding ethnic and linguistic data in North Macedonia adds a further layer of sensitivity. Under the Law on the Use of Languages, in force since 2008, the language of any ethnic community constituting at least 20% of a municipality's population acquires official status (Ljakoska, 2016) — the same 20% threshold that recurs in the national Guide for Implementation of the National Strategy for Equality and Non-Discrimination in assessing whether a given community's representation in public administration and social-support statistics is adequate. Because this threshold is itself calculated from census-derived local ethnic-structure data, its practical application inherits the comparability problems documented throughout this paper — a further instance of a methodological limitation with direct downstream consequences for public policy.

THE UNDERESTIMATION OF MIGRATION AND EMIGRATION

Of the demographic phenomena addressed in this paper, migration is the one whose official measurement is most consistently and most severely deficient — a pattern with a specific disciplinary explanation. Morgan and Lynch, reviewing the sources of demography's success as a cumulative science, note that births and deaths are "biologically based" and "anchored in an unmistakable and universal reality," permitting relatively reliable cross-temporal and cross-group measurement, whereas migration was long ago described by Kirk as the "step-child of demography" precisely because it "defied refined measurement comparable to that associated with fertility and mortality" — a scale-dependency of migration data quality that Eklund et al. (2016) document extends well beyond the Balkans to environment-migration research generally. The North Macedonian, Serbian, Bosnian and Romanian evidence assembled in this paper bears this characterization out in detail.

For North Macedonia specifically, Sotiroski and Hristoski (2014) document official institutions "concealing" emigration figures and cite starkly inconsistent estimates of the Macedonian emigrant population: 550,000 according to Eurostat (2012) against a far smaller official figure. Only 50,000 persons were officially recorded as having left the country between 1989 and 1994, yet the 1994 census itself recorded 173,611 Macedonian citizens already living abroad — a discrepancy corroborated by both national demographic-development strategies, which state in near-identical language sixteen years apart that "statistical data at the national level on the volume of emigration abroad do not reflect the real situation" (Government of the Republic of Macedonia, 2008, 2015).

Romania offers a starkly quantified regional parallel: Kiss (2013) reports that Romania's population register "has practically collapsed," with officially registered emigration of roughly 128,000 persons (2001–2011) against a World Bank estimate of 2.8 million Romanians resident abroad in 2010 — official statistics capturing under 10% of the estimated outflow. Serbia's 2020 UNDP-sponsored "Depopulation Data Challenge" produced a Facebook-based estimate of roughly 860,000 emigrants, against a 2011 census figure of about 313,000 (Drašković & Nikitović, 2022).

Nikolić (2024) demonstrates the practical consequences of this measurement problem with unusual precision, comparing three methodologically distinct approaches to measuring Serbian internal migration for the identical 2002–2011 period: a vital-statistics method, a census-based retrospective method, and administrative records of registered address changes. The three methods classify a substantially different number of municipalities as net-immigration areas for the same period — a threefold-plus range of estimates for a single underlying demographic reality — and in suburban settlements whose boundaries changed through partial annexation, unrealistically high recorded birth and death counts appear relative to registered population, a settlement-level artefact of exactly the kind of boundary change discussed in Section 5.

THE PROLONGED ABSENCE OF CENSUS ENUMERATION

Perhaps the single most consequential illustration of the problems documented in this paper is the fact that North Macedonia conducted no population census for nineteen years, between 2002 and 2021; a planned census in 2011 was abandoned mid-process. The principal point of dispute concerned exactly the de facto/de jure definitional question already discussed in Section 4 — whether to count as residents persons who had been absent from the country for more than one year. In the absence of a census, official population figures for the intervening two decades rested on extrapolation from the 2002 count combined with vital statistics; by the time of the eventual 2021 census, the State Statistical Office itself acknowledged that the true population was likely substantially below the extrapolated official figure of roughly 2.08 million, with unregistered emigration the principal source of the discrepancy. The international consequences of the gap were already visible well before 2021: preparing its 2004 Revision of the World Population Prospects, the United Nations Population Division could anchor North Macedonia's total population only to the 2002 census, while its fertility, mortality and international-migration inputs for the country ran no later than 2002, 2001 and 1998 respectively (United Nations, 2005) — meaning that, only three years into what would become a nineteen-year inter-censal gap, the country's contribution to a major international demographic dataset was already resting on migration statistics up to four years out of date. The 2021 census was ultimately conducted using a combination of direct enumeration and cross-checked data from six national administrative databases, a methodological innovation discussed further in Section 10.

Bosnia and Herzegovina provides an almost exact structural parallel, with an even longer gap: twenty-two years between the 1991 and 2013 censuses, again over whether to count citizens working abroad as residents (Lukić Tanović & Marinković, 2024). The 2013 census, conducted under international monitoring because of the sensitivity of the residency question, still ended with an extralegal decision on 196,000 disputed cases and two competing official results differing by 58,081 persons (4.7%). As of 2023, Bosnia and Herzegovina had neither budgeted for nor legislated a new census, despite most European countries having completed their 2021 round.

Taken together, these cases show that the prolonged absence of census enumeration is not a uniquely Macedonian phenomenon but a recurring feature of post-Yugoslav statistical systems wherever population counts intersect with contested questions of ethnic composition, territorial status, or the scale of emigration. In each case, the underlying dispute is ultimately reducible to the same definitional question already identified in Section 4 as a source of ordinary inter-censal discontinuity — the treatment of persons temporarily or permanently absent from the country — but escalated, by its political stakes, from a technical footnote into a multi-year or multi-decade breakdown of the statistical system itself.

DISCUSSION: ALTERNATIVE DATA SOURCES AND METHODOLOGICAL RESILIENCE

The evidence assembled in Sections 4–9 indicates that none of the problems addressed in this paper is unique to North Macedonia. Serbia offers the most extensively documented set of parallels, from Vojvodina and Eastern Serbia to national-level ethnic-category instability and multi-method migration comparisons (Djurdjev, Arsenović & Dragin, 2010; Knežević, 2011, 2014; Knežević & Vojković, 2015; Trnavčević & Knežević, 2023; Nikolić, 2024). Croatia and Bosnia and Herzegovina demonstrate that even more EU-integrated or more constitutionally fragmented neighbours face structurally identical problems, Bosnia's case being an even more extreme version of North Macedonia's own census gap (Nejašmić, 2011; Mutabdžija, 2018; Lukić Tanović & Marinković, 2024). Romania extends the pattern of migration under-measurement beyond the Balkans, while Czechia shows that even well-resourced, transparent systems are not immune to these tensions, merely better placed to mitigate them (Kiss, 2013; Vachuška & Kurkin, 2022). At the supranational level, the EU's INSPIRE Directive, the NUTS/NTES apparatus, and successive UN vital-statistics standards confirm that this tension is treated as requiring formal institutional resolution rather than as an incidental inconvenience. The problems identified in this paper are therefore best understood as a general feature of demographic research on any territory marked by repeated post-socialist administrative reorganization combined with politically sensitive census methodology — and methodological solutions developed elsewhere in the region, from constant-area reconciliation schemes to cross-country migration-data methodologies, merit serious consideration for adaptation to the Macedonian case. Serbia's own account of its 2022 census places this choice of method within a wider European pattern: across the European Union's roughly 2020 census round, the national statistical institute reports that 10 member states conducted a register-based census, 11 a combined census drawing on both direct enumeration and administrative sources, and 6 a traditional, fully field-based census (RZS, 2022). North Macedonia's 2021 census and Serbia's own 2022 census both fall into the middle category in practice — each supplementing direct, door-to-door enumeration with administrative data for a subset of the population — even though only the Macedonian census is formally described in these terms in the sources reviewed here. Table 4 summarizes these and the other methodological similarities and differences between the two countries' census practice discussed throughout this paper.

If the classical decennial census, taken together with periodically revised administrative boundaries, cannot on its own deliver the continuous, spatially consistent data series that demographic research at the local level requires, two broad directions of response emerge from the literature reviewed here.

The second direction concerns methodology in the narrower sense: a more deliberate combination of quantitative census-based analysis with qualitative and mixed-methods approaches. Finney (2020) calls for population geographers to pursue "epistemological opportunities" through mixed-methods research; Nejašmić

(2011) proposes a Demographic Information System linked to GIS as a partial technical response to census-dependency; and Vidicki and Stojšin (2021, 2023) frame the issue as one of overcoming "methodological dogmatism" — the tendency to treat a single research tradition as self-sufficient when, as the Kichevo ethnic-structure case illustrates clearly, a purely quantitative reading of census tables can actively mislead rather than merely under-inform. Schatz (2012) offers a concrete technique: "data-linked nesting," sampling interview respondents directly from an existing census or survey list to allow direct comparison between qualitative and quantitative sub-samples. Older, historically grounded sources of qualitative demographic evidence — from nineteenth-century parish registers reconstructed by Drandić (2013) in the near-total absence of any regular census, to contemporary biographical and retrospective survey methods (Antoine & Rakotonarivo, 2012) — indicate that the impulse to complement official statistics with other forms of evidence is older than the current "mixed methods" vocabulary suggests. Drandić's reconstruction of consistent, disaggregated birth and marriage time series for a period with no census illustrates, in miniature, what a settlement-level demographic study of North Macedonia could ideally construct across the 2002–2021 gap discussed in Section 9.

Table 4. Methodological similarities and differences between North Macedonia and Serbia in census practice

Aspect	North Macedonia	Serbia
Census cycle	Irregular — nineteen-year gap (2002–2021); planned 2011 census abandoned	Regular decennial cycle (1948–2022), no equivalent gap
Territorial coverage	Full national territory in every census	Kosovo excluded from 1991 (boycotted by Albanian population), and 2002/2011/2022 ("conditions did not exist"); reduced coverage in Preševo and Bujanovac, 2011 (boycott)
Residence definition	"Usual residence" concept introduced 2002; SSO states this "does not allow a complete comparability" with earlier censuses (SSO, 2002)	Revised "permanent population" definition, 2002 (only persons abroad under one year counted as residents); Vojvodina recalculation under new methodology: −43,694 persons, −2.2% (Djurdjev, Arsenović & Dragin, 2010)
EU/international alignment	2021 census applies five EU regulations and the UNECE/Eurostat CES 2020 Recommendations (SSO, 2022)	2011 census introduced the international "usual residence" concept (Vachuška & Kurkin, 2022)
Administrative-source integration	2021: direct enumeration supplemented by six national administrative databases for 132,260 persons (Ljakoska et al., 2024)	Not identified to the same extent in the sources reviewed here
Economic activity methodology	Working-age population redefined from 15–79 to 15–89 years from 2023; subsistence farmers reclassified as not employed	2011 census replaced the three-way classification (economically active / persons with personal income / dependent population) with a two-way active/inactive split (Vachuška & Kurkin, 2022)
Ethnic categories	1948: no ethnic breakdown; Bosniak added 2002; Not declared / Unknown / Administrative-source categories added 2021	"Yugoslav" category rose 1961–1971, then collapsed by 2002; "Muslim" moved from a religious (1948) to an ethnic (1961) category, largely replaced by "Bosniak" (2002) (Knežević, 2011)

Official acknowledgement of non-comparability	Yes — SSO (2002): "these changes do not allow a complete comparability of the data"	Yes — RZS (2024): comparisons "must take into account the methodological and territorial changes that occurred from census to census"
Alternative migration-data sources	Sotiroski & Hristoski (2014): Eurostat estimate of 550,000 emigrants against a far smaller official figure	UNDP "Depopulation Data Challenge" (2020): Facebook-based estimate of roughly 860,000 emigrants against a 2011 census figure of about 313,000 (Drašković & Nikitović, 2022)
Census methodology type (EU c.2020 context)	2021 census used a combined method — direct enumeration supplemented by administrative registers for 132,260 persons (Ljakoska et al., 2024)	2022 census used the traditional method (door-to-door enumeration), for the first time with electronic rather than paper questionnaires; RZS notes that across the EU's c.2020 census round, 10 member states used a register-based census, 11 a combined census, and 6 a traditional census (RZS, 2022)

Source: authors' compilation, based on sources cited throughout this paper.

Taken together, these considerations point toward a research practice for North Macedonia that: (a) documents explicitly, for every longitudinal or territorially comparative study, the administrative-territorial and methodological changes intervening between the census years or vital-statistics periods being compared, following the model of the UK Office for National Statistics' dedicated metadata publications; (b) applies schematic reconciliation techniques of the kind developed by Knežević (2014) to construct spatially consistent time series independent of the prevailing administrative division of any single year; (c) treats settlement-level ethnic and demographic indicators with particular caution, given their demonstrated sensitivity to both territorial reorganization and category redefinition; and (d) actively incorporates complementary data sources — administrative, geospatial, and increasingly digital-trace — as a matter of course, publishing, wherever an administrative source is used to supplement direct enumeration, an explicit account of exactly which variables derive from which source, on the Czech rather than the more opaque Macedonian 2021 model.

CONCLUSION

Statistical data on population remain indispensable to demographic research, to regional and spatial planning, and to the formulation of population and ethnic-groups policy in North Macedonia. Yet the evidence reviewed in this paper shows that the raw output of successive censuses cannot be treated as a straightforwardly comparable time series. Changes in census methodology and in the definition of the resident population, repeated administrative-territorial reorganization at the municipal level, a prolonged nineteen-year absence of census enumeration between 2002 and 2021, the restricted availability of settlement-level data outside census years, and instability — administratively, politically and demographically driven — in the recording of ethnic structure and the measurement of migration together constitute a coherent set of methodological constraints on longitudinal and territorially disaggregated demographic analysis. The case of the municipality of Kichevo

illustrates how territorial and ethno-demographic instability can compound one another within a single case; the case of North Macedonia's own census gap, and its almost exact structural parallel in Bosnia and Herzegovina's twenty-two-year gap, illustrates how the same underlying definitional dispute can, under sufficient political pressure, escalate from a routine inter-censal footnote into a multi-decade breakdown of the statistical system itself.

These problems are not specific to North Macedonia: comparable evidence from Serbia, Croatia, Bosnia and Herzegovina, Romania, and further afield, together with institutional responses at EU and UN level, indicates that they are a structural feature of demographic research in territories marked by repeated post-socialist administrative reorganization and by politically sensitive census methodology. This comparative regularity is, in one sense, reassuring — methodological solutions developed elsewhere in the region, from constant-area reconciliation schemes to formal tests for statistically "floating" ethnic categories to jointly developed cross-country migration-data methodologies, are directly transferable to the Macedonian context — but it also underlines the scale of the underlying problem. Future demographic research on North Macedonia would benefit from the systematic, explicit documentation of methodological and territorial discontinuities in any historical data series used; from greater engagement with complementary, non-census data sources, transparently documented at the level of individual variables; and from closer methodological dialogue with the substantial body of comparable research already produced for neighbouring countries of the former Yugoslavia and the wider region.

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МЕТОДОЛОШКИ ПРЕДИЗВИЦИ ВО ДЕМОГРАФСКИТЕ ИСТРАЖУВАЊА И КРЕИРАЊЕ НА ПОЛИТИКИ ЗА НАСЕЛЕНИЕТО

Современото проучување на населението е незамисливо без користење на статистички податоци. Притоа, од непроценливо значење се обемот и квалитетот на истите. Податоците кои се употребуваат во демографските истражувања треба да произлегуваат од организирано собирање на податоци од институции и релевантни извори. Истите треба да овозможуваат континуирано следење на промените коишто се случуваат во обемот и структурата на населението, анализирање на демографските процеси, но воедно, да претставуваат и основа за предвидување на идните развојни тенденции.

За податоците кои се однесуваат на населението неопходно е истите да ги задоволат следните карактеристики: да се веродостојни, релевантни, со соодветен опфат, да се употребливи за конкретно истражување, да обезбедуваат споредливост (методолошка и просторна) и слично. Освен достапните статистички податоци, неопходно е и собирање на податоци за одредена проблематика директно на терен. Таквите податоци заедно со достапните статистички податоци имаат значајна улога во согледувањето на развојните процеси кај населението, но истовремено и во планирањето на идните демографски тенденции. Врз основа на тоа е возможно да се креираат политиките за развој на населението, вработеноста и слично. Тие се неопходни за креирање, а потоа и спроведување на политики за рамномерен регионален развој, за разместеност на дејностите и функциите, инфраструктурата и.т.н.

Целта на трудот е да укаже на значењето и улогата на податоците, согледување на одредени нивни недостатоци, особено во поглед на некои содржини, како и примена во креирањето на политики за населението.

Клучни зборови: статистички податоци, демографски истражувања, политики за население.

UDC:
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FIRST GEOGERONTOLOGICAL RESEARCH

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ABSTRACT

The main focus of the paper is geogerontology, that is, the geographical aspects that are part of the multidisciplinary nature of gerontology. Geogerontology is a subdiscipline of medical geography.

In the research, we seek to answer which people had the longest lifespan and from which geographical area they originated. The manuscript represents the oldest people over 100 years old.

We present facts about the beginning and establishment of state civil registry offices, keeping civil registers (births, marriages and deaths) and vital statistics (structure and processing of population data on multiple bases). The main goal of the paper is the presentation of the oldest people over 100 years old. In several tables, we present data on elderly people over 100 and over 110 years old by continent, country, and data on centenarians in the R.N. Macedonia.

This manuscript is a first introductory research. For a larger research, only for Macedonia, it is necessary to use data from the state archives, from the registry offices of the Ministry of Interior and data from the registry books of religious communities.

Keywords: medical geography, geogerontology, centenarians, civil registry, world, Macedonia

INTRODUCTION

Gerontology - the science of aging and longevity (from the Greek word, geron - "old man" and logic - science). That is, gerontology is the science of the sociological, psychological, cognitive and biological aspects of aging.

The multidisciplinary nature of gerontology includes a large number of subfields,

so in addition to gerontologists, researchers and practitioners from the fields of biology, medicine, criminology, social work, psychology, psychiatry, sociology, economics, political science, architecture, geography, pharmacy, public health, and anthropology are involved in the research. (Hooyman, N.R.; Kiyak, H.A., 2011).

Geogerontology is a subdiscipline of medical geography. Medical geography or health geography is an interdisciplinary science that studies the relationships between human health, the occurrence of diseases, and the geographic environment.

That is, it deals with the broader study of the natural and social conditions of a specific geographical territory, which affect human health, the occurrence of certain diseases, epidemics, etc.

Key aspects of the subject of study are the geographical distribution of diseases, the impact of the environment on health, and access to health services. While the subject of research of geogerontology encompasses the study of the elderly only, namely:

- numerical movement and geographical distribution of the elderly (by continents, countries, regions and settlements);
- natural and geographical conditions (positive and negative impact of relief, climate, hydrography and biogeography on the lives of the elderly); and
- socio-economic and social characteristics (of the elderly by gender, education, nationality, religiosity, activity, occupation, lifestyle, social conditions, access to nursing homes, etc.).

The earliest registration of births, marriages and burials was established in parish churches as early as the 16th century, for example in England in 1538, in France in 1539, Sweden 1608-1631, etc. A large part of these church books do not register the entire population on the territory of the mentioned countries, but only the part over which the church parishes have jurisdiction. This means that they are incomplete and do not have continuity in recording the population.

The first vital statistics registers (births, marriages and deaths) date back to the beginning of the 19th century. Namely, the first establishment of civil registry offices to maintain a register of civil registry books for all citizens regulated by the Law on the Registration of Births and Deaths was introduced: in France in 1804, Romania in 1806-1812, the Netherlands in 1811, England and Wales in 1836/37, Hong Kong in 1841, in Scotland from 1855, for the whole of Australia in 1860, Ireland in 1864, Sri Lanka in 1864, Canada from 1867, Spain in 1871, Germany in 1876, India in 1886, etc. (Dimitrov, V, N., 2013; https://parishregister.co.uk/)

In the Republic of Macedonia, civil registry books were introduced by the Law on Civil Registry Books of 09. May 1946. Civil registry books for births, marriages and deaths are kept first in the civil registry offices at the municipal level, and then in the Ministry of Internal Affairs. Special forms for vital events, which are filled out by civil registry officers, are obliged to submit them to the statistical services, which process them and publish them in the aforementioned books.

Previously, the service for statistics of vital statistics was based on church protocols for births, deaths and marriages. However, in our country there are also such older books, so the group of the oldest church protocols for births, deaths and marriages in the territory of Macedonia are those from the beginning of the 19th century. A large part of these books are deposited in the state archive of the R. N. Macedonia. (Dimitrov, V. N., 2013)

The dramatic increase in the elderly population in post-industrial Western countries has led gerontology to become one of the fastest growing fields of science. Significant progress has been made in increasing average life expectancy.

Accordingly, it is predicted that by 2050, about 25% of the world's population will be people over 65 years of age, and that the number of people aged 85 and over will increase from 5.3 million to 21 million. The fastest increase will occur in the age group 90 to 94 years, which will increase from 26.4% in 2010 to over 30% in 2050. It is also predicted that the majority of children born after 2000 will live to an average age of 100. (SSO, 2023) There is no doubt that with the rapid growth of the aging population, social work education and training specialized in older adults and practitioners interested in working with older adults will be in greater demand.

Today, but also in the future, the elderly population will be geographically most represented in all European countries, followed by Japan, the USA, Canada, China, India, Australia, Russia, etc.

In 2030 in the R. N. Macedonia, life expectancy at birth, by gender, for men will be 76.5 years and for women 81.2 years, in 2050 the average age of men will be 81.0 years and for women 86.0 years, and in 2070 the average age of men will be 84.3 years and for women 88.3 years. By 2050, in the R. N. Macedonia, an elderly population will be present in all settlements, and the largest number will be in cities. The state will need to build nursing homes in all urban settlements. In 2050, in the R. N. Macedonia, the elderly population over 65 years of age will account for over 30%. (SSO, 2023)

It is certain that in the coming decades the number of elderly people (over 65 years old) will increase significantly, and in 2050 there will be over 3 billion people in the world (or 30% of the total number of over 10 billion people), of which several hundred million will be over 80 years old and several million people over 100 years old.

OBJECTIVES AND METHODOLOGY

This manuscript is the first research of this type and scope. We emphasize that the research on this question is extensive and cannot be realized through a single paper. In the research, we strive to answer which people had the longest life expectancy in the world and in Macedonia, and from which geographical area they originate.

In the research, we use the method of analysis and synthesis. We mostly use secondary data sources: literature, data from internet addresses, and statistical data.

We also partially use primary data on centenarians from the R. N. Macedonia, namely: birth and death certificates. To fully complete primary data on centenarians, significant work is required, which requires a lot of time, a greater volume of work and quality.

MAIN PART

In the research, we seek answers to several questions related to the duration of human life in years: - Who lived the longest in the world and in Macedonia?, then - Who is the oldest person alive today in the world and in Macedonia?, etc. The answers to some of the questions are in the tables and the short text. However, there remain open questions for which we do not have answers.

- How many years does a person live?
- Which person lived the longest?
- Which is the oldes person alive nowadays?

In search of an answer to this question, we start from the oldest book, the Bible. From the Holy Scriptures - the Bible, we extract data on 25 names of people who lived for many centuries. We will not go into detailed analyses, but one thing is certain: the maximum human lifespan gradually decreased from almost 1,000 to 110 years. (Table 1.)

Table 1. People in the Bible who lived over 100 years

Name	Years	Lived from - to BC	Name	Years	Lived from - to BC
Methuselah	969	/	Arpachshad	438	2094-1656
Jared	962	/	Saleh	433	2124-1691
Noah	950	/	Enoch	365	/
Adam	930	/	Peleg	239	2249-2010
Seth	912	/	Abraham	175	1996-1821
Kenan	910	/	Job	140	/
Enos	905	/	Avram	137	/
Mahalalel	895	/	Judai	130	/
Cain	860	/	Saara	127	/
Seth	800	/	Aron	123	1574-1451
Lamech	777	/	Moses	120	1571-1451
Shem	600	/	Josif I	110	1745-1635
Eber	463	2283-1819	/	/	/

Source: Holy Scripture - Bible, 2017; Dictionary of the Holy Scriptures (Bible dictionary), 2011; Dimitrov, V. N., 2025; https://record.adventistchurch.com/2022/06/29/the-ten-oldest-people-in-the-bible/

Many of the data presented in tables 2 and 3, especially regarding the length of life, are controversial, especially for people from the more distant past. The tables list "super-long-lived" people who lived for two or more centuries. There are no reliable

documents about the accuracy of the data and they are all unsubstantiated claims based on rumors and legends.

Data for certain areas are scientific hoaxes, some are forgeries, some are exclusively propaganda in nature, some are created for political purposes, some are in search of a sensation for the popularity of a certain geographical area, some data is based on inaccurate entries in church books, etc.

However, the dilemma about the reliability of the data remains, because we do not have the opportunity to research and analyze whether these are mysteries created by nature or scientific and other forgeries. In Tables 2 and 3 we provide an overview of the oldest men and women. Namely, men up to 115 years old (a Macedonian, who died in 2010) and for women up to 117 years old (the list is shortened because we need to add another 70 oldest women up to 115 years old, and there is no woman from Macedonia. The oldest Macedonian woman lived to be 113 years old. See Table 6.)

Table 2. Overview of the oldest men

Rank	Name	Birth	Death	Age	Place of death or residence
1	Ignacy Lewski	1231	1913	682	Poland
2	Aldulaziz bin mutaib Al Rashid	1186	1876	673	Egypt
3	Colestian Veglin	1261	1876	615	United States
4	Lp Suwang	1551	1995	444	Cambodia
5	Li Ching Yuen	1677	1933	256	China
6	Devraha Baba	1740	1990	250	India
7	Tomas Karnej[1]	1588	1795	207	England
8	Tapaswiji Maharaj	1770	1955	185	India
9	Peter Karsten[1]	1539	1724	185	Hungary
10	Mahashta Murasi Hoax	1835	2014	179	India
11	Ivan Rovin[1]	1553	1725	172	Hungary
12	James Olofintuyi	1844	2014	170	Nigeria
13	Javier Pereira	1789	1958	169	Columbia
14	Henri Dzenkins[1]	1500	1670	169	England
15	Shirali-baba Muslimov[2]	1805	1973	168	Azerbaijan
16	Chesten Marchant	1512	1676	164	Great Britain
17	Dhagobo Ebba	1853	2015	162	Ethiopia
18	Jozef Surington[1]	1637	1797	160	Norway
19	Jegor Korejev[1]	1802	1957	155	Russia
20	Mohanned bin Zarei	1859	2013	154	Saudi Arabia
21	Mohammed bin Masoud	1861	2014	153	Oman
22	Tom Parr[2]	1483	1635	152	Great Britain
23	Mahmud Eyuvazov[2]	1808	1960	152	Azerbaijan
24	Gabriel Umer Enemon	1864	2015	151	Nigeria
25	Andrej Adroshenko[1]	1777	1927	150	Russia
26	Ilija Titov[1]	1800	1949	149	Russia
27	Saparman Sodimejo	1870	2017	147	Indonesia

28	Mbah Gotho	1870	2016	146	Indonesia
29	Drakenberg[1]	1626	1772	146	Netherlands
30	Vailije Tiskin[1]	1806	1951	145	Russia
31	Dzonatan Esinden[1]	1613	1757	144	England
32	Shapkovski[1]	1787	1932	144	Abkhazia Georgia
33	Omar Abas	1857	2001	144	Malaysia
34	Majid Agayev[1]	1835	1978	143	Azerbaijan
35	Feroz-ud-Din Mir	1872	2014	142	Pakistan
36	Khfaf Lazuria[1]	1835	1975	140	Azerbaijan
37	Habib Miyan	1869	2008	139	India
38	Georg Vunder[1]	1626	1761	136	Germany
39	Alimihan Seyiti	1886	2021	135	China
40	Moloko Temo	1874	2009	135	South Africa
41	Robert Tejlor[1]	1764	1898	134	England
42	Jose Coelhode Souza	1884	2017	133	Brazil
43	Dzon Sel[1]	1788	1919	131	United States
44	Trajko Smiljevic[1]	1804	1935	131	Serbia*
45	Marcijan Balarevic[1]	1796	1926	130	Russia
46	Masumex Sanei Torogi	1899	2024	125	Iran
47	Save trom the Savevci family[3]	1578	1697	119	Macedonia
48	Mitre trom the Savevci family[3]	1572	1689	117	Macedonia
49	Mitre Bozinovski[4]	1865	1981	116	Macedonia
50	Jiroemon Kimura	1897	2013	116	Japan
51	Christian Mortensen	1882	1998	116	United States
52	Emiliano Mercado del Toro	1891	2007	116	Puerto Rico
53	Juan Vicente Pérez	1909	2024	115	Venezuela
54	Walter Breuning	1896	2011	115	United States
55	Sadush Memedovski[5]	1895	2010	115	Macedonia

Source: https://gerontology.fandom.com/wiki/List_of_the_verified_oldest_people ;
[1]Stefanovik, S. & Kocijanic, M., 1986; *The longest-lived Yugoslav, according to the same source, was Trajko Smiljević (1804-1935), who died at the age of 131. It is only stated that he lived in Serbia, but there is no information in which place. (p.24) [2]Leontieva, P. L., 1983; [3] Damevski, B., 1998; [4]Lazarevski, G., 2014; [5]Tanevski, B., 2010; Dimitrov, V. N., 2025.

Table 3. Overview of the oldest women

Rank	Name	Birth	Death	Age	Place of death or residence
1	Mama Esifiho	1824	2018	194	Nigeria
2	Fatma Hanum	1764	1928	164	Turkey
3	Maria Priu	1680	1838	158	France
4	Ali Al - Alakim	1871	2018	147	Saudi Arabia
5	Eulalija Peres	1738	1878	140	Spain
6	Halime Hatun	1874	2012	138	Turkey
7	Margaret Patte	1602	1739	137	Great Britain
8	Tuti Yusupova	1880	2015	135	Uzbekistan
9	Alimihan Seyiti	1886	2021	135	China

10	Antisa Khvichava	1880	2012	132	Georgia
11	Sarht Rashidova	1875	2007	132	Azerbaijan
12	Sahan Dosova	1875	2007	132	Kazakhstan
13	Maria Oliva de Silva	1880	2010	130	Brazil
14	Koku Istanbulova	1889	2019	129	Russia
15	Cruz Hernandez	1878	2007	128	El Salvador
16	Jeanne Calment	1875	1997	122	France
17	Kane Tanaka	1903	2022	119	Japan
18	Sarah Knauss	1880	1999	119	United States
19	Lucile Randon	1904	2023	118	France
20	Sister Andrea	1905	2023	118	France
21	Nabi Tajima	1900	2018	118	Japan
22	Marie Louise Meilleur	1880	1998	117	Canada
23	Violet Brown	1900	2017	117	Jamaica
24	Maria Branyas Morera	1907	2024	117	Spain
25	Emma Morano	1899	2017	117	Italy
26	Chiyo Miyako	1901	2018	117	Japan
27	Delphia Welford	1875	1992	117	United States
28	Misao Okawa	1898	2015	117	Japan

Source: https://gerontology.fandom.com/wiki/List of the verified oldest_people ; Dimitrov, V., N., 2025

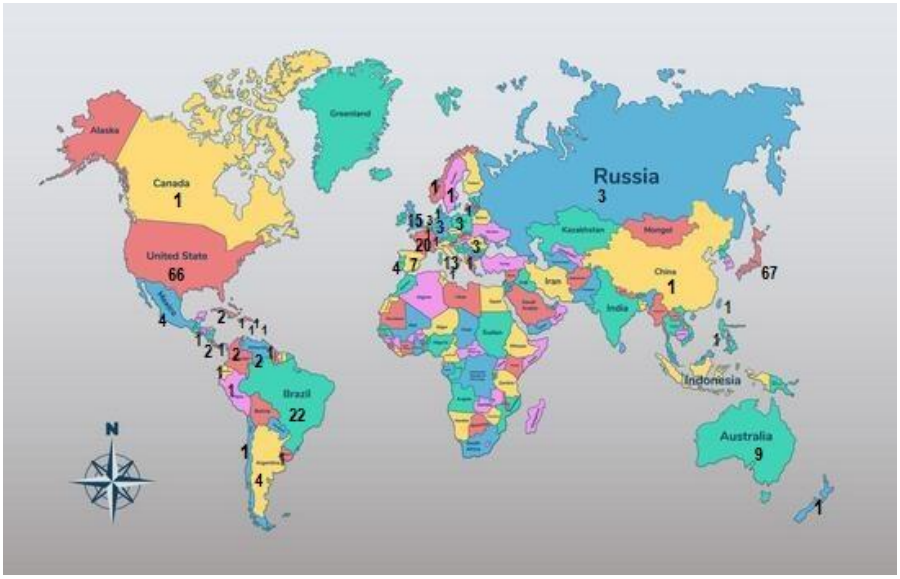
Since the beginning of the 20th century, many countries around the world have begun to regularly keep civil registers. Thus, today we have a large list of living and deceased centenarians in many countries around the world.

As of February 8, 2026, there were 278 living people over 110 years old registered in the world. Of these, the number of centenarian women was 244 (87.8%) and the number of men was 34 (12.2%). Looking at the continents, the most centenarians over 110 years old are in America, 116 people (41.7%), in Europe 82 (29.5%), in Asia 70 (25.2%), and in Australia and Oceania 10 people (3.6%), while in Africa there is no registered old person over 110 years old.
https://gerontology.fandom.com/wiki/Oldest living_people

The elderly over 110 years old are distributed in 44 countries: Japan (67 people), United States (66), Brazil (22), France (20), United Kingdom (15), Italy (13), Australia (9), Spain (7), Mexico (4), Argentina (4), Portugal (4), Romania (3), Netherlands (3), Poland (3), Germany (3), Russia (3), Costa Rica (2), Cuba (2), Colombia (2), Venezuela (2), Chile (1), New Zealand (1), Denmark (1), Ecuador (1), Paraguay (1), Saint Lucia (1), Norway, (1), Guyana (1), Dominican Republic (1), Canada (1), Switzerland (1), El Salvador (1), Trinidad and Tobago (1), Jamaica (1), Panama (1), Greece (1), Belgium (1), Peru (1), Sweden (1), China (1), Taiwan (1), Philippines (1), Malta (1) and Lithuania (1 person). (See: Map 1)

Spatially, the largest concentration of centenarians is in Japan (in addition to geriatric homes, centenarians are also found in traditional families on the islands of Okinawa and Hokkaido), in the United States (the largest proportion of centenarians are found in geriatric homes), followed by centenarians in Brazil, France, the United Kingdom, Italy, etc. (Map 1)

The longevity of people is the result of advanced medicine, a healthy lifestyle, a clean environment and other positive environmental factors. In addition to the above countries, there are other countries in the world with a significant concentration of the elderly population of 100 and over 100 years old, spread across rural and urban areas. Many of the centenarians live in traditional families in mountainous and other clean regions (example: the Caucasus Mountains), Georgia, Armenia, Azerbaijan, then in Kyrgyzstan, Tajikistan, Turkey, India, Nepal, etc.



Map 1. Geographic distribution of people over 110 years old, by country (as of 08.02.2026)

Of the total number of 278 living people, only 50 people (about 18%) were over the age of 112. The geographical distribution by continent was as follows: 21 people in America, 18 people in Asia, 10 people in Europe and 1 person in Australia. Looking at the countries, people over 112 years old were distributed in the following 13 countries: Japan (18 people), USA (11), Brazil (6), France (3), United Kingdom (2), Italy (2), Argentina (2), Romania (1), Portugal 1, Spain 1, Mexico 1, Chile 1 and Australia 1 person. https://gerontology.fandom.com/wiki/Oldest_living_people
Table 4 lists the oldest living people, women and men.

Table 4. Overview of the oldest living people in the world, women and men

Oldest living female				
Rank	**Name**	**Birth**	**Age as of 7 Feb 2026**	**Country**
1.	Erhel Caterhan	21 Aug 1909	116 years,170 days	UK
2.	Maria - Rose Tessier	21 May 1910	115 years,262 days	France
3.	Naomi Whitehead	26 Sept 1910	115 years,134 days	USA
4.	Lucia Laura Sangento	22 Nov 1910	115 years, 77 days	Italy
5.	Yolanda Belitrao de Azevedo	13 Jan 1911	115 years, 25 days	Brazil
6.	Shigako Kadawa	28 May 1911	114 years,255 days	Japan
7.	Beatriz Ferreira Duarte	21 June 1911	114 years,231 days	Brazil
8.	Bonita Gibson	4 July 1911	114 years,218 days	USA
9.	Raynunda Luzia da Conceicao	1 Aug 1911	114 years,190 days	Brazil
10.	Fuyo Kishimato	20 Dec 1911	114 years, 49 days	Japan
Oldest living men				
Rank	**Name**	**Birth**	**Age as of 7 Feb 2026**	**Country**
1.	Joao Marinho Neto	5 Oct 1912	113 years,125 days	Brazil
2.	Ilie Ciocan	10 June 1913	112 years,242 days	Romania
3.	Ken Weeks	5 Oct 1913	112 years,125 days	Australia

Source: https://gerontology.fandom.com/wiki/Oldest_living_people ; Edited by the author

In the following text, we will provide an answer to the oldest Macedonian centenarians that we discovered through this research. However, we emphasize that there are open questions that will require additional research.

- Who was the first Macedonian?
- Who Macedonian lived the longest?
- Who is the oldest person alive today in the R. N. Macedonia?

If we refer to history for the appearance of the ancient Macedonians, then most likely the first Macedonian was Macedon!?[1]

If the country ruled by Macedon was called Macedonia (and that was at least 4000 years ago), the then inhabitants who lived and today's inhabitants who live on the territory of Macedonia, regardless of name, surname, religion, nation, etc., are

[1] Macedon is a mythical eponymous hero of Macedonia and the Macedonians. He is first mentioned by Hesiod, and there are several versions of his mythological origin. In various contradictory sources, he is listed as the son of Zeus and Theia (daughter of Deucalion) and brother of Magnete, then as one of the ten sons of Aeolus, then the son of Helen and brother of Dor, then the son of Ajax and one of the fifty sons of the Arcadian or king of Emathia, Lycaon. There is another version that he was the son of the Egyptian god Osiris, who, leaving the rule of Isis to her, set out to conquer the world together with his sons Macedon and Anubis. When he arrived in Thrace, Osiris killed King Lycurgus, and Macedon proclaimed him king and left him to rule here in the land that was named Macedonia after him. Macedon's sons became eponyms for several regions, cities, mountains, and rivers in Macedonia. (Macedonian Encyclopedia, vol. 2, 2009; Proeva, N., 1997; Proeva, N., 2004.)

Macedonians. Everyone can call themselves Macedonians and the Macedonian people whenever and wherever they want without anyone arguing or forbidding them.

– Which Macedonian lived the longest?

Total of 1,767 settlements have been registered in the Republic of Macedonia, the assumption is that for a period of 200 years (1825-2025) if there were at least 1 to 5 centenarians in each settlement, and then the total number of centenarians ranged from a minimum of 1,767 to a maximum of 8,835 people. To confirm this, serious research is needed in the Death Registers located in the State Archives of the Republic of Macedonia and in the departments in Skopje, Kumanovo, Tetovo, Ohrid, Veles, Shtip, Prilep, Bitola and Strumica, as well as research in other professional services, institutions, using literature, etc.

The oldest civil registry books are the church ones that are in the archives and date from 1804 onwards. In some civil registry books we notice that the dates of birth, marriage and death of a certain number of people are registered with a delay of several years (especially in the period from 1912 to 1918, the Balkan Wars and the First World War). Thus, for many people, only the year is recorded without a date of birth, marriage or death, and other data is missing. We also note other cases, especially among adopted children, where only the year of birth is entered and nothing more. We also register so-called "phantom persons", born persons whose years are later entered in the civil registry books, based on the memory of a parent or another close person.

We also note copies of birth records for a certain number of years. Thus, in the birth records, the same person with the same first and last name may be recorded in two birth records, but with different data for the year of birth. Most often, this was done for males to avoid military conscription, that is, to present themselves as minors, or to receive a pension sooner or later, etc. While for females, it was done to present themselves as younger, etc.

Based on the above, for the persons in table 5 with serial numbers 10 and 14 we have a confirmed answer, while for the others we do not have a confirmed answer for the accuracy of the ages. Also, in table 6 for the person with serial number 1 we do not have a confirmed answer for the accuracy of the ages, while for the others we have a confirmed answer.

So far, the oldest confirmed person in Macedonia was the oldest woman, Fikrie Loki (1914-2024), who died at the age of 110 years and 247 days (Table 6), and the oldest man was Ramiz Selami (1914-2023), who died at the age of 108 years and 265 days (Table 5).

Also, the oldest confirmed person born in Macedonia was Elizabeth Kimoff (1904-2015), who died in Canada at the age of 110 years and 329 days. (Table 7)

Table 5. Oldest men from the R.N. Macedonia

Oldest men					Municipality of	
Rank	**Name**	**Birth**	**Death**	**Age**	**birth**	**death**
1.	Trajko Smiljevic[1]	1804	1935	131	/	/
2.	Save trom the Savevci family[3]	1578	1697	119	Demir Hisar	Demir Hisar
3.	Mitre trom the Savevci family[3]	1572	1689	117	Demir Hisar	Demir Hisar
4.	Mitre Bozinovski[4]	1865	1981	116	Novaci	Novaci
5.	Sadush Memedovski[5]	1895	2010	115	Novaci	Novaci
6.	Sargjo Karagja Bradina[5]	1778	1889	111	Mavrovo and Rostushe	Mavrovo and Rostushe
7.	Magden from the Savevci family[2]	1525	1635	110	Demir Hisar	Demir Hisar
8.	Nikola from the Brsakovci family[2]	1840	1850	110	Demir Hisar	Demir Hisar
9.	Boshe from the Josifovci family[2]	1808	1918	110	Demir Hisar	Demir Hisar
10.	Ramiz Selmani	10 Okt. 1914	2 July 2023	108 years, 265 days	Lipkovo	Lipkovo
11.	Lozan from the Savevci family[2]	1592	1699	107	Demir Hisar	Demir Hisar
12.	Gjorgjija from the Lichovci family[6]	1840	1947	107	Demir Hisar	Demir Hisar
13.	Hristo Dimitrovski[7]	1897	2004	107	Bitola	Bitola
14.	Ibush Ademi	15 April 1918	Living	107 years, 298 days	Cair	Cair

Source: [1]Stefanovik, S. & Kocijanic, M., 1986; *Trajko Smiljevic (1804-1935) who died at the age of 131. He was most likely from Macedonia. The name and surname Trajko Smilević or Smilev/ski was and is a common name and surname in Macedonia. This remains to be confirmed through extensive research in the birth and death registers in the state archives. [2]Leontieva, P. L., 1983; [3]Damevski, B., 1998; [4]Lazarevski, G., 2014; [5]Tanevski, B., 2010; [5]http://www.mn.mk/istorija/3137 ; [6]Popovski-Licho, A., 1993; [7]Personal archive of the author. https://gerontology.fandom.com/wiki/List_of_oldest_people_from_Macedonia ; Edited by the author.

The person Trajko Smilević (1804-1935) most likely came from Macedonia. Such a name and surname are common in many parts of Macedonia. To confirm the authenticity of the 131-year life, extensive research in the birth and death registers in all departments of the State Archives of Macedonia will be necessary.

Table 6. Oldest women from the R.N. Macedonia

Oldest women					Municipality of	
Rank	**Name**	**Birth**	**Death**	**Age**	**birth**	**death**
1.	Masa trom the Apostolvci family[1]	1875	1988	113	Demir Hisar	Demir Hisar
2.	Fikrije Loki	10 Jan. 1914	13 Sep. 2024	110 years, 247 days	Kosovo	Tetovo
3.	Zaide Sali	17 May 1902	24 Dec. 2011	109 years, 221 days	Cucer Sandecvo	Aracinovo
4.	Zejna Hajra	2 Avg 1875	02.Mart 1985	109 years, 212 daus	Kicevo	Kicevo
5.	Esma Ballazhi	1 July 1878	6.Maj 1985	106 years, 309 days	Kicevo	Kicevo

Source: [1]Damevski, B., 1998; Edited by the author;
https://gerontology.fandom.com/wiki/List_of_oldest_people_from_Macedonia

Table 7. List of the Oldest Macedonian emigrants ever

Oldest Macedonian emigrants						Municipality Country of	
Rank	**Name**	**Sex**	**Birth**	**Death**	**Age**	**birth**	**death**
1.	Elisabeth Kimoff	F	20 Nov. 1904	15 Oct. 2015	110 years, 329 days	Novo Selo	Canada
2.	Karavilka Petrovic	F	15 June 1902	9 Mar 2013	110 years, 267 days	Bitola	USA
3.	Rachel Nahmias	F	7 Oct 1917	10 Jan 2026	108 years, 95 days	Bitola	USA
4.	Ted Petkoff	M	31 Jan 1904	5 April 2012	108 years, 65 days	Bitola	Canada
5.	Aleksandar Nikolov	M	12 July 1914	7 Oct 2020	106 years, 87 days	Negotino	Bulgaria

Source: https://gerontology.fandom.com/wiki/List_of_oldest_people_from_Macedonia;
Edited by the author

– Who is the oldest living person in the Republic of Macedonia today?

The oldest living person over 100 years old in the Republic of Macedonia is Ibus Ademi, born on April 15, 1918, who today (February 8, 2026) is 107 years and 298 days old and lives in the municipality of Cair in the city of Skopje.

DISCUSSION

- What is the maximum length of human life?

Scientists often ask this question, to which a definitive answer has not yet been received. Table 8 shows the average life expectancy in separate historical periods of human development and in the future until 2100.

Table 8. Estimated average life expectancy in years by period

Period	Average life expectancy in years	Period	Average life expectancy in years
Stone Age[1]	19	1951-1970 year[2]	60-65
Bronze Age[1]	21,5	1971-1983 year[2]	65-70
Ancient Age[1]	20-30	1984-2000 year[3]	70-73
XVI century[1]	29,5	2001-2010 year[4]	73-75
XVII century[1]	29	2011-2025 year[4]	75-77
XVIII century[1]	28,5	2026-2030 year[4]	77-80
XIX century[1]	35,5-40,5	2031-2050 year[5]	81-85
1901-1934 year[1]	44,8-59,8	2051-2075 year[5]	86-90
1946-1950 year[1]	57,7-60	2076-2100 year[5]	91-100

Source: [1]Stefanovik, S., & Kocijanic M., 1986; [2]Yugoslavia - thirty years after liberation and victory over fascism 1945 - 1975 ; [3]Friganovic, M., 1978; [3]Wertheimer-Baletic, A., 1982; [3]Breznik, D., 1980; [4]Nejasmic, I., 2005; [4]Risteski, S.,2009; [4]Dimitrov,V.N.,2018; [5]Author's assessment; Dimitrov,V.N., 2025.

According to the UN, in 2021 there were 593,000 people in the world over the age of one hundred. Japan had the most centenarians in the world with about 120,000 people (20.2%). Every year the number of centenarians increases by several thousand. Thus, in 2025 there will be 630,000 people in the world who have reached their 100th birthday (or 0.0076% of the world population - 8,250,174,000 (03.10.2025) (https://www.worldometers.info/world-population/).

More than half of them are in just ten countries, among which Japan stands out as the absolute record holder with 123,000 people (19.5%) and where the average life expectancy of the population is 85 years (for women 88 years and for men 82 years), and with the participation of centenarians in the total population of 0.01%, making it at the top in the world. This is followed by the United States with about 74,000 centenarians (0.02%), China with about 49,000 (0.0035%), India with 38,000 centenarians (0.0027%), etc. However, if the number of centenarians is compared to the size of the population of the countries, then the United States and China fall down the list, while France, Greece and Italy approach the top, and at the very top is Monaco with a centenarian share of 2.4% of the total population. Monaco has the most centenarians, 950 centenarians or 2.4% of the total population (Monaco had a population of 39,100 in 2021).

In 2021, countries with high prevalence were Hong Kong (with 133 per 100,000 inhabitants), Guadeloupe - a former French colony (100), Japan (98), Uruguay (85), France (47), Great Britain (26), USA (20) and Macedonia with a prevalence of 4 centenarians per 100,000 inhabitants is devastating compared to the world average. (https://www.worldometers.info/demographics/life-expectancy/#google_vignette)

Experts say the rise in the number of centenarians is due to improvements in quality of life and health care, reduced smoking and better working conditions. The research uses data from the UN and reveals huge differences in longevity around the world, with Macedonia far behind the global average and needing to rethink its

approach to health and care for older people. Many of the countries where people live the longest have high investments in health per capita, have better access to and quality of health services, low crime rates and high quality of life and living standards.

In 2025, in over 40 countries the average life expectancy of the population was over 80 years. The highest average life expectancy, at over 84 years, was in: Monaco 86,5; San Marino 85,8; Hong Kong 85,7; Japan 85,0; South Korea 84,5; Andorra 84,2; Switzerland 84,2, Australia 84,2 i Italy 84,0 years. https://population.un.org/wpp/

In 2025, the average life expectancy in the world (The World Bank: World Development Indicators, 2025) is 73.5 years (females 76.2 and males 70.9 years), for comparison, in 2000-2005, the average life expectancy in the world was 64.7 years (women 67.0 and men 62.5 years) (Ivo Nejasmic, 2005). So, in 25 years, the average life expectancy in the world increased by 8.8 years. If this trend continues, the average life expectancy in the world in 2050 will be 82.3 years, in 2075, 91.2 years, and in 2100 a high 99.9 years. This means that in many countries the average life expectancy of the population will be over 100 years.

Many of the world's leading gerontologists agree that the maximum length of human life ranges between 110 - 120 years. Men who live "perfectly healthy" can live up to 114.1 years, and women 115.7. ("Nature Communications"). Most likely, the result of the centenarian is an orientation towards healthy aging, which involves a combination of nutrition, physical activity and a healthy environment. However, a significant number of gerontologists, however, believe that the maximum length of human life is constantly increasing as a result of the progress of medicine, so according to them, a person can live up to about 150 years. (Dimitrov, V.N., 2025)

However, according to futuristic thinking, the maximum length of human life could change significantly if artificial intelligence and robotics took over all activity and "care" for humans. Then the limit of life would be raised to several centuries, of course this could happen if there is no cataclysm to the detriment of humanity.

In general, the increase in the average life expectancy of the world's population is thanks to advances in medicine, improved living standards, a developed healthcare system, quality healthcare services, regular healthy living habits, etc.

In 1970-72, the average life expectancy in Macedonia was 67.3 years, of which men with 66.4 and women with 68.2 years (Disan Breznik, 1980). The average life expectancy is constantly increasing and in 2025, out of a total of 201 countries and territories, Macedonia ranked 69th with 77.7, (females 79.8 and male 75.4 years), and the last is Nigeria with 54.78, (male 54.45 and females 55.12).

If the average life expectancy in 2005 in the Republic of Macedonia was 74 years (Dimitrov, V. N., 2018), it means that in twenty years it increased by 3.7 years, and if the same dynamics continue, then in 2050 the average life expectancy will be 81.4 years, in 2075 85.7 years, and in 2100 88.8 years.

Today, other rural and urban areas with a concentration of elderly people aged 100 and over stand out in the world. Areas in the following countries stand out in particular: Kyrgyzstan, Azerbaijan, Georgia, Armenia, Russia, Italy, Greece, Portugal, Spain, France, China, India, Ecuador, the USA, etc. So, in many countries in the world, the population is aging rapidly and several zones with centenarians

stand out. Hundreds of thousands of centenarians live in many million-plus cities and other cities around the world, but also in traditional families, and of course in retirement, nursing, geriatric and other homes.

In 2050, the world will have 9.8 billion inhabitants. By 2050, the number of countries in the world with an average life expectancy of over 80 years will be about 100, of which a dozen will have an average life expectancy of over 90 years. By mid-century (2050), the standard of living will have increased significantly, the number of pensioners will be over 30% or over 3 billion, of which several million people will be over 100 years old.

By the end of the 21st century, the Earth will have over 11.2 billion inhabitants, of which about 50% will be elderly. Retirement will be over 70 years old (or there will be no retirement - everyone will be able to work until they want and for as long as they can, and in addition to a pension they can also receive a regular salary!?, and if robots take over all the work, then humans will "enjoy"!?), the average life expectancy will be over 95 years old, and in some countries over 100 years old. This means that the number of centenarians will increase significantly, to over one hundred million people. Of course, unless a new pandemic (similar to Covid-19) emerges, it would be disastrous for centenarians.

We emphasize again, in the manuscript we present only an initial possibility for more detailed research. Because, according to statements by older people, there were more centenarians in Macedonia in the past than today. We do not have specific data for this claim. To confirm this, all the Birth and Death Registers kept in the State Archives of Macedonia, the Ministry of Internal Affairs - Civil Registry Office, archives of religious communities and other entities will have to be investigated. Also, data should be extracted from other books, various documents, data from over 200 monographs on Macedonian settlements, in which valuable data on domicile centenarians can be found.

This research opens up the possibility to value longevity, to celebrate life, to promote healthy living, to educate about active recreation. (Dimitrov, V. N., 2025).

With God's grace and blessing for a long life, I express the following: "If you live above average, that is your reward, if you live over 90 years, that is a reward from the angels, and if you live over 100 years, that is a reward from God." The three symbolic words: your reward, reward from the angels, and reward from God, are a combination of genes, quality of life, proper nutrition, physical activity, better working conditions, advances in medicine, and a healthy environment.

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THE RETURN OF THE TERRITORY AFTER THE "END OF HISTORY": THE SHAPE OF POLITICAL GEOGRAPHY TO COME

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ABSTRACT

This article asks who speaks for geography now that geopolitics has returned after the "end of history". It starts from the expectation, widespread in the popular reading of the post-Cold War period, that borders, strategy and geography were losing their significance, and confronts it with the events of 2014–2026. Three propositions are advanced. First, the period after 1989 brought not an end but a continuity of the territorial and positional logics of power, while the norm of territorial integrity that constrained them after 1945 is eroding; Russia's aggression against Ukraine in 2022 does not open a new phase but makes this continuity visible. Second, the return of geography has two strands, which correspond to Ratzel's *Raum* and *Lage*: territory as an object of conquest and appropriation, in Ukraine and in the rhetoric about Greenland, and chokepoints and flows as instruments of power, in the Strait of Hormuz**;** territory returns alongside flows, not as a restoration. The US strike on Iranian nuclear facilities in June 2025, Operation Midnight Hammer, shows that technology can overcome physical distance, but that political space, rather than disappearing, sets the conditions and the price of crossing it. Third, what returns first is geopolitics as practice and discourse. Whether political geography will have a voice in interpreting this return depends on whether it can offer analytical tools that go beyond neoclassical reflexes. The article puts three such tools to work: a ladder of territorial revisionism, the analysis of geopolitical codes and a reading of geopolitical discourse by register.

Keywords: geopolitics; territory; chokepoints; territorial integrity; neoclassical geopolitics; critical geopolitics; political geography

INTRODUCTION

Political geography has already experienced one period of marginalisation. After the Second World War, discredited by its association with German Geopolitik, it became what Berry (1969, as cited in Johnston, 2001) called a "moribund backwater", before reviving from the mid-1970s onwards (Johnston, 2001; Muir, 1976). This article extends that history over the past three and a half decades and starts from a question that seemed entirely legitimate at the end of the Cold War: If history, in the sense in which Fukuyama (1989) defines it, is coming to an end, does political geography face a second marginalisation? Strictly speaking, Fukuyama's thesis concerns the end of ideological evolution, that is, liberal democracy as the final form of government, not the end of wars. The expectation that peace and stability would spread throughout the world is its popular and historically influential reading (Gallaher, 2009, pp. 71–72).

The question, however, turned out to be wrongly posed. Political geography did not disappear after 1989. Critical geopolitics, in fact, came of age in the 1990s. What changed was its place in public debate. When geopolitics returned, first after 2001 and forcefully after 2014, it was interpreted above all in international relations, strategic studies and think tanks, often in the neoclassical register that Megoran (2010) criticises and Haverluk et al. (2014) defend. The question this article asks is therefore not whether political geography returns, but who speaks for geography when geopolitics returns, and with what tools.

The aim is not to prove that "geography is back" but to show why contemporary events make spatial analysis necessary again, without automatically legitimising classical geopolitics. First, the period after 1989 brought not an end but a continuity of the territorial and positional logics of power, while the norm of territorial integrity that constrained them after 1945 is eroding. Russia's aggression against Ukraine in 2022 does not open a new phase but makes this continuity visible. Second, the return of geography has two strands: the return of territory as an object of conquest and appropriation, in Ukraine and in the rhetoric about Greenland, and the return of chokepoints and flows as instruments of power, in Hormuz. Third, what returns first is geopolitics as practice and discourse, and its interpretation is conducted largely outside the discipline. Whether political geography will have a voice in that interpretation depends on whether it can offer analytical tools that go beyond neoclassical reflexes.

Methodologically, the article is a critical reading of recent literature and primary documents through concepts drawn from political geography: territory and sovereignty, geopolitical codes and orders, and the distinction between formal, practical and popular geopolitics. The sources play three distinct roles, which are kept apart throughout. Official documents, speeches and resolutions (e.g. Putin, 2021, 2024; The White House, 2025; United Nations General Assembly, 2022) serve as evidence of practical geopolitics, that is, of what states claim and do. Peer-reviewed articles serve as analytical sources. Analyses by think tanks, institutional documents such as NATO (2023) and web commentaries are treated as texts of

formal geopolitics: they are read as part of the discourse under study rather than as neutral authorities, even where they also supply factual detail. A simple bibliometric indicator from OpenAlex (Priem et al., 2022) is used in section 9 to trace the proliferation of the term geopolitics. One methodological rule applies throughout: that events can be read through classical geopolitical frames does not mean that they confirm them. The analysis covers events up to mid-2026.

GEOPOLITICS: FOUR MEANINGS AND TWO LOGICS

The fate of geopolitics mirrors the fate of political geography. The ambiguity of the term is best illustrated by the two definitions in the *Oxford English Dictionary* cited by Dahlman (2009, p. 87): "It is, on the one hand, 'the influence of geography on the political character of states' and, on the other, 'a pseudo-science developed in National Socialist [Nazi] Germany'. Both definitions have troubling connotations - the former for its deterministic view of geography, the latter for its connection to fascism." In what follows, the term is used in four senses that need to be kept apart: German Geopolitik of the interwar period; classical geopolitics as a broader intellectual and practical tradition that includes Mackinder and Spykman; neoclassical geopolitics, the contemporary revival of that tradition, associated above all with Kaplan's (2009) rediscovery of Mackinder (Megoran, 2010; Haverluk et al., 2014); and critical geopolitics as the problematisation of all of them. When this article argues of the "return of geopolitics", it refers to the return of the classical tradition as practice and discourse, not to Geopolitik. Neoclassical geopolitics is the form this return most often takes when it is written down, in think tanks, strategic studies and the press. It is therefore a genre of formal geopolitics, not a practice of states.

After the Second World War, the tradition of advocating state power did not disappear but became less visible (Herb, 2008). It continued in military academies, in the popular media and in South American military regimes, while through Spykman and his thesis of the rimland academic geopolitics moved from geography to international relations and strategic studies (Herb, 2008; Jones et al., 2004, pp. 4–7). In a textbook from the Russian tradition, Okunev (2024) describes this continuity with the term revisionism, a reformulation of geopolitics as a security discourse: "The revisionist school of thought skillfully avoided the trap of justifying aggressive expansionism and militarism, shifting from expansionist ideas to security discourse." Okunev's "revisionism" should not be confused with the use of the term in international relations, where "revisionist powers" are states that seek to overturn the existing order (Mead, 2014) - in his usage it is the discipline, not the state, that revises itself. Herb (2008) observes: "With the exception of the case of Hérodote, geopolitics or political geographies that advocate state power are mainly pursued outside of geography at present."

The response of political geography was critical geopolitics, which developed from the late 1980s, above all in the work of Gearóid Ó Tuathail (also published as Gerard Toal) and Simon Dalby. Gallaher et al. (2009, p. 8) summarise its basic thesis:

"Instead, critical geopolitics holds that all truth claims are political: that they are made on behalf of vested political interests and often in the pursuit of political economic imperatives." Following Ó Tuathail and Dalby, Painter (2008, p. 65) distinguishes three registers of geopolitical practice: formal geopolitics, developed in think tanks, strategic institutes and academia; practical geopolitics, conducted by state institutions; and popular geopolitics, the everyday cultural constructions of the mass media and film. In a 2026 forum on whether Trump is an anomaly or the herald of a new geopolitical order, Sharp (in Agnew et al., 2026, p. 59) questions the usefulness of this distinction: "Trump's apparent refusal to use diplomatic channels, and diplomatic language, has raised the stakes of engagement (and rendered fairly meaningless O'Tuathail's (1996) distinction between formal, practical and popular geopolitics)." This article retains the distinction precisely as a diagnostic tool. When a head of state conducts foreign policy through social media, practical and popular geopolitics merge, and the merger can be observed only if the registers are kept analytically apart. Sections 8 and 9 apply the distinction systematically (Table 2), and the case of Greenland shows why it matters: a text of formal geopolitics disavows annexation, while the practical geopolitics of the administration does not rule out the use of force. Both traditions are used in this article: the classical one as a set of frames through which current events are read, the critical one as a way of analysing that reading.

Two further distinctions organise the argument. The first concerns the forms in which geography enters power. Ratzel (1897) distinguished between *Raum*, the area a state occupies or claims, and *Lage*, its position relative to other places, routes and powers. The distinction allows the two strands of the contemporary return to be named precisely. Territorial logic treats *Raum* as the object of power: territory is conquered, annexed, purchased or claimed. Positional logic, as the term is used here, means the use of location (*Lage*) rather than area (*Raum*) as a source of power: control over chokepoints, corridors, bases and overflight rights through which flows pass, rather than appropriation of territory itself. It has a contemporary counterpart in the concept of weaponised interdependence, which shows how states that control the hubs of global networks can turn the networks themselves into instruments of coercion (Farrell & Newman, 2019). The second distinction concerns what "logic" means when this article claims continuity. It refers to the practice of treating territory and position as objects and instruments of power, not to the normative framework within which that practice operates. After 1945 that framework was dominated by the norm of territorial integrity, under which the forcible revision of borders became rare and, when it occurred, was generally not recognised (Zacher, 2001). The argument is that the practice has been continuous, while the norm that constrained it is now eroding. The distinction also makes the continuity thesis testable: a genuinely new phase would require either a new practice or the collapse of the norm, not merely a larger scale of the old practice.

THE END OF HISTORY AND THE SECOND "MORIBUND BACKWATER"

The fall of the Berlin Wall and the dissolution of the Soviet Union created a climate in which, in its popular reading, geopolitical thinking seemed redundant. Within academic geography, the 1990s were in fact the decade in which critical geopolitics flourished - the expectation concerned above all the practice of politics. Sloan (2026) reconstructs its assumptions. Beyond the first, that the United States was an indispensable power, two are directly political-geographical:

> Two more assumptions took hold: first, democracies would not for the foreseeable future be required to think strategically. Second, thinking about assumptions, ends, ways, means, and the evolving strategic and political importance of certain geographical locations and configurations would have little pertinence in a new globalized world.

The third assumption links trade with peace and political change. Sloan (2026) sums it up with the German maxim: "It is summed up in the German mantra of 'Wandel durch Handel' ('change through trade'), the hope that both Russia and China would turn into Western style democracies and free market economics by trading intensively with the West." Had these assumptions been correct, political geography would have faced the prospect of a second marginalisation, after that of the 1950s and 1960s. In a world in which borders lose their significance, trade produces peace and the liberal order spreads of its own accord, the question of the spatial causes and effects of political processes appears secondary.

The opposite happened. The dissolution of the Soviet Union created fifteen new subjects of international relations and fundamentally changed the geopolitical situation of the region (Demedziuk, 2017). The dissolution of Yugoslavia, in turn, brought Balkanisation, in the original sense of the term, back to the place where it originated. Following Brzezinski (1997), Mirza and Ayub (2022) describe the situation: "Post-Cold War Balkan region in Europe was internally weak, torn by ethnic, religious, and territorial conflicts." The new borders and new states were not a deviation from the new order but an integral part of it. Territory also remained an object of military force from the very first months of that order. Iraq's annexation of Kuwait in August 1990 was declared void by the Security Council (United Nations Security Council, 1990), and the war that reversed it became the clearest demonstration of the norm of territorial integrity in action (Zacher, 2001). The boundaries of the norm nevertheless remained contested. In his address on the annexation of Crimea, Putin (2014) invoked "the well-known Kosovo precedent" to justify Russia's action, turning the Western-backed secession of 2008 into an argument for Russian revisionism. In the South Caucasus, Azerbaijan recovered Nagorno-Karabakh by force in 2020 and 2023, within its internationally recognised borders but at the price, in 2023, of the flight of more than 100,000 Armenians (UNHCR, 2024): the norm protected borders, not the populations within them. After the terrorist attacks of 11 September 2001, the war in Iraq and the global financial crisis, Mackinder re-entered public debate. Megoran (2010, p. 187) describes the

logic of this return: "For Kaplan, Mackinder is the wise 'Victorian' sage to whom we must at last return having recognised the enduring relevance of his insights as the heady promises of post-Cold War neoconservative politics and neoliberal economics are buried in the wreckage of the Iraq debacle and global financial collapse." A pattern was thus visible more than a decade before 2022: when the promises of the post-Cold War order fail, classical geopolitics returns.

The annexation of Crimea in 2014 revealed the essential part of this pattern: territory once again became an object of military appropriation in Europe. Sloan (2026) links it to what was to follow: "The failure of the West to deter Russia after the invasion of Crimea in 2014 was compounded by the invasion of Ukraine in February 2022." Mileski et al. (2023) theorise such changes through the concept of geopolitical order and note that the transition from the Cold War order happened more suddenly and quickly than earlier transitions. The events since 2014 suggest that the Cold War order collapsed quickly, but that the order that is to replace it has not yet been established.

2022: CONTINUITY, NOT A NEW PHASE

Russia's aggression on Ukraine of 24 February 2022 is usually described as a historical turning point, and the surprise was real, not least because of the severity of Russia's military actions against civilians and civilian infrastructure (Śliwiński, 2023). But the war is a turning point in its consequences and in the norm it openly breaks, but not in its logic. The continuity is twofold, chronological and substantive.

Chronologically, the territorial phase of the war began not in 2022 but in 2014. NATO (2023) dates its beginning to 20 February 2014, when the operation to annex Crimea began, whereas Kyrydon and Troyan (2022, p. 170) date it to 26 February 2014 and periodise it as follows:

> The war of aggression unleashed by the Russian Federation against Ukraine has lasted more than eight years, since February 26, 2014. It has passed through two phases: I - hybrid war from February 26, 2014 to February 23, 2022; II - total large-scale conventional war, lasting from February 24, 2022.

Substantively, the object of the war is territorial. The Kremlin justifies the war with several narratives, from the "denazification" of the Ukrainian government to NATO's eastward enlargement, and part of the realist literature seeks its causes precisely in that enlargement (Mearsheimer, 2014); Kyrydon and Troyan (2022) characterise this view as a justification of the aggression. The task here is not to adjudicate between these explanations but to show the object of the war. In any case, both Russia's own claims and the outcome of the war are territorial. The territorial claim was prepared in identity terms before the invasion: Putin (2021) wrote that "Russians and Ukrainians were one people - a single whole" and that "true sovereignty of Ukraine is possible only in partnership with Russia". The territorial logic is also visible in the very course of events: "On the 21 February 2022 the Kremlin recognized the so-called

Donetsk People's Republic and the Luhansk People's Republic as independent entities, opening the way to their annexation by the Russian Federation" (NATO, 2023). On 30 September 2022 Russia proclaimed the annexation of four Ukrainian regions, Donetsk, Luhansk, Zaporizhzhia and Kherson, including territory its forces did not control at the time. The General Assembly declared the annexation invalid by 143 votes to 5, with 35 abstentions (United Nations General Assembly, 2022). In June 2024 Putin (2024) made the withdrawal of Ukrainian troops from the entire territory of these four regions a precondition for a ceasefire and negotiations. NATO's (2023) own definition of the war as an attempt "to regain spheres of influence lost as a result of the collapse of the USSR" is the interpretation of a party to the confrontation, but on this point the primary record supports it. Demedziuk (2017, p. 101) had already described the political-geographical core of this mechanism: "The psychological aspect is based on manipulating the opponent, 'seizure' of part of the territory, arousing and supporting ethnic separatists, creating a regional opposition, aimed at federalisation, leading to the detachment of certain territories from the states." The war of 2022, therefore, does not usher the world into a new phase of practice, but rather, it shows that after 1991 territory never ceased to be an object of power politics. What is new is not the logic but its scale, and the open breach of the norm of territorial integrity by a permanent member of the Security Council.

A WORLD DIVIDED

The war in Ukraine divided the world, but not along the lines of the Cold War. For the West it is a question of international law (NATO, 2023), whereas part of the media in the Global South frames it rather as a conflict to be resolved through dialogue (Akinboade et al., 2023). The line of division follows the debate on the polarity of the international system. One group of authors speaks of a new bipolarity between the United States and China (Mileski et al., 2023). China, by contrast, promotes the multipolar narrative. De Freitas (2026, p. 55) describes its function: "China has long argued that the U.S. unipolar moment is over and that a multipolar world is both inevitable and desirable." In this reading, a war against Iran opposed by most of the Global South only reinforces that narrative. A third group speaks of a world without a centre, for which Mirza and Ayub (2022) cite Kupchan's *No One's World* and Buzan's decentred globalism.

The dispute over polarity is therefore not merely analytical. Multipolarity is at once a description of the system and a geopolitical programme, and the choice of description is already a choice of side. For political geography this is a familiar insight: the division of the world into blocs and spheres has always been a representation as well, and not merely a statement of fact. Okunev (in Agnew et al., 2026) takes this insight a step further with the idea of situational polarity: "Its essence lies in the fact that the world is simultaneously unipolar, bipolar, and multipolar, depending on which side you look from and which specific issue is being discussed (Okunev, 2020)." In his examples, Russian policy follows a unipolar logic when it supports sanctions

against North Korea, a bipolar one on the geopolitical choice of Ukraine and a multipolar one in the Syrian settlement. The choice of a polar description is, in this reading, itself a geopolitical act. Writing from an African perspective, Aniche (in Agnew et al., 2026) holds that states remain the dominant actors and that the competition between Chinese and Western infrastructure initiatives is producing a geo-economic order resembling Cold War bipolarity, with Africa as one of its central arenas. The war returned Europe to the center of geopolitics, but at the same time it accelerated the shift of the center of gravity towards Eurasia. Śliwiński (2025) draws the broader conclusion that, as the focus of international relations shifts from the North Atlantic back to Eurasia, China and Russia are increasingly likely to hold the keys to international peace and security, potentially more so than the United States.

HEARTLAND AND RIMLAND AS FRAMES OF READING

The two best-known formulas of classical geopolitics are once again being used to read current wars, and the first question is who is doing the reading. The Heartland reading of Russia's war belongs above all to formal geopolitics: to Western strategic studies (Śliwiński, 2023; Sloan, 2026) and, on the Russian side, to the Eurasianist tradition (Okunev, 2024). The practical geopolitics of the Kremlin speaks a different language, that of historical unity, compatriots and security (Putin, 2021, 2024). Formal geopolitics thus translates an identity claim into a spatial formula. Russian aggression, motivated by both strategic and identity considerations, is read through Mackinder's (1919) dictum:

> Who rules East Europe commands the Heartland: Who rules the Heartland commands the World-Island: Who rules the World-Island commands the World.

Śliwiński (2023) applies the formula to the war: "Notably, the key to controlling the Heartland area lies in Central and Eastern Europe, as it is an area that borders the Heartland to the West." Ukraine lies precisely in this space, which Kyrydon and Troyan (2022) regard as central to Russia's position. Nor is the reading only a Western one: as Okunev (2024) shows, Russian geopolitical thought, especially the school of Eurasianism, shared the Anglo-Saxon reading of the Heartland. Sloan (2026) describes Mackinder's present-day topicality: "Today there is a third rainstorm, a product of Russia's invasion of Ukraine." After Pearl Harbor and the onset of the Cold War, this is the third revival of his work. Such readings do not imply geodeterminism. Mackinder (1904, p. 437) himself lists non-geographical factors: "The actual balance of political power at any given time is, of course, the product, on the one hand, of geographical conditions, both economic and strategic, and, on the other hand, of the relative number, virility, equipment, and organisation of the competing peoples."

The war of the United States and Israel against Iran, which began on 28 February 2026 (Britannica Editors, 2026), is read, again mainly in formal geopolitics (Ullah, 2026), through the other classical formula, that of Spykman (1944, p. 43, as cited in

Gray, 2015, p. 873): "Who controls the Rimland rules Eurasia; who rules Eurasia controls the destinies of the world." Okunev (2024) locates the battlegrounds of the Cold War almost exclusively in the Rimland, Iran among them. After the ceasefire of 8 April 2026, the war continued in the form of a US naval blockade of Iranian ports and restrictions on navigation through the Strait of Hormuz (Belhaj, 2026). Its logic is not that of territorial conquest. Bassou (2026, p. 14) formulates the first lesson: "The first lesson is that coercion can serve as a substitute for occupation." The object of the struggle is control of flows. In Ratzel's terms, it concerns *Lage* rather than *Raum*. Hormuz, through which about one fifth of global oil consumption passes (U.S. Energy Information Administration [EIA], 2025), overturns a basic assumption of globalisation (Belhaj, 2026, p. 22): "For decades, Hormuz embodied a central paradox of globalization: a narrow and exposed passage carrying a large share of global energy flows, yet one that remained largely insulated from sustained disruption. In 2026, that paradox collapsed. Exposure became leverage." For a single chokepoint, the formula restates the logic of weaponised interdependence (Farrell & Newman, 2019).

Control of flows, however, is itself exercised through claims over space. The same author formulates the political-geographical essence of the crisis (Belhaj, 2026, p. 28):

> The result is worse than legal void, it is legal duplication: two parallel readings of the same maritime space, each aligned with a different conception of order - one privileging sovereignty, the other circulation.

Iran's geography is a resource that compensates for its military inferiority. Sarkhosh et al. (2026) write that Iran regards the strait as a key asset in its doctrine: "It also views the Strait as a critical asset in its doctrine of asymmetric warfare, relying on unconventional tactics and weapons to deter or counter superior adversaries." The consequences are also felt in the Heartland: "If Gulf shipping lanes become unsafe, China's reliance on land-based energy imports via Russia and Central Asia will increase" (De Freitas, 2026, p. 54). The insecurity of sea routes lends new value to overland routes across Eurasia, a Mackinderian motif, this time without Mackinder.

Symbolically, the two classical frames are being used simultaneously to read two wars at the two ends of the contact zone between the Heartland and the Rimland: in the west, in Ukraine, and in the south, in Iran. In the classical schemes Ukraine does not belong to the Rimland in the narrow sense: for Mackinder it is part of Eastern Europe, the key to the Heartland, whereas for Spykman the Rimland is the coastal belt of Eurasia. The first war is a war for territory, the second a war for control of flows. Bassou (2026, p. 19) links the two through their common outcome: "This war has confirmed a truth that history has been accumulating for over a century: In the 21st century, even the most powerful nations find it first difficult, and eventually impossible, to overthrow their enemies through military force alone. Russia in Ukraine and America in Iran both provide contemporary illustrations of this reality."

That events can be read through the classical frames, however, does not mean that they confirm them. The fit itself is at least partly a product of the reflex described in a web commentary from the first weeks of the Iranian crisis: "During geopolitical

crises, the influence of classical theories of international relations tends to come to the fore" (Ullah, 2026). Sloan (2026), himself an advocate of Mackinder, recognises the same problem: "In the discipline of international relations, there are few theories that have been as misread and poorly utilized as geopolitics. Today it is caught in a vortex of overuse and misreading." The Heartland and the Rimland are useful as frames for the persistent spatial conditions of power, but not as explanations that replace political decisions.

DISTANCE AND SPACE: FROM MIDNIGHT HAMMER TO HORMUZ

Even before the war of 2026, on 22 June 2025, the United States struck three Iranian nuclear facilities. Galbraith (2025, p. 799) describes the operation: "This attack, called 'Operation Midnight Hammer' involved a combination of stealth bomber planes that had departed eighteen hours earlier from Missouri and missiles launched from U.S. submarines." A world power projected its will from its own territory, across oceans and continents, without having to rely on immediate geographical proximity to the target. This does not mean that bases, supply lines and routes have lost their importance, but that the traditional strategic value of particular locations, on which classical geopolitics built the projection of power, is changing. The question belongs to geopolitics itself. Sloan (2026) writes of classical geopolitics: "It provides an assessment of how changes in transport and weapons technology can affect the political and strategic importance of certain geographical locations and configurations." Technology does not abolish geography - it changes the value of particular places.

The same flight has another side. Physical distance can be overcome, but political space does not disappear, it becomes conditional and costly. Even a strike launched from Missouri depended on positions held in advance: during the eighteen-hour flight the bombers completed multiple in-flight refuellings, supported by what the Chairman of the Joint Chiefs of Staff described as "dozens and dozens of air refueling tankers" (Caine, 2025). *Lage* did not vanish, it moved from the launch point into the logistical network. Political space, for its part, did not stop the strike but registered it. Among the states that questioned the legality of the strikes, Iraq objected to "repeated violations of Iraq's airspace as breaches of its sovereignty and the UN Charter" (Galbraith, 2025, p. 800, note 32). When Iran responded with a strike on the American base in Qatar, Qatar invoked the same principle: "Qatar objected strongly to this 'blatant violation of the sovereignty and airspace of … Qatar, international law and the Charter of the United Nations'" (Galbraith, 2025, p. 804). A distinction should be drawn here between sovereignty as a legal-political principle and the actual capacity to control airspace: the objections of Iraq and Qatar show that the principle is invoked precisely when actual control has been overridden. In 2025 such objections raised the political cost of the operation without preventing it. Access to foreign territory is nevertheless neither automatic nor unconditional. Lesser (2026, p. 41) observes: "The U.S. has been accustomed to more or less unfettered access to European

bases and the ability to overfly allied territory as needed to support routine operations in the Middle East." In the war of 2026, which the United States waged as Operation Epic Fury, this habit proved to be conditional: "As noted above, European allies have grown increasingly reluctant to provide operational support for Operation Epic Fury" (Lesser, 2026, p. 41). Physical geography may be losing some of its value, but the political geography of sovereignty, airspace and alliances retains its own: not as a barrier that technology cannot cross, but as a set of conditions that determine the political price of crossing it.

Technology also has limits. The depth of one of the facilities exceeded the capabilities of even the most powerful weapons: "The third nuclear facility, Isfahan, was targeted with submarine-launched missiles focused only on inflicting surface-level damage, reportedly because the site's considerable depth would have thwarted even bunker buster bombs" (Galbraith, 2025, p. 800). In 2026, the Strait of Hormuz confirmed the same duality elsewhere: the ocean can be overflown, but a strait, and whoever controls it, can choke the global geoeconomy. Bassou (2026, p. 19) draws the broader conclusion: "Yet the conflict has also revealed something more subtle: overwhelming tactical and technological superiority can coexist with a structural strategic inability to translate that superiority into political outcomes." Geography in politics is thus at once defeated and invincible: the same technology that shrinks the world comes to a halt at the height of a mountain and the width of a strait.

TRUMP 2.0: TERRITORY IN THE RHETORIC OF THE HEGEMON

Trump's second term moved the territorial logic from the periphery of the system to its centre. Anglițoiu (2026) writes: "However, the second term of the Trump Administration brought forth a multitude of postulates, initiatives and expectations of geostrategic essence, which revived the realist perspective that geopolitics is expansionism by other means." Greenland is the clearest example. Paul (2026) recalls that the idea is an old one: "The acquisition of Greenland has repeatedly been a topic of discussion within US government circles since the 19th century." What is new is its persistence and its consequences for the Alliance: "For their part, the Danish intelligence services have responded by identifying the United States, for the first time ever, as a potential threat to the security of the Kingdom since Washington is no longer ruling out the use of military force even against allies" (Paul, 2026). The practical register is explicit: asked in January 2025 whether he would rule out military or economic coercion to gain control of Greenland and the Panama Canal, the president-elect declined to do so, saying that the United States needed them "for economic security" (Breuninger, 2025).

A proposal for the integration of Greenland with the United States, published in *Strategic Horizons*, a publication of the US Northern Command, with a note that the views expressed are the author's own, explicitly rejects the interpretation of annexation: "At its core, this proposal is not about annexation, coercion, or imperial ambition - it is about offering Greenlanders a clear, compelling, and pragmatic choice"

(Gunasekara-Rockwell, 2025). Read as a text of formal geopolitics, such a disavowal recalls a rhetorical maneuver familiar from the history of the discipline, in which the name of a practice is distanced from its content. Paul (2026) offers two interpretations. The first is personal: Trump may simply see the island as the largest real-estate deal of his life. The second is structural: "On the other hand, the bid for Greenland makes sense if the geostrategic objective of the Trump administration is to establish a US-controlled North American hemisphere protected by a comprehensive defence system ('Golden Dome')." A broader hemispheric logic, extending beyond North America, took military form in Venezuela, where on 3 January 2026 US forces seized Nicolás Maduro in Caracas and took him to New York to stand trial (Curtis, 2026). In the forum cited in section 2, the operation is read as the emergence of a "Donroe Doctrine" (Sharp, in Agnew et al., 2026) and as a form of new imperialism (Flint, in Agnew et al., 2026). Venezuela, however, is a case of intervention within a hemispheric sphere, not of territorial appropriation. It belongs to the logic of spheres of influence than to that of annexation.

The hemispheric logic also has a doctrinal text. The National Security Strategy released in December 2025 announces a "Trump Corollary" to the Monroe Doctrine, commits the United States to restoring its preeminence in the Western Hemisphere and to denying "non-Hemispheric competitors" the ability to position forces there or to own or control strategically vital assets in the hemisphere (The White House, 2025). It is a text of practical geopolitics in the strict sense, and section 9 reads it as a geopolitical code.

Bados Nieto (2026) describes the mechanism with the tools of critical geopolitics and securitisation theory and reaches for the vocabulary of Geopolitik: "From this perspective, Greenland is presented as a 'vital' space, Haushofer's contemporary Lebensraum, whose eventual loss of control would alter maritime routes, national defence capabilities and the strategic balance with China and Russia, reproducing a preventive logic that shifts the traditional threshold of war." The analogy is polemical but telling: the concept that after 1945 came to embody the stigma of the discipline is once again being used in scholarly analysis, albeit as critique. The logic of spheres of influence is thus returning from three directions: NATO (2023) attributes it to Russia, Bados Nieto (2026) to the United States, and part of the literature applies it to China (Mileski et al., 2023). From the standpoint of classical geopolitics, Sloan (2026) criticises precisely this policy: "This is complicated by the Trump administration's inability to recognize the opportunities and restraints of a closed international political system where geography is not political destiny." Even the advocates of classical geopolitics, then, do not read it as a licence for territorial expansion.

Critical scholars of geopolitics reach the same conclusion from the opposite direction. For Preciado Coronado (in Agnew et al., 2026), Trumpism speaks the language of realism but does not practise it: strategy gives way to coercion backed by only thin consent. Sharp (in Agnew et al., 2026) notes that the classical ring of "America First" does not extend to Trump's geopolitical economy. The same forum also diagnoses something stronger than a return of spheres of influence, namely the

erosion of the norm of territorial integrity, and from three directions at once. Jones (in Agnew et al., 2026) observes that all three great powers now treat territorial integrity as negotiable, in rhetoric or by force: the United States with its designs on the Panama Canal, Canada and Greenland, Russia in Georgia and Ukraine, and China in the South China Sea and in Bhutan, with Taiwan in view. Flint (in Agnew et al., 2026, p. 49) links Washington's wavering support for Ukraine and its readiness to accommodate Russia's territorial claims with Trump's own view that territory belongs to whoever is strong enough to take it, a view that in his reading also underlies the ambition to annex Greenland, and concludes: "The old geometry of territorial integrity seems to be no more." The two territorial cases of this article thus share a single logic, that of treating territorial integrity as negotiable, but they do not stand on the same rung. Table 1 distinguishes five rungs of territorial revisionism, from rhetorical and toponymic claims to annexation by force. The scale is the rung on which a state acts. Read in this way, the ladder also shows that the hegemon's territorial turn did not begin in 2025. In his first term, Trump recognised Israeli sovereignty over the Golan Heights and Moroccan sovereignty over Western Sahara (Proclamation No. 9852, 2019; Proclamation No. 10126, 2020): a lower rung than annexation, but one that already treats territory held by force as open to recognition. Whether that logic is new is a separate question. Flint reads Trump as announcing a new world order, a product of declining US hegemony and of the geopolitical transition it sets in motion. Sharp (in Agnew et al., 2026, p. 59) is more cautious: "Firstly, the 'post-liberal' Trump administration has abandoned the previous US emphasis on persuasion, diplomacy and negotiation to a language of friends and foes, but this differs only in scale from George W Bush's insistence that post-2001, states were 'either with us or with the terrorists.'" The two readings are compatible with the argument of section 4 if the logic is distinguished from the norm and from the order: the logic is continuous, the norm is eroding and the order is in transition. In the case of the hegemon, what is new is not the logic but the rung on which it is now practised, and the fact that it is practised by the state that led the defence of the norm in 1990–1991.

Trump's second term also shows the merger of registers announced in section 2. Territorial claims are made not only in strategy documents but in names and maps. On his first day in office, the president ordered that the Gulf of Mexico be renamed the Gulf of America, describing it as "an indelible part of America" (Executive Order No. 14172, 2025). Within weeks the new name appeared on Google Maps for users in the United States, and the White House barred an Associated Press reporter from the Oval Office because the agency kept the old name in its style guidance (Nilsson-Julien, 2025). An executive order, an act of practical geopolitics, was enforced through a digital map and through access to the press, that is, through the channels of popular geopolitics. Toponymy is one of the oldest political-geographical acts, and here it shows practical and popular geopolitics merging in a way that can be described only if the two registers are first kept apart. The repeated description of Canada as a potential "51st state" (Breuninger, 2025) belongs to the same register: rhetoric that costs nothing to utter but turns the territorial integrity of an ally into a topic of conversation.

Table 1. A ladder of territorial revisionism

Rung	Form	Examples
1	Rhetorical, toponymic and cartographic claims	Renaming of the Gulf of Mexico (2025); Canada as a "51st state" (2025)
2	Coercive pressure without the use of force	Greenland and the Panama Canal: refusal to rule out coercion (2025)
3	Intervention within a sphere of influence, without annexation	Capture of Nicolás Maduro in Caracas (2026)
4	Recognition of territory acquired or held by force	US recognition of Israeli sovereignty over the Golan Heights (2019) and of Moroccan sovereignty over Western Sahara (2020)
5	Annexation by force	Kuwait by Iraq (1990); Crimea (2014); Donetsk, Luhansk, Zaporizhzhia and Kherson (2022)

Source: author's own compilation from the sources cited in sections 3, 4 and 8.

WHAT IS RETURNING, AND WHO SPEAKS FOR GEOGRAPHY?

The world after 2022 is a world of open questions: relations between the United States and the European Union, the position of the United States in NATO, the role of China, the future of Iran and the Middle East, and the future of Ukraine and Russia. Alliances persist, but without a common direction. Belhaj (2026, p. 23) writes: "They operate instead as flexible, interest-driven arrangements, what might be termed alliances without alignment." Contemporary conflicts also call into question the third assumption reconstructed by Sloan, namely that economic interdependence necessarily produces political stability. Belhaj (2026, p. 34) concludes: "Interdependence is no longer always stabilizing. And vulnerability is no longer just a weakness - it can also be a source of power."

In this context, three things need to be distinguished. Geopolitics is returning as a practice: states are again thinking in terms of territory, spheres of influence, strategic locations and chokepoints. Geopolitics is also returning as a discourse: the word geopolitics is once again everywhere. Agnew (2026, p. 41) observes: "Newspaper headlines and social media feeds announce the 'geopolitics of this' and 'the geopolitics of that.'" Flint (in Agnew et al., 2026) adds that this proliferation obscures rather than clarifies the nature of the changes under way. The proliferation can be measured. In OpenAlex (Priem et al., 2022), the number of works with "geopolitics" in the title rose from 31 in 1990 to 297 in 2010, 670 in 2022 and 1,363 in 2025, relative to all indexed works, this is a rise from about 15 to about 93 per million, with marked jumps in 2014 and in 2024-2025 (author's calculation; data retrieved on 21 August 2026). But the return of the practice and of the word is not the same as a return of the discipline's voice. Megoran (2010, p. 188) warns that critical geopolitics was

complacent in believing that it had defeated classical geopolitics: "However, I suggest it bespeaks complacency that the successful institutionalisation of critical geopolitics in geography departments has vanquished neo/classical geopolitics." Neoclassical geopolitics shares with classical geopolitics a realist understanding of international relations, political conservatism, the ambition to advise politicians and a propensity for dramatisation, generalisation and simplification, and for this very reason the old arguments against classical geopolitics are not sufficient to refute it (Megoran, 2010). The opposite pole of the debate is represented by Haverluk et al. (2014), who argue that critical geopoliticians, by defining themselves against geopolitics, cartography and environmental explanation, have limited their own influence: "We argue for a more holistic, neo-classical geopolitics." Megoran asks political geography to engage neoclassical geopolitics critically, while Haverluk et al. ask it to compete with neoclassical geopolitics on its own ground. Both, in different ways, register the same gap: the discipline's voice in public debate on geopolitics is weaker than its institutional position in geography departments would suggest.

The events after 2022 show that tools for reading them are available within political geography, in both its classical and its critical wing, even though much of the current debate is conducted outside the discipline. The corpus of this article illustrates the point: of the analyses of the events of 2014–2026 cited here, only the 2026 forum (Agnew et al., 2026) appeared in a journal of political geography and geopolitics, while the others were published in journals of international relations, security studies, international law, media and area studies, by think tanks, or as web commentary. The discipline has, however, begun to respond, as the 2026 forum cited above shows: twelve scholars, most of them political geographers, discuss whether Trump is an anomaly or the herald of a new geopolitical order (Agnew et al., 2026). The concept of the geopolitical code, developed by the political geographer Taylor, describes the logic of states that are returning to territory (Taylor, 1993, p. 64, as cited in Mileski et al., 2023):

> The geopolitical code is the result of practical geopolitical thinking. It contains a set of political-geographic assumptions that support the state's foreign policy. The geopolitical code includes the definition of national interests, identifying external threats to those interests, the planned response to those threats, and the justification of such response.

The concept of the geopolitical order, in turn, encompasses the organisation of space as a whole (Agnew & Corbridge, 1995; Mileski et al., 2023). Bados Nieto's analysis of securitisation, in which a geographical issue becomes a security necessity, is essentially critical-geopolitical. Belhaj's distinction between sovereignty and circulation addresses a classic political-geographical question about the nature of space. The question, therefore, is not whether geography matters again, because that much is obvious. The question is which political geography will interpret it.

Megoran (2010) draws a historical parallel with the first return of geopolitics, in the 1980s. Geographical scholarship then responded to Hepple's call (Hepple, 1986, as cited in Megoran, 2010) by examining both the traces of classical geopolitical thought and the rise of contemporary conservative geopolitics. The present revival, Megoran (2010, p. 188) argues, calls for the same response: "Kaplan's article likewise illustrates that we have both a disciplinary and a political duty to engage with the latest revival of classical geopolitics, that of neoclassical geopolitics."

Three tools of political geography are particularly relevant to this task. The first is the concept of territory and territoriality, which makes it possible to analyse Ukraine and Greenland not as exceptions but as cases of an ongoing contest over the control of space. The second is the pair of concepts of geopolitical code and geopolitical order, which link the assumptions of individual states to the organisation of space as a whole (Flint & Taylor, 2018). The third is the critical analysis of geopolitical discourse, which treats the revival of Mackinder and Spykman, and the vocabulary of vital space, spheres of influence and hemispheric defence, not as explanations but as objects of analysis. Together, they allow the discipline to take the return of territory seriously without reproducing the neoclassical reflex.

Read as geopolitical codes, that is, as statements of a state's interests, of the threats to them, of the planned response and of its justification, the 2025 US National Security Strategy and the 2023 Russian Foreign Policy Concept reveal something that the Heartland - Rimland reading cannot see. The Russian Concept defines Russia as "a unique country-civilization and a vast Eurasian and Euro-Pacific power" at the core of the "Russian world", names the near abroad as the main direction of its foreign policy and identifies the United States as the principal source of anti-Russian policy (Ministry of Foreign Affairs of the Russian Federation, 2023). The US Strategy announces that "after years of neglect" the United States will reassert and enforce the Monroe Doctrine, defines illegal migration, drug smuggling, cartels and the presence of "non-Hemispheric competitors" as the main threats in the hemisphere, and presents its response as a "Trump Corollary" to the doctrine (The White House, 2025). The two codes are structurally alike. Each defines a privileged sphere adjacent to the state, each justifies its claim to that sphere in historical or civilisational terms rather than in terms of international law, and each treats the presence of an outside power within the sphere as a threat in itself. A Heartland reading places Russia's claim at the centre of world politics and America's at its edge, in the outer or insular crescent (Mackinder, 1904). A code reading shows instead two codes that converge on the same geometry, a world of adjacent spheres, which is precisely the geometry the norm of territorial integrity was meant to replace.

The third tool can be shown in the same way. Table 2 sorts the four cases discussed in this article by register. Two observations follow. First, the classical frames of Heartland and Rimland appear almost exclusively in the formal register,

while practical geopolitics speaks the languages of history, identity, security and hemispheric doctrine. The neoclassical reflex is a translation of these languages into spatial formulas, not a description of how states reason. Second, the popular register is the least documented in the literature used here, although it is the register in which practical and popular geopolitics now merge. Far from being meaningless, as Sharp (in Agnew et al., 2026) suggests, the distinction between registers is what makes this merger visible.

Table 2. Four cases in the three registers of geopolitics

Case	Formal geopolitics	Practical geopolitics	Popular geopolitics
Ukraine	Heartland readings (Śliwiński, 2023; Sloan, 2026); NATO enlargement as cause (Mearsheimer, 2014)	"Historical unity" (Putin, 2021); annexation of four regions (2022); withdrawal as a precondition for talks (Putin, 2024)	Divergent framing in US, Chinese and South African newspapers (Akinboade et al., 2023)
Hormuz	Rimland readings (Ullah, 2026); "exposure became leverage" (Belhaj, 2026)	Iran's doctrine of asymmetric warfare (Sarkhosh pour et al., 2026); US naval blockade (Belhaj, 2026)	Not addressed in the sources used
Greenland and Canada	Integration proposal disavowing annexation (Gunasekara-Rockwell, 2025); "Lebensraum" as critique (Bados Nieto, 2026)	Refusal to rule out coercion (Breuninger, 2025); Danish threat assessment (Paul, 2026)	Canada as a "51st state" (Breuninger, 2025)
Venezuela and the hemisphere	"Donroe Doctrine" and new imperialism (Sharp and Flint, in Agnew et al., 2026)	"Trump Corollary" (The White House, 2025); capture of Maduro (Curtis, 2026)	Gulf of Mexico renamed, enforced through map platforms and press access (Nilsson-Julien, 2025)

Source: author's compilation. Registers after Ó Tuathail and Dalby, as summarised by Painter (2008, p. 65).

Taking the return of territory seriously also means specifying what exactly is returning. Agnew (2026, p. 46) acknowledges that territorial geopolitics is reviving almost everywhere, but immediately qualifies the observation: "Persisting global strategic interdependence, however, in terms of global capital flows, trade, migrant flows, and financial connectivity, undermines the case for the emergence of a singular geometry of global power based entirely on inter-imperial rivalry and spheres of influence." Territory returns alongside flows, not instead of them, which corresponds

to the two strands identified in this article. Okunev (in Agnew et al., 2026) goes further: "The construction of walls and the introduction of duties are, perhaps, not so much a return to the 19th century as the agony of a departing territorial model." Whichever reading prevails, the return of territory is not the restoration of a territorial world. This is precisely why it calls for political geography rather than for the neoclassical reflex, which recognises only one geometry of power.

THE SHAPE OF POLITICAL GEOGRAPHY TO COME

If political geography is to speak for geography in the return of geopolitics, four lines of research follow from the argument of this article. The first is the political geography of chokepoints, corridors and logistical networks, the *Lage* of power, where control over flows replaces or accompanies the conquest of territory and where the vocabulary of weaponised interdependence (Farrell & Newman, 2019) can be given the spatial precision it often lacks. The second is the erosion of the norm of territorial integrity, traced not only in wars of annexation but on all the rungs of Table 1. The open question is at what point the accumulation of lower rungs, from renaming and recognition to coercion and intervention, changes the norm itself (Zacher, 2001). The third is toponymy and cartography in digital statecraft, where executive orders are enforced through map platforms and access to the press, and where practical and popular geopolitics merge in real time. The fourth is the perspective of small states and of the semi-periphery, for which the erosion of territorial integrity is not an abstract question of world order but a direct condition of existence. Seen from the Balkans, where the Kosovo precedent is still invoked from opposite sides, the return of territory is a return to familiar ground. In each case the task is the one Megoran (2010) assigned to the discipline: to engage the latest revival of classical geopolitics rather than to assume that it has been defeated.

CONCLUSION

Instead of a second "moribund backwater", the end of history produced a paradox: the more geography was declared irrelevant, the more it returned. According to Sloan (2026), Mackinder's own work has followed a trajectory resembling that of the discipline as a whole: "This has to be juxtaposed with the reality that his book has been subjected to a phoenix-like trajectory in the twentieth and twenty-first centuries." Mackinder himself noted this as early as 1942: "My book returns as a ghost revisiting a world in which it lived without much honour" (Weigert, 1942, pp. 135–136, as cited in Sloan, 2026).

The period after 1989 brought not an end but a continuity of the territorial and positional logics of power, while the norm of territorial integrity that constrained them is eroding. Russia's aggression against Ukraine, the war with Iran and the American rhetoric about Greenland have made this continuity visible in two strands: territory as an object of conquest and appropriation, and chokepoints and flows as instruments of power, *Raum* and *Lage*. This continuity extends to the hegemon itself, yet the return of territory it reveals is not the restoration of a territorial world: territory returns alongside flows, within a plurality of geometries of power (Agnew, 2026). Operation Midnight Hammer and the crisis in Hormuz show that technology can overcome physical distance, but that political space, rather than disappearing, sets the conditions and the price of crossing it. What returns first, is geopolitics as practice and discourse, and when it is written down, it is often written in neoclassical form, and mostly outside the discipline. This time, the pressure on political geography to speak comes not from within the discipline but from the events themselves.

Therefore, there is a need for political-geographical analysis without a guaranteed disciplinary ascent. Whether political geography will have a voice in interpreting the return of geopolitics depends on whether it can offer tools that go beyond neoclassical reflexes. Such tools exist in both its classical and its critical wing, and this article has put three of them to work: a ladder that separates the logic of territorial revisionism from its scale, a reading of geopolitical codes that reveals a convergence on a world of adjacent spheres, and a reading by register that shows the neoclassical reflex to be a translation of state languages into spatial formulas rather than a description of how states reason. The discipline cannot leave the interpretation of territory to others in a world in which territory, borders and chokepoints are once again objects of war and appropriation. Its response will show whether it has learned from its own history, whether it will cede the field to the neoclassical reflex or subject that reflex to analysis together with the geopolitical narratives themselves.

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SCHRÖDINGER'S DUCK: POLITICAL GEOGRAPHY OBSERVED FROM NORTH MACEDONIA

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ABSTRACT

This article rethinks how the condition of political geography should be viewed: not as a single verdict but as a profile across three dimensions, institutional, intellectual and societal, observed from a specific place, in this case North Macedonia. To this end, it asks what the discipline is, how it developed as an academic subdiscipline and what condition it is in today. Its framing device is Schrödinger's thought experiment, in which the cat is replaced by the duck from Muir's question "dead duck or phoenix?": the condition of the discipline is not given in itself but depends on where and when it is observed. Drawing on Western and regional literature, the article advances three theses. First, the post-war stagnation of the discipline cannot be reduced to the stigma of German Geopolitik - the stigma fell upon a discipline with weak theoretical foundations and led to a self-imposed depoliticisation. Second, the revival did not primarily follow the quantitative route anticipated by its contemporary diagnosticians but was associated with a repoliticisation of geographical inquiry. Third, in North Macedonia political geography was institutionalised decades after Zagreb and Belgrade, although the Macedonian space has long been an object of political-geographical interest. The evidence points to the domestic institutional context rather than to the stigma shared by the entire Yugoslav space.

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Keywords: political geography; history of the discipline; institutionalisation; Geopolitik; post-Yugoslav space; North Macedonia

INTRODUCTION

Political geography is a long-established subdiscipline of human geography, yet the question of what it actually studies remain open. Painter and Jeffrey (2009, p. 16)

observe that, despite its well-developed institutional infrastructure, the discipline lacks a generally accepted definition: "Despite its journals, textbooks and courses, there is no universally accepted definition of the field of inquiry called 'Political Geography'." At the beginning of the 21st century, the question also acquired an existential tone. Herb (2008, p. 21), writing about a 2003 forum in *Political Geography* (Cox & Low, 2003), formulates it as follows: "If, as a recent academic forum showed, the political is alive and well in all of geography, does this not question the continued relevance and validity of having a separate sub-field of political geography?"

The same author (Herb, 2008, p. 21) also points to a way towards an answer: "The most fruitful response to such existential questions about academic subdisciplines is delving into the past and tracing the genesis of the subject." This article follows that path but starts from an additional premise: the definition and the history of political geography are two sides of the same problem. The history of political geography is also a history of changing attempts to define its object.

The framing of the article draws on three images. The first is the thought experiment that Erwin Schrödinger devised in 1935 as an objection to the Copenhagen interpretation of quantum mechanics (Matthias, 2026). The *Encyclopaedia Britannica* describes its essence as follows: "Schrödinger's cat argues that, in the Copenhagen interpretation, until an observer opens the box and reveals the cat's fate, the cat is both alive and dead - a state described as a 'superposition'" (Matthias, 2026). The second image is the question with which Muir (1976) opened the debate on the future of the discipline in the mid-1970s: "Dead duck or phoenix?" The third is Berry's 1969 diagnosis (as cited in Jones et al., 2004, p. 8) of political geography as a "moribund backwater" of geography, from which, according to the title of Johnston's (2001) article, the discipline subsequently emerged. In the title, Schrödinger's cat is replaced by Muir's duck, and this is more than a play on words because the history of the discipline had already supplied its own animal.

The metaphor is used here with the caution that Schrödinger himself called for: "The point, Schrödinger wrote, was that this 'ridiculous' scenario should discourage us from 'naively accepting as valid a "blurred model"' of reality" (Gershon, 2023). Superposition is therefore not treated as a finding but as a warning against judging the discipline as a whole, without time or space. The metaphor is thus used as a heuristic, not as an analogy with quantum mechanics: it does not claim that the discipline is in any physical sense indeterminate, only that a judgement about its condition remains indeterminate until the point of observation has been specified. Monte-Serrat et al. (2020) describe the moment of observation: "However, when someone looks inside the box, they see the cat 'alive or dead', not a paradox of an 'alive and dead' cat." Viewed as a whole, political geography appears simultaneously a dead duck and a phoenix; observed from a specific place and time, and in a specific dimension, its condition becomes determinate. Political geography, a discipline of place, must therefore be observed from somewhere, in this case from North Macedonia.

The article advances three theses. The first concerns the causes of the stagnation of political geography after the Second World War. The usual explanation, the

discrediting of the discipline through German *Geopolitik*, is correct but incomplete: the stigma fell upon a discipline with weak theoretical foundations and a tendency to avoid controversy, and it led to a self-imposed depoliticisation of the field, so a "political" geography that takes the state as given, without reflecting on its own politics, also loses its own object. The second thesis concerns the revival. The revival did not primarily follow the route anticipated by its contemporary diagnosticians, that of quantification, which marked only its first and limited wave, but was to a considerable extent associated with repoliticisation. These two theses are presented as a synthesis of the Anglophone literature, above all of Muir, Johnston, Herb, Jones et al. and Agnew, rather than as new claims; they serve as the baseline against which the regional case is read. The third thesis is that the condition of the discipline is not universal but depends on the place from which it is observed. In Skopje, political geography was institutionalised only in 2006, decades after Zagreb and Belgrade, even though the stigma of *Geopolitik* was shared by the entire Yugoslav space and Macedonia has been an object of political-geographical interest for more than a century. The available evidence points more strongly to the domestic institutional context than to the shared stigma.

Methodologically, the article is a critical literature review with a regional case study. Sections 2-4 are based mainly on a reading of key Western/Anglophone textbooks, handbooks and review articles published between 1975 and 2009 and of key articles on the state of the discipline (Muir, 1976; Johnston, 2001). Section 5 is a comparative review of the institutionalisation of the discipline in Belgrade, Zagreb, Ljubljana and Skopje, based on the regional literature in Croatian, Serbian, Slovene and Macedonian. The "condition" of the discipline is not a single quantity. The article distinguishes three of its dimensions: institutional (departments, university courses, journals), intellectual (theoretical and research output) and societal relevance (the need for spatial analysis of political processes). A discipline can be institutionally weak, intellectually productive and socially needed at the same time, meaning that these dimensions develop unevenly, and this is the precise sense in which the condition of the discipline depends on the point of observation. In the terms of the title, opening the box means choosing a place and a dimension. Section 5 does this for four centres, and Table 1 (Section 5.4) summarises the result by uniform thresholds of institutionalisation and by the three dimensions.

WHAT IS POLITICAL GEOGRAPHY?

The shortest definition is the one that Agnew (2002, p. 1) calls the commonsense one: "The commonsense meaning of political geography is the study of how politics is informed by geography." For a long time, according to Agnew, this meant an attempt to show how the physical features of the Earth influenced the division of the world into states and empires; today geography also encompasses social and economic differences between places, while politics has expanded to questions of political identity and political movements (Agnew, 2002, p. 1). The direction of the

relationship between the two components, however, is not unambiguous. Traditional, state-centred political geography saw it as two-way (East & Prescott, 1975). Muir (1981), in the second edition of a book first published in 1975, registers a shift away from the influence of geography on politics: "Consequently modern political geography has drifted in the direction of studying politics as an agent involved in landscape change, though good studies of the reverse relationship will always be welcomed."

The definitions of political geography follow the development of wider geographical thought, from the state and territorial units, through political processes, to territory and territoriality and to an understanding of the discipline as discourse. Jones et al. (2004, p. 2) distinguish four approaches to defining the field. The first defines it through political territorial units, borders and administrative subdivisions. Its best-known example is Hartshorne's definition, about which Muir (1981) writes: "The most frequently quoted definition of political geography was provided in 1954 by Hartshorne, who described the subject as 'the study of the areal differences and similarities in political character as an interrelated part of the total complex of areal differences and similarities'." The second defines the field through political processes, in the spirit of Cohen and Rosenthal (1971, as cited in Muir, 1981): "Political geography is concerned with the spatial attributes of political process." The third defines it through key concepts, above all territory and territoriality. For Cox (2002, p. 30), territory and territoriality, which bring together space and power, form the core of the discipline. For Johnston (2001), territoriality is precisely what distinguishes political geography from the rest of human geography.

The common problem of these definitions is the attempt to establish the "essence" of the discipline. Painter and Jeffrey (2009, pp. 15–16) propose instead that political geography be understood both as an institutionalised subdiscipline and as a discourse, and Jones et al. (2004, p. 2) add: "Yet political geography as it is actually researched and taught is much messier than these essentialist definitions suggest." The fourth, open approach therefore treats political geography as a field with dynamic boundaries. Jones et al. (2004, p. 3) express this with a metaphor fitting for the discipline itself: "Political geography has frontier zones, not borders." Muir (1997) had already registered the change of climate: "If we have not yet reached a point when all can simply accept that 'political geography is what political geographers do' at least there is a far broader toleration of diversity." The regional literature describes these frontier zones from within. Zupančič (2024, p. 71) writes: "The working fields of political geography lie rather at the edge of the established idea of the 'geographical': minorities, political borders, elections and electoral behaviour, administrative organisation and the subdivision of state territories simply do not look like the subject matter of geography."

For the purposes of this article, political geography is understood as a field of research into the mutual relations between power and politics, on the one hand, and space, place and territory, on the other (Jones et al., 2004, pp. 2–3). The criterion for belonging to the field is analytical rather than thematic. Muir (1981) writes: "Studies in political geography should clearly demonstrate the spatial causes and effects of

political processes; if neither of these are apparent, the subject is not a political-geographical one." This definition is operational rather than essentialist: it delimits the scope of the analysis, not the essence of the discipline. In Section 5.6 it is applied to the political-geographical research conducted in North Macedonia outside geography.

ASCENT, STIGMA AND STAGNATION

The Era of Ascent

Histories of political geography usually follow the same scheme: an era of ascent from the late nineteenth century to the Second World War, an era of marginalisation from the 1940s to the 1970s and an era of revival from the late 1970s (Jones et al., 2004, p. 4). In what follows, this periodisation is used only as a chronological framework, since such evolutionary accounts tend to present the history of a discipline as a story of progress (Herb, 2008, p. 21). As an analytical lens, the article uses Herb's (2008, p. 22) typology, which concerns the relationship of political geographers to the state: "Historically, political geographers have engaged with the state in three ways: they have sought to facilitate the process of maximizing its power over space; to maintain and manage its territorial existence; and to actively resist and question its spatially manifested actions." The three traditions, advocacy, governance and critique, correspond largely to the right, the centre and the left of the political spectrum (Herb, 2008, p. 23).

The academic history of the subdiscipline is usually associated with Friedrich Ratzel and his *Politische Geographie* of 1897 (Agnew, 2002, p. 13). With Ratzel, the state became the central object of geography, conceived as a living organism that requires a certain living space, *Lebensraum* (Jones et al., 2004, pp. 4-7). Gallaher et al. (2009, p. 1) state: "The development of modern political geography was intimately connected with the colonial project (Peet 1985)." It is in this context that the term geopolitics appears, coined by the Swedish political scientist Rudolf Kjellén in 1899 to denote the use of geographical knowledge in the service of particular national states (Agnew, 2002, p. 15). At the same time, in Britain, Halford Mackinder published his 1904 article "The Geographical Pivot of History"; the term heartland appears in his work only in 1919, in *Democratic Ideals and Reality* (Jones et al., 2004, pp. 4-7). Herb (2008) stresses the political function of these works: "There was a clear political dimension to these works and they made the discipline indispensable for the scientific justification of territorial conquest."

Geopolitik and the Discrediting of the Discipline

A distinction is needed here. German *Geopolitik* was a historically specific school of the interwar period. Classical geopolitics is a broader intellectual and practical tradition that includes both Mackinder and Spykman. Critical geopolitics is a later

problematisation of both. The most serious blow to the discipline came from German *Geopolitik*. In the interwar period, a network of German geographers and nationalists around Karl Haushofer and the journal *Zeitschrift für Geopolitik* (founded in 1924) used the ideas of Ratzel and Mackinder, suggestive cartography and the concept of *Lebensraum* as a scientific weapon for the German revisionist cause (Herb, 2008; Jones et al., 2004, pp. 4–7). Although *Geopolitik* differed from National Socialist ideology in attributing decisive influence to the natural environment rather than to race, abroad it came to be viewed as synonymous with Nazi imperialism (Herb, 2008). Jones et al. (2004, p. 7) summarise the consequences: "The misadventures of *Geopolitik* inextricably associated political geography with the brutality and racism of the Nazi regime and led to its discrediting as a serious academic pursuit."

After the war, political geographers reacted with a strict demarcation, which Herb (2008) describes as a rhetorical manoeuvre: works with geo-deterministic explanations and political motives were branded as geopolitics and pushed out of academic geography, while the label political geography was kept for studies regarded as objective and neutral. Herb (2008) concludes: "Academic work in political geography shifted wholesale into the tradition of governance." The intellectual expression of this shift was Hartshorne's functional approach (Hartshorne, 1950, as cited in Jones et al., 2004, pp. 7-8), whose aim was to depoliticise the discipline: political geography was to describe the internal dynamics and external functions of the state rather than to shape political strategy (Jones et al., 2004, pp. 7-8). In this tradition, as Herb (2008, p. 22) puts it: "The state is viewed as a given and its existence is not problematized." Depoliticisation, in the sense used in this article, therefore did not mean the absence of politics but the naturalisation of the state: a position in favour of the territorial status quo, presented as neutrality.

The consequences were visible for decades, and Short (1993, pp. 1-2) gives the sharpest formulation: "Geo-politics became discredited and political geography became an ossified subdiscipline of a tired subject, often taught, never researched, a prisoner to outdated theories." When geography underwent the quantitative revolution, political geography remained on the sidelines: with the exception of elections, its subject matter offered little to the search for spatial laws (Agnew, 2002, p. 100; Short, 1993, pp. 1–2). The picture of marginalisation is completed by two frequently cited findings, which Jones et al. (2004, p. 8) present together:

> Berry (1969) famously described it as 'that moribund backwater' and by the mid-1970s Muir (1976) found that political geography was taught in only half of Britain's university geography departments, with over two-thirds of heads of geography departments considering that the development of political geography literature was unsatisfactory compared with other branches of geography.

Geopolitik: Cause or Excuse?

The standard explanation of the marginalisation lays the blame on *Geopolitik*. Muir (1976) already judged it insufficient, since in his view the difference between the two was clear to anyone familiar with both. The German geopolitician Otto Maull

himself had formulated it (as cited in Muir, 1981): "*Geopolitik* is concerned with the spatial requirements of a state while political geography examines only its spatial conditions." In Muir's view, the greatest weakness lay elsewhere (Muir, 1976): "The greatest weakness of modern political geography concerns its theoretical basis; too many notions which have become entrenched as fundamental political-geographical concepts remain ambiguous, subjective and improperly tested." He also points to a disciplinary disposition (Muir, 1976): "Geographers as a whole may be a reticent and conservative breed possessed of an affinity for the uncontroversial which may sometimes lead them away from deserving cases for study, and from political geography in particular."

In the second edition of his book, Muir (1981) goes even further: "As the years go by, the geopolitical explanation appears more as an excuse than a cause, and other fields of study have survived misapplications of their knowledge." Physics, chemistry and biology made far more serious contributions to military purposes, and yet they did not lose their legitimacy. Muir (1976, p. 200) sums up his diagnosis as follows: "The reaction against *Geopolitik* was a serious setback to the development of political geography, but the subsequent resurgence of the branch was delayed by more deeply rooted deficiencies of theory and techniques."

In the synthesis proposed here, derived from Muir, Herb, Jones et al. and Agnew, the stigma of *Geopolitik*, the deeper theoretical weaknesses and the disciplinary tendency to avoid controversy are not alternatives but parts of the same mechanism. The weight of the additional factor should not be overstated: Muir (1976) himself considers it secondary, although twenty years later he describes the then predominantly conservative disciplinary establishment as hostile to any potentially controversial expression of political views (Muir, 1997). The stigma prompted political geographers to purge the discipline of any political engagement (Herb, 2008). Jones et al. (2004, p. 8) describe the consequence: "Moreover, fear of the sub-discipline's past made political geographers wary of modelling and theorising, such that research remained essentially descriptive and empirically driven." Depoliticisation, in turn, hollowed out the object of the discipline: a "political" geography that takes the state as given and does not theorise it cannot clearly say what distinguishes it from political science. If this interpretation is correct, a way out of the crisis could hardly have come from the methodological refinement of a depoliticised discipline, but above all from its repoliticisation.

REVIVAL AND ITS PARADOXES

Repoliticisation from the Margins

In this article, repoliticisation refers to two related processes: the extension of the object of research to relations of power, political conflicts and informal political processes, and the theoretical reconsideration of the discipline's earlier claim to neutrality. Defined in this way, repoliticisation is a change in research practice, and it

must be distinguished from institutional revival (journals, university courses, the place of the discipline within geography), which is the outcome to be explained. Agnew (2002, p. 87) links the revival to the erosion of the Cold War consensus under the influence of the civil rights struggle and the Vietnam War, as well as to generational change. Jones et al. (2004, p. 8) connect it with two parallel processes, the reintroduction of theory into political geography and the political turn in geography in general, and points: "Significantly, neither resulted from developments in the established mainstream of political geography, but rather reflected innovation at the fringes of political geography, producing research clusters which eventually came to eclipse the old-style 'functional approach'."

Where exactly the impulses came from remains contested. Blacksell (2006, p. 8) and Jones et al. (2004, pp. 8–10) argue that economic, social and urban geographers were the first to bring political conflict into their explanations, whereas Johnston (2001) argues that the take-off of political geography from the late 1970s was largely independent of trends in economic and social geography. The two views agree on a negative conclusion, which is more secure than any causal one: the revival did not come from established, functional political geography. Agnew (2002, p. 88) structures it in three intellectual waves: spatial analysis, then radical political economy in the 1970s and 1980s, and postmodern approaches from the late 1980s. The quantitative approach, associated above all with electoral geography, was thus part of the revival, but only as its first and limited wave (Agnew, 2002, p. 102; Jones et al., 2004, pp. 8-10). Institutional consolidation followed intellectual transformation: in 1982 the journal *Political Geography Quarterly* (later *Political Geography*) began publication, and in the 1990s it was joined by *Geopolitics* and *Space and Polity* (Short, 1993, pp. 1–2; Sidaway, 2008, p. 42).

Forecast and Outcome

The history of the revival can also be read through the forecasts of its contemporary diagnosticians. Berry's remark about the moribund backwater was made in a review of a quantitative study of international relations, and his goal was to draw political geography into the quantitative revolution (Johnston, 2001). Muir (1981) similarly sought the solution in borrowing from political science and in quantification, and predicted: "Present indications are that the rehabilitation and revitalisation of political geography will take place during the next ten years or so, mainly through the judicious adoption and creation of more accurate techniques of measurement and analysis." Sixteen years later, the same author notes that the forecast had come true as regards timing, but not as regards mechanism, and implicitly revises his earlier position (Muir, 1997): "Now, however, and in keeping with most current practice, I have felt no obligation to impose a quantitative dimension: this book is very largely a positivist desert; an equation-free zone." Johnston (2001) generalises the same finding: "Political geography did soon emerge from the moribund backwater to which Berry consigned it, especially from the mid-1970s onwards, but undoubtedly not in the form he anticipated."

The subsequent trajectory suggests that the rehabilitation of political geography depended less on the methodological refinement of a depoliticised discipline than on a broader repoliticisation of geographical inquiry: political economy, critical geopolitics, feminism and cultural politics. This is consistent with the first thesis: if stagnation was associated with depoliticisation, the way out was associated with its opposite. Muir (1997) registers precisely this change:

> Gone then are the days when it was assumed if unstated that geographical writing should be politically neutral and preferably apolitical - the discipline's (largely conservative) establishment being hostile to any potentially disruptive or controversial expression of political outlooks or moral beliefs: human sentiment should not intrude upon the study of humanity. During the last two or three decades these unrealistic constraints have largely been abandoned.

The Paradox of Success

The revival brought a new problem. Contemporary political geography has expanded both its scales of analysis, from the local to the supranational, and its very notion of the political (Gallaher et al., 2009, p. 1; Jones et al., 2004, p. 14). Jones et al. (2004, pp. 14-16) formulate the danger: "However, the danger of this transformation is that 'political geography' may become devalued by its very ubiquity - if everything is 'political' then it could follow that all geography is 'political geography'." Much political-geographical research today is conducted by cultural, social, economic and historical geographers, political scientists, sociologists and scholars of international relations (Jones et al., 2004, p. 16). This is the paradox formulated by Flint (2003, as cited in Jones et al., 2004, p. 16): political geography is institutionally healthy but lacks coherence and a clear direction. Of the three paths opened by the debate of the early 2000s, concentration, expansion and engagement, the third includes links with the political geographies produced outside the Anglo-American setting (Jones et al., 2004, p. 16).

This raises a question that is underrepresented in the canonical Anglophone histories of the discipline examined here: the discipline's own geography. Sidaway (2008, p. 42) recalls the criticism voiced by Perry in the late 1980s: "Writing a few years after the establishment of the journal Political Geography, Perry (1987: 6) claimed that 'Anglo-American political geography poses and pursues a limited and impoverished version of the discipline, largely ignoring the political concerns of four fifths of humankind'." Herb (2008, p. 34) suggests that, having broken out of an excessively state-centred view, the discipline now needs to transcend the barriers of language and ideology. For smaller, non-Anglophone academic communities, access to the discipline passes through the English language, and their contribution depends on whether local political-geographical questions are articulated in a way that is intelligible and relevant beyond the local setting. The next section applies this perspective to the (post)Yugoslav and Macedonian space.

STARLIGHT: POLITICAL GEOGRAPHY IN THE (POST)YUGOSLAV AND MACEDONIAN SPACE

A Light delayed

Every look at the stars is a look into the past. Light from the Sun takes about 8.3 minutes to reach the Earth, and light from the nearest star after the Sun about 4.3 years (NASA Space Place, n.d.). In astronomy this interval is called lookback time: the time that light from a distant object needs to reach the Earth (Oxford Reference, n.d.). The image we see is simultaneously present and past: we see it now, but it shows a state that has since changed.

Political geography in North Macedonia can be read according to the same logic. When the course first appeared at the Institute of Geography in Skopje in 2006, the discipline had already passed through its own history worldwide: it had been declared a moribund backwater and had revived again (Johnston, 2001). In the neighbourhood it had been institutionalised earlier: in Zagreb and Belgrade by decades, in Ljubljana by about a decade. Here, however, the metaphor has a limit, and precisely this limit is instructive. Light carries an image of the past, whereas knowledge about the discipline arrives almost in real time, through the literature. What arrives late is not knowledge but the institution. The delay therefore tells us when political geography arrived, not what it is like: in Macedonia it appears after the revival of the discipline and can start from its contemporary condition. The delay has also been noted by the Macedonian geographical community. One year before the course was introduced, Mijalov (2005, p. 491) wrote: "Towards the end of the 1970s, political geography as an independent discipline went through a period of new ascent. On the other hand, political geography in the Republic of Macedonia is a forgotten geographical discipline, and the reasons for this are more subjective than objective."

In the regional context, the third thesis breaks down into three propositions. First, the stigma of German *Geopolitik*, shared by the entire Yugoslav space, cannot by itself explain the Macedonian delay, since it prevented neither the institutionalisation of the discipline in Belgrade and Zagreb nor political-geographical research in Ljubljana. Second, the delay is ironic, since Macedonia has been an object of political-geographical interest for more than a century. Third, the delay of the discipline does not mean a delay in research: political-geographical questions in Macedonia are investigated by other disciplines.

The Shared Legacy

The stigma of *Geopolitik* also weighed on the Yugoslav space. Zorko (2014) documents the post-war situation through the testimony of Radovan Pavić (1965b, as cited in Zorko, 2014), according to whom, in the years after the liberation, political geography and geopolitics were understood too one-sidedly, exclusively as a tool of the German policy of conquest, so that their discredited subject matter and outlook did not find a place in university curricula. The first, somewhat broader foundations

of political-geographical views were presented in the courses in anthropogeography at the Department of Geography of the University of Zagreb. Two decades later, Pavić (1987, p. 46) still explains the aversion to the discipline by the inherited odium of Nazi geopolitics.

The Macedonian literature shares this diagnosis and extends it with an ideological factor. According to Talevski and Mileski (2005), for fifty years geopolitics was not included in the multidisciplinary study of the Balkans, which allowed idealistic views to prevail, according to which diplomacy, politics, the economy and military strategy based on ideological premises could take the place of geopolitics and largely refute it; the disintegration of Yugoslavia and the armed conflicts that followed showed these views to be unfounded. These factors were common to the entire Yugoslav space and therefore cannot by themselves explain the difference between the republics. The stigma weighed on the discipline in both Zagreb and Belgrade, and there it was institutionalised decades before Skopje. In the Macedonian case, Muir's (1981) argument that the geopolitical explanation is more an excuse than a cause carries additional weight: the stigma was the same, but the outcome was different.

Three Centres, Two Paths

Institutionalisation followed different paths: in Belgrade and Ljubljana through geography, and in Zagreb through political science. Zupančič (2024, p. 71) offers a general explanation for such differences, which should not be read as a restatement of the third thesis of this article but as a different mechanism, the usefulness of the field to a particular state setting, and is treated in Section 5.4 as a third hypothesis: "Political geography differs considerably from country to country, which is explained as a reflection of efforts to make the branch useful and, at the same time, of its attachment to the political and historical experiences of managing space in a particular state setting." The comparison is limited to these three centres, for which the regional literature provides the most complete record, and it should be read with one caveat: the available sources record different thresholds of institutionalisation, from lectures and single courses to academic disciplines at faculty level. Table 1 in Section 5.4 therefore compares the centres by uniform thresholds, leaving open the cells for which the available sources provide no record.

The Belgrade tradition has the deepest roots. According to Grčić (2000, p. 71), Jovan Cvijić included lessons in political geography in his lectures on anthropogeography shortly after the appearance of Ratzel's *Politische Geographie*; his lectures of 1901, published in 1966 as *Opšta geografija - Antropogeografija* [General Geography - Anthropogeography], contain the chapter "Države - politička geografija" [States - Political Geography]. Cvijić is also a regional example of the tradition of advocating state power. Grčić (2000, p. 71) writes:

> From the beginning of his scholarly career he had in mind national unification and the restoration of the Serbian state, and he prepared himself for the tasks associated with it. […] In the works "Promatranja o etnografiji Makedonije"

> [Observations on the Ethnography of Macedonia] (1903) and "Geografske osnove makedonskog pitanja" [The Geographical Foundations of the Macedonian Question] (1916), he offered an original view of the Macedonian question and stressed the importance of the Morava–Vardar valley for the Serbian people and state.

Cvijić's treatment of the Macedonian question has been the subject of criticism in Macedonian scholarship, but what matters here is that Macedonia is present from the very beginning of regional political geography, but as its object rather than its subject. Academic institutionalisation in Belgrade, however, came late: political geography has existed as an academic discipline at the Faculty of Geography in Belgrade since the 1978/79 academic year (Grčić, 2000, p. 71).

In Zagreb, the beginnings lie in the courses in anthropogeography at the Department of Geography, but the permanent institutional home of the discipline became the Faculty of Political Science. Zupanc (2020, p. 98) writes: "He spent his working life at the Faculty of Political Science in Zagreb, where he taught political geography and geopolitics (1963-1993)." Klemenčić (2020), who extends Pavić's activity over four decades, until the end of the century, begins his tribute with the sentence: "Radovan Pavić was the founder of political geography in Croatia." The faculty also publishes the journal *Politička misao*, through which Zorko (2014) traces the development of political geography, geopolitics and geostrategy from 1964 to 2013. A similar model exists in Trieste, where political geography is cultivated within political science (Gosar, 2001).

In Ljubljana, the discipline's institutional home is the Department of Geography. There, however, political topics entered geography by a distinctive route. Zupančič (2024, p. 68) writes: "Distinctly political topics entered the Slovene geographical community through a social-geographical filter." Although Randall (1955, as cited in Zupančič, 2024) had already applied the term "political geography" to the Carinthian plebiscite, the term itself entered Slovene academic usage only in the late 1980s. The field was prepared by Klemenčič's social-geographical research on minorities and borders, was introduced into the geography curriculum in the 1990s and in 2001 acquired a textbook (Zupančič, 2024, pp. 67-70). Within the geographical path there are two variants: in Belgrade, an anthropogeographical and state-centred one; in Ljubljana, a social-geographical one, centred on minorities and borders. In Slovenia, the institutional rise of the discipline followed events more than theory. Zupančič (2024, pp. 69-70) describes the fast development of political geography there as above all an echo of the field's fast rise at a time of great geopolitical change, and adds: "Political topics entered the geographical context of thinking faster than theoretical thought about this branch matured." In 1993, Ljubljana hosted the annual conference of the IGU Commission on Population Geography, devoted to "Geography and Ethnicity" (Zupančič, 2024, p. 70). In 1996, the Commission on the World Political Map of the International Geographical Union (IGU) entrusted it with its conference for 2000, held in May 2000 in Gorizia and Portorož and organised together with the University of Trieste (Gosar, 2001). The state of the discipline is illustrated by a sentence from the preface to the proceedings (Gosar, 2001): "Around

30 students of the University of Ljubljana, for whom Political Geography is their field of study, took part in the meeting." The absence is also telling. Among the twenty countries from which the 86 scholars registered for the conference came, Macedonia is missing (Gosar, 2001), even though the programme explicitly included the Balkans (Gosar, 2001).

Macedonia: A Belated Discipline

The Institute of Geography at the Faculty of Natural Sciences and Mathematics in Skopje introduced Political geography in 2006, with the adoption of the Bologna Process and the European Credit Transfer System, as an elective course in the first cycle of studies [source: study programmes of the Institute of Geography]. The course was introduced, and taught until the 2021 academic year, by Professor Risto Mijalov, the author of numerous studies in political geography. With the accreditation of the Demography study programme in 2010, political geography acquired compulsory status for the first time at the Institute of Geography. It was later also introduced as an elective course in the second and third cycles of studies. Political geography is also part of the curricula of the Faculty of Philosophy, where Professor Toni Mileski works on the subject in teaching and research.

Table 1 places the Skopje case alongside the three neighbouring centres, using uniform thresholds of institutionalisation and the three dimensions of the discipline's condition distinguished in Section 1. Cells with a dash denote thresholds for which the available sources provide no record; they indicate where further research is needed, not that the threshold is absent. Even in this incomplete form, the table shows that the centres differ not only in the date of the first course but in the order in which the three dimensions developed: in Ljubljana the intellectual dimension preceded the institutional one, whereas in Skopje the societal relevance of political-geographical questions long ran ahead of both.

Table 1. Political geography in four centres: uniform thresholds of institutionalisation and three dimensions of the discipline's condition

Threshold / dimension	Belgrade	Zagreb	Ljubljana	Skopje
First lectures with political-geographical content	1901: Cvijić's lectures on anthropogeography (Grčić, 2000)	After 1945: courses in anthropogeography, Department of Geography (Zorko, 2014)	–	–
First dedicated course	1978/79: Faculty of Geography (Grčić, 2000)	1963: Faculty of Political Science (Zupanc, 2020)	1990s: Department of Geography (Zupančič, 2024)	2006: Institute of Geography, elective
Compulsory course	–	–	–	2010: Demography

				study programme
Textbook	Grčić (2000)	–	2001 (Zupančič, 2024)	–
Dedicated teaching staff	–	R. Pavić, 1963–1993 (Zupanc, 2020)	–	R. Mijalov, 2006–2021
Journal or regular publication venue	–	Politička misao, from 1964 (Zorko, 2014)	–	–
International events	–	–	IGU Commission on Population Geography annual conference "Geography and Ethnicity", 1993; IGU Commission on the World Political Map conference, 2000 (Gosar, 2001; Zupančič, 2024)	Not represented at the 2000 IGU conference (Zupančič, 2001)
Institutional dimension	Within geography; faculty-level discipline since 1978/79	Within political science since 1963	Within geography; course from the 1990s, textbook 2001	Within geography; elective from 2006, first compulsory in the Demography programme in 2010
Intellectual dimension	Anthropogeographical and state-centred; state territory as the basic object (Grčić, 2000)	The state as the fundamental subject; geopolitics as doctrine (Pavić, 1987)	Social-geographical research on minorities and borders, preceding the course (Zupančič, 2024)	Studies by Mijalov within geography; research conducted largely in political and security studies (Section 5.6)
Societal relevance	Renewal of geopolitics in the 1990s tied to the dissolution of Yugoslavia and national questions (Grčić, 2000)	Discipline tied to conflict resolution (Zorko, 2014)	Applied aims concerning minorities and borders (Zupančič, 2024)	Continuous geopolitical exposure since 1991 (Section 5.5)

Compared with the neighbouring centres, the delay amounts to almost three decades relative to Belgrade, more than four to Zagreb, and more than a century relative to Cvijić's lectures. Relative to Ljubljana, where political geography entered the geography curriculum only in the 1990s (Zupančič, 2024, p. 70), the institutional delay is about a decade. The more important difference lies in the intellectual dimension: in Ljubljana the course was preceded by several decades of political-geographical research on minorities and borders within social geography, so that the institution followed an existing research practice. If the stigma is not a sufficient explanation, the causes most probably need to be sought in the domestic context, as also suggested by Mijalov's assessment that they are above all subjective. Within the Institute of Geography, the long-standing dominance of physical geography may have been an additional domestic obstacle. One aspect is evident: the delay affects the whole range of disciplines that take politics as their object. Political studies in Macedonia were established only in the early 1990s, within the Faculty of Law (Škarić, 2026, p. 236); research on social, political and legal phenomena, however, had been institutionalised earlier, in the Institute for Sociological, Political and Juridical Research of the University in Skopje, founded in 1965 (Institute for Sociological, Political and Juridical Research [ISPJR], n.d.).

Three further factors, which this article can only formulate as hypotheses, deserve separate research. The first is the hierarchy of the Yugoslav university system: the University in Skopje, founded in 1949, was younger and smaller than those in Belgrade, Zagreb and Ljubljana, and new disciplines may have spread from the larger centres to the smaller ones with a delay. The second is the political sensitivity of the Macedonian question: if political-geographical questions concerning Macedonia were politically charged and largely left to historiography, the status of Macedonia as an object of other people's political geography may itself have contributed to the delay. The Slovene comparison sharpens this hypothesis. There, too, the minority and border question was long left above all to historiography, until Klemenčič's social-geographical research turned it into a geographical object with explicitly applied aims (Zupančič, 2024, pp. 67–69). If the hypothesis holds, the question is why no comparable geographical turn occurred in Skopje. The third factor offers a possible answer. It follows from Zupančič's (2024, p. 71) explanation cited in Section 5.3, which points to a mechanism different from the institutional one: political geography develops where it is useful to a particular state setting and draws on that setting's experience of managing space. In Ljubljana, the minority and border question gave the field such a use. The Macedonian analogue, the position of Macedonians in the neighbouring states, did not, on the available evidence, become a comparable object of geographical research in Skopje. If this hypothesis holds, the delay reflects the absence of a demand that geography was expected, or permitted, to meet, rather than only the absence of an institutional home; it is closely related to the second hypothesis, since such a demand would have touched precisely the politically sensitive questions. All three hypotheses are consistent with Mijalov's assessment, but they require more detailed research into the institutional history of Macedonian geography and political science, based on study programmes, faculty decisions and the recollections of those involved.

The Irony of the Object

The delay is ironic. Macedonia is a space that has itself been an object of political geography of European significance ever since Cvijić. Talevski and Mileski (2005) describe the Balkans as a laboratory: "The Balkan Peninsula, with all its characteristics and historical challenges, is a veritable laboratory for the study of all the elements of geopolitics." Over the past three and a half decades, Macedonia has been almost continuously under the geopolitical spotlight: its peaceful independence in 1991, at the time of the Yugoslav wars, for which it was called an "oasis of peace"; the 2001 conflict and the Ohrid Framework Agreement; the name dispute with Greece, closed by the Prespa Agreement and the change of the country's name in 2019; the identity issues with Greece, Bulgaria and, in part, Serbia, which have still not been fully resolved; and the Euro-Atlantic path, on which the country long led the region but which has still not been completed. This trajectory is what the author terms EUthaNATOsion. The term denotes the condition, and the process leading to it, in which a state that has made membership of the European Union and NATO its overriding strategic goal accepts successive concessions, including concessions that holds its name, identity and constitution, until it is so transformed by them that it has no alternative but to continue pursuing the goal, even when the goal appears unattainable or obsolete. The word blends euthanasia (Greek εὐθανασία, from εὖ, 'well', and θάνατος, 'death') with the acronyms EU and NATO, while its ending evokes erosion. The metaphor is precise in three respects. What dies is not the state but its alternatives: each concession raises the cost of turning back. The process is gentle and consensual: it unfolds through negotiations, agreements and parliamentary votes rather than through force. And it is administered from outside: the conditions are set by other actors, including neighbouring states with a veto. North Macedonia is the paradigmatic case. A candidate for EU membership since 2005, when it was among the front-runners of the region, it was denied an invitation to NATO at the Bucharest summit in 2008 because of the name dispute with Greece, changed its constitutional name under the Prespa Agreement and joined NATO only in 2020. EU accession negotiations, blocked first by France and then by Bulgaria, were launched in 2022 on the condition of a further constitutional amendment, which has not been adopted; by 2026 no negotiating cluster had been opened, while Albania, from which the country was decoupled in 2024, had opened all six (Nowinowski, 2026). EUthaNATOsion is thus conceived both as an ideal type and as a cautionary case for other candidates from which membership demands comparable sacrifices. A concept coined in Skopje for the Macedonian experience is itself a small step from object to subject, the question with which this article concludes.

The editor of the proceedings of the 2000 conference notes that the dissolution of Yugoslavia called into question the very concept of the nation-state (Gosar, 2001), while Ljubljana and Trieste use the region as a research terrain. Macedonia, which lies at its centre, long remained an object of other people's political geography before acquiring its own.

Political Geography without Political Geographers?

The delay of the discipline does not mean that political-geographical questions are not studied in Macedonia. In the twenty-first century they are addressed above all in political and security studies, each from its own angle. The security approach is characteristic. Talevski and Mileski (2005) write: "The need to analyse and to recognise in a timely manner geopolitically based political actions and decisions is a very important component in the achievement of national security." Measured by the criterion adopted in Section 2, such research is political-geographical to the extent that it demonstrates the spatial causes or effects of political processes, whether or not it calls itself political geography. This is a sharpened variant of the paradox discussed in Section 4.3: in the Anglophone setting, political-geographical research is also conducted by non-political geographers because of the success of the discipline, whereas in Macedonia this is due to its long absence. The problem, therefore, is not the absence of political-geographical knowledge but the absence of an institutionally constituted field that recognises this knowledge as political geography.

The regional literature also qualifies the second thesis. The renewal of geopolitics in the 1990s is linked above all to the changed power relations in the Balkans, the dissolution of Yugoslavia and national questions (Grčić, 2000, p. 71; Talevski & Mileski, 2005). The definitions remain predominantly state-centred. For Grčić (2000), the basic object of political geography is state territory. For Pavić (1987), the state is the fundamental subject of political geography, and geopolitics is a doctrine. For Talevski and Mileski (2005), geopolitics is a component of national security. The same literature also contains self-critical voices: Grčić problematises the ideological function of geopolitics, and Zorko (2014) criticises Pavić for repeating the error of the classical geopoliticians by tying the discipline to conflict resolution. Zupančič (2024, p. 71) goes further and turns the critique towards the discipline as a whole, describing its rapid expansion in the 1990s as an uncritical popularisation: "The appeal to the 'political' had and still has, like 'sustainable' or 'ecological', a positive public echo; it is attractive and is therefore used more often than would be appropriate." In his view, this fostered an ideologisation around the idea of a "borderless Europe", while critical approaches, critical geopolitics among them, hindered rather than helped the field. This is more than a regional counterpart to the paradox discussed in Section 4.3. It is a direct challenge to the second thesis: the repoliticisation that this article treats as the way out of post-war stagnation is precisely what Zupančič regards as the problem. Politicisation in the region thus takes place predominantly within a state-centred framework, though not without internal critique, which is a different form from the critique of state power in the Anglophone discipline.

The article's position is that the challenge can be met by specifying what depoliticisation meant. As argued in Section 3.2, the post-war discipline was not apolitical: its depoliticisation consisted in the naturalisation of the state, a position in favour of the territorial status quo presented as neutrality. If this is correct, depoliticisation and repoliticisation are both political positions, and the difference

between them is not whether the discipline has a politics but whether it reflects on its own. Repoliticisation in the sense defined in Section 4.1 includes precisely this reflection, the theoretical reconsideration of the discipline's claim to neutrality. Ideologisation, in Zupančič's sense, is then not a consequence of repoliticisation as such but of politicisation without reflexivity, the replacement of one naturalised assumption, the given state, by another, such as a "borderless Europe". On this reading, Zupančič's warning is accepted, but his verdict on critical approaches is not: critical geopolitics is, in principle, an instrument of such reflexivity, even if its popularised uses can serve the opposite purpose.

The starlight metaphor also has another side: light that arrives late is nevertheless light in real time. The delay is a historical fact, not a measure of the quality of present-day research. Political geography in Macedonia appears after the revival of the discipline and can start directly from its contemporary, repoliticised condition. Institutional delay, however, also raises a separate question that this article cannot resolve: whether the late constitution of the discipline has affected the capacity of the domestic academic community to pose and conceptualise political-geographical questions about its own space independently. Delay is a chronological category, whereas dependence would be an epistemological one. The second does not automatically follow from the first, and the answer requires separate research.

CONCLUSION

The article started from Herb's (2008) question whether a separate subdiscipline of political geography is still justified if the political is present throughout geography. The answer cannot be sought in the essence of the discipline. Muir's (1981) analytical criterion, together with the metaphor of frontier zones rather than borders (Jones et al., 2004), makes it possible to preserve the identity of the field without closing it off.

The synthesis of the Anglophone literature supported the first two theses. The stagnation of political geography after 1945 was not merely a consequence of the stigma of *Geopolitik*: the stigma fell upon a discipline with weak theoretical foundations (Muir, 1976) and a tendency to avoid controversy, and together they produced a self-imposed depoliticisation that hollowed out the object of the discipline. The revival did not mainly follow the path of quantification anticipated by the diagnosticians of the time, Berry and Muir, which remained confined to part of the field (Johnston, 2001), it was to a considerable extent associated with repoliticisation. The most convincing evidence of this is the change in Muir's own attitude towards quantification between 1981 and 1997. The regional literature poses a direct challenge to this thesis: for Zupančič (2024), the politicisation of the field turned into ideologisation. The article's answer is that post-war depoliticisation was never neutral: by taking the state for granted, it was already a political position. The question, then, is not whether the discipline is political, but whether it reflects on its own politics.

The third thesis emerges from opening the box outside the Anglophone discipline. The Macedonian delay cannot be explained solely by the stigma of *Geopolitik*, which was shared by the entire Yugoslav space. The evidence points more strongly to the domestic institutional context, in which the discipline long lacked an institutional home in either geography or political science. The hierarchy of the Yugoslav university system, the political sensitivity of the Macedonian question, the absence of a demand that would have made the field useful (Zupančič, 2024) and the long-standing dominance of physical geography within the Institute of Geography are plausible additional factors that require further research. The delay is ironic for a space that, from Cvijić to the Prespa Agreement, has been an object of political-geographical interest of European significance, and whose political-geographical questions are investigated above all by other disciplines.

The three dimensions of the discipline's condition do not develop in step. In Macedonia there is political-geographical knowledge without a strong institutional field. In Ljubljana, political-geographical research within geography preceded the institution by several decades and paved the way for it (Zupančič, 2024), whereas in Macedonia such knowledge has developed largely outside geography. In the geopolitical present, marked by Russia's aggression against Ukraine, the war with Iran and the American rhetoric about Greenland, the need for political-geographical analysis is growing, but this alone does not guarantee the ascent of the discipline; this question is addressed in a separate article. The existence of a political-geographical object does not in itself ensure the existence or development of political geography as a distinct academic discipline. The answer to Muir's question, therefore, depends not only on place and time but also on which dimension of the discipline is observed: the institutional, the intellectual or its societal relevance.

Schrödinger's duck, then, is neither alive nor dead in itself. Observed from a specific place, at a specific time and in a specific dimension, its condition becomes determinate: in the Anglophone discipline the duck left the moribund backwater long ago. In Macedonia it arrived late, but it did arrive. What remains open is whether the Macedonian space, so far above all an object of political geography, will also become its (main) subject.

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SPATIAL DISPARITIES IN TOURISM SEASONALITY: A MULTI-INDICATOR APPROACH TO DOMESTIC AND INTERNATIONAL ARRIVALS

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ABSTRACT

Seasonality in tourism affects the economy at all levels-national, regional, and local level. This study analyzes seasonality in North Macedonia using a NUTS 3 approach at the regional level. Using a comprehensive dataset of 1440 observations covering a period of 15 years (2010–2024), the research explicitly distinguishes differences between domestic and international tourist arrivals. To determine the level of seasonality and variability of tourist flows, a robust multi-indicator methodology is applied, encompassing the Seasonality ratio (SR), Seasonal range (SRA), Coefficient of seasonal variation (SV), and the Gini coefficient. The results of the analysis show pronounced regional disparities. The Southeastern and Southwestern regions record the highest seasonality, with over 40% of tourists visiting for two months period. The Skopje Region experiences the lowest seasonality. Research also shows that domestic tourists have the highest number of visits in the summer months (July and August), whereas foreign tourists do not demonstrate peak season. The pandemic period (2020–2021) represents a statistical anomaly that caused distortions in typical seasonal patterns. The multi-indicator approach identifies a winter peak in the Polog Region, providing an opportunity to develop strategies to mitigate seasonal fluctuations, regional development, and address challenges associated with the peak.

Key words: tourism, seasonality, NUTS 3 regions, North Macedonia, multi-indicator approach

INTRODUCTION AND LITERATURE REVIEW

Seasonality is a universally recognized phenomenon in global tourism (BarOn, 1972, Baum and Hagen, 1999, Baum and Lundtorp, 2001, Allcock, 1989). It is an

important feature in the tourist arrivals time series and requires careful handling to improve the accuracy of seasonal tourism demand forecasts (Kulendran and King, 1997, Lim, 1998, McEniff, 1992). Seasonality implies cyclical variations in the movement of a phenomenon, or the repetition of an identical or similar pattern every calendar year at approximately the same time (Kožić, 2013). Biedermann (Biederman and Lai, 2008) stated that seasonality is a prevalent characteristic of travel and tourism, characterized by sharp variations in demand across the year. Seasonality also is defined as the irregularity in tourism, as reflected in visitor numbers, consumption, overnight stays, and transportation, which directly affects the creation of supply and demand at the tourist destination (Butler, 1994, Butler, 2001). Although tourism seasonality is considered a universal problem whose intensity varies across countries (Yacoumis, 1980), destinations with an established tourism industry have proven to be the most successful in mitigating it (Butler and Mao, 1997). Hylleberg (Hylleberg, 1992) grouped the basic causes of seasonality into three categories: weather variables (e.g., temperature, sunlight hours), calendar effects (e.g., the timing of religious festivals such as Christmas and Easter), and timing decisions (e.g., school holidays, industry shutdowns, dividend and bonus payout dates).

According to BarOn (BarOn, 1975), seasonality in tourism is driven by two basic elements, one 'natural' and the other 'institutionalized' (which, in some cases, are linked). The first concerns regular temporal variations in natural phenomena, particularly those associated with climate (e.g., temperature, rainfall, snow, and sunlight). Institutional seasonality results from human decisions and is shaped by religious, cultural, ethnic, and social factors. Seasonality in tourism driven by natural factors is generally stable over longer periods and is therefore largely predictable. Butler (Butler, 1994) defines five main reasons for seasonality: regular temporal variations in natural phenomena, human decision factors - the institutionalized seasonality, social pressure and fashion, sporting season, inertia and tradition. Hartmann (Hartmann, 1986) suggests that these differences indicate that tourist regions possess varying seasonal potentials and resources, resulting in distinct seasonal characteristics. Natural factors influencing these are beyond the control of decision-makers (Cuccia and Rizzo, 2011). There are minor differences in seasonal patterns between international and domestic tourists, conditioned by domestic tourists' greater sensitivity to weather (Agnew and Viner, 2001) and by fixed periods of school and work holidays that dictate the intensity of the summer peak (Murphy, 2013, Rosselló and Sansó, 2017).

Domestic tourists tend to respond more quickly to changes in the weather. After a period of sunshine, when rain sets in, they often leave the destination earlier, and the number of new domestic arrivals declines rapidly. In contrast, international tourists usually plan their trips well in advance and are less likely to alter their plans because of sudden weather changes; they typically arrive and stay according to their original schedule regardless of weather conditions. Just as the causes of seasonality are diverse and complex, so are its impacts (Koenig and Bischoff, 2004). Unsurprisingly, most researchers have noted that seasonal variation is an

uncontrolled factor that leads to several adverse effects (Chung, 2009) and with the growth of mass tourism, the impacts of tourism seasonality have become greater (Yan and Wall, 2003). According to Koening-Lewis and Bischoff (Koenig and Bischoff, 2004), the consequences of tourism seasonality are generally categorized into three main groups: economic, ecological, and sociocultural. The economic impact is most evident during off-peak periods, primarily through reduced profits from underused resources and facilities (Sutcliffe and Sinclair, 1980, Williams and Shaw, 1988). Variations in demand can lead to hotel shortages during peak seasons and to underutilization of tourism facilities in the off-season (Murphy, 2013, Butler, 1994, Koenig and Bischoff, 2004, Chung, 2009). Ecological impacts are associated with peak seasons, marked by adverse effects from the concentration of visitors at a destination during these periods. These include air pollution, sewage disposal problems, litter, noise, and reduced quality of life for the local population (Bender et al., 2005, Chung, 2009). Socio-cultural impacts extend not only to seasonal fluctuations in the host community but also to visitors (Koenig and Bischoff, 2004). Negative implications for residents arise from dramatic population increases during the summer months, which strain existing infrastructure and services. These include congestion, crowded streets, slower traffic, lack of parking, higher service prices, significant increases in the costs of community services, and overcrowding at attractions (Koenig and Bischoff, 2004, Commons and Page, 2001, Krakover, 2000). There are two primary perspectives to consider when examining the impact of seasonality on employment in tourism-dependent destinations. The most commonly expressed view is that the seasonal nature of tourism poses challenges for employers, making it difficult to recruit and retain full-time staff (Krakover, 2000, Pearce, 1989, Yacoumis, 1980, Mathieson and Wall, 1982). Nevertheless, the characteristics and measures of tourism seasonality, when compared across regions, remain poorly understood. Problem analysis and the search for solutions in competition among tourist regions are becoming more prevalent, but thus far only at the regional level (Bender et al., 2005).

Fluctuations in visitor numbers and revenues are widely regarded as a problem by the tourism industry, which invests considerable time, money, and effort to modify these patterns by developing and the implementing strategies to extend "shoulder seasons" or create "all-season" destinations (Corluka, 2019). To overcome seasonality, several approaches include launching additional seasons, diversifying markets, reducing prices, and offering off-season activities (Baum and Hagen, 1999). A destination may have one peak season, two peak seasons, or no distinct peak (Butler and Mao, 1997). The one peak seasons are typically divided into off-season (January-February, November-December), shoulder season (March–June and October), and peak season (July–September). Ćorluka (Corluka, 2019) further categorized the seasons as low (January, February, November, December), mid (March, April, May, October), and high (June–September). Two-peak destinations combine winter and summer tourism, often by promoting outdoor activities and events. Non-seasonal patterns are rare and typically found in tropical or urban destinations with a steady year-round flow of visitors.

Despite extensive research on tourism seasonality, few studies combine long-term data, regional (NUTS 3) resolution, and a multi-indicator framework while explicitly distinguishing domestic and international tourist flows in small transition economies.

The primary objective of this study is to analyze tourism seasonality in North Macedonia using a spatially approach at the NUTS 3 level. It uses a multi-indicator framework to examine various aspects of seasonal concentration, based on monthly tourist arrival data from 2010 to 2024. Special focus is placed on distinguishing between domestic and international arrivals to uncover variations in seasonal trends and regional responses. The study specifically explores the following research questions:

- What are the main characteristics of tourism seasonality in North Macedonia, and how does it vary across the eight statistical regions?
- Which regional differences can be observed in the seasonal patterns of domestic and international arrivals during the analyzed fifteen-year period?
- How well do the selected methods (Seasonal Ratio, Coefficient of seasonal variation, Seasonality Range, and Gini) reflect the complexity of seasonal concentration within Macedonian tourism industry?

Since the measures selected directly affect analytical accuracy, the methodology employs a multi-indicator approach to simultaneously assess the intensity, capacity, and inequality of tourist arrivals. This approach helps clarify seasonal fluctuations, which vary notably between domestic and international arrivals across various NUTS 3 regions in the country.

METHODOLOGY

To measure and analyze seasonality patterns in Macedonian tourism, this study employs a set of complementary statistical approaches. As Koenig-Lewis and Bischoff (Koenig and Bischoff, 2004) note, the choice of measures depends on the specific research questions and the level of detail required for the analysis. Our objective is to analyze and quantify seasonality in Macedonian tourism, including at the NUTS 3 level, and to examine seasonal disparities in arrivals of domestic and international tourists. To accomplish this, we selected several key indicators as the most appropriate measures: the seasonality ratio, the seasonal range, the coefficient of seasonal variation, and the Gini coefficient. As outlined at the beginning of this paper, the primary unit of analysis remains the monthly number of arrivals, which enables comparison with findings from other researchers (Bigović, 2012, Commons and Page, 2001, Cuccia and Rizzo, 2011). Karamustafa and Ulama (Karamustafa and Ulama, 2010) compared methods for measuring seasonality and analyzed their advantages and weaknesses. They explained that the seasonality ratio assesses the intensity of seasonal fluctuations, but the main drawback is that distributional skewness is influenced by extreme values, and focuses on data from a single year. In contrast, the Gini coefficient offers a more comprehensive evaluation by analyzing

the entire period and facilitating monthly comparisons. Fernandez-Morales and Mayorga-Toledano (Fernández-Morales and Mayorga-Toledano, 2008) noted that the Gini coefficient is more stable than earlier methods, as it is less affected by extreme values and more responsive to changes outside the peak period. Yacoumis (Yacoumis, 1980) uses two measures to demonstrate the importance of seasonality. The first is the coefficient of seasonal variation, defined as the standard deviation of the seasonal indices; a value of 100 indicates that the standard deviation equals the mean monthly visitors. This coefficient shows how visitor numbers fluctuate throughout the year and provides a simple way to quantify these changes. However, interpreting this coefficient can be challenging because, although it is derived from statistical calculations, seasonality itself is not a random variable within the year. The second measure is the seasonality ratio, a straightforward metric that highlights peak-season impact by taking the maximum in the numerator.
The following section presents a more detailed examination of the selected methods:

Seasonality ratio (SR):

The seasonality ratio is calculated as the highest monthly arrivals divided by the average number of arrivals per month. It ranges from 1 to 12. A ratio of 1 indicates that the number of visitors remains constant each month (no seasonality). Conversely, a ratio of 12 indicates the highest level of seasonality, with visitors concentrated in a single month (Karamustafa and Ulama, 2010). The annual average refers to the arithmetic mean of the twelve-monthly arrival values in year t.

$$v_{sum} = \sum_{i=1}^{12} v_i \qquad \bar{v} = \frac{v_{sum}}{12} \qquad SR = \frac{v_h}{\bar{v}} \tag{1}$$

Seasonal range (SRA):

The seasonal range (SRA) is the difference between the highest and lowest monthly indices (Koenig and Bischoff, 2004), with an index of 100 representing the average monthly number of arrivals. In our case study, if *Imax* is the highest monthly index in year *t* and *Imin* is the lowest monthly index in year *t*, the average of 100 indicates that the monthly average number of arrivals serves as the base index. The SRA for tourism in year *t* can be calculated as follows:

$$SRA = I_max\ (average = 100) - I_min\ (average = 100) \tag{2}$$

This measure can take theoretical values between 0 and 1200. With the same number of arrivals each month, the seasonal range is 0. If all visitors arrive at the regional level every month, the seasonal range is 1200.

Coefficient of seasonal variation (SV):

The coefficient of seasonal variation (SV) is equal to the standard deviation of the seasonal indices, where index = 100 is the average number of arrivals per month

(Baum and Lundtorp, 2001). Concretely, if *Ii* is a seasonal index, where *i* refers to the related month (i.e., 1 ≤ i ≤ 12), and $\bar{I}$ is the mean of seasonal indices (i.e., 100), then the coefficient of seasonal variation *s* related to tourism in the year *t* can 12 ∑ be calculated as follows:

$$S_t = \sqrt{\frac{\sum_{i=1}^{12}(Ii - \bar{I})^2}{12 - 1}} \quad (3)$$

The quantity (*Ii* – $\bar{I}$)in the previous formula refers to the deviation of *Ii* from the mean $\bar{I}$. A smaller coefficient *s* indicates less regional seasonality (both domestic and international arrivals). In comparison, a larger value of s signifies greater seasonality in the destination.

Gini coefficient (G):

The Gini coefficient is one of the most commonly used metrics for measuring revenue inequality induced by temporary disturbances. It is derived from the Lorenz curve (Baum and Lundtorp, 2001), which illustrates inequality, while the Gini coefficient provides a numerical measure of that inequality (Bigović, 2012). When the Gini coefficient equals 0, the number of visitors remains constant throughout the year. If *G* equals 1, this indicates complete inequality in the concentration of monthly visitors and arrivals (Kulendran and Wong, 2005). In tourism, a Gini coefficient of 1 indicates extreme seasonality, meaning the entire annual volume of arrivals occurs in a single month, with the remaining eleven months recording zero activity. Conversely, a value of 0 indicates a perfectly even distribution, with arrivals identical across all twelve months of the year. The more unequal the seasonal distribution of arrivals, the larger area between the Lorenz curve and the line of equality. The Gini coefficient is calculated as the area between the curve and the 45-degree equality line divided by the entire area below the 45-degree line.

$$G = \frac{2}{n}\sum_{i=1}^{n}(x_i - y_i) \quad (4)$$

n = ratio value (in the case of this study, number of months = 12),
xi = ratio order (i.e. 1/12, 2/12, …, 12/12); and,
yi = cumulative actual ratios in the Lorenz curve.

DATA

To quantify and understand the seasonality patterns in Macedonian tourism, a historical dataset from the State Statistical Office (Office, 2024) was used. It includes monthly tourist arrivals for each NUTS 3 region and national level, from January 2010 to December 2024. This yields 180 observations, with fifteen annual data values per month. These data are calculated for each of the eight regions, yielding a total of 1440 observations, or 2880 when both categories — domestic and international tourist arrivals — are considered.

The 15 year analyzed period, reached the highest annual tourists' arrivals in 2024 (1260425), the lowest annual arrivals reached in 2020 (467514), while the average arrivals was 859130 tourists per year. The peak of arrivals (113285) was recorded in August 2024, with international tourists accounting for 57% and domestic tourists for 43%. Annual averages by region were as follows: Vardar (20682), Eastern (23535), Southwestern (330891), Southeastern (125577), Pelagonia (61434), Polog (33902), Northeastern (7985), Skopje (256140).

During the period under analysis, the number of arrivals shows a positive trend (Figure 1), except in the pandemic year (2020). This is particularly evident among international tourists, with a 217% increase.

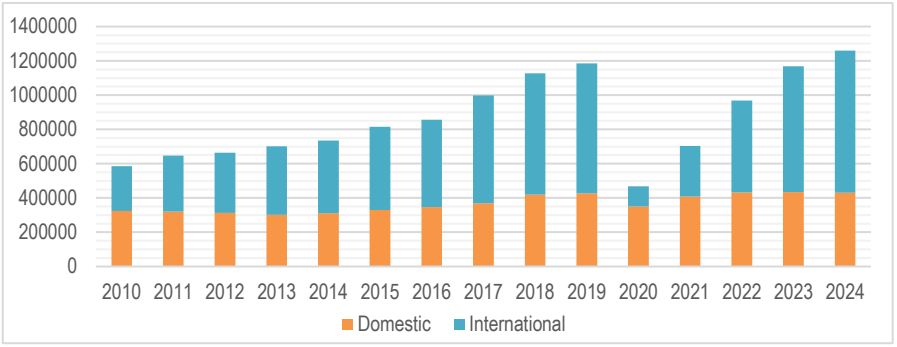


Figure 1. Domestic and international tourist arrivals in North Macedonia (2010 – 2024)

The Figure 2 shows that tourism in North Macedonia peaks in July and August, indicating that these are the main seasons. The shoulder seasons occur in May, June, and September. The remaining months—January, February, March, April, October, November, and December—are considered the off-peak season for tourism in North Macedonia. Domestic tourist arrivals are mostly concentrated in July and August, in contrast international tourist arrivals differences are minor and less pronounced.

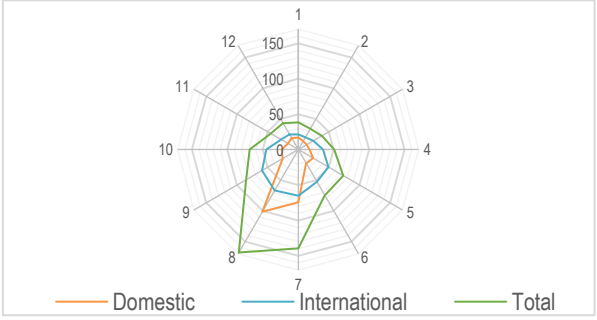


Figure 4. Monthly average domestic and international arrivals in thousands (2010 – 2024)

At the regional level, the two most visited months are grouped into three clusters (Figure 3), as follows: July and August (Northeastern, Southeastern, Vardar, Pelagonia, and Southwestern), August and September (Skopje and Eastern) and January and February (Polog). This national trend of high concentration in August aligns with previous studies for Ohrid-Struga subregion, where August also record the highest average number of arrivals (Dimeska Trajkova and Zlatanoski, 2025, Petrevska and Nikolovski, 2018).

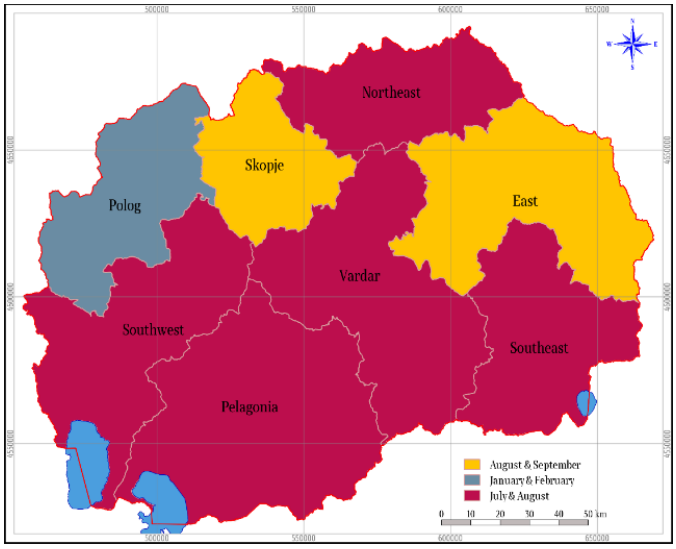


Figure 3. The top two visited months at the NUTS 3 regional level

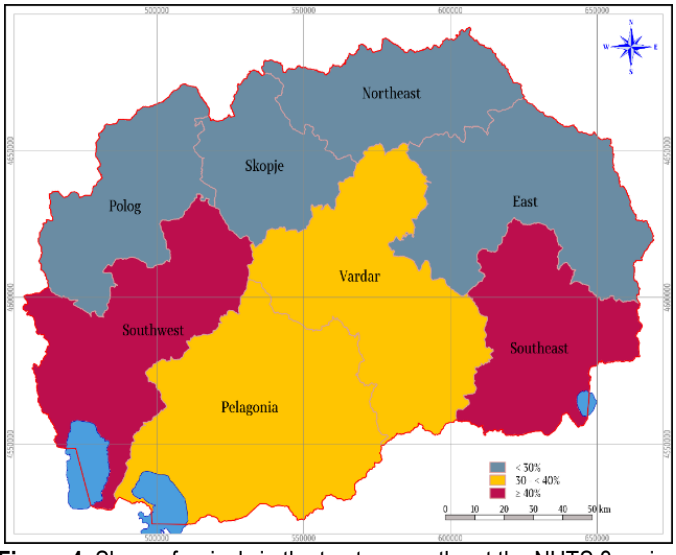


Figure 4. Share of arrivals in the top two months at the NUTS 3 regional level

Based on the analyzed data (Figure 4), the concentration of tourists in the two most-visited months is divided into three groups: under 30% of the total arrivals (Polog, Skopje, Northeastern, Eastern), from 30% to 40% of the total number of tourists (Vardar and Pelagonia), and over 40% of the total number of tourists (Southeastern and Southwestern). It can be concluded that the Southeastern and Southwestern regions exhibit the highest seasonality, followed by Vardar and Pelagonia, while the remaining regions show less pronounced seasonality.

RESULTS

Seasonality Ratio (SR)

Figures 5 and 6 present seasonality ratio results. The analysis shows that the Southeastern Region had the highest SR for domestic arrivals in 2019 (Figure 5), reaching SR of 6.2, while the Skopje Region recorded the lowest value of 1.17 in 2016.

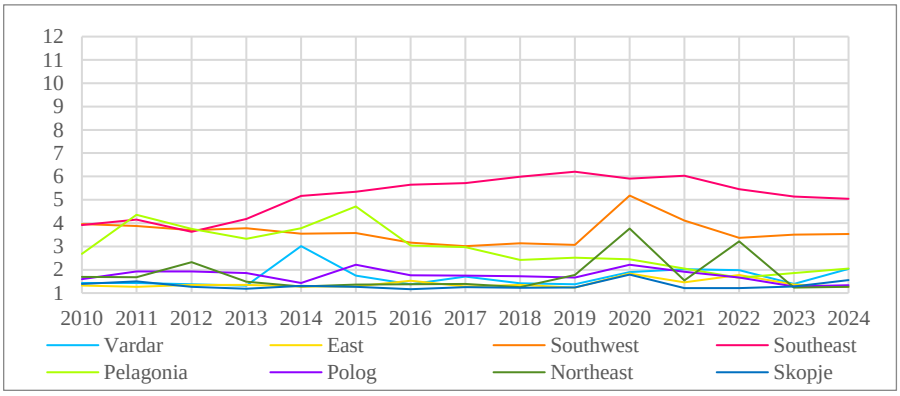


Figure 5. Seasonality ratio of domestic arrivals at the NUTS 3 regional level

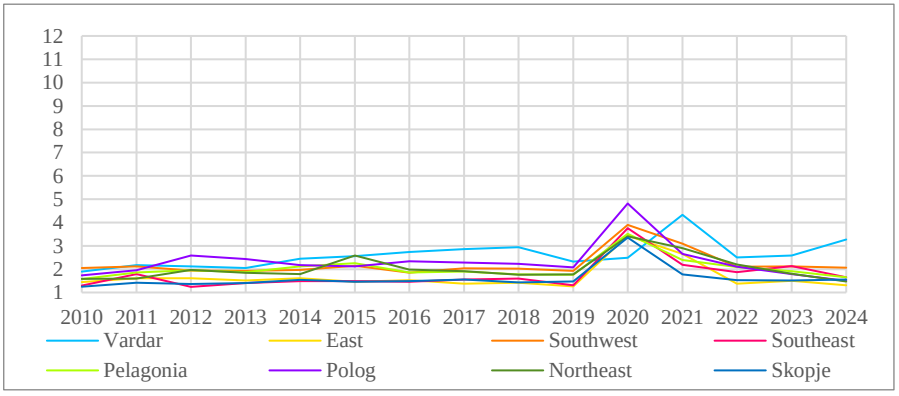


Figure 6. Seasonality ratio of international arrivals

The data indicate that the highest SR for international arrivals (Figure 6) was recorded in the Polog Region in 2020 (4.82) and the Vardar Region in 2021 (4.33). Conversely, a minimum value of 1.24 was registered in the Southeastern Region in 2012. The observed variations between domestic and international market segments underscore the complexity of seasonal demand. This distinction aligns with findings by Koenig & Bischoff (Koenig and Bischoff, 2004), who emphasizes that domestic and international arrivals often exhibit divergent seasonal patterns due to differing sensitivities to institutional and natural factors.

Seasonal range (SRA)

The calculated seasonal ranges are presented in Tables 1 and 2. Among domestic arrivals (Table 1), the highest SRA was recorded in the Southeastern Region in 2019 (594), while the lowest was observed in the Eastern Region in 2011 (37). Among international arrivals (Table 2), the highest SR was recorded in Polog Region in 2020 (482). The lowest SRA was recorded in the Southeastern Region in 2012 (37).

Table 1. Seasonal range of domestic arrivals

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	103	81	87	71	248	117	81	106	70	77	189	153	138	71	143
2	65	37	75	53	48	61	78	48	56	45	184	78	111	68	49
3	379	370	359	363	338	345	297	280	292	282	517	392	307	329	323
4	340	368	323	376	478	504	530	542	575	594	588	587	522	492	478
5	235	409	335	300	338	429	255	251	190	204	244	172	110	124	145
6	108	132	140	134	75	171	120	114	106	94	221	148	123	60	66
7	115	97	183	92	67	76	73	70	55	108	377	114	263	51	71
8	78	101	58	56	73	65	42	52	49	42	171	44	54	52	79

Note: Numbers 1–8 correspond to the following regions: 1 – Vardar; 2 – Eastern; 3 – Southwestern; 4 – Southeastern; 5 – Pelagonia; 6 – Polog; 7 – Northeastern; 8 – Skopje.

Table 2. Seasonal range of international arrivals

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	162	188	190	179	212	225	242	258	269	208	248	423	224	240	306
2	90	107	108	102	112	89	88	91	84	62	343	233	81	92	73
3	183	196	184	184	186	200	168	186	185	179	390	292	195	195	192
4	58	117	37	64	73	73	73	84	86	51	367	184	136	155	98
5	99	153	152	132	170	184	137	143	132	138	351	221	174	152	130
6	113	147	214	206	167	163	187	185	170	159	482	234	173	123	93
7	98	114	153	140	131	219	147	161	127	137	341	268	200	145	102
8	68	91	81	92	113	104	98	107	93	101	335	138	115	107	109

Note: Numbers 1–8 correspond to the following regions: 1 – Vardar; 2 – Eastern; 3 – Southwestern; 4 – Southeastern; 5 – Pelagonia; 6 – Polog; 7 – Northeastern; 8 – Skopje.

Coefficient of Seasonal Variation (SV)

All calculated seasonal variation values are presented in Figure 7. The data indicate that the lowest SV for domestic arrivals was recorded in the Skopje Region in 2021, with a value of 11.74 and the highest SV was recorded in the Southeastern Region

in 2021 (173.15). Among international arrivals, the lowest number was recorded in 2012 in the Southeastern at 10.57. The highest value was recorded during the pandemic in 2020 in Polog (149.27), and in 2021 in the Vardar Region (123.62) .

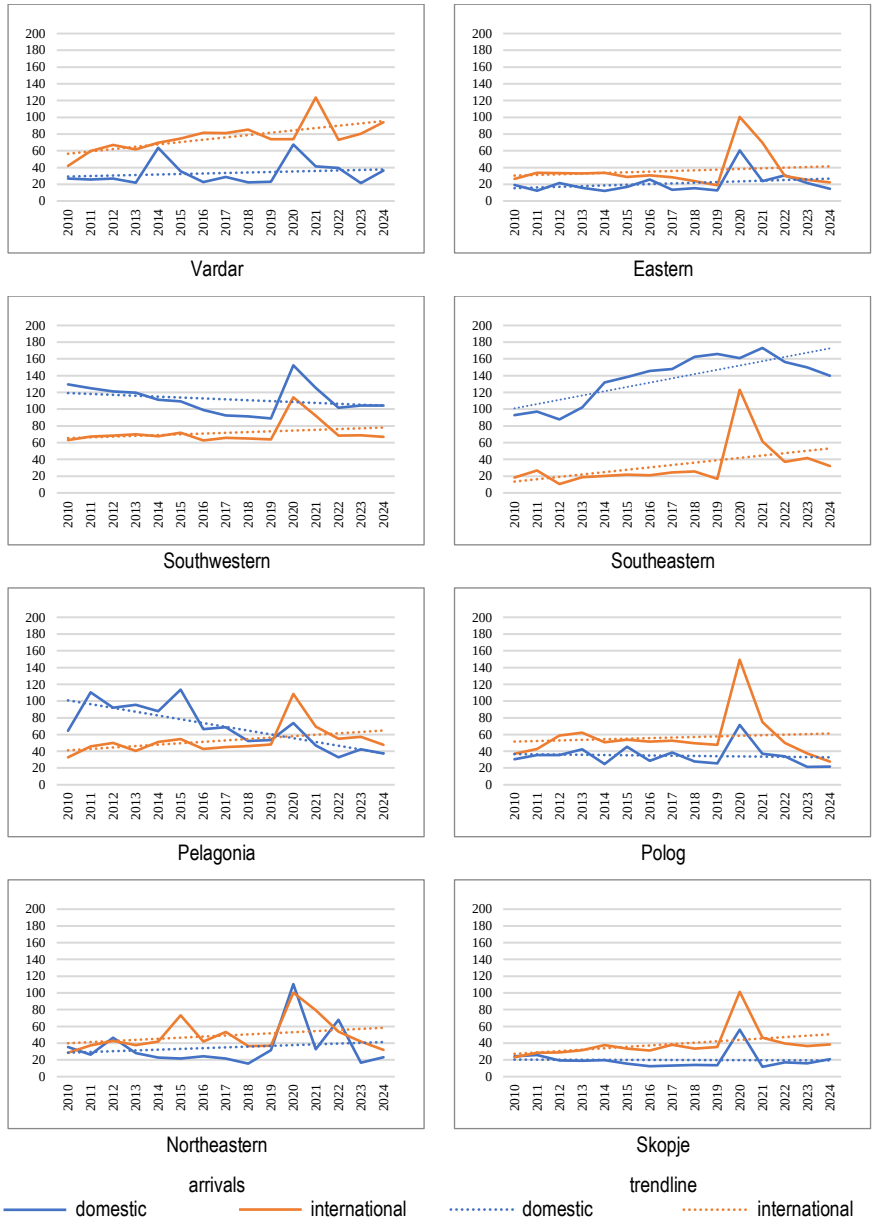


Figure 7. Coefficient of seasonal variation of domestic and international arrivals

Based on the data, regions in North Macedonia demonstrate stable seasonality trends among domestic tourists, with the Southwestern and Pelagonia regions

experiencing negative growth. Unlike the other regions, only the Southeastern Region has a high seasonality trend. On the other hand, foreign tourist trends are generally positive. This growth is most noticeable in the Vardar and Southeastern regions, followed by the Northeastern, Skopje, and Pelagonia region. Stagnant or mild growth trends characterize the region of Polog, Eastern, and Southwestern.

Gini coefficient

Seasonality in domestic arrivals is highest in the Southwestern and Southeastern regions, whereas for international arrivals it peaks in the Southwestern and Vardar regions. The lowest seasonality in domestic arrivals is observed in Skopje, Eastern, and the Vardar Region. In contrast, among international tourists, the lowest seasonality is observed in the Southeastern and Eastern region. The most significant seasonal differences are observed in the Vardar Region (international arrivals) and the Southeastern Region (domestic arrivals). Conversely, the smallest differences are observed in the Pelagonia and Southwestern regions (Figures 8, 9, and 10).

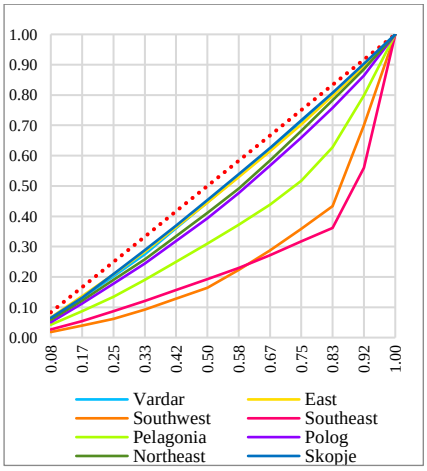


Figure 8. Lorenz curve of domestic arrivals

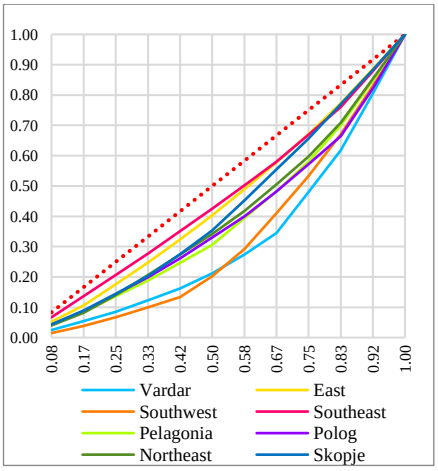


Figure 9. Lorenz curve of international arrivals

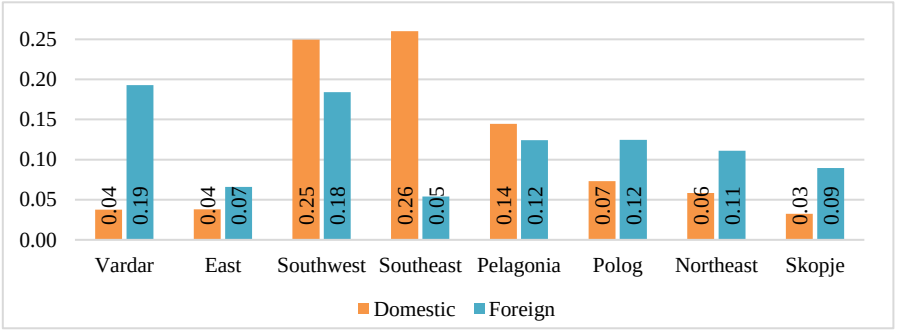


Figure 10. Gini index of domestic and international arrivals

DISCUSSION AND CONCLUSION

Analysis of tourist seasonality across the eight NUTS 3 regions of North Macedonia reveals notable spatial disparities and distinct behavioral patterns among domestic and international visitors. This section summarizes key findings aligned with the three main research questions:

Spatial disparities in seasonality: The study confirms that seasonality is disproportionately distributed across researched area. The Southeastern and the Southwestern regions experience highest tourist concentrations during specific months, with over 40% of annual arrivals occurring in just two months. Elevated SR values in the Southeastern Region, reaching up to 6.2 among domestic tourists highlights the prominence of lake tourism and summer cultural events. Conversely, Skopje, as the administrative center, demonstrates the lowest seasonal sensitivity.

Differences between domestic and international tourists arrivals (2010–2024): Domestic travelers peak sharply in July and August, while international visitors show a more balanced distribution year-round. However, the 15-year data reveal that the pandemic years 2020-2021 created artificially high seasonal peaks in international arrivals, notably in Polog Region (SR = 4.82) and Vardar Region (SR = 4.33), due to uneven market recovery. Similar findings were observed in the nearby Serbian tourism market (Trajkov et al., 2022, Pavlović et al., 2022). This pattern aligns with evidence from the mountain regions of Serbia and other inland destinations, where the seasonal nature of tourism is shaped by snow-dependent activities rather than summer recreation.

Evaluating the effectiveness of quantitative indicators: Employing a multi-indicator approach using SR, SRA, SV, and the Gini coefficient was vital for a comprehensive understanding. While SR highlights extreme peaks, the Gini coefficient offers a more stable view of overall distributional inequality across all 12 months. This methodological approach enabled precise identification of specific patterns, such as the winter peak in Polog Region (January-February), which is often missed when relying on a single indicator.

The lower seasonality in the Skopje Region is attributed to its dominant urban and administrative functions, whereas the stability observed in the Eastern and Vardar regions is driven by tourism products less sensitive to climatic variables. This includes cultural, wine, rural, and transit tourism, which operate independently of traditional seasonal cycles.

In summary, the study finds that regions such as Skopje, Eastern, and Vardar are less affected by seasonal changes, whereas regions such as Southeastern, Southwestern, and Polog experience significant seasonality. High seasonality can lead to inefficiencies, including underused infrastructure during off-peak seasons and overcrowding during peak periods, thereby hindering sustainable tourism development. These comparisons suggest that, although the country follows broader European seasonal patterns in tourism, its small size and limited diversification intensify seasonal concentration, underscoring the need for regional tourism strategies.

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UDC:
DOI:

ECOTOURISM OF THE SARAJEVO'S PROTECTED AREA "VRELO BOSNE" – BOSNA SPRING: A PARADIGM FOR SUSTAINABLE TOURISM?

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ABSTRACT

Ecotourism in Sarajevo is a significant driver of visits and its tourism image and increasing tourist urbanization. The natural monument Bosna Spring is among the city's most popular protected areas, combining natural and cultural features and serving as the top prominent recreational site in the city's immediate vicinity. The paper examines the ecosystem services, recreational values, and awareness of conservation at Bosna Spring, aiming to identify the advantages and challenges associated with the protection and advancement of ecotourism from the perspective of the younger generation: Erasmus students, who primarily represent EU visitors. The primary ecotourism functions are recreation and relaxation, with sports activities being favored by men and educational initiatives being more appealing to women. The youth is mostly aware of the conservation rules and regulations; however, it is more pronounced among return visitors than first-time visitors. The key priorities include conservation efforts, educational outreach, promotion of sustainable tourism, and scientific research. Despite the challenges faced by the area (urbanization and a lack of infrastructure), Bosna Spring is largely a representative model of a sustainable ecotourism destination.

Keywords: Bosna Spring, conservation, recreation, ecotourism, sustainable destination.

INTRODUCTION

The monument of nature "Bosna Spring"/ "Vrelo Bosne" (IUCN-III) is located in Sarajevo (Bosnia and Herzegovina) and is under the protection of "Protected Natural Areas of the Sarajevo Canton," covering an area of 603 ha. According to Temimović

(2018), Bosna Spring is one of the country's major ecotourism attractions and the most visited protected area. Thanks to its sustainable development strategy, it is considered a model example of (eco)tourism in this part of Bosnia and Herzegovina. Statistics from 2024 (ZPPKS, 2024) showed that during the first six months, 143,385 tourists visited Bosna Spring, which is 19,260 more than in the same period of the previous year, an increase of 15.5%. Foreign tourists account for 62% of all visitors, which highlights their importance in local ecotourism. These tourists pay at the same time a higher entrance fee, and this revenue is used for the management, maintenance, and protection of the area. These funds are mainly used for the development of tourism infrastructure, educational activities, and conservation of natural values. This phenomenon of rising interest in the area can also be evidenced in Google Trends data, where searches for the keyword Bosna Spring have been increasing over the long term. Searching for interesting natural heritage is therefore something that is resonating in trends among foreign and local tourists. The strategy that the protected area management chooses in communicating to foreign tourists can be crucial in the tourists' attitude towards the protected area itself; at the same time, it can also influence the tourists' willingness to pay a higher entrance fee, ergo increase the financial possibilities of improving the infrastructure and protecting the area.

Gathering information on the level of protection and development of the Bosna Spring area was necessary for the paper. Therefore, the first part of the thesis provides the readers with basic and contextual information that allows a better understanding of the current situation. Furthermore, we discussed the local government plan for the period 2020-2030, which provides proposals for changes in the conservation conditions and management system of the area. The following part of the paper analyses the results of a questionnaire survey focused on the perception of this protected area by young foreign visitors (Assessment of ecosystem services and conservation perspectives in the Bosna Spring Protected Area from the knowledge of youth visitors). The research examines how foreign young tourists perceive the importance of Bosna Spring, what ecosystem and infrastructural benefits the area provides them, and how they evaluate its role in the context of sustainable development.

METHODOLOGY

Protected areas are essential for the sustainability of ecosystems, the prevention of urban heat island levels, and the recreational values they provide not only to local residents but also to visitors from around the world. This paper focuses on assessing ecosystem services, recreational values, and conservation awareness in the Bosna Spring area. The aim is to identify the main benefits and challenges associated with the conservation of this site from the perspective of the young generation, especially

Erasmus students, as non-participating units in the region and with an external perspective on conservation from abroad. The main research questions are:

1) What ecosystem services and infrastructure services are most important to visitors? And are there gender differences in perception?
2) What is the level of visitor awareness of conservation and sustainable development rules in the area?
3) What are the views of the younger generation from abroad on the future development and conservation of the area?

The aim of the research is to get a comprehensive overview of young visitors' views on the current state and potential of the Bosna Spring area. This text analyses the results of the questionnaire survey and compares them with the management plans for the area, with an emphasis on sustainability and protection of the natural environment. The main research method was a questionnaire survey, which is a type of quantitative research aimed at collecting a large amount of data. This approach allows for a wide range of responses, as opposed to qualitative research, which focuses on detailed examination of individual cases. Research assessing the ecosystem services and recreational values of the Bosna Spring area was conducted through an online questionnaire survey. The questionnaire was designed to collect data on visitor habits, awareness, preferences, and attitudes towards environmental protection.

The questionnaire was divided into five sections: Visitor habits and frequency; Conservation awareness; Preferences regarding recreational activities and services; Willingness to contribute to nature conservation; Demographic data. The data collection focused on the younger generation of international visitors who could provide a unique perspective on ecosystem services and tourism pressure in the area. Unfortunately, it was not possible to include a broader group of respondents because the peak visitor season occurs primarily in the summer months. The goal was to gather as much relevant data as possible through social media and online campaigns to ensure the results were as representative as possible.

Questionnaire structure

The structure of the questionnaire was a combination of open- and scaled questions. At the beginning of the questionnaire, the focus was to find out the basic information of the respondents. Their gender and level of educational attainment were ascertained using a multiple-choice method where they chose from the options we provided. The rest of the questions were asked using scales. The first one is generally how knowledgeable visitors are about the area's opportunities and attributes. The respondent expressed this feeling using the scale: Not at all (1) - Very well (2). The next focused on visitor ratings in terms of the importance of each level from the visitors' perspective. Here respondents were given the opportunity to express their opinion on a scale of: Not important - 1, Rather not important - 2, Neutral - 3, Rather important - 4, Definitely important - 5. A large part of the questionnaire

consisted of questions exploring the positives and negatives that digitalization brings. We published the questionnaire on Friday, 3.12.2024, and therefore the data collection lasted 11 days until the specified deadline for the end of the data collection—Tuesday, 14.12.2024. Our primary platform was Google Forms, which in the end proved to be more useful than the initially intended Typeform portal due to the mainly free access. So, the data collection was online and, in a few cases, it was assisted data collection. The main characteristics of the respondents include their gender, which allowed us to focus on the differences and similarities they share. As a second characteristic is their number of visits, which was divided again into two groups. Overall, the data set contained a set of 41 respondents from a specific group of exchange students through Erasmus, CEEPUS, and other bilateral programs.

RESULTS

Ecotourism in Bosnia and Herzegovina

Sustainable tourism is a concept that connects nature conservation with the economic and social development of local communities. This approach aims to minimize the negative impacts of tourism on the environment while maximizing its benefits. Banda et al. (2019) stated that in Bosnia and Herzegovina, which is characterized by high biodiversity, sustainable tourism is an important tool for promoting regional development and protecting natural resources, which include the protection of endemic species of fauna and flora and watersheds, as well as their springs. One of the main elements of sustainable tourism is the emphasis on biodiversity conservation. Protected areas offer visitors the opportunity to experience authentic nature with minimal anthropogenic influence. These sites serve not only to protect natural values but also as resources for environmental education and recreation. According to Žunić (2022), tourism development is also supporting small and medium-sized enterprises, such as eco-oriented accommodation facilities that emphasize the use of local resources and traditions.Another key aspect of sustainable tourism is the involvement of local communities. These communities benefit from the income that tourism generates, for example, from the sale of local products or the provision of guiding services. This model also raises local awareness of the importance of conservation and motivates them to actively participate in the management of protected areas. Banda et al. (2019) noted that European and international projects also contribute to the development of sustainable tourism. Thanks to EU funding, activities have been implemented in protected areas in Bosnia and Herzegovina, which included the restoration of natural resources or the improvement of infrastructure for visitors. Žunić (2022) stated that these actions have not only increased visitor numbers but also enhanced economic opportunities for local people in the whole region.

Bosnia and Herzegovina's protected territory accounts for 4.57% of its total area. Nature conservation efforts in Bosnia commenced in the 19th century, with the strict nature reserve of "Perućica" (1954) as the first declared protected area in the country. Bosnia and Herzegovina has four national parks: "Sutjeska" (1962), Kozara (1967), Una (2008), and Drina (2017). The development of protected areas has been aligned with IUCN criteria (since 2003), leading to the establishment of more than a hundred protected areas within the country, with the first IUCN sites established in the Sarajevo Canton, such as “Bosna Spring” (bos. Vrelo Bosne), among others.

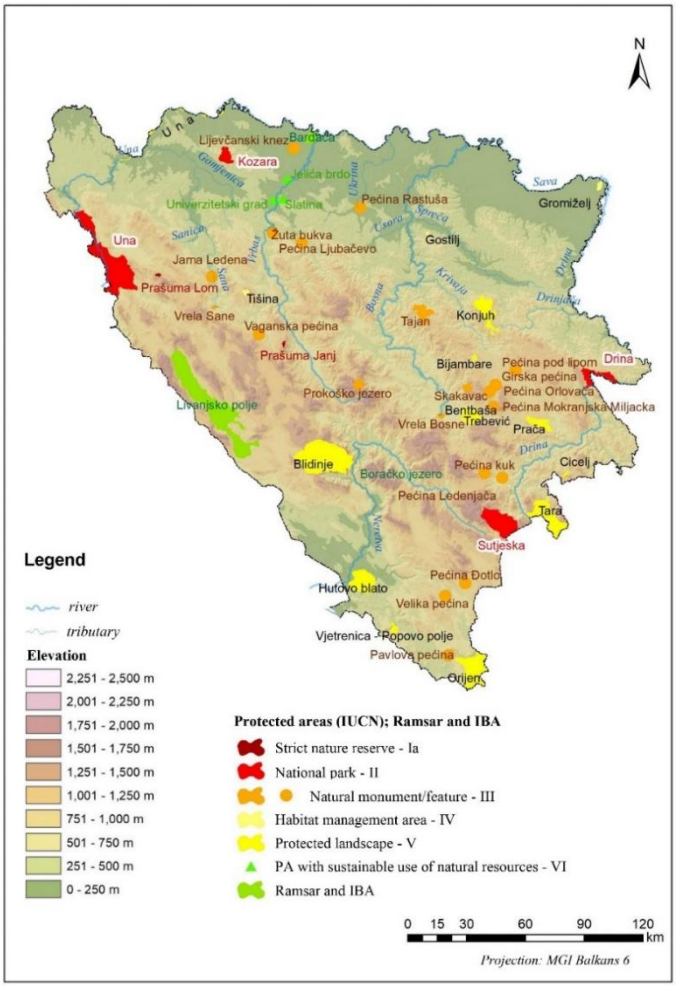


Figure 1. Map of protected areas in Bosnia and Herzegovina **Source:** Authors

Žunić (2023) observed that Bosnia and Herzegovina has been recognized as an ecotourism destination, with an increase in tourist visits to protected areas. However, the data on these visits is primarily based on ticket sales and parking lot usage. Green

spaces in proximity to the city are particularly favored by both international and local tourists, as Sarajevo serves as a connection between natural landscapes and urban settings, enhancing its overall appeal and demand as a tourist destination. Mirić et al. (2017) highlighted that natural attractions near Sarajevo, such as Bosna Spring, significantly contribute to the city's fundamental tourist image. Furthermore, Žunić (2018) emphasized a marked interest among tourists from Gulf countries, drawn by the refreshing natural environment. Žunić (2023) noted that the most frequented protected areas in Bosnia and Herzegovina are located in Sarajevo, attributed to the capital's popularity, favorable accessibility, tourist engagement, and the growing ecological awareness among visitors regarding the health benefits of immersing oneself in nature.

Case of Bosna Spring – tourism & geographical features with the key strategy goals of the protected area development

Bosna Spring, located in Sarajevo Canton, is one of the most significant protected areas in Bosnia and Herzegovina. Declared a natural monument in 2006, it spans 603 hectares, divided into a nucleus zone of 54.5 hectares and a buffer zone of 548.5 hectares. The nucleus zone, which includes the Bosna Spring and its immediate surroundings, is strictly protected to preserve its biological and hydrological diversity. The buffer zone allows for recreational activities and sustainable tourism, ensuring a balance between nature conservation and land use. The Bosna Spring is a unique hydrological phenomenon, located at the junction of the Igman and Bjelašnica mountains and the Sarajevo field, where the Bosna River originates. The area is rich in water resources, including thermal and thermo-mineral groundwater, surface water flows, and karst springs. The spring itself is a critical water source, providing drinking water for the city of Sarajevo. Its ecological diversity encompasses flooded forests, wet meadows, and aquatic habitats, which not only create a visually appealing environment for visitors but also serve as a refuge for many protected species of flora and fauna. Gajević (2013) stated that the area also plays a vital role in biodiversity conservation, providing a habitat for the endemic species Gammarus bosniacus and supporting diverse microhabitats.

On May 25, 2006, the Sarajevo Canton Assembly declared Bosna Spring a natural monument, establishing legal boundaries for its protection and classification as a Category III protected area. This legislation also set objectives for conservation, defined zones, and regulated interventions, natural resource use, and management responsibilities. The Cantonal Public Institution for the Protection of Natural Areas oversees the site's management, ensuring the preservation of its natural values, promoting sustainability, and developing infrastructure for tourists (FAO, 2014). Bosna Spring serves as a model for sustainable management and an inspiration for other protected areas in Bosnia and Herzegovina and beyond.



Figure 2. Bosna Spring - natural monument and popular ecotourism site in the capital of Bosnia and Herzegovina: Sarajevo's protected area (IUCN-III) **Source:** CA Author

Since the introduction of admission charges in 2014, the number of visitors to Bosna Spring has steadily increased, reaching over 250,000 in 2017, making it one of the most visited protected areas in the country. "Mostly visited and most popular protected areas in Bosnia and Herzegovina are those in Sarajevo (the capital), led by the protected landscape of Trebević and the natural monument Spring of Bosnia" (Žunić, 2022). Key cultural and historical landmarks, such as the Roman bridge at Plandište, nearby archaeological sites, and iconic locations like the Great and Small Alley, add significant cultural value and enhance the visitor experience (Temimović, 2018). At Žunić (2013), the Bosna Spring is a favorite protected and recreational site for both locals and tourists due to its attractiveness and accessibility. Furthermore, Žunić (2024) highlighted that the entire area of Bosna Spring represents a vibrant tourist environment, beginning with its buffer zone that encompasses the Ilidža spa park, complemented by an extensive promenade (Great Alley/Velika aleja) lined with the plane (Platanus acerifolia) and horse-chestnut trees (Aesculus hippocastanum).

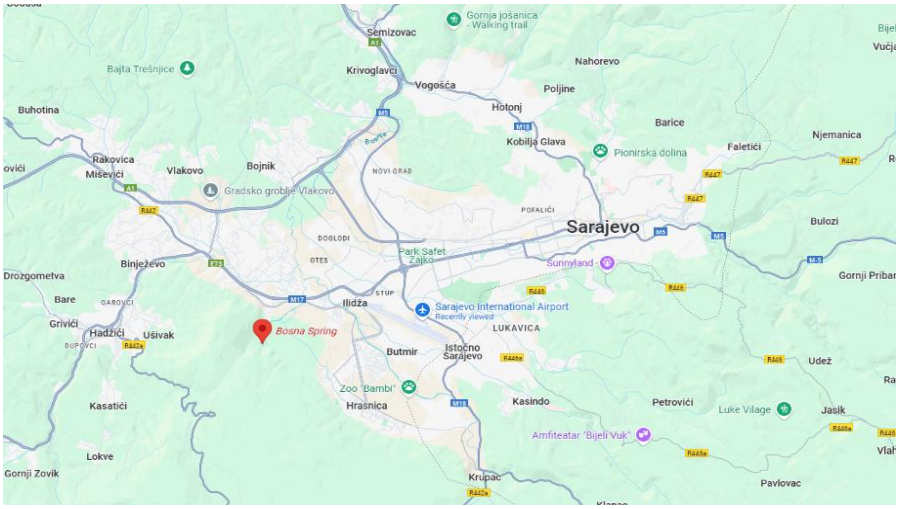


Figure 3. Location of Bosna Spring in Sarajevo, Bosnia and Herzegovina
Source: Authors, based on the Google Earth Maps

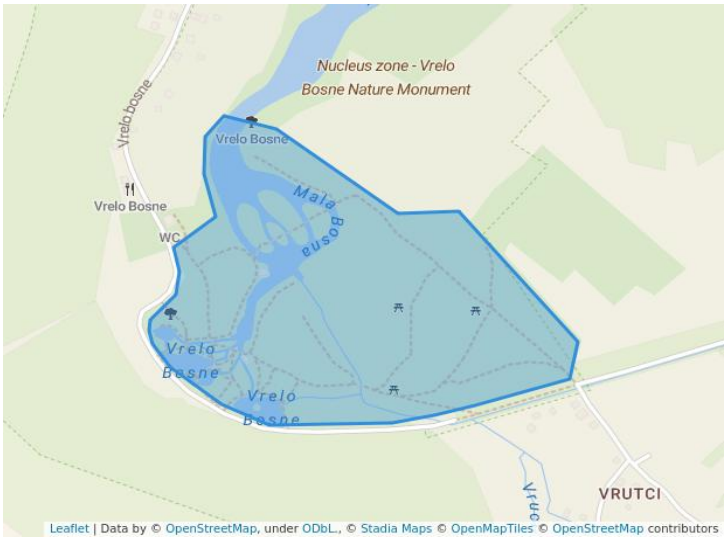


Figure 4. Nucleus area of the Bosna Spring/ Vrelo Bosne **Source:** Pacer, 2023

Despite its popularity, Bosna Spring faces challenges such as urbanization pressures from nearby development projects, often financed by foreign investors, and the need for improved infrastructure, including better sanitation facilities and enhanced access to individual monuments. Temimović (2018) noted that the Bosna Spring is a specific example due to its position close to the urban zone of the Sarajevo canton. The pressure of urbanization caused by development projects, the lack of protection of the surrounding karst areas (such as Igman and Bjelašnica), and the

low use of modern technologies for monitoring and sustainability of the protected area itself. Future plans aim to expand green tourism, focusing on environmental sustainability, cultural preservation, and economic benefits. Increasing local community involvement and raising visitors' environmental awareness are key steps toward long-term sustainability.

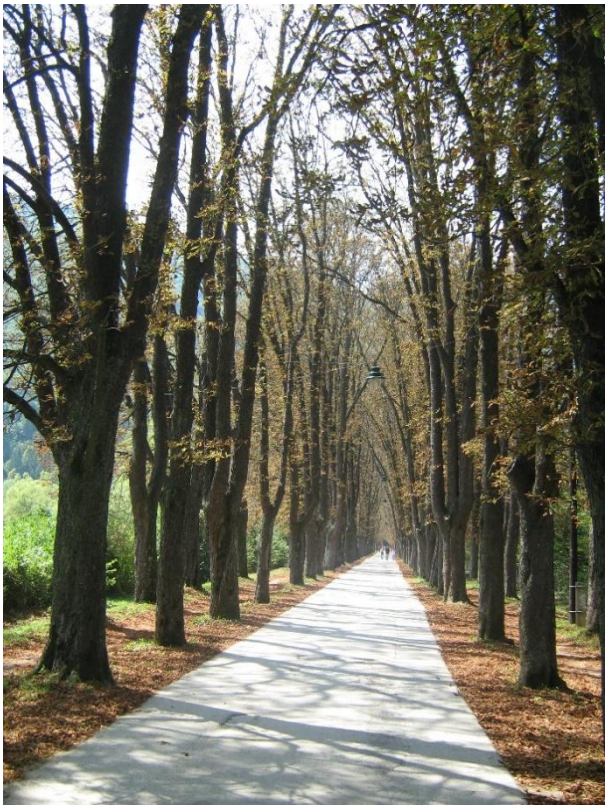


Figure 5. Great Alley of Platanus acerifolia **Source:** CA Author

Raising environmental awareness, introducing environmentally friendly technologies, and promoting socio-cultural sustainability are crucial for further development. The site appears to be a good model for educational programs (International Biodiversity Day has already educated over 15,000 students in the area). Sustainability in the area includes the protection of natural resources, the promotion of local traditions and culture, the use of renewable energy sources, and the enhancement of economic benefits for the local community. Bosna Spring is an example of how nature conservation can be combined with tourism development and an inspiration for other protected areas in Bosnia and Herzegovina.

This is also confirmed in the intention of the Strategy 2020–2030 (Ministry of Physical Planning, Construction and Environmental Protection of Sarajevo Canton, 2020). Some of the promoted objectives are, for instance, the promotion of cultural

and natural heritage and the organization of excursions and educational activities in cooperation with professional institutions, which are key priorities. The program allows for flexible booking and adaptation of content according to the age group and education of the participants. Basic equipment will be provided for research activities, and conditions for the presentation of results will be created. Workshops and excursions with expert commentary will be available to visitors, and refreshments and meals will be provided according to the length of the program.

However, the strategy also highlights threats facing Bosna Spring. Including mainly anthropogenic pressures associated with over-visitation and unsustainable use of the area. Increased numbers of visitors are leading to ecosystem disturbance and pollution of watercourses and soil, with sensitive hydrological resources particularly at risk. Illegal waste dumping, deteriorating infrastructure, and irresponsible visitor behavior also pose major risks to the long-term conservation values of the area. Protecting the Bosna Spring therefore requires strict measures to regulate activities in the protected area, close monitoring of the state of nature, and effective cooperation between area managers and visitors to ensure its sustainability.

Data analyses

As part of the processing, we transformed the data from the questionnaires into an Excel spreadsheet, which we coded sequentially. We divided the spectral responses into a scale of 1-5, and for specific alternative responses, we created specific codes (male - 8, female - 9). In the next step, we transferred the document into a .txt schema for processing in JASP. We used both univariate and bivariate data analyses. In doing so, we mainly considered the variability of first-time visitors' and multi-visitors' responses to questions about awareness of the area rules and conservation.

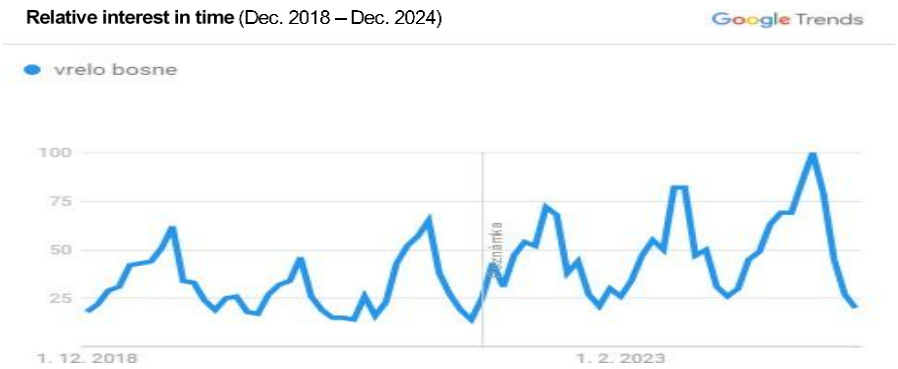


Figure 6. Respondent interest in survey. The numbers represent the relative to the highest point on the graph for that area and time. A value of 100 represents the highest popularity of a term. A value of 50 means the term was half as popular. A score of 0 means that there was not enough data for this term. **Source:** Own research supported by Google Trends, 2024

In the univariate analyses, the following responses can be detected: respondents are most aware of the recreational opportunities in the Bosna Spring area (75%), which is a logical result in the context of the fact that 85% of respondents went to the area specifically to visit the Bosna Spring area.

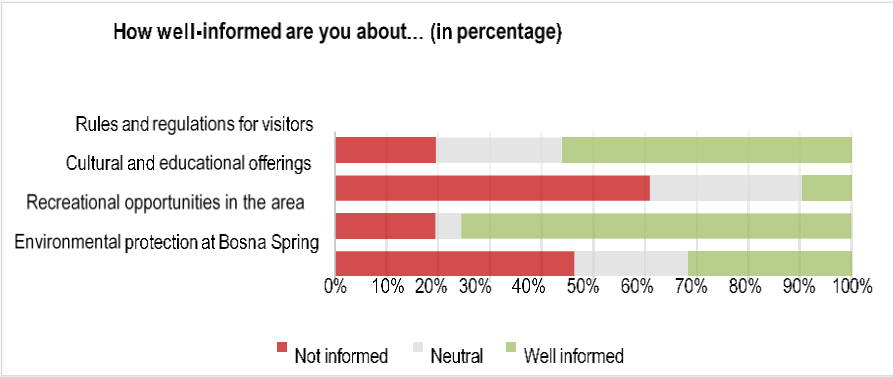


Figure 7. Conservation awareness and ecotourism preferences **Source:** Own research

The protected area communicates well the rules and regulations in the protected area, which 56% of visitors understood during their visit. This was most likely due to the number of visible info signs that are posted throughout the protected area.
On the other hand, visitors are not clearly informed before entering about the level of protection of the area. Almost half (46%) of the respondents answered that they are not familiar with the level of protection of the Bosna Spring. This is certainly a loss in the context of the increasing interest in the area. Bosna Spring is an interesting ecotourist attraction, within which the approach of the Bosnian administration to nature protection could be highlighted. According to Google trends and data from the ZPPKS, interest in the area and its protection is increasing.

The second part of the questionnaire asks about the importance of each of the area's governance objectives. Respondents are most supportive of nature conservation itself (100%) and related educational programs (76%), promotion of sustainable tourism (70%), and support for scientific research for conservation (68%). These responses were ranked as the most important by respondents, reflecting public interest in conservation objectives, which the protected area should therefore actively communicate.

Bivariate analyses accounting for the number of visits show significant differences in awareness of park rules. Visitors who have visited the park more than once are 11% more aware of the rules than those who have visited only once. For the other questions, there were no significant outliers or differences in the data. Men attach more importance to sporting opportunities in the area (19%), while women emphasize the importance of education and programs in the area (14 %). On the other hand, they agree on the importance of general nature conservation.

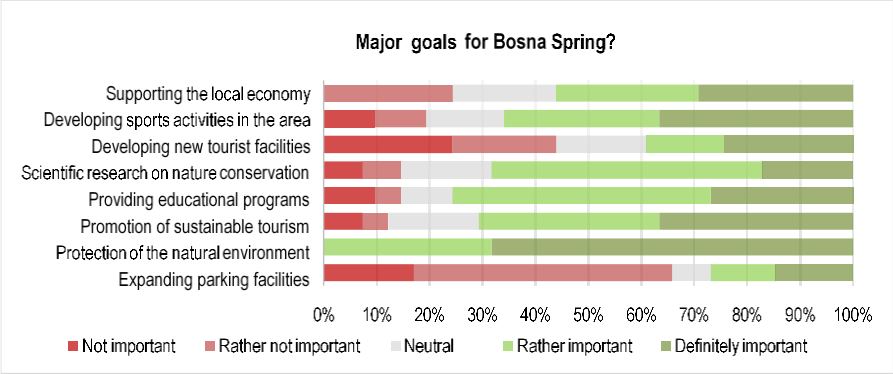


Figure 8. Ecotourism goals and willingness to contribute to nature conservation
Source: Own research

Table 1. Gender differentiation of respondent attitudes toward the contribution to nature conservation and ecotourism development

Most important goals for Vrelo Bosna	Male	Female	Diff.
Supporting the local economy	52	61	9
Expanding parking facilities	21	33	12
Protection of the natural environment	100	100	**0**
Promotion of sustainable tourism	74	65	9
Providing educational programs	69	83	**14**
Scientific research on nature conservation	69	66	3
Developing new tourist facilities	30	44	14
Developing sports activities in the area	74	55	**19**

Source: Own research, data in percentage

Other data show, for example, that visitors spend an average of 6 EUR here; 46% of the respondents had visited Bosna Spring more than once. This is probably related to the nature of the exchange students interviewed, for whom proximity to a protected area may be of interest. They often recommend visiting it to their families and friends who come to visit them, going to the area with them for the second time.

DISCUSSION

The findings show that the most important aspect that visitors associate with Bosna Spring is recreational opportunities, of which 75% of respondents are aware. This corresponds to the fact that 85% of participants visited the site primarily for recreation and relaxation. These results confirm that the area fulfills its role as an important ecotourism destination and serves as an important location for relaxation

and outdoor activities. Most notably, due to the highly urban nature of the Bosna Spring area, the importance of nature conservation is often overlooked and not sufficiently communicated to visitors.

In addition, the survey highlights gender differences in visitor preferences. While men place more importance on sporting opportunities (19%), women place more emphasis on educational programs (14%). This suggests the need for a balanced offer that caters to different visitor preferences, including improved infrastructure for recreational activities and enhanced educational initiatives. These two aspects are also among the most desired in general, which could be an interesting outcome for programs in Bosna Spring. The development of sports activities could be another objective of the protected area.

Despite a relatively high level of awareness of park rules (56% of respondents), results show that almost half of visitors (46%) are not familiar with the level of protection of the area. This indicates a gap in pre-visit communication and educational activities that should be addressed to highlight the protected status of the area and its ecological importance.

The findings underline the role of visible information signs in the site, as respondents cited them as a key source of information. However, the lack of information prior to entering the park presents an opportunity to improve awareness through online platforms, brochures, and visitor centres. Effective communication about conservation efforts could also further engage visitors and strengthen their appreciation of Bosna Spring's protected status.

The results show strong support for conservation-related initiatives, reflecting growing public interest in environmental sustainability. Respondents identified conservation (100%), educational programs (76%), promotion of sustainable tourism (70%), and scientific research (68%) as key priorities for site management. These findings are consistent with broader global trends, with younger generations increasingly valuing sustainability and environmental stewardship. The strong interest in educational programs suggests a need for expanded opportunities such as guided tours, workshops, and interpretive activities that convey the ecological and cultural value of the area. The development of such programs could simultaneously raise awareness and generate additional revenue.

Survey results show that repeat visitors (46%) are more familiar with park rules, with an awareness rate 11% higher than first-time visitors. This trend highlights the importance of ongoing visitor engagement, as individuals who visit the area repeatedly often act as informal ambassadors and encourage family and friends to visit. This can help to increase visitor numbers and promote a culture of conservation among local and international visitors.

Furthermore, data showing an average expenditure of 6 EUR per visit highlights the economic benefits to local communities, which could motivate greater involvement of local communities in park management. Encouraging local businesses to offer environmentally friendly services and products could further enhance the sustainable development potential of the site.

CONCLUSION

The results are limited by the sample of respondents selected. If this questionnaire were presented to local residents or visitors in season, they could provide a more interesting insight into their priorities. In particular, local residents who could comment not only on the level of protection and awareness of the area but also on the tendencies of urban expansion zones and other issues.

At the same time, the sample of 41 respondents is not a sufficiently representative sample. Although the idea that different priorities are gendered, i.e., different levels of gender groups have different priorities, is confirmed, in any case it is not possible to apply these results to the entire sample of visitors.

We would like to conclude with a brief review of the literature and research to highlight the challenges that Bosna Spring may face in the future. The findings also highlight several challenges, including:

a) Urbanization pressures: Development projects near Bosna Spring pose threats to its ecological integrity, requiring stricter enforcement of protection measures and sustainable land-use policies.
b) Communication of protection status: Enhancing pre-visit education through digital platforms, signage, and outreach programs is critical.
c) Infrastructure improvements: Investments in eco-friendly infrastructure can enhance the visitor experience while minimizing environmental impacts.

To overcome these challenges, the following recommendations are proposed:

a) Strengthen Communication and Education: Improving pre-visit education and on-site communication is crucial for raising awareness about the protected status and ecological importance of Bosna Spring. This can be achieved through targeted campaigns, interactive visitor centres, and guided educational programs.
b) Promote Community Involvement: Actively engaging local communities in tourism management and conservation activities will ensure that economic benefits are equitably distributed. This approach fosters a sense of ownership and encourages sustainable practices among residents.
c) Enhance Sustainable Infrastructure: Investing in eco-friendly infrastructure, such as renewable energy solutions, better waste management systems, and improved visitor facilities, will minimize the environmental impact while enhancing the visitor experience.
d) Diversify Tourism Offerings: Expanding educational and recreational programs will attract a broader range of visitors and emphasize the importance of conservation. These offerings can include workshops, interpretive tours, and cultural experiences that align with sustainable tourism principles.

By implementing these recommendations, Bosna Spring can serve as a leading model of sustainable ecotourism in Bosnia and Herzegovina. Balancing conservation priorities, visitor satisfaction, and community engagement is vital to preserving the area's natural and cultural heritage for future generations.

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SPATIAL PLANNING IN GEOGRAPHICAL REVIEWS (1962–2025): A BIBLIOMETRIC AND THEMATIC ANALYSIS

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ABSTRACT

Spatial planning is a system of comprehensive planning and organization aimed at achieving an optimal balance across multiple dimensions. Despite being an interdisciplinary and increasingly relevant field, there is a lack of studies analyzing the specific content and focus of spatial planning research, particularly at the national level in North Macedonia. To address this gap, this study examines the development of spatial planning research in the Republic of North Macedonia through an analysis of papers published in *Geographical Reviews* between 1962 and 2025. A bibliometric approach, combined with manual thematic classification, was applied to identify publication trends, authorship patterns, and the main research themes. The analysis reviewed all 58 issues of the journal, resulting in the identification of 43 scientific papers directly related to spatial planning. Papers were identified using relevant keywords in titles, abstracts, and, when necessary, the full text. The selected papers were classified according to their thematic focus into several categories, including land use, population, settlements, infrastructure, rural planning, urban planning, environment, tourism, and other relevant topics.

The temporal analysis indicates that the volume of spatial planning research within *Geographical Reviews* was not uniform throughout the analyzed period. The highest research output occurred during the 1980s, reflecting a period of intensified research activity, whereas the period between 2010 and 2019 experienced a decline in research output. More recent years demonstrate an increase in publications, indicating renewed scientific attention to spatial planning issues. The thematic analysis revealed a predominance of studies on urban planning and environmental topics, followed by research on tourism and socio-geographical aspects of space.

The conducted research confirms the important role of *Geographical Reviews* in documenting the evolution of spatial planning research and geographical thought in North Macedonia. Considering the increasing importance of sustainable spatial development,

environmental protection, and contemporary urban challenges, further growth in scientific research on spatial planning is anticipated.

Keywords: spatial planning, *Geographical Reviews*, bibliometric analysis, thematic analysis, North Macedonia

INTRODUCTION

According to Nadin and Stead (2008), spatial planning is embedded in institutional arrangements through which governments influence spatial development, with planning systems reflecting broader socio-economic and political contexts. Although spatial planning is, both in theoretical and practical terms, a relatively young scientific discipline, its roots extend far into the past (Zikov, 2005).

Spatial planning arose from the basic requirements of existence, security, and organized settlement. Over time, it evolved beyond immediate functional or defensive concerns, and by the 19th and 20th centuries, the focus shifted toward organized urban growth, infrastructure development, and social welfare, driven by industrialization, population growth, and emerging environmental awareness. In the Republic of North Macedonia, urban and spatial planning has a relatively short tradition. During the first half of the 20th century, urban plans were primarily developed for the country's larger cities. Following the 1963 Skopje earthquake, intensive urban planning activities were undertaken by the Skopje Urban Planning Service, supported by the United Nations and numerous countries involved in the reconstruction of the capital city. The first systematic spatial planning activities began in the 1970s with the establishment of the Directorate for Spatial Planning, which later developed into an Institute (Zikov, 2005). After gaining independence in 1991 and the transformation of the socialist system into a market-oriented economy, a new phase in spatial planning began (Ivanišević et al., 2021). As a sovereign state, North Macedonia assumed responsibility for directing spatial planning strategies and for organizing, utilizing, and protecting space over the long term (Zikov, 2005). Today, these responsibilities are primarily coordinated by the Ministry of Environment and Physical Planning, which represents the central governmental institution responsible for spatial planning at the national level.

Bibliometric analysis is a quantitative research method that systematically analyses scientific publications to identify research trends, influential authors, and the intellectual structure of a research field (Donthu et al., 2021). Recent studies illustrate its effectiveness: Zheng et al. (2023) used keyword co-occurrence analysis to examine the knowledge structure and research trends in the scientific literature on urban community garden systems; Rosni et al. (2017) employed keyword-based literature retrieval followed by the selection and classification of journal articles related to urban sprawl; Shao et al. (2023) conducted a bibliometric analysis of research on urban ecosystem services; Mehari and Genovese (2023) analyzed the land use planning literature using citation analysis and keyword co-occurrence

analysis; Liu et al. (2023) employed a combined machine learning and bibliometric approach to analyse research on land use change detection; and Sanchez and Afzalan (2017) identified the knowledge structure of urban planning research. These studies highlight how bibliometric methods provide insights into the development and evolution of scientific research. Although bibliometric studies often rely on specialized software or databases, the method can equally be applied through careful manual data collection and organization, as demonstrated in this study.

Despite the growing application of bibliometric analysis globally, there has been no comprehensive overview of publications on spatial planning within the Macedonian context, particularly in *Geographical Reviews*, which has served as a key platform for documenting theoretical and methodological developments in the field. To address this gap, this paper employs a bibliometric approach, screening and analyzing articles published between 1962 and 2025. The methodological approach adopted in this study was inspired by the bibliometric framework applied by Yang et al. (2023) and adapted to the specific context of a single national geographical journal. Accordingly, the study focuses on the temporal development of scientific production, the thematic structure of published research, and potential future directions of spatial planning studies within the Macedonian geographical community. The following research questions were formulated: (1) What are the trends in the production of spatial planning literature? (2) What are the main research themes and hotspots in the field, and how have they developed over time? (3) What are the potential directions for future research in spatial planning?

RESEARCH DESIGN

Data

This study focuses on the representation of spatial planning in *Geographical Reviews*, the official journal of the Macedonian Geographical Society, published annually. The journal features scientific articles, contributions, geographic news, information, and book reviews related to geography. While its primary focus is on North Macedonia, articles covering other regions are also included. *Geographical Reviews* has a long-standing tradition, with its first issue published in 1962. In total, there are 13 double editions, which account for 26 individual issues, along with 32 single editions, bringing the total number of issues to 58, all of which are counted separately in this study. All articles were retrieved from the official online archive of *Geographical Reviews* (https://igeografija.mk/reviews/archives) and, when necessary, from the print volumes at the library of the Institute of Geography, Faculty of Natural Sciences and Mathematics in Skopje.

METHODOLOGY

Bibliometric analysis provides quantitative methods for evaluating research performance and mapping the intellectual development, thematic evolution, and collaboration patterns of scientific fields (Borgman and Furner, 2002; Bornmann, 2014; Campbell et al., 2010). This study applies a bibliometric approach combined with manual thematic classification to examine the representation and development of spatial planning research in *Geographical Reviews* over time.

The selection of articles followed an adapted PRISMA-based procedure designed for single-journal bibliometric studies. All items published in *Geographical Reviews* between 1962 and 2025 were initially identified and subsequently screened according to predefined inclusion and exclusion criteria. The screening process distinguished between scientific and non-scientific content, followed by relevance screening focused specifically on spatial planning topics. The selection process is presented in Figure 1.

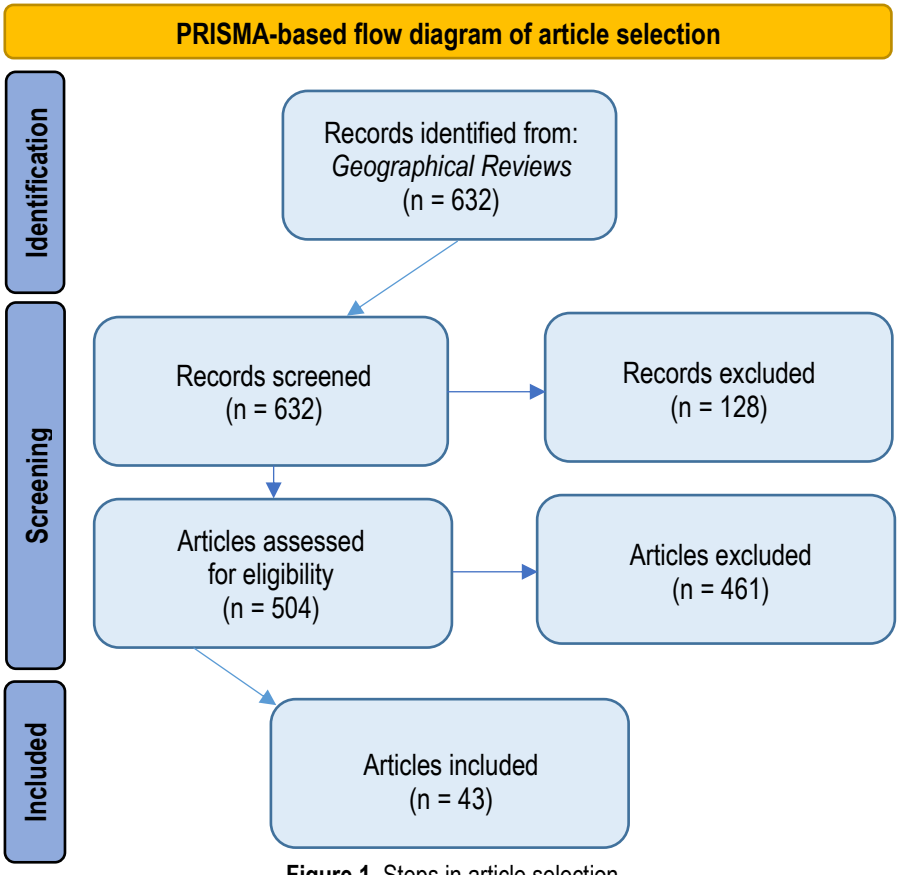


Figure 1. Steps in article selection
Source: authors' own elaboration

The PRISMA flow diagram shows that a total of 632 records were identified for the period 1962–2025. In the first screening phase, 128 records were excluded, primarily consisting of short geographical reviews, chronicles, news items, bibliographies, society reports and activities, anniversary articles, and in memoriam sections. The remaining 504 publications were classified as scientific papers and were further analyzed. A predefined set of keywords relevant to spatial planning was compiled, based on existing literature and standard terminology in the field. The keywords included: “spatial planning”, “land use”, “urban planning”, “space utilization”, and “space organization”. All 504 articles were screened for the presence of these keywords in titles, abstracts, and, where necessary, full texts. In the final phase, 43 articles were identified as having a primary focus on spatial planning. For the selected articles, bibliometric information was collected, including publication year, author(s), article title, and thematic sub-focus within spatial planning. This data allowed for quantitative and qualitative analysis of trends over time.

To assess changes and developments across decades, the articles were grouped into the following periods: 1962–1969, 1970–1979, 1980–1989, 1990–1999, 2000–2009, 2010–2019, and 2020–2025. This decade-based categorization facilitated the identification of long-term trends and shifts in research focus.

RESULTS

Temporal distribution of spatial planning articles

To examine the temporal trends in spatial planning research, all issues of *Geographical Reviews* published between 1962 and 2025 were analyzed. Table 1 summarizes the number of journal issues published in each period and the number of articles focused on spatial planning. This overview provides a foundation for understanding the evolution of spatial planning research within the journal over time.

Table 1. Number of journal issues and spatial planning articles per defined period

Defined period	No. of issues published	No. of spat. planning articles
1st period (1962–1969)	7	5
2nd period (1970–1979)	10	7
3rd period (1980–1989)	10	13
4th period (1990–1999)	7	4
5th period (2000–2009)	9	7
6th period (2010–2019)	9	3
7th period (2020–2025)	6	4
Total	58	43

Source: authors’ own elaboration

In the first defined period (1962–1969), seven journal issues were published, containing five articles related to spatial planning. During the second period (1970–1979), ten issues were published and the number of spatial planning articles increased to seven. This upward trend continued during the third period (1980–1989), which also comprised ten issues and recorded the highest number of spatial planning articles (13) within the entire study period.

In the fourth defined period (1990–1999), seven journal issues were published, containing a total of only four articles focused on spatial planning. The fifth period (2000–2009) experienced a modest increase in spatial planning research, with a total of seven articles published across nine journal issues. In contrast, the sixth period (2010–2019) recorded the lowest number of spatial planning articles, with only three publications despite nine journal issues being released. Notably, from 2016 to 2022, no articles on this topic were published, emphasizing the substantial decline in research activity during this period.

The most recent period (2020–2025) includes six journal issues and four articles related to spatial planning. Compared with the previous decade, the results suggest a partial recovery in the representation of spatial planning topics within the journal.

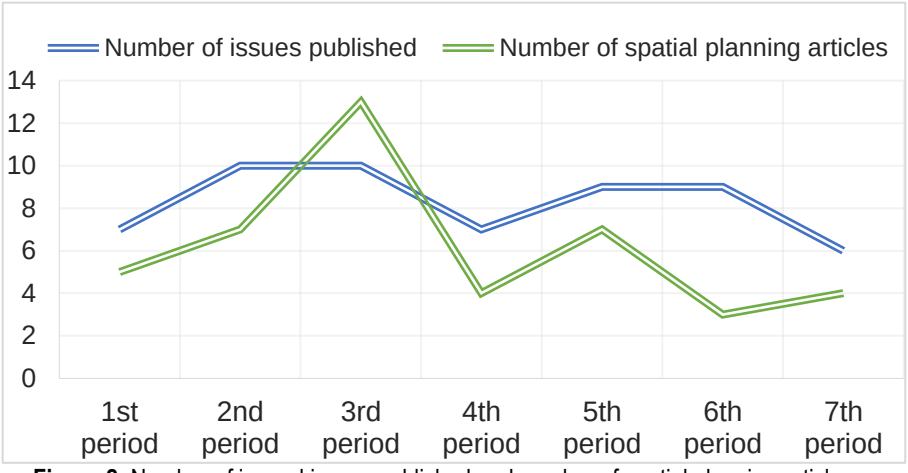


Figure 2. Number of journal issues published and number of spatial planning articles per defined period **Source:** authors' own elaboration

Figure 2 illustrates temporal trends in the number of journal issues and spatial planning articles across the seven periods. While the number of published issues remained relatively stable over the decades, the number of spatial planning articles has fluctuated significantly. The green curve exceeds the blue curve only in the third period (1980–1989), indicating a peak in academic interest in the field. On the other hand, the sixth period (2010–2019) exhibits a significant decline in research activity. The most recent period (2020–2025) indicates a modest increase in publication output, suggesting a renewed interest in spatial planning research within the journal.

Authorship analysis

A notable characteristic of spatial planning research in *Geographical Reviews* is the predominance of single-author papers, particularly among the older publications. Out of the 43 articles identified as related to spatial planning, only five were co-authored, indicating a largely individual research practice during the analyzed period. Figure 3 presents the eight most productive authors who published two or more papers on spatial planning. This overview highlights the key contributors to the development of spatial planning within the Macedonian geographical community.

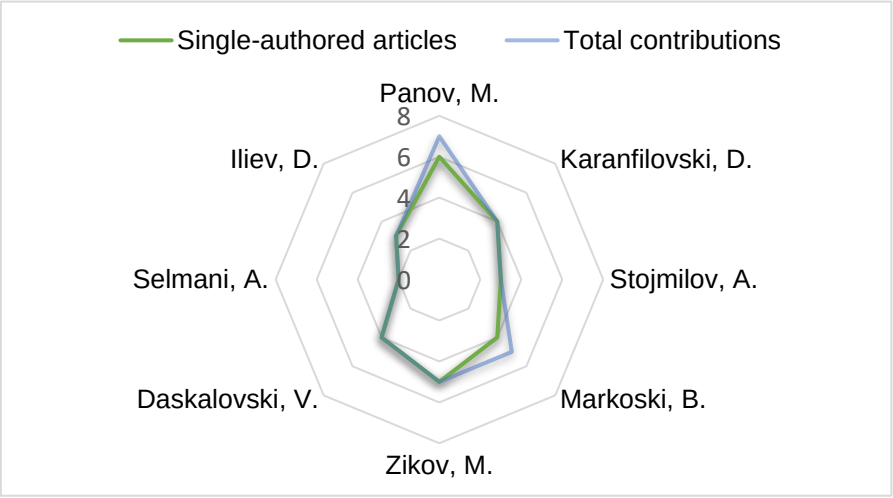


Figure 3. Authorship distribution of spatial planning articles in *Geographical Reviews*
Source: authors' own elaboration

The analysis of authorship patterns indicates that Mitko Panov was the most productive contributor to spatial planning research in *Geographical Reviews*, with a total of seven articles. He is followed by Mihailo Zikov and Blagoja Markoski with five articles each, while Dimitar Karanfilovski and Vasa Daskalovski each contributed four articles. Aleksandar Stojmilov and Dejan Iliev authored three articles each, whereas Aslan Selmani contributed two articles related to spatial planning. In addition to these authors, a considerable number of researchers contributed to the field through a single publication. To improve the clarity and readability of the graphical presentation, only authors with two or more publications were included in the analysis presented in Figure 3.

Thematic distribution of spatial planning articles

To obtain a clearer overview of the research orientation of the identified articles, a thematic classification was conducted. The analyzed papers were grouped into several spatial planning themes according to their dominant research focus, including

land use, population, settlements, infrastructure, rural and urban planning, tourism, environment, and a separate category labeled “Other” which is explained below. The thematic distribution of the identified articles is presented in Figure 4.

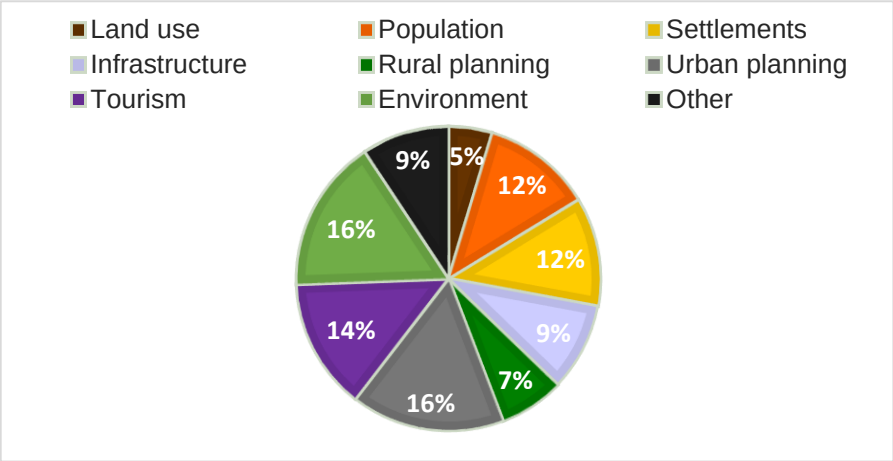


Figure 4. Thematic structure of articles related to spatial planning published in *Geographical Reviews* **Source:** authors’ own elaboration

Figure 4 presents the thematic distribution of articles related to spatial planning published during the analyzed period. Urban planning and environmental topics are the most represented research themes, each accounting for 7 scientific papers or 16% of the total number of analyzed articles. Tourism-related topics follow with 6 papers (14%), while studies focused on population and settlements in spatial planning account for 5 papers each (12%).

Furthermore, papers related to infrastructure represent 9% of the total sample (4 papers), followed by rural planning with 3 papers (7%) and land use with 2 papers (5%). A separate category labeled “Other” was also identified, consisting of 4 scientific papers (9%). This category includes papers that cannot be clearly classified within the previously defined thematic groups, such as studies related to spatial planning policies, legislation, methodological issues, and regional spatial plans.

To identify thematic changes over time, the classified articles were further analyzed according to the seven defined periods. Figure 5 shows the number of published articles within each thematic category across the analyzed periods. Each column is divided into segments representing the thematic structure of the articles published within the corresponding period.

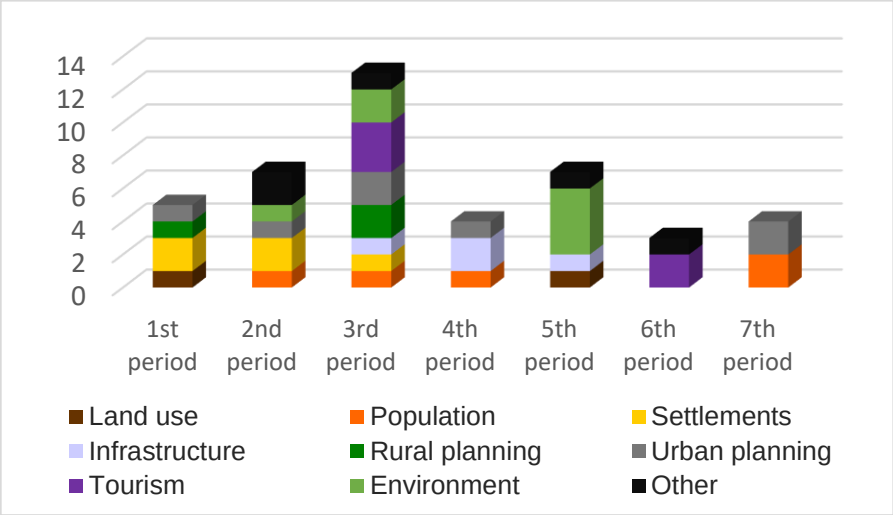


Figure 5. Distribution of spatial planning articles by thematic categories in *Geographical Reviews* (1962–2025) **Source:** authors' own elaboration

For example, the first period (1962–1969) includes one scientific paper each dedicated to land use, rural and urban planning, as well as two papers focused on settlements in spatial planning. The second period (1970–1979) shows certain similarities, with one paper related to urban planning and two papers dedicated to settlements. Population emerged as a spatial planning factor with one scientific paper, while it is particularly interesting that the first paper dedicated to environmental issues in spatial planning published in *Geographical Reviews* appeared exactly 50 years ago, in 1976. Furthermore, the second period also includes two papers classified within the "Other" category, focusing on methodological issues and regional spatial planning.

The third period (1980–1989) includes papers from all nine defined thematic categories, with the exception of land use. The greatest research focus during this period was placed on tourism in spatial planning, represented by a total of three scientific papers. Environmental topics, along with rural and urban planning, followed with two papers each.

The fourth period (1990–1999) consists of only four scientific papers, with the strongest research focus placed on infrastructure-related issues in spatial planning. The two papers specifically examine the road network and its influence on spatial organization, while the remaining two studies focus on population and urban planning.

The fifth period (2000–2009) is characterized by the dominance of papers dedicated to environmental issues in spatial planning, with a total of four scientific papers. This also represents the largest segment within the chart, indicating a particularly strong research orientation toward a specific thematic field. The remaining papers belong to the domains of land use and infrastructure, along with

one paper dedicated to the Law on Territorial Organization of the Republic of Macedonia adopted in 2004. The sixth period (2010–2019) comprises only three scientific papers, mainly dedicated to tourism-related issues.

The last period (2020–2025), which is still ongoing, comprises four scientific papers with an equal representation of population and urban planning topics. During this period, legislative and planning activities are underway in the country, including the preparation of a new law on spatial planning and a new national spatial plan. Considering the growing relevance of spatial planning issues, these developments may contribute to an increase in spatial planning research by the end of the decade. Particular growth may be expected in multi-thematic studies addressing sustainable urban development, environmental protection, and related planning challenges.

DISCUSSION

The analysis of spatial planning research published in *Geographical Reviews* between 1962 and 2025 reveals several important features of the field in North Macedonia. When examining temporal trends, it is evident that the number of spatial planning articles does not follow a continuous upward trajectory but rather fluctuates across decades. Sharifi et al. (2023), in their bibliometric review of urban studies and regional and urban planning literature from 1956 to 2022, identified a rapid increase in scientific production over the study period. Similar results were reported by Paul et al. (2025), whose bibliometric analysis identified substantial growth in peri-urban research publications between 1976 and 2023. In contrast, the peak of publications in *Geographical Reviews* occurred during the 1980s, followed by periods of decline and stagnation.

A different pattern is observed in authorship trends. Four of the five co-authored articles in *Geographical Reviews* were published recently (2015–2025), reflecting an increase in collaborative research activity. This finding is consistent with the results of Ho et al. (2026), who found that the average number of authors per publication in urban studies and planning research increased from 1.6 to 3.2 between 1991 and 2021. The predominance of single-author publications in earlier periods suggests that spatial planning research in North Macedonia has traditionally been conducted individually, likely due to the small size of the research community and limited institutional collaboration.

The results from *Geographical Reviews* indicate a strong focus on urban and environmental planning. This finding is consistent with the bibliometric analysis conducted by Sareen and Haque (2023), which identified environmental issues and sustainable peri-urban development as major research themes. In addition, tourism-related studies represent another important thematic group within *Geographical Reviews.* This observation is consistent with the findings of Krabokoukis and Polyzos (2023), whose bibliometric analysis revealed an increasing integration of tourism development, urban planning, and sustainability.

Overall, the findings indicate that, despite the relatively limited number of

publications, *Geographical Reviews* reflects several trends observed in international spatial planning literature, including the growing importance of collaborative research and the increasing attention devoted to environmental and urban planning issues. At the same time, the fluctuations in publication output and the limited representation of certain thematic areas reveal specific characteristics of the Macedonian scientific context and point to potential directions for future research.

CONCLUSION

This study provided a bibliometric overview of spatial planning research in the Republic of North Macedonia, focusing on publications in *Geographical Reviews* from 1962 to 2025. The analysis identified temporal fluctuations in publication output, a predominance of single-author papers in earlier periods with a recent increase in collaborative research, and a thematic focus on urban planning, environmental issues, and tourism. These findings demonstrate the contribution of *Geographical Reviews* in documenting the evolution of spatial planning research and highlight the alignment of Macedonian research with broader international trends.

However, several limitations should be considered when interpreting the results. The main limitation of this study is that the analysis is restricted to a single national journal, which may not fully represent the entirety of spatial planning research conducted in North Macedonia. In addition, the scope of the dataset limited the application of advanced bibliometric techniques, such as co-authorship and citation network analysis, keyword co-occurrence matrices, and specialized software packages including VOSviewer and Bibliometrix. Furthermore, the thematic classification was based on manual coding, which introduces a degree of subjectivity.

To build upon this study, future research could expand the analysis to include all Macedonian geographical journals, as well as regional and international publications, in order to provide a more comprehensive picture of spatial planning research. Employing advanced bibliometric tools and network analysis software could enable more detailed co-word, co-authorship, and citation analyses. Comparative studies involving neighboring countries or the broader Balkan region could further contribute to understanding the position and development of Macedonian spatial planning research within the regional scientific context. Additionally, investigating emerging topics and interdisciplinary collaborations would offer valuable insights into the evolving research priorities and existing knowledge gaps within the field.

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ПРОСТОРНОТО ПЛАНИРАЊЕ ВО ГЕОГРАФСКИТЕ РАЗГЛЕДИ (1962–2025): БИБЛИОМЕТРИСКА И ТЕМАТСКА АНАЛИЗА

АПСТРАКТ

Просторното планирање е систем на сеопфатно планирање и организација насочен кон постигнување оптимална рамнотежа помеѓу повеќе просторни и функционални димензии. И покрај тоа што е интердисциплинарна и актуелна научна област, постои недостиг од студии кои го анализираат специфичниот содржински фокус на истражувањата во просторното планирање, особено на национално ниво во Република Северна Македонија. За да се пополни оваа празнина, ова истражување го анализира развојот на истражувањата во областа на просторното планирање во Република Северна Македонија преку анализа на трудови објавени во списанието *Географски Разгледи* во периодот од 1962 до 2025 година. Применет е библиометриски пристап, комбиниран со рачно извршена тематска класификација, со цел да се идентификуваат објавувачките трендови, авторската застапеност и главните истражувачки теми. Анализата ги опфати сите 58 броја на списанието, при што беа идентификувани 43 научни трудови директно поврзани со просторното планирање. Трудовите беа селектирани преку релевантни клучни зборови во наслови, апстракти и, по потреба, во целиот текст. Потоа беа класифицирани според нивниот тематски фокус во неколку категории, вклучувајќи користење на земјиштето, население, населби, инфраструктура, рурално и урбано планирање, животна средина, туризам и други релевантни теми.

Временската анализа покажува дека обемот на истражувања во областа на просторното планирање во *Географските Разгледи* не е рамномерно распределен низ

анализираниот период. Највисоко ниво на истражувачка продукција е забележано во 1980-тите години, што укажува на период на засилена научна активност, додека периодот од 2010 до 2019 година се карактеризира со намалена истражувачка продукција. Во поновите години се забележува зголемување на бројот на објавени трудови, што укажува на обновен научен интерес за прашањата од просторното планирање. Тематската анализа покажува доминација на студии од областа на урбаното планирање и животната средина, по што следуваат истражувања поврзани со туризмот и социо-географските аспекти на просторот.

Спроведеното истражување ја потврдува важната улога на списанието *Географски Разгледи* во документирањето на еволуцијата на истражувањата во просторното планирање и географската мисла во Република Северна Македонија. Со оглед на сè поголемото значење на одржливиот просторен развој, заштитата на животната средина и современите урбани предизвици, се очекува понатамошен раст на научните истражувања во оваа област.

Клучни зборови: просторно планирање, *Географски Разгледи*, библиометриска анализа, тематска анализа, Северна Македонија

UDC:
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THE EDUCATIONAL POTENTIAL OF PROTECTED AREAS IN GEOGRAPHY TEACHING: PERCEPTIONS OF STUDENTS AND TEACHERS IN NORTH MACEDONIA

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ABSTRACT

Protected areas are natural units of exceptional ecological, scientific and educational value. They can be included in geography teaching to support a better understanding of natural processes, ecosystems and sustainable development. However, their inclusion in geography curricula in North Macedonia remains limited and unsystematic. The aim of this paper is to determine the level of awareness, the experiences and the attitudes of students, as well as the perceptions of geography teachers, regarding the representation and educational potential of protected areas in geography teaching in North Macedonia. The research was carried out using the survey method, the method of analysis and the method of synthesis. The data are based on a survey conducted among students and geography teachers in primary and secondary education. The results indicate a high level of interest among students and geography teachers in a more systematic integration of these contents. The need for fieldwork and project assignments, stronger institutional support, improved access to relevant educational materials and continuous professional training of teaching staff is particularly emphasised. The analysis concludes that the representation of content on protected areas will contribute to students' education and environmental awareness.

Keywords: protected areas, educational process, geography, students, teachers

INTRODUCTION

Values related to nature conservation develop from an early age, so education plays an essential role in forming environmentally aware and responsible

generations. Education for nature protection teaches students to be responsible towards nature and to live in balance with it. The school, as an educational institution, provides significant opportunities for the upbringing and education of students towards the protection and conservation of nature. To prevent the destruction of nature, it is necessary to act both educationally and practically (Dimitrovska 2008). Protected areas are one of the most important mechanisms for the long-term conservation of biological and landscape diversity. According to the IUCN, a protected area is "a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2008). In the Republic of North Macedonia, the categories of protected areas and the protection regimes are regulated by the Law on Nature Protection (Official Gazette of the Republic of Macedonia 2004). In addition to their ecological value, protected areas also have an educational function. They are a suitable place for studying natural processes, and many of them develop educational programmes in cooperation with schools, thus giving students direct contact with nature (Stolton et al. 2015). Protected area managers and schools can develop joint programmes, including teacher training (Savić et al. 2019), and experiences with children in protected areas show that emotional attachment to place fosters empathy and engagement in nature conservation (von Lachmann et al. 2021). Geography is the subject in which this function can be realised most naturally. The International Charter on Geographical Education emphasises the role of geography in understanding the human–environment relationship and in education for sustainable development (IGU-CGE 2016), while the goals of education for sustainable development require learning that links knowledge, attitudes and action (UNESCO 2017). A comparison of geography curricula shows that their contribution to sustainability literacy depends on the extent to which the content is linked to skills and practical application (Miao et al. 2022). One of the best ways for students to get to know and experience nature, and to understand its importance, is through direct contact with it. Fieldwork should therefore become an integral part of the educational process.

Fieldwork is an integral part of the teaching process in geography. Teaching carried out outside the classroom and the school, in which students in an organised way carry out various observations, measurements, research, drawing, photographing, recording, and the collection and systematisation of diverse materials and data in order to become acquainted with geographical space more thoroughly and objectively, is called fieldwork or the field method (Dimitrov, Markoski 2011). A review of 150 studies on outdoor learning shows that fieldwork, when well conceived, planned and followed up with classroom activities, enables students to develop knowledge and skills that complement classroom teaching, but also that its use is limited by concerns about safety, teachers' lack of confidence, shortages of time, resources and support, and curriculum requirements (Rickinson et al. 2004). Project-

based teaching, which focuses on critical thinking, collaboration and creativity (Scott 2015), is a second approach through which the topic can be addressed actively, and its effects on functional geographical knowledge have been examined in both Serbia and North Macedonia (Đorđević et al. 2019; Đorđević et al. 2024). In the Republic of North Macedonia, there is still a lack of empirical research on how protected areas are included in geography teaching and how students and teachers perceive this topic. The aim of this paper is to determine the knowledge, experiences and attitudes of students, as well as the attitudes of geography teachers, regarding the inclusion of protected areas in teaching. The research focuses on four questions: (1) how much and what students know about protected areas and from which sources they obtain information; (2) which teaching activities are used and how widely fieldwork is applied; (3) whether students' attitudes differ according to level of education and participation in fieldwork; and (4) how teachers assess the representation of the topic in the curricula, the teaching materials and the working conditions.

RESEARCH METHODS

The research is quantitative, conducted with two anonymous questionnaires (one for students and one for teachers), and complemented by a content analysis of geography and natural science curricula and textbooks. The student questionnaire contains 18 closed-ended questions grouped into four parts: basic knowledge of protected areas, their study in geography lessons, sources and teaching materials, and activities used. The teacher questionnaire contains 12 questions in three parts: representation of the topic in teaching, availability of teaching materials, and importance of the topic in the educational process. For some questions, multiple answers could be selected.

The research included students in grades VIII and IX of primary education and in years I and II of secondary education, where geography is taught. Of a total of 74,167 students, 1%, i.e. 745 students, were surveyed (Table 1). The survey also covered geography teachers: of approximately 473 teachers, 26.2%, i.e. 124 teachers, were surveyed (Table 2). The survey was conducted from 1 to 30 November 2024 via social media.

Table 1. Number of students in grades VIII and IX and years I and II in the 2024/2025 school year

Primary education 2024/2025		**Secondary education 2024/2025**	
VIII	IX	I	II
19087	19907	17984	17189
total: 38,994		**total**: 35,173	
Total: 74,167			
Surveyed students – 745		**1%**	

Source: State Statistical Office of the Republic of North Macedonia

Table 2. Number of geography teachers

School	Geography teachers
Primary school	364
Secondary school	109
Total	**473**
Surveyed teachers – 124	**26.2%**

Source: https://gocemitevski.github.io/sredni-ucilista-mk/

The data were processed using descriptive statistics (frequencies and percentages), with a focus on the awareness and attitudes of students and geography teachers and on the representation of the topic of protected areas in the curricula. Using the method of synthesis, conclusions and recommendations were formulated for improving geography teaching, with the aim of transferring knowledge about protected areas more effectively and involving students more actively in the teaching process.

RESULTS

Protected areas in the curricula

The analysis of the curricula and textbooks shows that the topic is present in several grades and years, but to a small extent and mainly through national parks (Table 3). The content is mainly informative, and the curricula do not provide for specific activities related to protected areas (fieldwork or project work), so their implementation depends on the teacher's initiative.

Table 3. Representation of the topic of protected areas in the curricula

Grade / year	Subject	Context in which the topic is covered
Grade VI	Natural sciences	Environmental protection
Grades VII and VIII	Geography	Protection of flora and fauna; national parks, nature reserves and natural monuments
Years II and III, gymnasium	Geography	National parks; biodiversity and sustainable tourism
Year I, hospitality and tourism vocational education	Geography	Role of protected areas in the conservation of flora and fauna

Source: Authors' analysis of textbooks (Gjorgoski et al. 2023; Panov, Selmani 2016; Pavlov, Pavlovski 2020; Vasilevski et al. 2002; Stojmilov 2002; Pavlov et al. 2017; Pavlov 2022).

Students' knowledge and experiences

Most students (87.9%) state that they know what protected areas are, 78.3% have visited a protected area, and 75.3% have studied them in geography lessons. However, only 16.1% of students learn about the topic "often", while 37.2% answered "rarely" or "never". Knowledge is limited to one category: national parks are known by 85.4% of students, while all other categories are recognised by less than one third, and multipurpose areas by only 6.3%. The picture is almost identical for the categories studied in class, which corresponds to the focus of the curricula (Table 4).

Table 4. Students' knowledge of and experiences with protected areas

Question / answer	n	%
Knows what protected areas are – yes (n = 736)	647	87.9
Has visited a protected area – yes (n = 741)	580	78.3
Has studied them in geography lessons – yes (n = 737)	555	75.3
Has taken part in an excursion or visit as part of geography teaching – yes (n = 732)	339	46.3
How often protected areas are studied (n = 741)		
often	119	16.1
sometimes	346	46.7
rarely	211	28.5
never	65	8.8
Categories: known (n = 717) / studied in class (n = 711)	**known, %**	**studied, %**
National park	85.4	88.3
Natural monument	28.0	26.4
Nature park	28.5	27.7
Protected landscape	14.8	14.9
Strict nature reserve	13.0	16.0
Wilderness area	12.3	11.1
Multipurpose area	6.3	8.4

Multiple answers were possible for the categories
Source: Authors' survey of students, 2024.

The most common source of information is the teacher's lecture (59.3%), followed by the internet (54.1%) and textbooks (45.9%), while visits to protected areas are cited by 22.3% of students. As the activity that helps them most in learning, students most often choose the teacher's lecture (62.7%), while group projects (34.9%), excursions (34.6%) and work with maps and atlases (30.4%) are chosen by approximately one third. Educational videos and documentary films (55.2%) and lectures by experts (46.2%) were rated as the most useful additional resources (Table 5).

Table 5. Sources of information, activities and resources according to students (multiple answers possible)

Option	n	%
Most common sources of information (n = 734)		
teacher's lecture	435	59.3
internet (websites and videos)	397	54.1
geography textbooks	337	45.9
visits to protected areas	164	22.3
documentary films	105	14.3
Activities that help most with learning (n = 713)		
teacher's lectures	447	62.7
group projects and presentations	249	34.9
visits to protected areas (excursions)	247	34.6
work with maps and atlases	217	30.4
documentary films	117	16.4
Resources that would be most useful (n = 728)		
educational videos/documentary films	402	55.2
lectures by experts in the field	336	46.2
research articles	209	28.7

Source: Authors' survey of students, 2024.

Students' attitudes

Of the students, 78.4% rate the study of protected areas as important or very important, and 87.8% believe that it improves their understanding of nature protection. More lessons on the topic are wanted by 53.8%, but as many as 34.7% are undecided. The inclusion of the topic in the curricula is most often rated as "moderately effective" (61.4%). Regarding textbooks, most students are not sure whether they contain enough information (45.5%), and 30.3% believe they do not. Half of the students (49.2%) believe that the topic should definitely be given more prominence in the curricula (Table 6).

Table 6. Students' attitudes towards the representation and importance of the topic

Question / answer	n	%
Importance of studying protected areas (n = 719)		
very important	211	29.3
important	353	49.1
partly important	135	18.8
not important	20	2.8
Effectiveness of inclusion in the curricula (n = 728)		
very effective	124	17.0
moderately effective	447	61.4
ineffective	114	15.7
not included at all	43	5.9

Sufficient information in textbooks (n = 730)		
yes, there is enough	177	24.2
no, there is not enough	221	30.3
not sure	332	45.5
Would like more lessons on protected areas (n = 730)		
yes	393	53.8
no	84	11.5
don't know	253	34.7
Learning improves understanding of nature protection (n = 732)		
yes, significantly	344	47.0
yes, to some extent	299	40.8
no	36	4.9
not sure	53	7.2
The topic should be given more prominence in the curricula (n = 733)		
yes, definitely	361	49.2
maybe, but it is not a priority	284	38.7
no, it is not necessary	39	5.3
not sure	49	6.7

Source: Authors' survey of students, 2024.

Fieldwork and differences between groups of students

Of the students, 46.3% took part in an excursion or visit to a protected area as part of geography teaching. Among those who took part and rated the experience (n = 334), 51.8% rate it as very useful, 43.7% as moderately useful and 4.5% as not useful for understanding the importance of conservation. Students who took part in fieldwork show more positive attitudes towards the topic. They more often want more lessons on protected areas (60.7% vs. 47.9%), more often believe that the topic should definitely be given more prominence (54.4% vs. 44.6%), more often state that learning significantly improves their understanding of nature protection (51.6% vs. 42.7%) and more often rate the topic as very important (34.4% vs. 24.5%) (Figure 1). The difference is even more pronounced depending on whether the topic was covered in class: among students who studied protected areas, 92.6% know what they are, compared with 73.9% of those who did not study them.

The differences between primary and secondary school students are smaller. Secondary school students more often believe that textbooks do not contain enough information about protected areas (40.8% vs. 26.6%), have less often taken part in fieldwork (40.4% vs. 48.6%) and less often state that learning about protected areas "significantly" improves their understanding of nature protection (40.4% vs. 50.0%). For the other questions, the differences between the two groups are small.

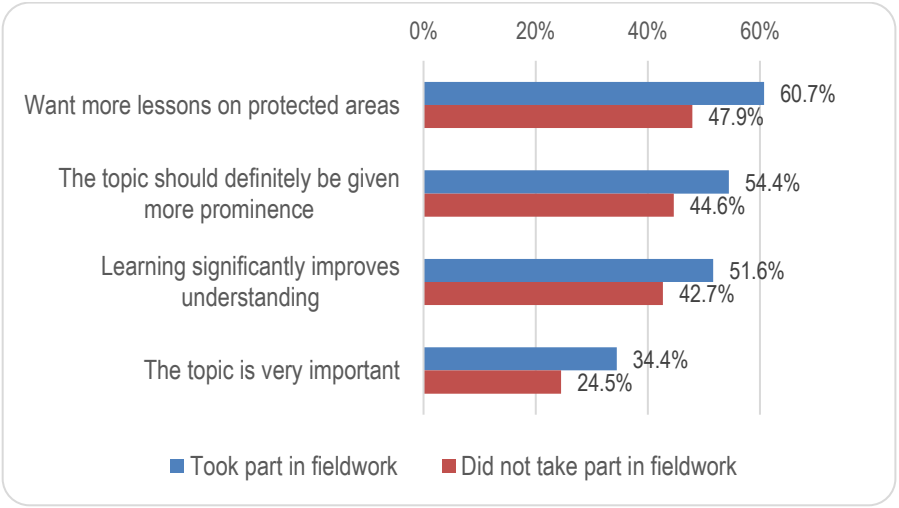


Figure 1. Students' attitudes according to participation in fieldwork in a protected area (%)
Source: Authors' survey of students, 2024.

Teachers' attitudes and practice

Teachers most often include the topic in their teaching "sometimes" (38.7%) or "often" (31.9%), and 16.0% "very often". The coverage of the topic in the curriculum is rated as good by 15.8%, as acceptable but in need of additional materials by 44.2%, and as insufficient or non-existent by 40.0%. The assessment of teaching materials is similar: only 11.7% consider them very useful and up to date, while 35.8% consider them limited and inadequate. The lack of teaching materials is also the most frequently cited challenge (70.1%), ahead of lack of time (28.2%) and lack of student interest (17.9%).

In explaining the topic, teachers most often use projects and research (53.8%), discussions (51.3%) and lectures (42.0%), while only 17.6% use fieldwork. At the same time, field research is rated as the most effective activity for engaging students (63.0%), and support for field activities and visits is the most common recommendation for improving teaching (53.3%). Students' interest is rated as partial by 60.8% of teachers, and 71.7% believe that students do not have sufficient knowledge of the importance of protected areas (Table 7).

As the most important thing to convey to students, teachers single out the natural beauty and importance of protected areas (51.7%), followed by the problems and challenges of their conservation (38.3%), and least often practical activities for nature conservation (20.8%). Teachers rate the topic as more important than students do: 97.5% of teachers and 78.4% of students consider it important or very important, with 51.7% of teachers and 29.3% of students rating it as "very important" (Figure 2).

Table 7. Responses of geography teachers

Question / answer	n	%
How often they include the topic in teaching (n = 119)		
very often	19	16.0
often	38	31.9
sometimes	46	38.7
rarely	14	11.8
never	2	1.7
Coverage of the topic in the curriculum (n = 120)		
well developed and clearly set out	19	15.8
acceptable, additional materials needed	53	44.2
insufficient, covered very briefly	44	36.7
not covered at all	4	3.3
Assessment of teaching materials (n = 120)		
very useful and up to date	14	11.7
sufficient, but need supplementing	61	50.8
limited and inadequate	43	35.8
I do not use them at all	2	1.7
Methods used (n = 119)*		
projects and research	64	53.8
discussions	61	51.3
lectures	50	42.0
fieldwork	21	17.6
Most effective activities for engaging students (n = 119)*		
field research	75	63.0
discussions and debates	45	37.8
practical projects	43	36.1
multimedia presentations	31	26.1
Greatest challenges (n = 117)*		
lack of teaching materials	82	70.1
lack of time	33	28.2
lack of student interest	21	17.9
Recommendations for improving teaching (n = 120)*		
support for field activities and visits	64	53.3
more resources and teaching aids	25	20.8
more interactive lesson plans and materials	25	20.8
training and workshops for teachers	17	14.2
connecting students with experts	14	11.7
Students' interest in the topic (n = 120)		
very interested and active	43	35.8
partly interested	73	60.8
not interested at all	4	3.3

Multiple answers possible **Source:** Authors' survey of geography teachers, 2024

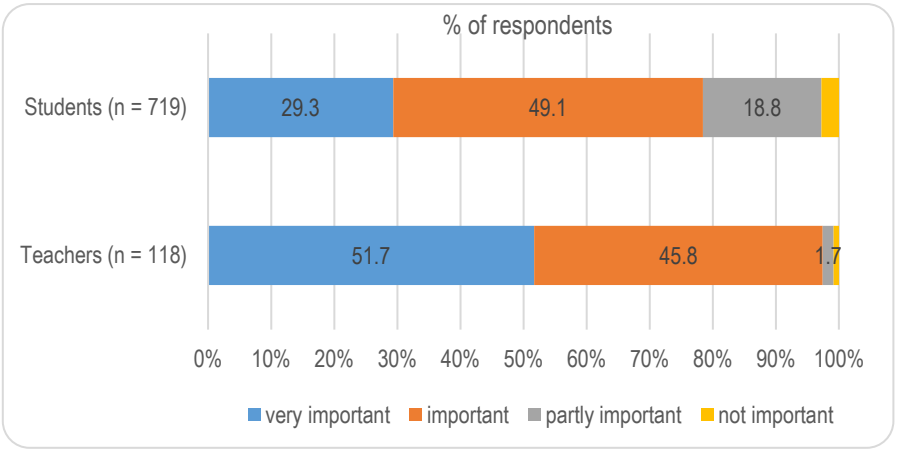


Figure 2. Assessment of the importance of studying protected areas among students and teachers (%) **Source:** Authors' surveys of students and geography teachers, 2024.

DISCUSSION

The results show that students are familiar with the concept of protected areas, but their knowledge is limited and superficial. Almost nine out of ten students know the concept, but their knowledge is practically reduced to national parks, while the other categories of the national protection system remain unknown to the majority. This is consistent with the finding of the curriculum analysis that the content is concentrated on national parks, and it indicates that students know what teaching offers them. This is also confirmed by the relationship between covering the topic in class and knowledge of the concept, which is the strongest relationship identified in the research.

The teacher remains the main source of knowledge, but more than half of the students also look for information on the internet, and they choose videos and documentary films as the most useful resources. In contrast, teachers rate multimedia presentations as the least effective (26.1%), and the lack of teaching materials is their greatest challenge. Taken together, these results point to the need for up-to-date, verified and easily accessible digital materials on protected areas in the country, which would direct students' independent searching towards relevant sources.

The research showed that fieldwork is highly valued but rarely used in teaching. Teachers rate it as the most effective activity and most often ask for support precisely for it, yet fewer than one fifth use fieldwork, and more than half of the students have never taken part in fieldwork in a protected area. The survey did not directly examine the reasons for the infrequent use of fieldwork. Among the challenges offered, teachers most often chose the lack of teaching materials, but other possible reasons, such as financial and organisational obstacles, were not covered by the questions. Therefore, the reasons for the infrequent use of fieldwork in North Macedonia should be the subject of separate research.

Students who took part in fieldwork have more positive attitudes towards the topic, which points to the benefits of learning in a natural environment. However, the research was conducted at a single point in time, so it cannot be concluded that fieldwork itself caused the more positive attitudes. It is possible that more interested students, or the students of more engaged teachers, take part in such activities more often. In addition, almost half of the participants rate the experience as only moderately useful. This suggests that students sometimes experience fieldwork more as an outing than as learning, and that its effect depends on whether it is well designed, prepared and followed up with classroom activities. Therefore, simply increasing the amount of fieldwork in nature is not enough. Field assignments with clear objectives are needed, such as those described in the national methodological literature (Dimitrov, Markoski 2011), together with their integration into project work (Đorđević et al. 2019).

Teachers and students view the topic differently. Teachers almost unanimously consider it important, but rate students' interest as partial and their knowledge as insufficient, whereas students assess their own knowledge more favourably. A considerable share of students are undecided, for example about the need for more lessons, which may mean that the topic has not so far been presented to them in an engaging way. It should be noted that the research has several limitations. The survey was conducted online, with students and teachers who responded voluntarily, so the results cannot be fully generalised to all students and teachers in the country. Primary school students are overrepresented. The responses express students' opinions rather than their actual knowledge. With online surveys, the possibility that someone completed the survey more than once cannot be excluded.

CONCLUSION

Protected areas are represented in geography teaching in the Republic of North Macedonia, but to a limited extent, mainly through national parks and most often through lectures. Students know the concept and national parks, but are much less familiar with the other categories of protected areas. They consider the topic important, but a considerable share of them have not formed an opinion on its representation. Teachers rate the topic as very important, the teaching materials as insufficient and fieldwork as the most effective activity, although they rarely use it.

Three recommendations emerge from the results of this research. First, the content of curricula and textbooks should be extended from national parks to the entire system of protected areas and to the problems of their management and conservation. Second, teaching materials on the protected areas of the country are needed, including digital and video content, as well as elaborated field and project assignments that teachers can apply directly. Third, fieldwork in protected areas requires institutional support – organisational and financial – and cooperation between schools and protected area managers, including teacher training. This research represents an initial step in identifying the attitudes of students and teachers

towards the inclusion of protected areas in education. In further research, this issue will be explored in greater depth through a more detailed analysis of the ways in which protected areas are included in geography teaching, as well as through an examination of the effects of fieldwork, by measuring students' knowledge and attitudes before and after teaching in a protected area.

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ОБРАЗОВНИОТ ПОТЕНЦИЈАЛ НА ЗАШТИТЕНИТЕ ПОДРАЧЈА ВО НАСТАВАТА ПО ГЕОГРАФИЈА: ПЕРЦЕПЦИИ НА УЧЕНИЦИТЕ И НАСТАВНИЦИТЕ ВО СЕВЕРНА МАКЕДОНИЈА

ПРОШИРЕН АПСТРАКТ

Заштитените подрачја се природни целини со исклучителна еколошка, научна и образовна вредност. Тие се погодно место за проучување на природните процеси, а многу од нив развиваат образовни програми во соработка со училиштата. Географијата е предметот во кој оваа образовна функција може најприродно да се оствари, особено преку теренска и проектна настава. Сепак, во Северна Македонија недостасуваат емпириски истражувања за тоа како заштитените подрачја се вклучуваат во наставата по географија и како оваа тема ја перципираат учениците и наставниците.

Целта на трудот е да се утврдат познавањата, искуствата и ставовите на учениците, како и ставовите на наставниците по географија, во врска со вклучувањето на заштитените подрачја во наставата. Истражувањето е квантитативно, спроведено со два анонимни анкетни листа и е дополнето со анализа на содржината на наставните програми и учебниците по географија и природни науки. Анкетирани се 745 ученици од VIII и IX одделение во основното и од I и II година во средното образование, како и 124 наставници по географија. Податоците се обработени со дескриптивна статистика (фреквенции и проценти) и со вкрстување на одговорите меѓу групите ученици.

Анализата на наставните програми покажува дека темата е присутна во неколку одделенија и години, но во мал обем, претежно преку националните паркови и без предвидени конкретни активности како теренска или проектна работа. Повеќето ученици (87,9%) знаат што се заштитени подрачја, но нивното знаење е сведено речиси само на националните паркови (85,4%), додека другите категории ги препознаваат помалку од една третина од учениците. Главен извор на информации е наставникот (59,3%), а потоа интернетот (54,1%) и учебниците (45,9%). Темата ја сметаат за важна или многу важна 78,4% од учениците и 97,5% од наставниците.

Најизразен резултат е разликата меѓу вреднувањето и примената на теренската настава. Наставниците ја оценуваат како најефективна активност за ангажирање на учениците (63,0%), но ја применуваат само 17,6%, а повеќе од половина од учениците никогаш не учествувале во теренска настава во заштитено подрачје. Учениците што учествувале во теренска настава покажуваат поповолни ставови: почесто сакаат повеќе часови за темата (60,7% наспроти 47,9%) и почесто ја оценуваат како многу важна (34,4% наспроти 24,5%). Наставниците како најголем предизвик го наведуваат недостигот на наставни материјали (70,1%), а како најчеста препорака поддршката за теренски активности (53,3%).

Од резултатите произлегуваат три препораки: проширување на содржините од националните паркови кон целиот систем на заштитени подрачја; изработка на современи наставни материјали, вклучително дигитални содржини и разработени теренски и проектни задачи; и институционална поддршка и соработка меѓу училиштата и управувачите на заштитените подрачја, вклучително и обуки за наставниците. Истражувањето претставува почетен чекор, а натамошните истражувања треба да ги испитаат ефектите од теренската настава преку мерење на знаењата и ставовите на учениците пред и по наставата во заштитено подрачје.

Клучни зборови: заштитени подрачја, образовен процес, географија, ученици, наставници

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20 ГОДИНИ РГД "ГЕОСФЕРА" – БИТОЛА

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Оваа година Регионалното географско друштво „Геосфера“ од Битола одбележува 20 години постоење. Тоа е регионално географско друштво на наставници и професори кои го предаваат наставниот предмет географија во основни и средни училишта во регионот на градовите Битола, Ресен и Демир Хисар, и руралните општини Новаци и Могила. Ова здружение на граѓани е формирано во 2006 година.

РГД „Геосфера“, всушност е продолжение на сите четири претходни форми на здружување на наставниците по географија во Битола и пошироко, од 1956 до 2006 година, значи цели 70 години, и тоа започнувајќи од: „Прва географска секција“ (1956-1968), преку „Регионална географска секција“ (1969-1977), па „Географско здружение на Општина Битола и Демир Хисар“ (1977-1983) до „Здружение на географичари“ (1983-2005).

РГД „Геосфера“ од основањето (2006) и активно соработува со Македонско географско друштво - Скопје (формирано 1949 година). Во почетокот „Геосфера“ регистрира над 50 активни членови а денес брои околу 30 редовни членови и дваесеттина пензионирани наставници и професори по географија.

Прв претседател на РГД „Геосфера“ (2006-2010) бил проф. д-р Никола В. Димитров, кој во тоа време бил советник по географија во Биро за развој на образованието ПЕ Битола, а потпретседател бил проф. Мите Ристов. Од 2010 година претседател на РГД „Геосфера“ е м-р Мите Ристов, професор по географија во СОУ Гимназија "Јосип Броз - Тито“ - Битола, а потпретседател е м-р Гордана Бошковска Богоевска, професор по географија во ООУ "Тодор Ангелевски" - Битола.

Главни активности на друштвото се: организирање на едукативни предавања, семинари, обуки, реализација на нагледни наставни часови за

членовите, учество на локални, регионални, национални и меѓународни проекти, панел дискусии, форуми, јавни настапи, изјави за медиуми, волонтерски и хумани акции и сл. Друга значајна активност на здружението е организирање и реализирање на повеќе ученички општински, регионални и еден национален натпревар по географија (2010) на кои учествуваат голем број ученици и ментори - наставници и професори по географија.

Во текот на своето дваесетгодишно постоење друштвото за членовите наставници и професори организирало и реализирало повеќе екскурзии и теренска настава на повеќе места во Македонија.

Голем број ученици од основни и средни училишта од регионот кој го покрива друштвото учествувале на натпревари по географија и освоиле многубројни награди. Голема заслуга за тоа имаат менторите наставници и професори по географија.

Членови на друштвото се учесници на национални и меѓународни симпозиуми, научни собири, конгреси и конференции во организација на Македонското географско друштво и Институтот за географија. Од вкупниот број членови, 8 колеги се носители на научни титули, и тоа доктори на географски науки (3) и магистри по географија и други науки (5).

Членови на друштвото публикувале научни, стручни и популарни трудови, монографски книги, учебници и др. Исто така, повеќе членови на РГД „Геосфера“ се добитници на разни награди, плакети, признанија и сертификати.

Во годината на јубилеј, РГД „Геосфера“ ќе организира неколку активност од јавен карактер со цел запознавање на битолската јавност со работата на здружението.

Повеќе информации за РГД „Геосфера“ може да се најдат на веб страната: https://geosfera.weebly.com

UDC:
DOI:

-IN MEMORIAM-



ПРОФ. Д-Р НИКОЛА ПАНОВ (1952–2026)

На 25 јуни 2026 година, на 73-годишна возраст, почина проф. д-р Никола Панов, редовен професор во пензија на Институтот за географија при Природно-математичкиот факултет во Скопје, поранешен раководител на Институтот и долгогодишен претседател на Македонското географско друштво. Со неговото заминување македонската географска наука изгуби еден од втемелувачите на современите проучувања на туризмот, посветен универзитетски професор и активен општествен деец.

Никола Панов е роден на 17 август 1952 година во Скопје, каде што ги завршил основното и средното образование. Дипломирал во 1978 година на Географскиот факултет во Скопје, со дипломскиот труд „Водоснабдување на селата во сливното подрачје на реката Бабуна“. Својот работен век го започнал на Институтот за географија, каде што во 1983 година стапил во работен однос како помлад асистент.

Во 1988 година магистрирал на Природно-математичкиот факултет во Белград, со магистерскиот труд „Туристичка валоризација на вештачките езера во Република Македонија“, а во 1989 година бил избран за асистент. Во 1994 година докторирал на Институтот за географија при ПМФ во Скопје, со

дисертацијата „Комплексни проучувања на резиденцијалниот туризам во Република Македонија“. Во 1995 година бил избран за доцент, во 2000 година за вонреден професор, а во 2005 година за редовен професор.

Во фокусот на неговите научни истражувања беше социоекономската географија, со акцент на туризмологијата и демографските процеси. Објави голем број научни и стручни трудови на македонски, српски и англиски јазик, во кои ги разработуваше прашањата за руралниот, планинскиот, спортскиот и винскиот туризам, валоризацијата на културното наследство, угостителството, одржливиот развој и демографијата.

Автор е на повеќе универзитетски учебници, меѓу кои „Основи на туризмот“ (2004), „Сообраќајна географија“ (2004, во коавторство со Р. Темјановски), „Географија на Европа“ (2007, со М. Талеска), „Туристичка географија“ (2008, со С. Штетиќ) и „Економика на туризмот“ (2012, со М. Талеска). Особено место во неговото творештво заземаат монографските и енциклопедиските изданија „Туристичка валоризација на манастирите во Република Македонија“ (1998), „Македонија земја на туризмот“ (2000), „Туристичка енциклопедија на Република Македонија“ (2001) и „САД“ (2002). Напиша и бројни учебници по географија за основното и средното образование.

Беше носител и учесник во низа научни и апликативни проекти, како што се „Комплексни географски проучувања на поречијата на Бабуна и Тополка“ (2011–2013), „Туристичка карта на Република Македонија“, „Национални паркови Пелистер и Галичица“ и „Потенцијални можности за развој на Козјачијата и Средорек“. Раководеше со истражувањата за улогата на туризмот во ревитализацијата и запирањето на депопулацијата во руралните средини во западниот дел на земјата, а беше и координатор на проектот „Зачувување на Охридското Езеро“ и главен консултант во проектот „Осоговијата – еко регион“. Неговата заложба за заштита на водните ресурси особено дојде до израз преку координацијата на проектот „Спас на Дојранското Езеро“ и објавувањето на книгата „Спасот на Дојранското езеро, вистината за проектот ‚Ѓавачко поле‘“ (2004).

Предаваше на сите три циклуси на студии, несебично пренесувајќи им го на студентите своето богато знаење и теренско искуство. Менторираше над дваесет магистранти и докторанди и повеќе од сто дипломци, кои денес како професори, туризмолози и општествени чинители го продолжуваат неговото дело.

Паралелно со наставата и истражувањата, проф. Панов извршуваше и одговорни раководни функции: беше раководител на Институтот за географија и продекан за финансии на Природно-математичкиот факултет. Надвор од Универзитетот беше државен секретар во Министерството за животна средина и просторно планирање, претседател на Авто-мото сојузот на Македонија (АМСМ) и претседател на Туристичкиот сојуз на град Скопје. На меѓународен план беше инструктор по екологија во Светската мотоциклистичка федерација (FIM), член на Комисијата за туризам при Светската автомобилистичка

федерација (FIA) и претставник на Република Македонија на Осмата сесија на Комисијата за одржлив развој на ОН во Њујорк (2000).

Особено значаен белег остави во Македонското географско друштво, кое го предводеше како претседател во два мандата, од 1998 до 2007 година. Остана верен член и поддржувач на Друштвото до крајот на животот. Во списанието „Географски разгледи“ објави трудови посветени на туризмот и животната средина (2001) и на одржливиот развој и туризмот (2002), како и коавторски труд за влијанието на политичко-економските прилики врз туризмот во балканските држави (2004).

За својата работа доби бројни општествени и стручни признанија. Беше прв добитник на наградата „Св. Кирил и Методиј“ на истоимениот универзитет во Скопје, која му беше доделена за врвни остварувања во наставно-образовната дејност и за исклучителен придонес во развојот и афирмацијата на Универзитетот. Општина Кисела Вода и Дојран го прогласија за свој почесен граѓанин.

Покрај по своите академски и општествени постигнувања, проф. д-р Никола Панов ќе остане запаметен и како семеен и традиционален човек, искрен пријател и посветен ментор. Неговиот научен и човечки траг останува трајно врежан во македонската географија и во сеќавањата на сите генерации што имаа чест да учат и да соработуваат со него.

Нека му е вечна слава!

Проф. д-р Христина Димеска Трајкова

UDC:
DOI:

-IN MEMORIAM-



ПРОФ. Д-Р ВАСИЛ ГРАМАТНИКОВСКИ (1934–2026)

На 30 јуни 2026 година, на 92-годишна возраст, почина проф. д-р Васил Граматниковски, редовен професор во пензија на Институтот за географија при Природно-математичкиот факултет во Скопје, поранешен декан на Географскиот факултет, раководител на Институтот за географија и претседател на Македонското географско друштво. Со неговото заминување македонската географска заедница изгуби еден од своите долгогодишни и заслужни дејци.

Васил Граматниковски е роден на 15 јануари 1934 година во селото Љубојно, Преспа. Основното образование го завршил во родното место, а гимназија во Битола во 1956 година. Истата година се запишал на групата за географија на Природно-математичкиот факултет во Скопје, каде што дипломирал во 1960 година. Во 1962 година бил избран за асистент на Географскиот институт при ПМФ, со што започнал неговиот долгогодишен универзитетски пат.

Како асистент, во 1968 година ги завршил постдипломските студии од областа на аграрната географија на Филозофскиот факултет во Љубљана. Потоа, со одобрение на Наставно-научниот совет, одржувал настава по стопанска географија, а во 1972 година бил избран за предавач по предметот Општа стопанска географија. Во 1974 година докторирал на Географскиот институт при ПМФ во Скопје, со дисертацијата „Природно географските и

социоекономските процеси во Преспанската Котлина како фактори што го условуваат идниот стопански развиток на котлината“. Во 1975 година бил избран за доцент, во 1980 година за вонреден професор, а во 1985 година за редовен професор по Општа стопанска географија.

Својата научна ориентација во стопанската географија ја продлабочувал и преку повеќе студиски престои во странство. Во 1966 година престојувал во Полската академија на науките и уметностите во Варшава, во 1968 и 1969 година на Географскиот институт и на Високата техничка школа во Минхен, а во 1974 година на Географскиот институт при Економскиот факултет во Минхен. Во 1976 година гостувал со предавања на географските институти во Љубљана и Загреб.

Неговата научна дејност беше насочена кон стопанската и аграрната географија, со посебен интерес за развојните можности на одделни простори. Централно место во неговите истражувања заземаше Преспанската Котлина, неговиот роден крај. Покрај дисертацијата, ѝ ја посвети и обемната студија „Природно-географски, демографски и имотни карактеристики на Преспанската Котлина“ (Годишен зборник, кн. 21, 1975), а на Преспа ѝ се навраќаше и во подоцнежните децении. Во овие истражувања природните услови, населението и имотните односи ги разгледуваше заедно, како фактори на стопанскиот развој. Од вкупно 74 објавени труда, пет се објавени во странство, а резултатите од своите истражувања ги презентираше на повеќе научни собири во земјата и во странство.

Паралелно со наставата и истражувањата, проф. Граматниковски извршуваше и одговорни раководни функции. Во периодот 1977-1979 година беше декан на тогашниот Географски факултет во Скопје, а во два мандати, 1984-1988 и 1992-1996 година, раководител на Институтот за географија. Беше и раководител на Заводот за општествена географија и на Заводот за етнологија.

Посебно место во неговата професионална биографија зазема Македонското географско друштво. Во периодот 1969-1973 година беше секретар на тогашното Географско друштво на СР Македонија, а од 1990 до 1994 година, во годините на осамостојувањето на Република Македонија, беше претседател на Друштвото.

За својата работа беше добитник на Орден на трудот со златен венец, а по повод 70 години од основањето на Македонското географско друштво, во 2019 година, му беше оддадено признание како на еден од неговите поранешни претседатели.

Проф. д-р Васил Граматниковски припаѓаше на генерацијата што го продолжи делото на основоположниците на современата македонска географска мисла и учествуваше во нејзиниот научен и институционален развој. Неговиот придонес останува запишан во научните публикации, во историјата на Институтот за географија и во повеќедецениската дејност на Македонското географско друштво. Со почит и благодарност ќе се сеќаваме на него.

Нека му е вечна слава!

Проф. д-р Ристо Мијалов



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