

JEL Classification: Q54, Q56

<https://doi.org/10.35945/gb.2023.16.005>

CLIMATE CHANGE IMPACTS ON THE TOURISM INDUSTRY IN GEORGIA

GIORGI BREGADZE

Doctor of Economics, Professor of Caucasus University, Georgia

ABSTRACT. This study delves into how climate change affects nature-based tourism in Georgia, focusing on its impact on winter and Seaside tourism. Concerns arise from observed snow cover trends at pivotal ski resorts such as Bakuriani and Gudauri, indicating potential threats to the winter tourism calendar. The escalation of climate-induced natural disasters and coastal erosion poses immediate economic risks, necessitating prompt adaptation strategies. Economic models project adverse impacts on tourism and GDP, emphasizing the need for tailored mitigation measures. Variances in climate impacts across diverse tourist zones underscore the vital requirement for unified and comprehensive adaptation approaches. The article advocates for multifaceted strategies encompassing business, consumer behavior, and destination dynamics, stressing the integration of climate research into policy frameworks and awareness initiatives. This integration is vital to foster resilient and sustainable tourism development in Georgia amid the exigencies posed by climate change, ensuring the safeguarding of the state's tourism future.

KEYWORDS: EFFECT OF CLIMATE CHANGE ON TOURISM INDUSTRY, TOURISM NATURE-BASED VULNERABILITY, ADAPTATION STRATEGIES.

INTRODUCTION

Climate change, commonly called global warming, is one of the most pressing worldwide challenges, exerting its influence across various aspects of life through direct and indirect pathways. This article delves into the potential effects of global warming on tourism, specifically examining the correlations between climate change and Georgia's burgeoning tourism industry. This relevance is underscored by the pivotal role tourism plays as the fastest-growing sector in the country, contributing significantly to its economic prosperity. Georgia's tourism industry predominantly relies on nature-based attractions, rendering it susceptible to climatic conditions.

Given the pivotal economic contribution of the tourism sector in Georgia, it becomes imperative to scrutinize its vulnerability to diverse environmen-

tal factors, including climate change. Georgia, endowed with diverse natural landscapes, historical treasures, and cultural richness, has witnessed a rapid surge in its tourism industry in recent years. This growth has brought about opportunities and challenges, remarkably amplifying the susceptibility to natural disasters. Hence, there is an exigent need for extensive research to discern the precise impact of climate change on tourism, ultimately leading to the formulation of robust adaptation strategies. This paper aims to present a comprehensive study of this sector, focusing notably on seaside and winter tourism, which stand out as particularly vulnerable to the impacts of climate change. In Georgia's tourism portfolio, these forms of tourism hold paramount significance, aligning with the country's marketing strategy that emphasizes three primary products—wine and food, nature and adventure, and cultural heritage—alongside four sup-

plementary offerings, namely health and wellness, seaside tourism, MICE (Meeting, Incentive, Conference, Exhibition) tourism, and city breaks (Ecorys, 2018: 68). [1] Winter tourism falls under the umbrella of nature and adventure. It holds paramount significance in Georgia, evidenced by the establishment of the Mountain Trail Agency, which is solely dedicated to fostering its development. In contrast, seaside tourism remains integral to the country’s tourism landscape.

In 2022, international visitors to Georgia reached 4.7 million, marking a significant recovery of 60% compared to the post-COVID year of 2019. Concurrently, domestic visits surged to 16 million in 2022, evidencing a pronounced rebound following the pandemic as locals began exploring their country amid COVID-19 restrictions. The combined total of international and domestic visits tallied at 21 million.

However, the distribution of international and domestic visits remains uneven, with Tbilisi commanding the lion’s share. In 2022, international visitors were predominantly concentrated in Tbilisi and the Ajara region, while domestic visits exhibited a relatively equitable spread. An exceptional surge in domestic visits was observed in the Imereti region alongside Tbilisi (see Table 1).

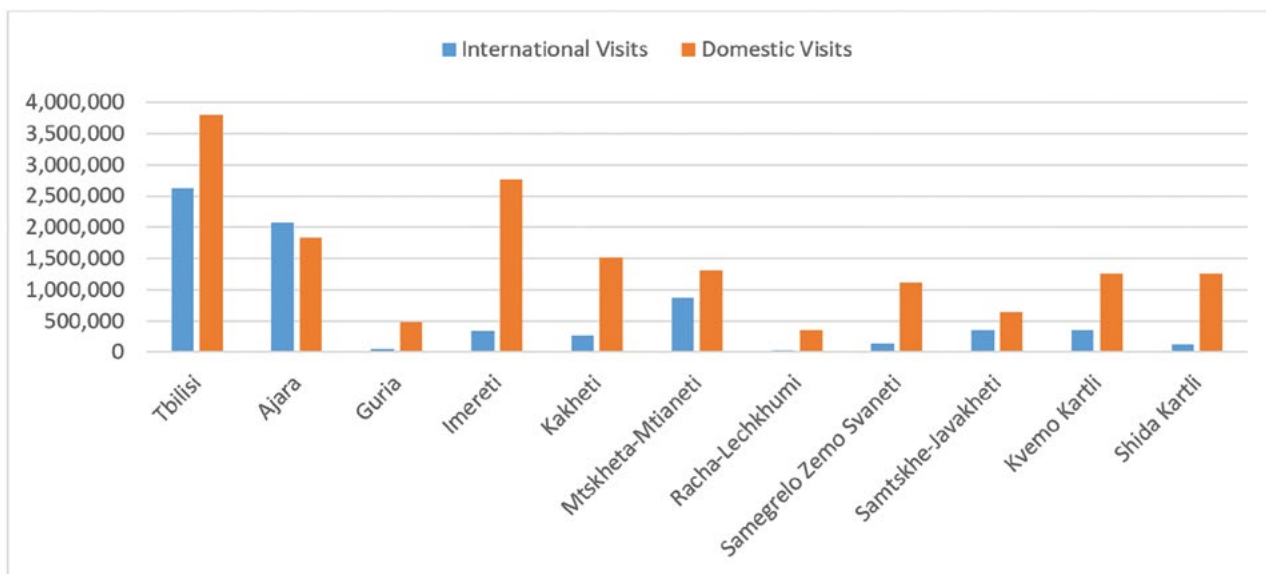
Among the seaside destinations, Batumi emerged as particularly popular among interna-

tional visitors, accounting for 2 million visits (44% share). Comparatively, other destinations such as Kobuleti (3.2%), Ureki (1.2%), and Anaklia (0.2%) registered lower shares. Roughly half of international visitors to Georgia chose to visit one of its seaside destinations during their trip in 2022.

Regarding mountain tourist resorts, Kazbegi attracted the most international visitors, recording 433 thousand visits, constituting a 9.4% share. Followed by Gudauri (6.2%), Mestia (1.7%), and Bakuriani (1.3%), these winter resorts collectively accounted for 9.2% of international visitors’ visits in 2022, despite their shorter seasons. This trend indicates promising growth in visitor dynamics.

Global warming poses a significant threat to Georgia’s tourism development trajectory in the long term. The anticipated rise in temperature is poised to curtail winter sports seasons—skiing, sledding, ice skating—and jeopardize the viability of ski resorts like Bakuriani, Gudauri, Goderdzi, Tetnuldi, and Hatsvali. Moreover, rising sea levels could imperil coastal tourism along the Black Sea coast. Climate change’s potential to amplify natural disasters—both gradual and abrupt—may escalate costs associated with adaptation measures, posing further challenges to the tourism sector. Climate-induced alterations in biodiversity and forestry structure may also profoundly impact eco-tourism in the foreseeable future.

Figure 1: Distribution of International and Domestic visits by regions in 2022



Source: Statistics Office of Georgia

Table 1: Average Snow Cover Height in Bakuriani by Months

month/period	AVERAGE SNOW COVER, CM			CHANGE, %		
	1961-1976 (1)	1977-1992 (2)	2007-2020 (3)	1 – 2	1 – 3	2 – 3
January	31.7	32.1	35.3	1.2	11.4	10.1
February	39.8	45.1	46.3	13.3	16.3	2.7
March	35.3	30.1	28.4	-14.7	-19.5	-5.6
April	4.3	3.8	3.8	-11.1	-10.4	0.8
October	0.4	0.5	0.0	19.0	-88.9	-90.7
November	4.8	6.0	4.5	24.2	-6.1	-24.4
December	18.9	16.7	19.3	-11.8	2.0	15.8

Source: National Environment Agency (NEA), authors' calculations.

CLIMATE IMPACT ON GEORGIA'S TOURISM: SNOW TRENDS AND COASTAL DYNAMICS

A predominant effect of climate change manifests as a rise in average temperature. Projections indicate an anticipated elevation in Georgia's average temperature across all months, albeit with uneven distribution. Over the last 50 years, air temperature escalation has ranged between 0.2 to 0.7 degrees. Particularly notable is the substantial temperature surge observed in the Mtskheta-Mtianeti region (Kartvelishvili et al., 2023:164).[2]

Given the sensitivity of winter tourism to climate shifts, an investigation into snow cover height indicators was conducted. This facet of tourism in

Georgia encompasses the ski locales of Bakuriani, Gudauri, Goderdzi, Tetnuldi, and Hatsvali. Unfortunately, due to data incompleteness, an analysis of snow cover height was unfeasible for the winter resorts of Goderdzi (Adjara), Tetnuldi, and Hatsvali (both Samegrelo Zemo Svaneti).

Focusing on Bakuriani resort and considering available data, three distinct observation periods (1961-1976, 1977-1992, and 2007-2020) were assessed, measuring the average monthly cover level. Analysis revealed compelling trends: an upsurge in average snow cover height from 1961 to 1992, followed by a decline from 2007 to 2020. Notably, from May through October, the snow cover height in this area was negligible, rendering anal-

Table 2: Average Snow Cover Height in Gudauri by Months

month/period	AVERAGE SNOW COVER, CM		CHANGE, %
	1961-1976 (1)	2002-2019 (2)	1 – 2
January	79.5	93.4	17.50
February	105.6	114.4	8.33
March	127.4	126.6	-0.62
April	87.0	82.1	-5.64
May	12.9	12.5	-3.31
October	2.4	1.0	-58.13
November	15.6	16.0	2.69
December	52.4	47.9	-8.64
Annual average	40.2	36.7	-8.8

Source: National Environment Agency, authors' calculations.

ysis during these months inconsequential. Across 1961-2020, heightened snow cover was observed in Bakuriani during January and February, with declines in March and November. February marked the peak snow cover period. The dwindling snow cover primarily occurred during months of lower levels, indicating a potential reduction in the winter season's duration, which could adversely impact Bakuriani's winter tourism development (refer to Table 1).

The resort area of Bakuriani experienced a noteworthy change, showing a considerable 20% decrease in average snow cover levels between 1961 and 2020, declining from 35 cm to 28 cm. Conversely, January and February witnessed an increase in average snow cover by 11% and 16%, respectively. Additionally, a noticeable decline in snow cover height between 2007 and 2020 was observed in November (see Table 1).

For the Gudauri, the analysis focused on two observation periods: 1961-1976 and 2002-2019. The analysis parameter considered the average snow cover level per month. The summarized results are detailed in Table 2.

The data analysis revealed the following trends: Within the Gudauri resort zone, there was a decline in the average annual snow cover height between the periods 1961-1976 and 2002-2019. Notably, the average snow cover in June, July, August, and September in this area is virtually absent, rendering analysis of these parameters irrelevant for those months. When comparing the periods 2002-2020 and 1961-1976, an increase in average snow cover occurred during January (+17.5%) and February (+8.3%), alongside a decrease in April (-5.6%) and December (-8.6%). Typically, March exhibits the maximum snow cover in Gudauri. Furthermore, there was a recorded decline in the average snow cover height in April, May, and October, potentially shortening the winter season (see Table 2).

Climate change is poised to have a profound and varied impact on seaside (coastal) tourism in the long term, presenting both positive and negative facets. On the upside, warmer temperatures may enhance the comfort of beachgoers.

However, concerning negative impacts, the rise in sea levels along the country's entire coastline poses significant concerns regarding coastal erosion. Over the period 1956-2007, the Black Sea lev-

el increased by 0.7 meters, exacerbating issues related to coastline erosion. Notably, the frequency of storms has surged, marking a 50% increase in annual occurrences during the same period (Asian Development Bank, 2021:15).[3] These trends and manifestations are poised to detrimentally affect the long-term prospects of the tourism sector, impeding economic development and hindering income growth for the population.

It is crucial to underscore that coastal erosion is not solely attributed to global warming; other contributing factors include large-scale infrastructure projects like port beautification and expansion and transport infrastructure development, including significant hydropower plants.

Anticipated temperature increases along the Black Sea coastline (by 3-6 degrees) pose a risk of elevating sea surface temperatures. This scenario could adversely impact fishing activities and marine tourism, potentially leading to the disappearance of certain fish species and reducing the appeal of underwater tours for tourists (Asian Development Bank, 2021:20).[3]

It is essential to note that approximately half a million residents inhabit the controlled Black Sea coastline, placing them in the high vulnerability category concerning global warming, considering the factors and potential threats previously discussed. Hence, integrating discussions and considerations regarding climate change into the strategic planning for coastal zone development becomes imperative.

Understanding the tourism sector's response to climate shifts is pivotal for comprehending Georgia's tourism landscape. The tourism indices are used for this effectively and have been instrumental in various studies. For instance, the Holiday Climate Index (HCI) assessed 11 tourist sites across three 30-year periods (1986-2015, 2041-2070, and 2071-2100). Findings suggest that while long-term bioclimatic resources in Georgia may not be significantly affected by anticipated climate shifts, adverse impacts due to global warming were observed in Mestia, Lentekhi, and Shovi (Fourth National Communication of Georgia under the UNFCCC, 2021:38)[4]

The Tourism Climate Index (TCI) evaluated climate change impacts in Ajara, Upper Svaneti, and Kakheti from 1961 to 2010. Results showed favor-

able tourism conditions in Ajara's coastal zone during spring in the late 20th century. However, the Black Sea coastlines experienced deteriorating conditions in summer and autumn. Conversely, alpine zones, notably Khulo, exhibited improved tourism conditions year-round, underscoring the significant potential for mountainous Ajara's development (Georgia's Third National Communication to the UNFCCC, 2015:76). [5]

Furthermore, TCI projections indicate favorable tourism climate conditions in Upper Svaneti from March to November in the latter half of the 21st century, though adverse conditions are expected in winter. This forecast of an extended summer tourism season in the region presents promising investment opportunities for residents and potential investors. In Kakheti, TCI assessments across two 25-year periods (1961-1985 and 1986-2010) revealed relatively stable values, suggesting the limited influence of climate change on tourism. Predictions anticipate improved winter tourism climate conditions, with possible declines in summers, while preserving Kakheti's allure for agro-tourism (Georgia's Third National Communication to the UNFCCC, 2015:182).[5]

GEORGIA'S CLIMATE CHALLENGES: ECONOMIC IMPACT AND TOURISM VULNERABILITY

Georgia faces significant losses due to the increased frequency of natural disasters, mainly linked to global warming. The country's geograph-

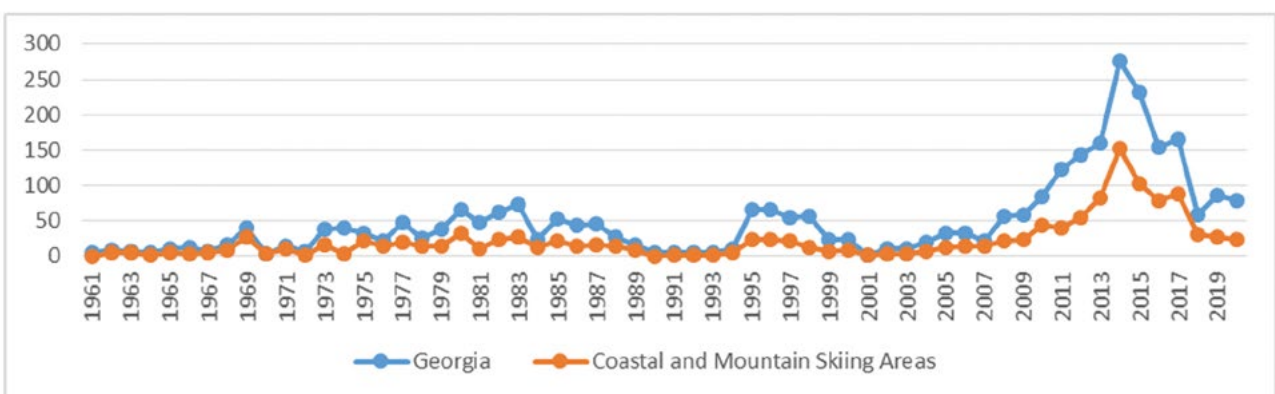
ic and climatic traits make it susceptible to various calamities, such as floods, droughts, storms, landslides, mudslides, and avalanches.

In 2021, the National Statistical Service of Georgia reported 106 natural hydrometeorological events, a notably higher figure than previous periods, leading to increased losses stemming from these disasters. Geological disasters, particularly landslides, also exhibited a surge in occurrence. For instance, 1,107 landslide cases and 203 mudslide incidents were documented throughout Georgia in 2021, significantly surpassing figures from previous periods (Geostat, 2021).[6]

Figure 2 illustrates the natural disaster statistics spanning the 1961-2020 period, revealing a discernible upward trend in these occurrences. The escalation, particularly notable since 2001, took a downward turn from 2015. Over the 2003-2020 span, the country witnessed an average annual increase of about 23% in the total count of natural disasters—a notably high rate.

In coastal and mountain-skiing areas (*refer to Figure 2*), crucial zones for tourism-driven economic activities, a similar upward trend in natural disasters is evident. The frequency of these events in these zones averages at 44% compared to the national count, implying that approximately half of all natural disasters occur in tourist-centric areas. This heightened frequency detrimentally impacts the tourism industry, resulting in losses and damages. As the climate crisis persists and exacerbates, the tourism sector faces amplified challenges and heightened risks, with adaptation

Figure 2: Natural Disasters Statistics, 1961-2020 period*



Source: National Environment Agency (NEA)

* Coastal and mountain-skiing zones include Adjara, Guria, Abkhazia, Samegrelo-Zemo Svaneti, Mtskheta-Mtianeti and Samtskhe-Javakheti regions.

costs likely to surge, thereby adding pressure to the state budget.

With nearly three-quarters of service exports tied to tourism and the sector contributing 12.6% to the national GDP in 2019 (Bregadze, 2021:131) [7], it becomes paramount to explore how climate change might impact the broader macroeconomic landscape of the nation.

The Ministry of Economy and Sustainable Development of Georgia collaborated with GIZ in 2021 to develop the E3.ge model and assess the long-term economic repercussions of climate change. This comprehensive model scrutinizes various climate-related events—coastal erosion, sea level rise, precipitation alterations, floods, landslides, and mudslides—examining their macroeconomic impacts. Additionally, the model probes into potential economic consequences of climate adaptation measures. Among its fundamental assumptions, the model projects an annual decline of 0.25% in Georgia’s tourism flows due to climate change, subsequently impacting the demand for essential goods and services within the economy.

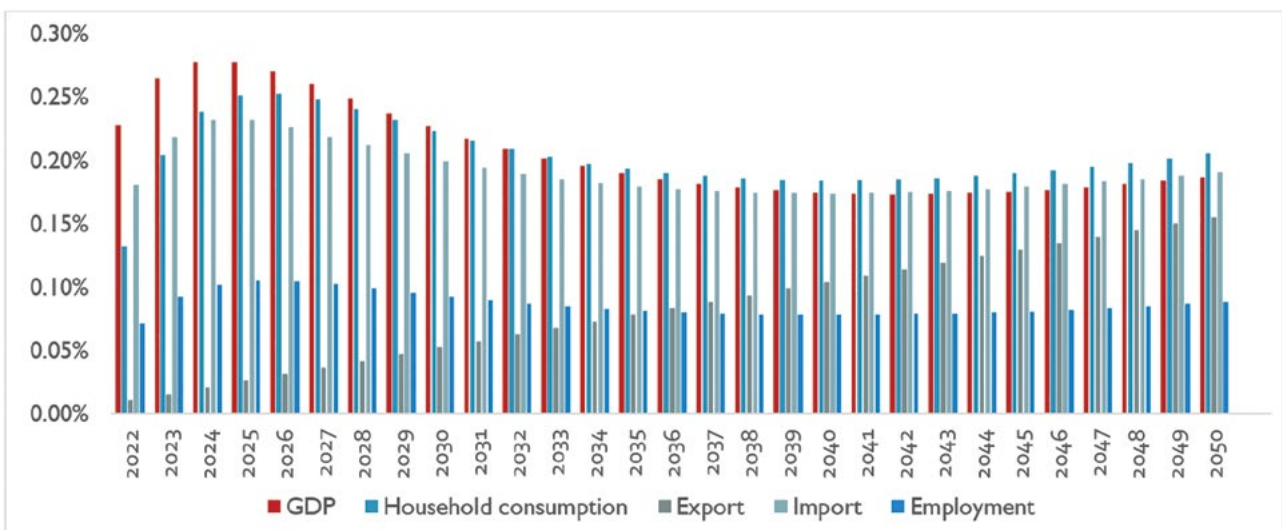
The outcomes derived from the E3.ge model, assessing the macroeconomic impacts of climate change, reveal a concerning trajectory. Between 2025 and 2050, climate change is anticipated to exert increasing and adverse effects on key macroeconomic indicators, including GDP, consumption,

investments, imports, and employment. During this period, the annual economic loss attributed to tourism is projected to reach 1% of the country’s GDP. Notably, climate change’s influence will affect consumption, investment, imports, and employment, with employment witnessing the most negligible impact, estimated at approximately 0.5% of GDP by 2050 (refer to Figure 3) (GIZ, Ministry of Economy and Sustainable Development of Georgia, 2021:5).[8]

The formulation and execution of climate change adaptation strategies within the tourism industry involve a complex process engaging multiple stakeholders with diverse interests, including businesses, government bodies, academic institutions, non-profit organizations, research entities, and international donors. Generally, the adaptation framework for the tourism sector against global warming comprises six essential pillars: business adaptation, sustainable adaptation, destination adaptation, frameworks for adaptation, adaptation policy, and consumer adaptation. These facets represent crucial components for effective adaptive policies in tourism.

Business adaptation primarily focuses on adjusting tourism businesses within the private sector. The challenge here lies in the lack of climate change awareness and commitment, often overshadowed by concerns about business viability.

Figure 3: Impacts of Climate Change on Gross Domestic Product and Its Components in Georgia



Source: Sectoral Policy Brief of the Ministry of Economy and Sustainable Development of Georgia and GIZ (2021).

Consumer adaptation centers on understanding tourist behavior under varied climate conditions, while destination adaptation concentrates on local, individual, and regional-level adjustments considering available resources. The crucial role of stakeholders' motivation is notably pertinent here. Adaptation policy, a government responsibility, should encompass stakeholders' interests and envisage all feasible options, considering country-specific factors and available resources. Sustainable adaptation in tourism emphasizes development in a manner that is both climate and nature-friendly (Njoroge J. M, 2015:97).[9]

A critical aspect is the foundation of climate strategies on comprehensive studies and research—a missing element in Georgia's context. As a strategic imperative, tourism authorities must stimulate research on bioclimatic resources at local destinations or regions and assess climate change impacts on the tourism sector to generate valuable insights for practitioners and economic stakeholders. Facilitating this process should align with Georgia's National Adaptation Plan (NAP).

Integrating climate change considerations into tourism policies and action plans is a significant challenge that falls under the national policy authorities' responsibility. Raising awareness about global warming and its potential threats and risks is crucial in Georgia. It should be integrated into educational programs to foster increased awareness among the populace.

CONCLUSION

Climate change is a paramount long-term determinant influencing the trajectory of the tourism sector, significantly impacting the industry

through increasing temperatures, declining snow cover, heightened frequency of natural disasters, and rising sea levels. These manifestations could potentially detrimentally affect tourism, potentially impeding its progress. Formulating a development strategy for the tourism sector demands a comprehensive consideration of climatic factors, particularly for coastal and alpine tourism, aiming to mitigate the adverse impacts of global warming and minimize potential future losses and damages. Effective adaptation in the tourism industry necessitates the inclusive involvement of all key economic stakeholders—businesses, consumers, and governmental entities—streamlining concerted efforts toward climate-resilient strategies.

The profound influence of climate change on Georgia's tourism sector underscores the urgency of integrating climate considerations into the core of tourism policy and planning. The observed vulnerability of critical tourism segments, such as winter and mountainous tourism, demands immediate attention for tailored adaptation strategies. It is crucial to propel extensive research initiatives, aligning with Georgia's National Adaptation Plan, to comprehensively gauge climate change impacts on tourism. Furthermore, fostering awareness among the populace through educational programs is pivotal in mitigating the potential threats of global warming.

In essence, climate change adaptation in the tourism industry is not merely a matter of responding to the immediate challenges but requires a proactive and sustained effort. As the tourism sector remains a linchpin of Georgia's economy, integrating climate-conscious strategies becomes imperative for ensuring its resilience and sustainable growth amidst the evolving challenges posed by climate change.

REFERENCES:

1. Ecorys Polska, Policy and Management Consulting Group (PMCG), & The Best Place – European Place Marketing Institute (2018). *Marketing, branding, and promotional strategy for Georgia*, p. 68.
2. Kartvelishvili, L., Tatishvili, M., Amiranashvili, A., Megrelidze, L., & Kotaladze, N. (2023). *Weather, climate and their change regularities for the conditions of Georgia*. Universali. p. 164. <https://doi.org/10.52340/mng.9789941334658>

3. World Bank, Asian Development Bank (2021). *Country Climate Risk Profile – Georgia*
4. UNFCCC (2021). *Fourth National Communication of Georgia under the United Nations Framework Convention on Climate Change*. p. 38. https://unfccc.int/sites/default/files/resource/4%20Final%20Report%20-%20English%202020%2030.03_0.pdf [Last Access 02.11.23].
5. UNFCCC (2015). *Georgia's Third National Communication to the United Nations Framework Convention on Climate Change*. <https://unfccc.int/sites/default/files/resource/Geonc3.pdf> [Last Access 20.11.23].
6. National Tourism Administration of Georgia. (n.d.). *Statistics portal*. Retrieved from <https://gnta.ge/statistics/> [Last Access 10.11.23].
7. Bregadze, G. (2021). *Toward The Introduction Of Tourism Satellite Account–Case Study Georgia. Globalization and Business, №11*, p. 131. <https://doi.org/10.35945/gb.2021.11.018>
8. GIZ, Ministry of Economy and Sustainable Development of Georgia (2021). *Economic Effects of Adaptation in Tourism and Infrastructure Sectors. Sectoral Policy Brief*. p. 5. <https://www.giz.de/de/downloads/giz2021-en-georgia-sectoral-policy-brief-tourism-infrastructure.pdf> [Last Access 18.11.23].
9. Njoroge, J.M. (2015). *Climate Change and Tourism Adaptation: Literature Review. Tourism and Hospitality Management*, p. 97.