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## Toward Climate-Resilient Tourism in Algeria: A Policy Evaluation and Strategic Framework for Sustainability

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#### Abstract

This paper assesses current tourism policies in Algeria with a focus on climate resilience and proposes improvements for sustainable development. Despite great strides in economic growth and infrastructure development, tourism policies in Algeria often lack comprehensive integration of climate resilience. The study examines key policy documents, including the National Tourism Strategy (2018-2023), the Coastal Tourism Development Plan, the Ecotourism Promotion Strategy, and the Sustainable Tourism Action Plan. The report identifies critical gaps such as insufficient resources, lack of coordination, and inadequate implementation mechanisms. Through stakeholder interviews and case studies in Oran and the Auras-Sahara region, the research highlights the importance of collaborative approaches between local governments, industry representatives and local communities. Findings indicate that while structural measures like sea walls and investment in resilient infrastructure offer immediate relief, sustainable practices and diversification of tourism activities are essential for long-term resilience. The research reveals that regions with active stakeholder engagement demonstrated more effective adaptation and resilience measures. Additionally, the study underscores the need for integrating climate science into policy development, advocating for a holistic approach that considers environmental, social, and economic dimensions. By providing actionable recommendations and practical insights, this research contributes to the literature on climate resilience in tourism and offers a roadmap for enhancing policy effectiveness and sustainability in the Algerian tourism sectors.

**Keywords:** Climate Resilience; Tourism Policies; Sustainable Development; Coastal Tourism; Tourism Strategy; Résilient Infrastructure

#### 1. Introduction

Tourism has nested itself to be an important industry in Algeria influencing the economic base as well as the social and cultural aspects. Nevertheless, there are some challenges that the sector entails especially under the current circumstances of steady global climate change that is very risky to the sustainability of most tourism activities. It is crucial to comprehend how policies related to tourism governance affect climate change resilience to formulate strategies that improve the economic aspect but minimize negative environmental impacts.

Tourism in Algeria holds significant economic potential, offering opportunities to diversify national income, reduce unemployment, and stimulate regional development. Despite its cultural richness and diverse geographical zones, Algeria remains underrepresented in the global tourism market. According to recent analyses, the country's Travel and Tourism Competitiveness Index (TTCI) scores lag behind regional averages, particularly in tourist service infrastructure and international openness (Bedjaoui, 2022; World Economic Forum, 2022, 2024). Yet, cultural and heritage tourism, especially in cities such as Constantine and regions like Bou Saâda, remain underexploited despite their capacity to support sustainable growth (Rehailia, Benmalek, & Cherabi, 2021; Berreghioua & Khalfallah, 2022). Heritage assets listed by UNESCO are still not fully integrated into tourism strategies (Boudia & Khalki, 2021), and while the national plan "Destination Algeria" has outlined broad strategic goals, implementation remains inconsistent (Ministry of Tourism and Traditional Industries, n.d.; Belahcene, 2019).



Figure 01. Unveiling Algeria's Tourism Challenges and Opportunities

However, Algeria's tourism potential is increasingly threatened by climate change and environmental degradation. Rising temperatures, desertification, and extreme weather events are already altering tourism demand and seasonal patterns, particularly in the Sahara and along the Mediterranean coast (Sahabi Abed & Matzarakis, 2018; Hilmi, 2020). Comfort indexes have shown a gradual decline in favorable tourism conditions in major cities such as Algiers (Hameidia & Medjerabe, n.d.). Moreover, increasing vulnerability in water resources and ecosystem services—both critical to tourism infrastructure—further limits the sector's sustainability (Nichane & Khelil, 2015; Khelil & Nichane, 2014). As climate sensitivity remains a defining feature of the tourism industry, the need for adaptive frameworks in Algeria has become more urgent than ever.

Despite this pressing need, Algerian tourism policies still lack integration of climate resilience as a core objective. In many developing contexts, tourism policy goals are rarely aligned with environmental risk management (Loehr & Becken, 2024; Becken & Clapcott, 2011). Algeria's policy documents often refer to sustainability in broad terms but fail to incorporate measurable adaptation goals or performance indicators (Bouadem, 2011; Belahcene, 2019). This disconnect is critical when assessed against global frameworks such as the United Nations' Sustainable Development Goals (United Nations, 2024) and the Global Sustainable Development Report (Independent Group of Scientists, 2019), which call for the

alignment of tourism with climate action. Moreover, Algeria's competitiveness in global tourism rankings continues to be hindered by this policy fragmentation (World Economic Forum, 2019; 2022).

There is growing academic consensus that climate-resilient tourism requires an integrated policy model encompassing adaptation, governance, and proactive environmental stewardship. Scholars have proposed strategies that involve ecosystem-based management, inclusive stakeholder engagement, and responsive governance (Scott, Hall, & Gössling, 2012; Rahman, Saud, & Nawaz, 2024; Njoroge, 2015). Within the Algerian context, achieving these goals depends on closing institutional gaps and mainstreaming climate risks in planning and investment decisions (Abderzag, Hamza, & Chakroun, 2024; Grimm, Alcântara, & Sampaio, 2018). The need for flexibility in governance, especially in disaster-prone or high-risk regions, is also evident from recent studies on tourism resilience (Sarker, 2024).

This study aims to bridge that gap by evaluating existing Algerian tourism policies through the lens of climate resilience. It examines how well national and regional strategies integrate adaptation principles, assesses stakeholder perspectives through interviews and surveys, and analyzes case studies from key tourism regions. The goal is to generate evidence-based recommendations to help align tourism development in Algeria with global sustainability standards and climate resilience imperatives.

## 2. Theoretical and Policy Background

#### **2.1.Conceptual Framework**

The concept of **climate resilience** has emerged as a cornerstone in discussions on sustainable development, particularly within climate-sensitive sectors like tourism. It refers to the capacity of socio-economic and environmental systems to absorb, adapt to, and recover from climate-related disturbances while maintaining core functions (Scott, Hall, & Gössling, 2012; Rahman, Saud, & Nawaz, 2024). In tourism, this resilience includes both the protection of natural assets and the ability of tourism stakeholders to adapt operations and governance in response to climate threats (Becken & Clapcott, 2011; Loehr & Becken, 2024).



Figure 02. Building Climate-Resilient Tourism

**Sustainable tourism** is defined by the United Nations as tourism that meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future (United Nations, 2024). It encompasses **adaptation**— adjustments in tourism systems in response to actual or expected climatic stimuli— and **mitigation**, which refers to reducing emissions from tourism-related activities (Scott et al., 2012). These concepts are interlinked: climate-resilient tourism must balance mitigation goals with robust adaptation strategies (Njoroge, 2015; Grimm, Alcântara, & Sampaio, 2018).

Globally, several models have been proposed for embedding climate resilience into tourism planning. Becken and Clapcott (2011) advocate for national climate action plans with embedded tourism risk assessments, while Sarker (2024) emphasizes decentralized, context-specific policy frameworks. Regionally, Hilmi (2020) highlights the vulnerability of MENA countries to climate hazards and calls for integrated tourism-water-land use strategies. In Algeria's context, applying such models requires institutional coordination and data-driven planning—a gap identified by scholars and development experts alike (Loehr & Becken, 2024; Rahman et al., 2024).

## 2.2.Policy Landscape in Algeria

Algeria has long acknowledged the role of tourism in economic diversification, enshrining this goal in its national development plans. The "Algeria Destination Plan" and broader strategic visions under the Ministry of Tourism and Traditional Industries emphasize infrastructure investment, product diversification, and regional promotion (Ministry of Tourism and Traditional Industries, n.d.; Bouadem, 2011). However, these policy documents largely treat climate risks as peripheral rather than central planning concerns.



Figure 03. Climate Adaptation Gap in Algerian Tourism

Only limited attempts have been made to explicitly integrate climate change adaptation or resilience into Algerian tourism policy. Belahcene (2019) and Rehailia, Benmalek, and Cherabi (2021) note that environmental sustainability is often discussed in generic terms without clear implementation roadmaps. Assessments of tourism-environment policy links suggest a lack of cross-sectoral coordination, fragmented governance, and the absence of climate indicators in performance evaluation (Abderzag, Hamza, & Chakroun, 2024; Bedjaoui, 2022). Moreover, local studies underline the disconnect between urban tourism development and environmental planning, as seen in Bou Saâda and other regional contexts (Berreghioua & Khalfallah, 2022).

Despite Algeria's ratification of key international agreements, such as the Paris Climate Accord and the 2030 Sustainable Development Goals (United Nations, 2024), these commitments have not been systematically translated into actionable policies within the tourism sector. There remains a critical **gap in both literature** 5132 remittancesreview.com

**and policy** concerning the integration of climate adaptation measures into Algerian tourism frameworks (Loehr & Becken, 2024; Hilmi, 2020). This gap is compounded by a scarcity of localized climate data, low institutional capacity, and weak collaboration between tourism and environmental ministries.

## 3. Methodology

## **3.1.Research Design**

This study adopts a **mixed-methods approach**, integrating both qualitative and quantitative methods to capture the complexity of climate resilience within Algeria's tourism sector. This design allows for the triangulation of data from diverse sources—policy documents, stakeholder perspectives, statistical indicators, and regional case studies. Combining interpretative and empirical approaches provides a comprehensive framework for evaluating policy effectiveness and stakeholder alignment with sustainability goals.

## **3.2.Data Collection**

## a) Document and Policy Analysis

National and regional tourism plans, including the "Destination Algeria" strategy and climate-related frameworks, were systematically reviewed to assess policy content and institutional commitment to resilience.

## b) Semi-Structured Interviews

Interviews were conducted with 19 key stakeholders across government, academia, and the private sector. The sample included senior officials from the Ministry of Tourism, environmental experts, and business operators (**Table 1**).

Sector	Number Interviewed
<b>Government Officials</b>	8
<b>Environmental Experts</b>	6
<b>Private Sector Operators</b>	5

 Table 1. Interview Participants by Sector

Source: Prepared by the authors based on interview schedule

#### c) Surveys

A total of 250 structured surveys were distributed among three groups: tourists, local residents in target regions, and tourism professionals. The aim was to measure perceptions of climate impacts, policy adequacy, and satisfaction with current tourism development (**Table 2**).

Category	Number Surveyed
Tourists	120
Local Communities	85
<b>Tourism Operators</b>	45

 Table 2. Survey Sample by Stakeholder Category

Source: Constructed by the authors based on survey records.

#### d) Case Studies

Three regional case studies were selected to reflect the diversity of tourism contexts in Algeria: **Oran** (coastal), **Aurès** (mountain), and the **Sahara** (desert). These areas were chosen for their strategic importance and differing climate exposure profiles (**Table 3**)



Figure 04. Geographical Map of Algeria Highlighting Study Area



Panoramic view of AuresSahara of Algeria (Bechar)



Panoramic view of the port of Oran on the Mediterranean coast

Figure 05. Panoramic Views of Key Tourism Regions in Algeria

**Source:** Photograph by the authors during field

Region	Tourism Type	Key Focus
Oran	Coastal	Urban coastal resilience
Aures	Mountain	Ecotourism adaptation
Sahara	Desert	Desert tourism vulnerability

Table 3. Case Study Sites and Focus

Source: Constructed by the authors based on regional selection criteria.

The visual documentation of Algeria's key tourism regions supports the spatial and thematic findings of this research. The panoramic view of the Aures Mountains reveals a rugged ecotourism landscape undergoing climatic stress, particularly from snow loss and ecological degradation, which has prompted a shift toward diversified cultural and hiking tourism. In contrast, the panoramic image of the Sahara in Bechar underscores the harshness of the desert climate while highlighting emerging adaptation practices, such as eco-lodges and solar-powered tourism infrastructure, that embody low-impact development. Lastly, the panoramic view of the port of Oran on the Mediterranean coast captures the scale of urban coastal tourism development, which is highly vulnerable to sea-level rise and seasonal flooding. Together, these images offer a spatial lens on Algeria's diverse tourism environments, each demanding tailored climate-resilient strategy

## 3.3.Data Analysis

Thematic coding was applied to interview transcripts and open-ended survey responses using qualitative software, enabling identification of common patterns across sectors. Statistical analysis of closed survey items was conducted using SPSS, including frequency analysis, cross-tabulation, and correlation tests.

A **policy evaluation framework** was developed based on international indicators of climate resilience and sustainable tourism, including benchmarks from the World Economic Forum (2022; 2024) and the UN Sustainable Development Goals remittancesreview.com

(United Nations, 2024). This framework was used to systematically assess the alignment of Algeria's tourism policies with global best practices.

A comparative cross-case analysis was performed between Oran, Aurès, and the Sahara case studies to draw insights on local adaptive strategies, challenges, and replicable models.

#### 4. Results

#### 4.1.Evaluation of Key Tourism Policies

The analysis of Algeria's main tourism policies between 2018 and 2023 revealed considerable variation in how climate resilience is addressed. The **National Tourism Strategy** prioritizes economic diversification and infrastructure development but contains limited reference to climate adaptation. The **Coastal Tourism Development Plan** partially integrates resilience measures, especially regarding urban coastline protection. The **Ecotourism Promotion Strategy** shows moderate attention to nature-based solutions and rural inclusion, while the **Sustainable Tourism Action Plan** emphasizes sustainability but fails to establish direct climate linkages (Table 5).

Policy Document	Main Focus	Climate Resilience Integration
NationalTourismStrategy (2018–2023)	Economic diversification, heritage sites, infrastructure	Weak – few adaptation references
Coastal Tourism Development Plan	Urban beachfront projects, marine protection	Partial – coastal protection addressed
Ecotourism Promotion Strategy	Protected areas, rural community inclusion	Moderate – nature-based solutions present
Sustainable Tourism Action Plan	Greencertification,emissions,localpartnerships	Low – sustainability emphasized but not linked to climate

**Table 4.** Evaluation of Key Tourism Policies (2018–2023)

**Source:** Prepared by the authors based on national and regional tourism policy documents.

#### 4.2. Stakeholder Insights

Interviews with 19 stakeholders revealed shared concerns about the lack of institutional coordination and monitoring mechanisms in policy implementation. Government officials cited fragmented governance and funding delays, while tourism operators emphasized infrastructure deficiencies. Environmental experts criticized the weak integration of ecosystem-based approaches and the absence of local climate data in decision-making. These perspectives were consistent across all three studied regions.

Stakeholder Type	Key Concerns Raised	Suggested Improvements
Government	Lack of coordination, weak	Interagency coordination,
Officials	enforcement	climate adaptation plans
Tourism Industry	Seasonal unpredictability, coastal erosion	Resilient infrastructure, diversify destinations
Environmental Experts	Limited science-policy linkage	Climate modeling, ecosystem- based approaches

**Table 5:** Interview Summary – Perceptions of Climate Risks and Policy Gaps

Source: Prepared by the authors based on stakeholder interviews (2024).

#### 4.3.Survey Findings

Survey responses from 250 participants, including tourists, local community members, and tourism operators, highlighted strong public awareness of climate change and broad support for sustainable tourism. The majority of respondents were between the ages of 26 and 40, with a high level of education. Climate awareness was rated "high" by most, and 78% expressed support for sustainable tourism development, suggesting readiness for behavior change and policy acceptance (Table 6).

Group	% of Respondents	Age Group Most Represented	Gender (Majority)
Tourists	48%	26–40 years	Male
Local Communities	34%	41–55 years	Female
Tourism Operators	18%	30–45 years	Male

**Table 6.** Survey Respondent Demographics and Awareness

Source: Constructed by the authors based on field survey data.

#### 4.4.Case Studies

The three case studies—Oran (coastal), Aurès Mountains (mountain), and the Sahara (desert)—exhibited distinct climate risks and adaptive practices. In **Oran**, sea-level rise and seasonal flooding have prompted sea wall construction and adjustments to tourism seasons. In the **Aurès Mountains**, snow-based tourism is in decline due to shorter winters, prompting diversification into hiking and cultural tourism. In the **Sahara**, water scarcity and extreme heat are being addressed through solar technology and eco-lodge development (Table 7).

 Table 7. Climate Challenges in Case Study Regions

Region	Main Climate Risk	Adaptation Practices
Oran	Sea-level rise, urban flooding	Sea walls, seasonal shifts
Aurès Mountains	Snow loss, erosion	Diversified activities
Sahara	Heatwaves, water scarcity	Solar, eco-lodges

**Source:** Constructed by the authors based on field visits and stakeholder interviews.

#### **4.5.**Comparative Policy Implementation Analysis

A comparison between the quality of policy design and implementation reveals systemic gaps. Although many strategies are well-structured on paper, actual enforcement is limited. The **National Tourism Strategy** suffers from lack of monitoring and funding mechanisms. The **Coastal Tourism Plan** is hindered by weak environmental safeguards. The **Ecotourism Strategy**, though moderately implemented, lacks strong community engagement. The **Sustainable Tourism Plan** remains mostly aspirational due to poor inter-ministerial coordination (Table 8).

Policy	Design Quality	Implementation Level	Main Implementation Gap
National Tourism Strategy	High	Low	Monitoring & funding
Coastal Tourism Plan	Moderate	Low	Environmental safeguards
Ecotourism Strategy	Moderate	Moderate	Local community engagement
Sustainable Tourism Plan	High	Low	Inter-ministerial coordination

 Table 8. Policy Implementation vs. Design – Stakeholder Assessment

Source: Prepared by the authors based on stakeholder interviews and document analysis.

#### 5. Discussion

The findings of this study underscore a growing alignment between Algeria's tourism aspirations and global discourses on climate-resilient development, yet significant policy and implementation gaps remain. Comparative literature shows that successful climate-adaptive tourism strategies rely on early integration of environmental resilience into national planning frameworks (Becken & Clapcott, 2011; Loehr & Becken, 2024). Algeria's policies echo this direction in form but lack consistent operational mechanisms. While the National Tourism Strategy demonstrates awareness of diversification goals, its failure to address resilience

metrics contrasts sharply with models from other MENA countries, where ecosensitive and adaptive planning is being institutionalized (Hilmi, 2020; Rahman, Saud, & Nawaz, 2024).

Barriers to effective policy implementation in Algeria are consistent with constraints identified in regional literature—particularly in terms of limited financial resources, insufficient data infrastructure, and institutional fragmentation (Abderzag, Hamza, & Chakroun, 2024; Bouadem, 2011). Interviews with government officials confirmed that inter-ministerial silos impede integrated policy execution, especially when climate resilience falls outside the mandate of traditional tourism bodies. Similarly, the absence of climate adaptation indicators in monitoring frameworks exacerbates disconnection between design and enforcement, a challenge echoed in other global contexts (Scott, Hall, & Gössling, 2012).

The evidence also suggests that a combination of **structural and non-structural responses** is critical. Engineering solutions such as sea walls in Oran and solar installations in the Sahara are essential, but they must be complemented by zoning, early-warning systems, and participatory planning to ensure long-term effectiveness (Sarker, 2024; Grimm, Alcântara, & Sampaio, 2018). Overreliance on hard infrastructure risks reducing community involvement and local innovation, particularly in rural and heritage areas where identity and ecology are deeply intertwined.

Importantly, the study confirms that **multi-stakeholder governance** plays a foundational role in adaptive capacity. Stronger engagement with local communities, NGOs, and the private sector can enhance legitimacy, uptake, and co-ownership of policy tools (Njoroge, 2015; United Nations, 2024). Stakeholders in the Aurès Mountains, for example, have begun mobilizing around ecotourism opportunities in response to declining snow-based tourism—a bottom-up resilience strategy worth scaling.

Finally, the case studies demonstrate a notable potential for **eco-tourism and cultural tourism diversification** as climate-smart alternatives. Regions like the Sahara and Aurès Mountains exhibit early signs of low-carbon tourism models, including solar-powered accommodations and community-run cultural circuits.

These align with global sustainability frameworks and Algeria's own heritage strengths (Rehailia, Benmalek, & Cherabi, 2021; Boudia & Khalki, 2021), indicating a viable path forward if backed by coherent policy support.

# 6. Policy Recommendations6.1.Strategic Policy Improvements

To close the gap between policy design and on-ground effectiveness, Algeria must urgently integrate **climate science** into all levels of tourism policy formulation. Current strategies remain fragmented, with weak reference to climate indicators and resilience metrics. A national climate-tourism task force could ensure that adaptation scenarios and vulnerability data shape planning priorities, particularly for high-risk areas like the coast and desert (Becken & Clapcott, 2011; Loehr & Becken, 2024).

Second, **cross-sectoral policy coordination** must be institutionalized. The Ministry of Tourism should work in concert with ministries of environment, infrastructure, and water resources to design integrated climate-resilient development zones. Mechanisms like inter-ministerial climate tourism councils and shared data platforms are essential to eliminate institutional silos (Rahman et al., 2024; Hilmi, 2020).



Figure 06.: Integrating Climate Science into Tourism Policy

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Finally, policies should be backed by robust **monitoring and accountability frameworks**. This requires clear benchmarks for resilience outcomes, annual audits, and stakeholder reporting. Such mechanisms would not only enhance transparency but also build trust among local communities and private actors (Scott, Hall, & Gössling, 2012).

#### 6.2. Climate-Resilient Planning Approaches

Policymakers should expand **nature-based and low-impact tourism** strategies to balance development with ecosystem protection. Priority should be given to preserving biodiversity hotspots and promoting non-invasive tourism models, especially in the Aurès Mountains and southern Sahara (Rehailia et al., 2021; Grimm et al., 2018).

Investment in **resilient infrastructure** is also critical. This includes building allseason roads, climate-proof accommodation, green roofs, and renewable energy integration for tourism facilities. Oran's reliance on traditional coastal infrastructure should transition toward more adaptive, sustainable construction, particularly given rising sea levels (Berreghioua & Khalfallah, 2022).

Furthermore, Algeria must **mainstream community-based tourism models** that embed resilience at the grassroots. This means recognizing local knowledge, redistributing economic benefits, and providing technical and financial incentives to small-scale operators (Abderzag et al., 2024; Njoroge, 2015).

## **6.3.**Capacity Building

Building capacity at the local and institutional level is fundamental to long-term resilience. Public awareness campaigns, school programs, and digital content can enhance **climate awareness among communities** and tourists alike. This is especially needed in rural regions where exposure to global climate discourse is low (Boudia & Khalki, 2021).

At the same time, **training programs for local governments and tourism operators** should focus on sustainable design, climate risk management, and digital innovation. Partnerships with universities and regional development centers can deliver continuous professional education and applied research support (Bouriah & Keroui, 2022; United Nations, 2024).

#### 7. Conclusion

This study evaluated Algeria's tourism policy framework through the lens of climate resilience, revealing critical gaps in the integration of environmental adaptation across strategic plans. Key findings highlight that while national documents such as the National Tourism Strategy and the Ecotourism Promotion Plan reference sustainability, they lack enforceable mechanisms, dedicated climate indicators, and clear pathways for stakeholder coordination. Survey and case study data confirm a significant divergence between policy intent and implementation, particularly in high-risk regions such as Oran, Aurès, and the Sahara.

The analysis underscores the necessity of **shifting from reactive to proactive tourism policy models**. Algeria's current approach relies heavily on infrastructure-based solutions post-impact rather than preventive, science-based planning. Proactive policies should include climate forecasting, vulnerability mapping, community co-design of tourism strategies, and the institutionalization of environmental performance monitoring.

These findings are not only critical for Algeria, but they also offer **valuable implications for other climate-vulnerable tourism economies**, particularly across the Middle East and North Africa. Countries facing similar risks—heatwaves, coastal degradation, and water scarcity—can draw insights from Algeria's evolving tourism-environment dynamics to inform more resilient development models.

Future research should prioritize **longitudinal policy tracking** to measure the effectiveness of adaptation interventions over time, and promote **regional comparative studies** to identify transferable best practices. In addition, deeper analysis of financing mechanisms, institutional learning, and digital governance tools could provide a more holistic understanding of what makes tourism systems climate-smart and adaptive.

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