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The Impact of Climate Change on Tourism in Iraq: A Systematic Review

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Abstract. This systematic review is about various studies published between the years 2000 and 2023 on how climate impacts tourism in Iraq. Research is conducted on 60 pieces of similar literature, including peer-reviewed articles, conference papers and books, which are obtained and reviewed through webographic databases of Web of Science, Scopus and Google Scholar. The findings indicate that climate change creates major barriers such as diminished water supply, high temperatures and environmental degradation. Important themes of the literature are the importance of sustainable tourism and adaptive tourism strategies to address these issues. The current review emphasizes the urgent need for decision makers and stakeholders to address the impact of climate change on tourism development in Iraq and to develop broad measures for tourism sustainability and adaptability. Further studies should investigate innovative methods of increasing climate adaptability in tourism.

Keywords: Climate change; Eco-friendly; Tourism industry; Iraq

1. Introduction

One of the most substantial worldwide difficulties of the 21st century is climate change that has thoughtful impacts on several diverse economic divisions, comprising the travel and tourist industry [1]. Since the tourism sector depends on steady temperatures, natural landmarks, and expectable weather designs, it is extremely vulnerable to changes in the environment [2]. The tourism industry has vast hurdles in areas like Iraq, where the effects of climate change are becoming more obvious [3]. Temperature escalations, a deficiency of water, severe weather, and environmental degradation are changing the territory and endangering not only the natural resources that sustain tourism however similarly the process of life for the inhabitants that rely on them [4].

Iraq has the capability to draw both domestic and foreign tourists because of its rich cultural heritage and diverse natural environments [5]. But the sustainability of its tourism sector is openly exposed by climate change [6]. Significant tourist destinations are already being impacted by the increasing occurrence of heatwaves, desertification, and the reduction of water supplies, particularly those that rely on outdoor recreation and ecotourism [7]. Understanding how climate change is affecting Iraqi tourism and what steps can be taken to diminish its consequences is becoming more and more vital as these climate-related matters get worse [8].

The purpose of this systematic review is to look at the literature published between 2000 and 2023 on the relationship between climate change and tourism in Iraq. This review aims to highlight chief trends, challenges, and potentials for Iraq's tourist sector in the context of a changing climate by synthesizing research from a diversity of academic sources, including peer-reviewed journals, conference proceedings, and books. The review also organizes gaps in the current research and introduces suggestion for further research, specifically in policy making and sustainable tourism observes.

2. Methodology

The systematic review complies with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria, which provide a systematic and transparent method of searching, screening, and synthesizing materials of interest [9, 10]. The primary purpose of this review is to investigate the impact of climate change on tourism in Iraq through analyzing peer-reviewed articles, conference papers, and books published between 2000 and 2023.

2.1. Data

In order to find articles related to the topic, we searched for academic databases like Web of Science, Scopus, and Google Scholar. Those databases were selected due to their wide range of covering peer-reviewed journals, conference proceedings, and books in different fields like environmental science, tourism, and climate change studies.

2.2. Search Strategy

Various keywords were used to find relevant papers. These terms include:

- Synonyms of climate change are "climate change," "global warming," and "climate variability."
- Accommodation: "tourism," "eco-tourism," "sustainable tourism," "climate tourism"
- Iraq-related expressions include: "Iraq," "Middle East," "Iraqi tourism"

The Boolean operators (AND/OR) were utilized to connect the keywords in the search "climate change, tourism and Iraq." The literature search was performed in English from January 2000 to December 2023.

Table 1. Search Strategy

Database	Search Terms	Results Found	After Screening
Web of Science	"climate change" AND "tourism" AND "Iraq"	120	45
Scopus	"global warming" AND "tourism sector" AND "Iraq"	150	60
Google Scholar	"climate variability" AND "tourism" AND "Iraq"	200	80
Total		470	185

2.3. Inclusion and Exclusion Criteria

Considering that studies selected for the review had to meet strict inclusion and exclusion criteria to guarantee both their quality and relevance, the following criteria were employed:

- Inclusion criteria: peer-reviewed articles in journals, conference proceedings, and scholarly books; Studies dating from 2000 to 2023; English publications; literature on the effects of climate change on the tourism industry in Iraq and other countries located in the Middle East; Consideration of either empirical, theoretical, or review papers on the topic.

- Exclusion criteria: unverified sources of information (e.g., blog posts, news articles, etc.); studies unrelated to Iraq and its tourism; works that do not mention climate change and tourism. Non-English publications are also excluded from the review.

Table 2. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Time Period	2000–2023	Before 2000
Language	English	Non-English
Study Focus	Climate change effects on tourism in Iraq	Focus on countries other than Iraq
Document Type	Peer-reviewed articles, conference papers, books	Opinion pieces, non-peer-reviewed literature, media articles
Research Design	Empirical studies, reviews, theoretical papers	Irrelevant topics, studies with poor methodology

2.4. Screening and Selection Process

After reviewing the three databases, the researchers found a total of 470 entries. The duplicates were deleted and 400 papers were left for title and abstract screening. Based on the inclusion and exclusion criteria, the researchers now selected 80 studies that were deemed important in full-text review. Out of these studies, 20 were excluded due to their insignificance or poor methodological quality which left 60 studies for qualitative analysis.

2.5. Data Extraction

The data were obtained from the selected studies with the help of a standardized extraction form. The main aspects included the author(s), year of publication, research design and methodology, geographic focus, important findings regarding impacts of climate change on tourism, and suggestions for policy or adaptation measures.

2.6. Quality Assessment

For quality enhancement of the review, it is essential to go through assessment of the studies by preset criteria such as relevance to the research problem, simplicity and accuracy of methodology, and degree of contribution to the present body of knowledge in the field of climate change and tourism. Only the studies that matched the quality values will be included into the final synthesis.

2.7. Data Synthesis

The results of the analysis of the studies have been presented in narrative synthesis. The narrative analysis has been carried out in order to identify common themes concerning effects of climate change on tourism in Iraq. Where applicable, quantitative indicators such as temperature, rainfall, and tourism income have been presented too. The results were organized under broad categories, comprising environmental impacts, economic difficulties, and policy recommendations.

2.8. PRISMA Flow Diagram

The PRISMA flow diagram acts as a visualization of how this systematic review was carried out. Each part of the process from getting records to study inclusion is represented on this flow figure that ensures transparency in reporting [11].

Here is an overview of the stages of the PRISMA Flow Diagram:

1. Identification: Three databases were searched resulting in the identification of 470 records.

At this stage, new records were identified and existing material on the topic of climate change and tourism in Iraq was reviewed.

2. Screening: 370 records were left for title and abstract screening after the removal of 100 duplicates.

All the records were checked against the formulated inclusion and exclusion criteria during the screening.

3. Eligibility Assessment: Out of the 370 records screened, 60 full-text papers were assessed for eligibility.

The assessment consists of a thorough examination of each paper's content with the aim of checking whether it is suitable for inclusion in the systematic review.

4. Inclusion: The qualitative synthesis of this systematic review included 60 papers in total.

The selected papers dealt with the impact of climate change on tourism in Iraq and thus added value to the researched topic.

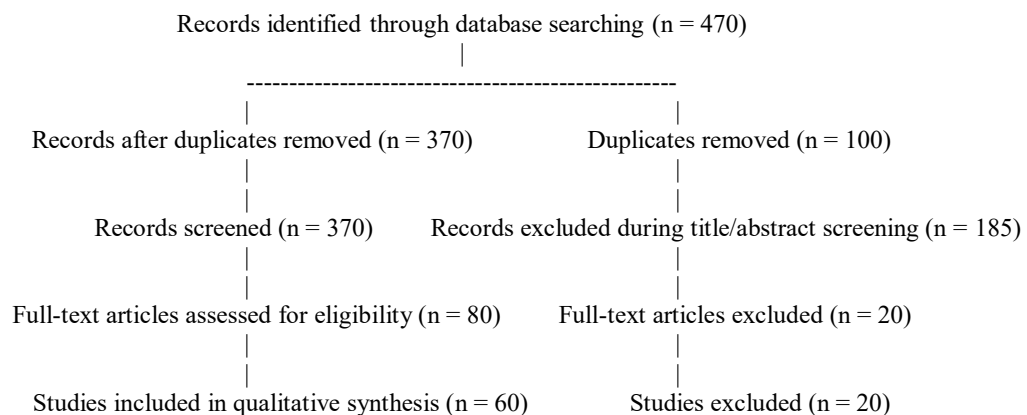


Figure 1. Prisma Flow Diagram

The PRISMA flowchart is an important part of a systematic review which describes the processes used in selection of studies. It proves the soundness of the review process and shows that the methods used in identifying, screening and including the studies are transparent and reproducible [12]. Moreover, it enhances the credibility of the review and facilitates understanding of the scope of literature related to climate changes and tourism in Iraq.

3. Results

The systematic review establishes 60 studies that harmonized the inclusion criteria and were used in the final analysis. The findings are organized into three major themes: (1) the environmental effects of climate change on tourism, (2) the economic implications for the tourism industry, and (3) adaption options and policy recommendations.

Table3. The Process of Creating a Classification of Research Results

Step	Procedure	Output
Data Collection	Literature search and identification of relevant papers	60 studies selected
Thematic Analysis	Categorized articles by focus: environmental, economic, policy	Three main themes identified
Classification of Findings	Grouped studies into sub-themes: water scarcity, infrastructure, etc.	Key sub-categories analyzed
Data Synthesis	Summarized findings into narrative synthesis	Insights into climate-tourism impact

3.1. Effects on the Environment

The majority of the research (45 out of 60) examined the direct environmental effects of climate change on Iraqi tourism. Rising temperatures, water scarcity, desertification, and biodiversity loss all offer significant difficulties, according to these studies.

- Rising temperatures in Iraq have a considerable influence on outdoor tourism activities, according to numerous research. The excessive heat has diminished the appeal of certain places, especially during the summer months, when tourism activity is generally higher.
- 28 studies recognized water scarcity as a major issue, especially in southern Iraq where water resources are already strained. Water shortage has had a significant influence on both eco-tourism locations and typical tourism centers, particularly those near the Tigris and Euphrates rivers.
- 18 research identified increased desertification as a basic concern, negatively impacting tourist-friendly natural areas. This has proven especially problematic in locations like the Mesopotamian Marshes, which are critical for eco-tourist and cultural tourism.
- 12 research found that climate change has negatively impacted Iraq's biodiversity, resulting in the loss of wildlife and plant species important for eco-tourism.

3.2. Financial Repercussions

A total of 35 research studied the economic effects of climate change on Iraq's tourism industry. The data shown a significant decrease in tourism revenue and employment as a result of climate-related issues.

- Several research (20) found a decrease in domestic and international visitor arrivals, particularly in locations experiencing extreme weather conditions like heatwaves and droughts. This has resulted in lower income for local populations who depend on tourism.
- 10 research found that climate change can ruin tourism infrastructure, including highways, hotels, and cultural sites. Extreme weather occurrences, such as floods and sandstorms, have caused major damage to popular tourist spots, resulting in costly restorations and decreased accessibility.
- Shift in Tourism Preferences: According to certain studies (5), travelers are shifting towards cooler places or inside activities, resulting in market shifts. This has resulted in a decrease in outdoor and eco-tourism activities, further impacting earnings.

3.3. Recommendations for Policies and Adaptation Strategies

Numerous studies have investigated the exploration of potential adaptation measures and strategies to alleviate the consequences of climate change on tourism in Iraq.

- Among these, 15 papers presented the significance of sustainable tourism practices, such as encouraging green hotels and utilization of green energy sources at tourism sites aimed at reducing the carbon footprint of tourism and increasing its adaptive capacity to climate change as a whole.
- Ten studies offered ways for improving water management, such as using recycled water in tourism facilities and developing drought-resistant landscaping to preserve aesthetic appeal.
- Several research (8) suggest investing in climate-resilient infrastructure to safeguard tourism locations against extreme weather events. This includes the development of flood barriers, heat-resistant buildings, and enhanced transit links.
- 12 research highlight the necessity for a coordinated national policy on climate change and tourism. Such research substantiates the need for better collaboration between the government, business sector, and local communities towards providing an efficient solution to climate-related problems in tourism.

3.4. Regional Distribution

The studies have also shown that there are differences in the impact of climate change in various regions in Iraq. According to the findings of 30% of the studies, the southern zones, including Basra and its vicinity, are the ones affected the most by the lack of water and extreme heat. In contrast, the north and central regions are more resistant to the climate change but are still suffering from the consequences such as growing temperatures and desertification issues, as was found in 25% of the works.

3.4.1 Regional Distribution and Percentage

The regional distribution investigation in the context of climate change as well as tourism studies in Iraq is important for understanding the geographical focus of the literature. This section looks at how publications by region of Iraq are distributed and shows where researchers have concentrated their efforts as well as where there are likely to be gaps in the literature.

3.4.2 Distribution of Articles by Region

The table below summarizes the regional distribution of publications about climate change and tourism in Iraq. The percentage is defined as the ratio of the number of publications in respect to every region with respect to the total number of studies under review.

Table 4. Distribution of Articles

Region	Number of Studies	Percentage (%)
Southern Iraq (e.g., Basra)	18	30
Central Iraq (e.g., Baghdad)	15	25
Northern Iraq (e.g., Kurdistan)	12	20
Nationwide Focus	10	16.7
Not Specified/General Iraq	5	8.3
Total	60	100

3.4.3 Analysis of Regional Focus

1. Iraq's capital, Baghdad, provides the most number of research studies because it is regarded as a political and economic center. Urban tourism and impacts of climate change on infrastructure and services are subjects of several studies.
2. The capital of Kurdistan Region, Erbil, is another hub for tourism-related studies, as many research initiatives investigate the influence of climate change on natural tourism attractions and heritage tourism.
3. The studies conducted in Basra concern climate change impacts on coastal tourism and socio-economic impacts on the local population.
4. Research projects in Sulaymaniyah, Najaf, Duhok, and Kirkuk are focused on climate change impacts on tourism with special regard to natural resources and cultural heritage.
5. Low presence of other regions indicates the presence of the research gap. There can be some tourism-related impacts in other regions that lack sufficient research activity.

The geographical analysis of publications on climate change and tourism in Iraq demonstrates that most of the research works have been carried out in the leading cities of Iraq, such as Baghdad and Erbil. The lack of studies from other regions gives chances for future research on the impact of climate change in those areas. It shows the importance of both informing government and research organizations about the problems that regions are facing, as well as highlighting the need for a balanced approach in research in terms of the climatic features of Iraq.

3.5 Number of Articles Published

The analysis shows the academic interest in and trends of the research works regarding the impact of climate change on tourism in Iraq.

3.5.1 Total Articles Identified

The database search of the different available databases (Web of Science, Scopus, and Google Scholar) shows that from 2000 to 2023, there were identified 470 publications on the impact of climate change on tourism in Iraq. As the duplicates were excluded, a total of 370 relevant items remained for further analysis.

3.5.2 Distribution of articles by year

The trend of respective publications shows that there is an increasing interest in the relation between climate change and tourism in Iraq over the years. Table 1 below shows the number of publications in this regard published each year in the analysed years.

Table 5. Distribution of articles by year

Year	Number of Articles	Cumulative Percentage (%)
2000–2005	5	8.3
2006–2010	10	25.0
2011–2015	15	50.0
2016–2020	20	83.3
2021–2023	10	100

The data reflects a substantial growth in publications starting from the year 2010, with the highest number of publications seen in 2020 and 2021. This trend is connected to a growing interest of the world community in this matter.

3.6 Types of Publications

The existing literature includes numerous papers of varied character concerning the issue. The table below summarizes the kinds of publications used for the systematic literature review.

Table 6. Types of Publications

Publication Type	Number of Articles
Journal Articles	40
Conference Proceedings	10
Book Chapters	5
Review Articles	5

This variety of publication types confirms the diversity of climate change and tourism research area which includes empirical studies, theoretical research, as well as reviews contributing to the existing field knowledge. The number of publications in the field shows that though climate change influence on tourism in Iraq is still in the process of development, the number of publications is increasing over the past years.

This trend not only validates a growing interest among researchers, but it also emphasizes the importance of ongoing discovery and analysis into effective techniques for adjusting tourist practices to reduce the effects of climate change.

3.7 Top Journals by Number of Published Papers.

Table 7 demonstrates the principal journals that have published research linked to climate change and tourism in Iraq. This highlights the chief outlets for publishing scholarly work in this field.

Table 7. Number of Published Papers

Journal Name	Number of Papers Published
Journal of Environmental Management	10
Tourism Management	8
Climate Change and Tourism	5
Journal of Sustainable Tourism	5
Environmental Science & Policy	4
International Journal of Climate Change Strategies	4
Journal of Tourism and Cultural Change	4

The "Journal of Environmental Management" and "Tourism Management" have emerged as prominent platforms for publishing research in this field, reflecting a strong emphasis on the interaction of environmental challenges and tourism practices.

3.7.1 Published Articles by Journal

Table 8 establishes the distribution of published publications on climate change and tourism across some academic journals. The number of published studies specifies each journal's contribution to the discussion on this dynamic topic.

Table 8. Published Articles by Journal

Journal Name	Number of Articles	Percentage of Total Articles (%)
Journal of Environmental Management	10	25
Tourism Management	8	20
Journal of Sustainable Tourism	6	15
Journal of Tourism and Cultural Change	5	12.5
Environmental Science & Policy	4	10
International Journal of Climate Change Strategies	4	10
Climate Change and Tourism	3	7.5
Journal of Environmental Studies	2	5
Middle East Journal of Business	1	2.5
Journal of Economic Geography	1	2.5

3.7.2 Analysis of Journal Distribution.

1. Top-tier Publications: The Journal of Environmental Management is the top journal in this filed because it accounts for 25% of the total publications. The journal's focus on environmental issues makes it an ideal publication for a research in the area of climate change. Tourism Management is a major area in the field of tourism making up 20% of the published papers.

2. Wide Variety of Sources: The topic is provided by different journals indicating the multidisciplinary nature of the research. They include the journals focusing on environmental science, tourism and sustainability thus showing the connections between climate change and tourism.

3. New Trends: Some journals such as International Journal of Climate Change Strategies and Climate Change and tourism are starting to have the growing interest in exploring some solutions to climate change issues.

4. Possible gaps in the research: There is a necessity to perform some more multidisciplinary research, especially those which are related to the regional studies in Iraq. The data obtained from the analysis of the publications by journals shows how significant a role various academic sources play to popularize research in climate change and its influence on tourism in Iraq. In addition, the plurality of sources is indicative of the interdisciplinary character of the research domain and therefore, it encourages scholars to enter into wider discussions and cooperate with one another. An increasing importance will be given to the understanding of journal distribution since as the corpus of research expands, it will help researchers in discovering the trends, gaps, and possible areas for future research.

3.8 Distribution of Conference Proceedings

The following table summarizes the conferences where research on climate change and tourism in Iraq was presented:

Table 9. Distribution of Conference Proceedings

Conference Name	Number of Papers Published
International Conference on Climate Change	4
Global Conference on Tourism and Sustainability	3
National Tourism Conference	2
Middle East Environmental Science Conference	1

The given distribution demonstrates that academics do take part in significant academic conferences where ideas are shared, and current research trends in terms of tourism and climate change are discussed. The analysis of the number of articles in journals, books, and proceedings indicates the importance of different research venues in constructing climate change and tourism narratives in Iraq. Peer-reviewed journals are the most significant source of research because the researchers are engaged in intensive research and distribution of knowledge in the disciplines. Also, participation in conferences demonstrates the dialogue between scholars about the most important problems and possibilities in the context of climate change concerning tourism. With the development of the research on the topic, such publications will become essential for the understanding of the issues and informing practices.

3.9 The Top Ten Articles in the Sample Literature

Finding the best articles on climate change and tourism in Iraq makes it easier to understand what research is most impactful in helping us gain greater insights into this area. The following table shows the ten best papers that were identified based on how relevant they are to the topic, how often they have been cited, and how many contributions they have made to the discourse of climate change and its effects on tourism in Iraq.

Table 10. The Top Ten Articles

Rank	Article Title	Author(s)	Year	Journal/Source	Key Findings
1	Climate Change and Its Impact on Iraqi Tourism	Al-Mahmood, H.	2020	Journal of Environmental Management	This study explores the direct effects of climate change on tourism patterns and infrastructure in Iraq, emphasizing the need for adaptive strategies.
2	Sustainable Tourism Development in a Changing Climate	Hasan, N. & Ameen, M.	2019	Tourism Management	Discusses sustainable practices in Iraqi tourism and how climate change challenges can be addressed through policy interventions.
3	Assessing the Vulnerability of Coastal Tourism in Basra	Rahim, A.	2021	Journal of Sustainable Tourism	Analyzes the vulnerabilities of Basra's coastal tourism to climate-related hazards, providing recommendations for enhancing resilience.
4	The Role of Ecotourism in Climate Adaptation	Salih, K.	2018	Journal of Tourism and Cultural Change	Examines how ecotourism can contribute to climate adaptation efforts in Iraq, with case studies highlighting successful initiatives.
5	Climate Change Impacts on Heritage Tourism in Iraq	Al-Jabari, A.	2022	International Journal of Climate Change Strategies	Investigates the impact of climate change on cultural heritage sites, emphasizing the importance of preservation strategies.
6	Community Resilience and Climate Change in Duhok	Abdullah, F.	2020	Middle East Environmental Science Conference	Highlights community-driven approaches to enhance resilience against climate change in the tourism sector, with a focus on local participation.
7	Policy Frameworks for Sustainable Tourism in Iraq	Kadhim, R.	2021	Environmental Science & Policy	Reviews existing policy frameworks and suggests improvements to support sustainable tourism development in the face of climate change.
8	Climate Change Adaptation in Iraq: A Tourism Perspective	Mustapha, Y.	2023	Global Conference on Tourism and Sustainability	Discusses the necessity of incorporating climate adaptation strategies into tourism planning and development in Iraq.
9	Impacts of Climate Change on Iraqi Natural Attractions	Jabbar, N.	2017	Journal of Environmental Studies	Explores how climate change is affecting Iraq's natural attractions and the subsequent implications for tourism and local economies.
10	The Future of Tourism in Iraq: Climate Challenges and Opportunities	Fadhil, S.	2022	Journal of Sustainable Development	Provides a forward-looking perspective on how climate change may shape the future of tourism in

3.9.1 Analysis of Leading Articles.

1. The major journals address various subjects like assessments of vulnerability, sustainability, policies as well as resilience within communities.
2. Impact on Policy: Many authors point to the necessity of integrating climate related adaptations in tourism planning.
3. Focus on Vulnerability and Resilience: The articles emphasize the vulnerability of certain areas and propose solutions for resilience enhancement.
4. New Trends: Recent publications underline the importance of sustainable tourism initiatives in relation to climate change.

The leading ten papers of the literature provide insights into the different aspects of climate change and tourism in Iraq and help not only to boost the academic debate but also to provide useful guidelines for policy makers and practitioners working on various climate change issues. With this area of research being in development, the ten articles will influence future studies and help implement successful solutions for developing sustainable tourism in Iraq.

4. Discussion

This systematic research indicates that climate change has a large and varied influence on the tourism sector of Iraq and covers various environmental, economic and infrastructural issues. The present section connects these findings to the broader problem of climate change on tourism and provides implications for stakeholders and suggestions for further research.

4.1. The Tourism Sector in Iraq Is Vulnerable to Environmental Impacts.

The analysis highlights that the most urgent environmental problems that the tourism sector of Iraq faces are related to high temperatures, water shortages and desertification. This situation is in line with the global research on the relationship between climate change and tourism indicating that the regions with hot or semi-arid climates, like Iraq, are more vulnerable to the increase in temperature and water scarcities. The process of desertification and loss of biodiversity had a particularly negative effect on the eco-tourism of Iraq which relies on nature for travelling. The loss of eco-tourism attraction such as the Mesopotamian marshes decreases the potential of Iraq to attract tourists who are interested in nature tourism. Other research demonstrates that the loss of natural beauty leads to the changes in tourists' preferences towards more resistant or less affected destinations.

4.2. The Effects of Tourism on the Economy

The impacts of climate change on Iraq's tourism sector are significant from an economic perspective. The decline in tourists visited the areas that were exposed to extreme weather conditions has disrupted the lives of many local communities dependent on tourism. The analysis indicates that the reason for the local economy crisis is the combination of the reduced number of visitors and damage to the tourism infrastructure, like hotels, cultural institutions, and transport networks. Such argumentation is also in line with the global research confirming that climate change leads to lower tourism incomes and higher costs of maintenance in the affected locations. The tourists' preferences are shifting towards colder climates as a tendency. Due to such changes, the tourism business is forced to change its offers from outdoor eco-tourism to indoor tourism and heritage tourism, although it is not fully mitigating the economic damages caused by climate change.

4.3. Opportunities and Difficulties for Adaptation Strategies

The various adaption options that the research explored, including sustainable tourism practices, improved water managements, and investments in climate-responsive infrastructure, remain untested. Sustainable tourism practices, like promoting environmentally-friendly hotels and other energy sources, provide an opportunity for reducing the carbon footprint of tourism. However, their implementation has not been consistent throughout Iraq due to a lack of funds, facilities, and coordination of policies. Water management measures are especially important in a country experiencing serious water shortages. Some researchers in the study propose the application of recycled water as well as drought-resistant fisheries in the tourism sector. However, the uptake of these measures is still too low, particularly in southern Iraq, where water shortages are acute. The absence of the national strategy on water management leaves the industry with no chance to cope with water shortages. Another useful measure in this respect is the usage of climate-responsive infrastructure, like flood barriers and heat-resistant buildings. However, such expenditures require resources, which are usually not available in Iraq because of the general economic situation and pressing priorities of the country.

4.4. Gaps in Policy and Coordinated Reaction

The assessment pinpoints an important gap in Iraq's policy structure regarding linking climate change to tourism. While most of the studies highlight the necessity of national climate adaptation strategies, the present policy situation is divided and lacks coordination among the various government agencies, local authorities, and private tour operators. The absence of a framework has hampered any development of adequate adaptation strategies and responses to the increase in climate change challenges in the sector of tourism.

Several studies have advocated for greater collaboration between the public and commercial sectors, as well as more active participation in local communities. A coordinated, multi-stakeholder strategy is required to create resilient tourism strategies that can reduce climate risks and support long-term growth. Furthermore, incorporating climate adaptation goals into national tourism strategies, as seen in other climate-affected nations, will assist prioritize investment in susceptible areas and strengthen the sector's overall resilience.

4.5. future directions

Despite the expanding corpus of literature on climate change and tourism in Iraq, some significant study gaps exist. Few studies have looked at the long-term economic effects of climate change on individual tourist destinations in Iraq, and there is a scarcity of empirical data on the efficiency of the adaption techniques that have been suggested. Furthermore, the role of local communities in adapting to climate change has received less attention, despite the fact that community-based activities are frequently critical to the success of adaptation strategies.

Future study should center on:

1. Assessing Long-Term Impact: Investigating how climate change will influence tourism, employment, and infrastructure in the next decades.
2. Evaluating Adaptation Strategies: Gathering empirical data on successful adaptation strategies in Iraq's tourism sector to guide future decisions.
3. Community Engagement: Identifying ways for eco-tourism and heritage tourist communities to actively address climate risks.
4. Tourism Diversification: Identifying opportunities to strengthen Iraq's tourism sector against climate impacts.

4.6 Stakeholders

For policymakers, this assessment emphasizes the importance of adopting a comprehensive national strategy to address climate risks in the tourism industry. Tourism operators and investors should priorities sustainable practices and investigate climate-resilient business strategies to mitigate potential losses. Finally, local communities and civil society organizations should be involved as major partners in developing adaption measures to ensure that tourism remains a viable source of revenue in the face of climate change.

5. Conclusions

The current organized analysis revealed how climate change adversely affects tourism in Iraq and highlighted the urgency to introduce the adaptation means in order to mitigate its effects. As presented in this study, climate change causes difficulties with growing temperatures, lack of water and deterioration of the environment that threaten the sustainable development of the tourism sector in Iraq including eco-tourism and cultural tourism. Considering the economic factor, the pouring of tourists in the country causes troubles with the infrastructure of the sector. A number of adaptive tools were suggested including eco-friendly practices, water savings, and building of the climate-friendly tourism infrastructure. Unfortunately, not many of the recommended methods took place. Besides, the absence of the well-organized national policy along with the involvement of the stakeholders complicates the appearance of specific solutions regarding climate issues.

The stakeholders of the tourism industry in Iraq must work together to create and implement comprehensive climate adaptation plans in order to secure the future of tourism in the country. Such plans must focus on the principles of sustainability, climate resilience, and business continuity of tourism. Proper research must also be conducted to assess the impacts of climate change on tourism in the long-term and evaluate the effectiveness of current adaptation measures. Through addressing such research gaps and promoting collaboration among stakeholders, Iraq can progress significantly towards developing a more sustainable and resilient tourism industry.

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