

## ANALYSIS OF A CULTURAL AND NATURAL DESTINATION: WADI RUM (JORDAN)

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### ABSTRACT

We explore the tourism and the geographical and cultural context of the Wadi Rum region of Jordan, which integrates a rich history and stunning natural landscapes. Tourism began in Wadi Rum after the creation of the State of Jordan in 1946. Due to the geological importance of the region, Wadi Rum was included in the list of UNESCO World Heritage nature reserves, which increased tourism to the region. The beauty of the landscape and its historical significance has attracted the attention of cinema, most notably the films Lawrence of Arabia and Mars. The results highlight the great importance of the tourism sector in Wadi Rum and Jordan, especially for employment generation. We also note the particular impact of the international political situation in the Middle East environment on Wadi Rum and Jordan.

**Keywords:** Wadi Rum; Jordan; International Context; Natural destination; Cultural destination; World Heritage Site.

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**Análisis de un destino cultural y natural: Wadi Rum (Jordania)**

**RESUMEN**

Exploramos el turismo y el contexto geográfico y cultural de la región jordana de Wadi Rum, que integra una rica historia e impresionantes paisajes naturales. El turismo comenzó en Wadi Rum tras la creación del estado de Jordania en 1946. Debido a la importancia geológica de la región, Wadi Rum se incluyó en la lista de reservas naturales del Patrimonio Mundial de la UNESCO, lo que incrementó el turismo en la región. La belleza del paisaje y su importancia histórica han atraído la atención del cine, sobre todo de las películas *Lawrence de Arabia* y *Marte*. Los resultados ponen de relieve la gran importancia del sector turístico en Wadi Rum y Jordania, en especial para la generación de empleo. También, señalamos la especial repercusión que tienen los impactos de la situación política internacional del entorno de Oriente Próximo en Wadi Rum y Jordania.

**Palabras clave:** Wadi Rum; Jordania; Contexto internacional; Destino natural; Destino cultural; Patrimonio de la Humanidad.

**1. INTRODUCTION**

Jordan, often regarded as the cradle of civilizations, is home to archaeological discoveries that date back around one and a half million years. Over the course of history, numerous civilizations have flourished in this region, beginning in the Stone Age and continuing through the Islamic era, passing through the Persian, Greek, Roman, and Byzantine periods. Each of these civilizations left behind significant cultural and architectural landmarks, such as theatres, temples, churches, mosques, palaces, and castles, and contributed to advancements in water management, agriculture, and housing (Ministry of Tourism and Antiquities, 2024a).

One of Jordan’s most remarkable natural sites is the Wadi Rum Reserve, located in the southern region of the country. Spanning over 74,000 hectares, it is Jordan’s largest protected area and features breathtaking landscapes, including vast sandy deserts and towering rock formations. The rocks of Wadi Rum are among the oldest on Earth, shaped over millions of years by natural forces such as wind and water, creating stunning geological formations that captivate visitors (Abdulhalim *et al.*, 2015).

During the early 20th century, Wadi Rum gained prominence as a strategic location in the Arab Revolt against the Ottoman Empire. The region was a key battleground where Arab forces, supported by Lawrence of Arabia, carried out guerrilla warfare, famously targeting the Hejaz Railway to disrupt Ottoman supply lines (Saunders, 2020).

Today, Wadi Rum stands as a major tourist destination and a symbol of Jordan’s natural and cultural heritage. In 2011, the Wadi Rum Reserve was inscribed on UNESCO’s Mixed World Heritage List, recognizing both its natural beauty and its cultural significance. Visitors from around the world come to experience its dramatic landscapes, engage in ecotourism activities, and learn about the region’s rich history (Goudie & Seely, 2011).

Tourism in Wadi Rum plays a crucial role in Jordan’s economy by providing jobs and income to local communities, while receiving significant political and financial support from

the Jordanian government. Both the late King Hussein and the current King Abdullah II have emphasized Wadi Rum’s importance as a national treasure that must be preserved for future generations. This reflects Jordan’s commitment to understanding the region’s global significance and protecting it as a shared heritage of humanity (World Heritage Convention, 2010).

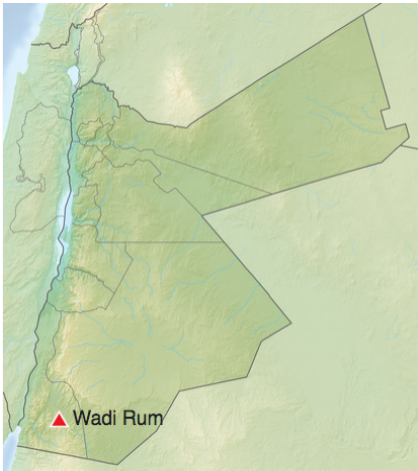
This research aims to explore the historical and touristic significance of Wadi Rum and its contribution to the economic and tourism sectors of Jordan. The key research question is: How has the history of the Wadi Rum Reserve impacted the development of tourism and the local economy in Jordan?

By examining Wadi Rum’s unique history, cultural heritage, and its role in Jordan’s tourism industry, this research contributes to a broader understanding of how natural and historical sites can serve as engines of economic growth and cultural preservation. The study underscores the importance of balancing tourism development with the protection of Jordan’s natural and cultural resources.

2. GEOGRAPHY AND LOCALIZATION OF WADI RUM

Wadi Rum or Valley of the Moon is a desert valley in south-eastern Jordan (Figure 1). The valley is covered with alluvial sediments and sand accumulations that give rise to dunes. Mountains and rocky outcrops of granite and sandstone protrude from the terrain. The highest point is Jabal Umm ad Dami at 1,854m (Bazazo, 2021).

Figure 1  
LOCALIZATION OF JORDAN AND WADI RUM



Source: Tschubby, 2018 and Wikipedia



Source: The World Factbook, 2024

Wadi Rum is located in southern Jordan, some 60 kilometres from Aqaba, the country’s only outlet to the sea, which lies on the Red Sea. Wadi Rum is also close to Saudi Arabia. Wadi Rum is a natural and cultural area protected by Jordanian law in 1988 as a Nature Reserve,

covering 720 km<sup>2</sup>, and was recognised by UNESCO as a World Heritage Site in 2011. With more than 24,000 rock inscriptions, Wadi Rum has immense cultural significance. Conservation efforts have also been directed at maintaining the region’s unique ecosystem, with some 285 species of plants and 173 species of birds and reptiles recorded in the area (Bazazo, 2021). The protected area of Wadi Rum has a hot and dry desert climate throughout the year, despite some rainfall in winter. It is a continuation of the deserts that occupy much of Saudi Arabia and continue through southern Jordan, Palestine and the Sinai Peninsula (Figure 2).

**Figure 2**  
**WADI RUM DESERT VEGETATION**



Source: Authors

The conservation of the Wadi Rum protected area began in 1979, when an IUCN/WWF report on the Development of Wildlife Conservation in Jordan proposed the protection of Wadi Rum. The initial protected area was 540 km (54,000 ha). In 2002, based on previous studies carried out by the Royal Society for the Conservation of Nature and the Aqaba Special Economic Zone Authority, the area of the Wadi Rum Reserve was expanded to 72,000 ha (Strachan, 2012).

**Figure 3**  
**LANDSCAPE OF WADI RUM**



Source: Baviere, 2011

The Wadi Rum region is also characterised by its diverse terrain and geographical formations. Tectonics and erosion of the reliefs have resulted in very striking topographic forms, which together with the weathering of the reliefs with very vivid colours, especially red (Figure 3) (Bazazo, 2021).

Some of the most prominent features are the high cliffs of Jebel Umm al-Ishrin and the red sand dunes surrounding Jebel Rum. The area also has rocky outcrops, narrow canyons and huge sandstone mountains, which contribute to the region's impressive landscape (Dudley & Reeves, 2013).

### 3. WADI RUM COMMUNITY CULTURE AND HERITAGE

Wadi Rum is closely associated with the Bedouin tribes, traditional inhabitants of this arid land. Several tribes live in or around the protected area, including the Zalabiya, Zawayda, Sweileheen, Amran, Qadman, Dabbour and Najadat tribes. Most of these communities are settled in villages, while a few families continue to move with their livestock throughout the year (Strachan, 2012).

These tribes continue to use the pastures of the Wadi Rum reserve area as part of their cattle drives, some also use this space for agriculture or tourism activities.

Droughts in the 1950s and 1960s clearly reduced the number of livestock grazing in the Wadi Rum area. Subsequently, there has been a slow process of sedentarisation and migration to urban areas, which has greatly reduced the ecological pressure of livestock on Wadi Rum. Grazing is seasonal, so there is little impact on the environment. The Bedouin population continues to keep livestock as an economic option in the face of crises in other sources of work. Although some live in brick houses in villages, they take great pride in their culture and maintain their customs, traditional clothing and keep their goat-hair tents (Chatelard, 2003).

One of the most important aspects of Bedouin culture is hospitality to the stranger or traveller. Traditionally, the traveller was welcomed with food and lodging. Contact and a warm welcome to the stranger is still one of the distinctive elements of Bedouin culture today (Figure 4). This hospitality also extends to tourists (Alghad Newspaper, 2015).

**Figure 4**  
**BEDOUIN TRADITIONS IN A DESERT BEDOUIN TENT**





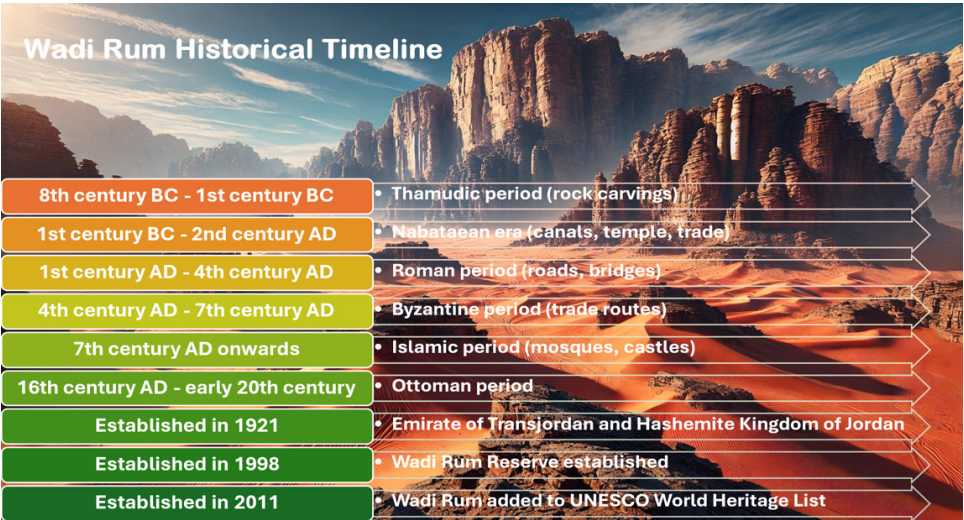
4. HISTORY OF WADI RUM

Wadi Rum lies on an important road that links the coastal areas of the Sinai Peninsula (Egypt), the Hisma Desert (Saudi Arabia) and the Mediterranean. Frankincense and myrrh were transported along this road from the Arabian Peninsula, while copper from the Wadi Araba region travelled in the other direction. This route was initially used by the Nabataeans and followed by the Romans (Kanaan, 2022).

From the 8th century BC to the 1st century BC, the area was inhabited by tribes from northern Arabia. Due to its strategic geographical location, Wadi Rum has witnessed various civilisations and nations, such as the Assyrians, the Babylonians, the Persians, the Greeks, the Nabataeans and later the Islamic civilizations (Van Der Steen, 2019). During this period, the Thamud people settled in the area, leaving behind a large number of rock engravings. These Thamud people can be identified as Arabs. Most of these Arabs were nomadic pastoralists, raising camels and goats and practising some irrigated agriculture to feed their livestock.

During the 1st-2nd century AD, the Nabataeans, a tribe from northern Arabia, gradually took control of the region and established their main centre at Petra from the 4th century BC onwards. Wadi Rum became a Nabataean site on the trade route between Hegra (Saudi Arabia) and Petra, both UNESCO World Heritage Sites (Bille, 2012).

Figure 5  
HISTORICAL TIMELINE IN WADI RUM



Source: Authors

The Nabataean settlement was a vital centre for trade and religious activities. It is likely that the pastoral tribes that lived in the area settled there on a permanent or seasonal basis. However, other tribes continued to live in and around the region, practising pastoralism, agriculture and using Thamudic writing to document their lives in the mountains (Tholbecq, 1998).

**Figure 6**  
**NABATAEAN TEMPLE IN WADI RUM**



Source: Wermer, 2009

During the Roman and Byzantine periods (1st-7th century AD), Wadi Rum gradually lost its role as a key stop on the caravan routes as much of the Arab trade was redirected to Syria or began to follow the sea routes along the Red Sea (Moaz *et al.*, 2015).

During the Roman and Byzantine eras, Wadi Rum went from being an important station on the caravan route to a marginal location as much of the Arab trade was diverted to Syria or relied on sea routes across the Red Sea. The settlement of Wadi Rum was abandoned, although pastoralists continued to live in the area (Gentry, 2017).

Wadi Rum remained on the periphery of the centres of power during the Islamic period. Arabic inscriptions near the main water sources tell stories of caravans passing through the region. However, human presence in the area was largely limited to Bedouin tribes, who continued their traditional practices of pastoralism, small-scale irrigated agriculture and trade with communities settled in the Jordanian highlands and the Red Sea coastal region. Before Islam, Wadi Rum was already a key stop for Arab trade caravans travelling between Mecca and Damascus (World Heritage Convention, 2010).

Wadi Rum was of great historical importance during the Ottoman period (AD 16th-early 20th century). Although it was not a major administrative or political centre between 1516 and 1918, it was part of the vast territory ruled by the Ottoman Empire in the Levant. During Ottoman rule, Wadi Rum belonged to the province of Damascus or Ottoman Syria, which covered much of the Levant. The empire relied on the Bedouin tribes of the area, including those living in Wadi Rum, to secure trade routes and maintain security. The region's strategic location on the pilgrimage and trade route connecting the Arabian Peninsula and the Levant made it valuable (Salibi, 1998).

A railway line, known as the Hejaz Railway (Mansour, 2006), passed through Wadi Rum, linking Istanbul (Turkey) with Medina (Saudi Arabia) and was used primarily to transport pilgrims. Bedouin tribes played a crucial role during this period, serving as guides and protectors of trade and pilgrimage caravans.

Towards the end of Ottoman rule in the early 20th century, Wadi Rum and the surrounding area underwent significant political changes, particularly during the Arab Revolt. Wadi Rum was the scene of some military operations between Arab forces led by Sharif Hussein bin Ali and Ottoman forces. The valley was also used strategically during the campaign of T.E. Lawrence, known as Lawrence of Arabia, to support the revolt against the Ottomans. The history of the Ottomans in Wadi Rum is therefore closely linked to Bedouin trade, military movements and wider regional transformations during that time (Wadi Rum. Protected Area, 2014).

With the outbreak of the Arab Revolt against the Ottomans, Bedouin tribes, particularly the Howeitat tribe, joined the forces of the Arab Revolt led by King Faisal, fighting against the Ottomans during the Arab Revolt of 1916 (Kayali, 2023). Lawrence of Arabia's presence facilitated the entry of weapons and explosives from Egypt, supported by Britain, for use against the Ottomans. During Lawrence's stay in Wadi Rum, important events took place in connection with the creation of the Emirate of Transjordan in the early 20th century.

The founding of Jordan during this period is attributed to the late King Abdullah I bin Hussein bin Ali Al-Hashimi, founder of the Hashemite Kingdom of Jordan and its first king. Abdullah was appointed emir of Transjordan after the Arab revolt led by his father, Sharif Hussein bin Ali, against the Ottoman Empire during World War I. He was born in 1882 in Mecca (South Arabia) (The American Magazine, 1947) .

King Abdullah established the Emirate of Transjordan in 1921 and set up the first system of central government, establishing the institutional frameworks of modern Jordan. He sought independence for the kingdom, culminating in the Anglo-Transjordanian Treaty of March 1946, which ended the British mandate and granted full independence to Transjordan (The American Magazine, 1947) .

Tourism work began to be prepared for the Wadi Rum area by the Jordanian government, especially after the production of the film *Lawrence of Arabia* in 1962 (Caton, 2023), which helped make Wadi Rum known around the world. Lawrence of Arabia gained great attention because of the film he made in the Wadi Rum area. The Wadi Rum exploration journey for mountain climbing and trekking began. With the support and encouragement of the Bedouins who have been in this area for generations, a book was written entitled (Trekking and Climbing in Wadi Rum, Jordan) (Howard, 1997). Tourist activities in this area include camping, horse and camel tours, and four-wheel drive vehicles. Visitors can stay overnight in camps that provide meals and other services.

In recognition of the unique natural and cultural Bedouin history of Wadi Rum and given the importance of tourism in building the local economy, the Wadi Rum area was declared a nature reserve by the Jordanian government, with support from the World Bank, in 1998. The Royal Society for the Conservation of Nature was tasked with preparing a management plan for the reserve in cooperation with local residents, and this team also works under the supervision of the Aqaba Special Economic Zone Authority. Its mission is to protect the desert areas in Wadi Rum and preserve nature from any attack or pollution. It also took care to protect the inscriptions and historical monuments found in the reserve (Groom *et al.*, 2022). As can be seen, the impact of the war on Gaza commenced in November 2023, yet the year 2023 Wadi Rum closed with a peak annual visitation

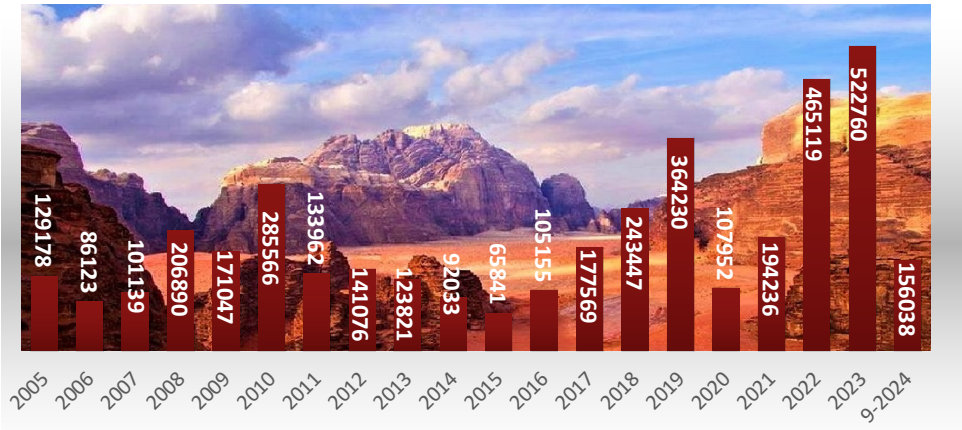


of 522,760 visitors, an increase of 12.4% over the previous year 2022, then decreased significantly in 2024, as the number of visitors by the end of September 2024 reached 156,038 visitors, a decrease of 70.16% over the previous year 2023, most of whom were local visitors to the Ministry of Tourism’s program (Our Jordan is Paradise) in order to preserve the tourism sector from collapse.

5. WADI RUM IN TOURISM ECONOMIC CONTEXT

Recent tourism activity in Wadi Rum began in 1984, when the British climbing team led by Tony Howard and Dee Taylor applied to the Ministry of Tourism for a permit to climb some of the mountains in Wadi Rum. The attempt was successful with the help of the Bedouins and the support of the Ministry. Howard and Taylor later wrote a book about this adventure, entitled *Trekking and Climbing in Wadi Rum Jordan*, which helped to increase the tourism movement and put it at the forefront of important tourist destinations around the world (Rough Guides, 2021). This fact, together with the dissemination of Wadi Rum through the audio-visual world and the environmental and cultural value of the territory.

Figure 7  
VISITORS TO WADI RUM



Source: Ministry of Tourism and Antiquities, 2024b

Since then, tourism has been growing in Wadi Rum as it has established itself as part of the Golden Triangle of tourism in Jordan (Petra-Wadi Rum-Aqaba). The growth of Petra internationally and the consolidation of Aqaba as a coastal destination has clearly favoured Wadi Rum, as it is located on the route between these destinations (Figure 7). Wadi Rum is a destination primarily focused on international tourism (70-80% is international tourism) (Table 1). The main tourist destination by number of visitors is Petra, with Wadi Rum in third place behind Mount Nebo (an important destination for the Christian community) (Table 1).

**Table 1**  
**VISITORS TO MAIN JORDAN DESTINATIONS AND PLACES**

	2022			2023			2022-23%
	Foreign	Jordanian	Total	Foreign	Jordanian	Total	Total
<b>Petra</b>	718,698	185,956	904,654	1,043,620	111,652	1,155,272	27.7%
<b>Jerash</b>	279,268	69,478	348,746	421,157	72,528	493,685	41.6%
<b>Mount Nebo</b>	419,503	43,185	462,688	615,020	40,199	655,219	41.6%
<b>Ajlun</b>	117,388	148,550	265,938	203,616	264,786	468,402	76.1%
<b>Madaba (Map)</b>	249,863	58,002	307,865	453,808	23,988	477,796	55.2%
<b>Madaba Center</b>	203,529	18,334	221,863	419,828	24,636	444,464	100.3%
<b>Wadi Rum</b>	341,726	126,138	467,864	456,751	66,009	522,760	11.7%
<b>Maghtas</b>	138,490	17,889	156,379	205,891	14,311	220,202	37.2%
<b>Dead Sea</b>	19,200	23,225	42,425	19,012	21,956	40,968	-3.4%
<b>Total Jordan</b>	2,996,550	1,048,138	4,044,688	4,665,755	1,026,124	5,691,726	40.7%

Source: Ministry of Tourism and Antiquities, 2024b.

A key aspect of tourism activity in Wadi Rum, the relationship between the Bedouin and tourism is characterised by mutual integration. The Bedouin have played an important and vital role in the development of tourism in Wadi Rum, providing many services, such as tourist guidance, the experience of Bedouin life in desert camps and the organisation of 4x4 excursions and camel rides that offer tourists a unique experience. The Bedouin way of life and their deep knowledge of the geography and history of the region are very important for the management of tourism activities, as they provide visitors with an authentic and unique experience, and attract many tourists seeking adventure, culture and connection with the desert environment

The number of tourists in Jordan in 2023 reached 5.7 million tourists, which was a significant increase compared to 2022 (Table 1). At the end of 2023, the Gaza war and the invasion of Lebanon began, which has had a very negative impact on Jordan’s tourism flows. By examining the origin of tourists to Jordan, we can observe that most of the travellers come from the Middle East, accounting for more than 40% of total inbound visitors. This reflects the strong regional tourism ties and the importance of nearby markets for Jordan’s tourism industry (Table 2).

**Table 2**  
**ARRIVAL TOURISTS IN JORDAN BY REGION**

	2018	2019	2020	2021	2022
Africa	58,000	63,000	20,000	30,000	71,000
Americas	182,000	216,000	41,000	62,000	192,000
East Asia and Pacific	137,000	158,000	36,000	15,000	53,000
Europe	511,000	678,000	142,000	169,000	577,000
Middle East	1,760,000	1,814,000	425,000	843,000	1,876,000
South Asia	80,000	75,000	18,000	40,000	136,000
Other not classified	1,422,000	1,484,000	386,000	853,000	1,373,000
<b>TOTAL</b>	<b>4,150,000</b>	<b>4,488,000</b>	<b>1,067,000</b>	<b>2,012,000</b>	<b>4,277,000</b>

Source: Ministry of Tourism and Antiquities, 2024c.

On the other hand, countries with the highest percentage of tourism revenues relative to GDP include the Maldives (38% of its GDP), Macao (28-30%), Cabo Verde (25-27%), Croatia (20-25%), Iceland (22%), Vanuatu (20-22%), Fiji (15-20%), Cambodia (18-20%), and the Bahamas (15-18%) (UNWTO, 2024; World Travel & Tourism Council, 2024). These percentages highlight the significant role tourism plays as an economic driver in these nations compared to other sectors.

In this context, we can observe that Jordan recorded inbound tourism expenditure as a share of GDP of 14.2% in 2022, which places the country within the group of countries with the highest inbound tourism expenditure as a share of GDP. In this way there is a strong dependence on tourism receipts by the country. Furthermore, it is worth noting that tourism receipts account for more than 80% of Jordan's services export revenues (Table 3). This highlights the key role that tourism plays not only in boosting the national economy, but also in generating the bulk of the country's services-related export earnings.

**Table 3**  
**TOURISM MACROECONOMIC INDICATORS OF JORDAN**

	2018	2019	2020	2021	2022
Inbound tourism expenditure over GDP	14.3	15.0	3.9	7.5	14.2
Outbound tourism expenditure over GDP	3.4	3.5	0.9	2.1	3.2
Tourism balance (inbound - outbound tourism expenditure) over GDP	10.9	11.5	3.0	5.4	11.0
Tourism openness (inbound plus outbound tourism expenditure) over GDP	17.7	18.5	4.8	9.6	17.4
Inbound tourism expenditure over exports of goods	80.3	81.3	22.0	36.6	55.8

	2018	2019	2020	2021	2022
Inbound tourism expenditure over exports of services	84.7	86.1	69.8	75.9	86.9
Inbound tourism expenditure over exports of goods and services	41.2	41.8	16.7	24.7	34.0
Tourism coverage (inbound over outbound tourism)	416.7	431.2	427.7	349.2	442.3

Source: UNWTO, 2023.

Job creation through tourism is one of the most important aspects both nationally and in Wadi Rum. Jordan is a country in need of job creation and the tourism sector is one of the most competitive national sectors with the greatest potential for job creation.

**Table 4**  
**EMPLOYEES IN THE TOURISM ACTIVITIES BY JORDAN LOCATION, 2023**

	Hotels- camps	Travel Agencies	Restaurants	Rent a Car	Tourist Shops	Tourist Guides	Horses Guides	Transport Company	Diving Centre	Glass Boats	Water Sport	Total employees
Amman	14,030	3,968	16961	983	354	1,381	0	2,200				39,877
Aqaba	2,525	102	749	64	48				139	120	255	4,002
Petra	1,269	100	42	10	49		200					1,670
Irbid	187	244	897	35	24							1,387
Dead Sea	2,862	0	165		3							3,030
Madaba	358	36	275	5	356							1,030
Zarqa	35	130	402	22				40				629
Jerash	50	11	370	5	36							472
Wadi Rum	190	0		1,000			330					1,520
Total	21,850	4,698	20,463	2,177	943	1,381	530	2,300	139	120	255	54,856

Source: The Ministry of Tourism and Antiquities, 2024c.

Tourism employment is concentrated in the capital, followed by Aqaba which generates a considerable number of employees due to the proliferation of businesses related to water activities (glass boats for wildlife viewing), scuba diving, as well as sun and beach activities, the Dead Sea (spas) and the destinations of Petra (cultural) and Wadi Rum (cultural, natural and desert excursions) (Table 4).

In Table 5, we present data on Jordan’s total tourism expenditure and the total employment and visits for Wadi Rum. Employees are all workers who hold the type of job defined as paid employment.

**Table 5**  
**EMPLOYMENT, VISIT AND EXPENDITURE IN WADI RUM AND JORDAN**

	Employees Wadi Rum	Visits to Wadi Rum	Total visitor expenditure (million USD) Jordan
2020	105	107,952	1,409.0
2021	162	178,474	2,675.4
2022	1220	465,119	5,807.7
2023	1490	522,760	7,399.2

Source: Ministry of Tourism and Antiquities, 2024b,c.

From the results of Table 5 we want to know in more detail the importance of tourism employment in Wadi Rum and Jordan. Therefore, we first analysed the correlation between tourism expenditure in Jordan and employees in Wadi Rum. Specifically, the Pearson correlation coefficient ( $r$ ) is 0.984, very close to 1, suggesting an almost perfect and positive relationship between the two variables. That is, as total visitor expenditure in Jordan increases, so does the number of employees in Wadi Rum. Since the value is positive, this implies that the higher the visitor expenditure, the higher the number of employees. This relationship suggests that an increase in tourism and visitor spending has a positive impact on job creation in the Wadi Rum area.

Next, we want to delve into the situation of tourism employment in Wadi Rum by proposing a model that relates visitors to Wadi Rum to the number of employees in the area. This relationship is explained by designing a log-log model, which is quite useful for analysing a proportional relationship between two variables, i.e. their elasticity. The model would be:

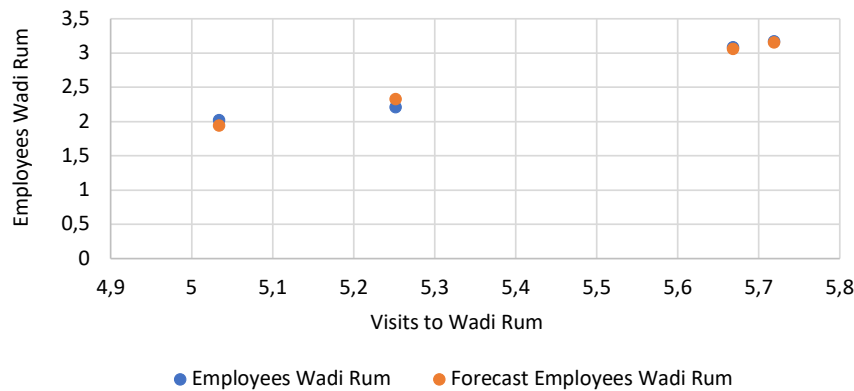
$$\ln(\text{EmployeesWadi Rum}) = \beta_0 + \beta_1 \ln(\text{VisitsWadi Rum}) + \varepsilon$$

where the dependent variable is employees Wadi Rum and the independent variable is visits in Wadi Rum. The coefficient  $\beta_1$  indicates the elasticity, or how much the number of employees in Wadi Rum changes with a percentage change in the number of visits (Table 6).

**Table 6**  
**RESULTS OF THE LOG-LOG REGRESSION ANALYSIS BETWEEN  
EMPLOYEES (Y) AND VISITS IN WADI RUM (X) (2020-2023)**

Predictor	$\beta$ (Beta Coefficient)	t-Student	p-value	R <sup>2</sup>
Log (Visits)	1.7709	9.846	<0.05	0.979

**Figure 8**  
**LOGARITHMIC REGRESSION BETWEEN EMPLOYEES AND VISITS**



Note: The regression model was estimated using ordinary least squares (OLS). A p-value <0.05 was considered statistically significant.

The model has an excellent level of fit, with a coefficient of determination of 0.979, i.e. 97.9% of the variability in the number of employees in Wadi Rum can be explained by the number of visits. This indicates that the model has an excellent fit and that visits are a very strong explanatory variable for the number of employees in Wadi Rum. The relationship is very robust. As for the coefficient  $\beta_1=1.7709$ , it indicates that a 1% increase in the number of visits to Wadi Rum will convert into a 1.7709% increase in the number of employees. In this sense, since the elasticity is greater than 1, it means that the number of jobs is very sensitive to the number of visits, because the change in the number of employees is proportionally greater than the number of visits to Wadi Rum.

Next, we can perform an analysis of the visit/employment ratio between Wadi Rum and Petra on average over the period 2020-2023.

	Wadi Rum	Petra
Ratio (visits/employment)	428.1	316.4

In Wadi Rum, 428 visits generate one employee while in Petra this value is 316 visits. Proportionally, a Wadi Rum's job supports 35% approximately more visits per person compared to Petra. Petra is more labour intensive, partly due to the strong employment weight of self-employment and the informal economy.

These differences may be a consequence of the different tourism model, Wadi Rum being a tourist destination offering experiences such as tours and outdoor activities that typically require fewer staff per visitor, while Petra, as an archaeological site, probably has more employees dedicated to conservation, security and administration and the presence of a lot of self-employment managed by the Bedouin population.



6. JORDAN AND WADI RUM IN INTERNATIONAL CONTEXT

The economic impact of the war in Palestine on the Wadi Rum region in Jordan could be significant, especially with regard to the tourism industry, which is one of the main sources of income for the region. The perception of regional instability negatively affects tourism in general, even if Wadi Rum is not directly involved in the conflict, as Jordan is a neighbouring country on the border with Palestine, which includes the Gaza Strip. In the following table, we see the percentage of variation according to whether they are tourists from Jordan or from abroad. We see that during the past eight years, foreign tourism has grown, with the exception of 2020, the year of the pandemic.

As for tourism from Jordan, it has grown even during the years of the pandemic, but from 2022 onwards, it has decreased for Jordanian tourists. It can also be noted that the impact of the war on Gaza began in November 2023 (Israel-Gaza war in maps and charts: Live tracker.2023), where the percentage of increase for foreign tourists reached 33.7% visitors, while domestic tourism decreased by -47.7%. The intensification of the war in the Gaza region, it has severely affected tourism in Jordan, as tourism in the Wadi Rum region recorded a decrease for foreign visitors -78.2% and for local visitors -14.5%, which is a very large decrease (Table 7).

Table 7  
EVOLUTION OF TOURISM ARRIVALS IN WADI RUM

Years	Relative change			Years	Relative change		
	Total	Foreign	Jordanian		Total	Foreign	Jordanian
2006	-33,3%	-32,9%	-41,4%	2016	59,7%	37,0%	137,1%
2007	17,4%	19,0%	-17,5%	2017	68,9%	98,9%	9,5%
2008	104,6%	103,1%	150,9%	2018	37,1%	51,8%	-15,5%
2009	-17,3%	-16,6%	-37,0%	2019	49,6%	55,0%	14,9%
2010	67,0%	59,9%	304,0%	2020	-70,4%	-86,2%	66,9%
2011	-53,1%	-53,3%	-50,7%	2021	79,9%	47,4%	103,3%
2012	5,3%	-4,3%	127,6%	2022	140,9%	413,7%	-1,2%
2013	-21,9%	-28,6%	13,9%	2023	11,7%	33,7%	-47,7%
2014	-16,4%	-8,9%	-41,5%	Sep-2024	-70,2%	-78,2%	-14,5%
2015	-28,5%	-34,0%	0,6%				

Source: Ministry of Tourism and Antiquities, 2024b.

Figure 9 shows the total destruction of residential buildings, including people in the Gaza Strip after the Israeli occupation raids. Our review of the history of tourism in Wadi Rum shows that the region relies heavily on international tourism and is clearly affected by regional and international events such as conflicts and wars that affect the movement of tourists.

**Figure 9**  
**EXTENSIVE DESTRUCTION OF BUILDINGS IN THE GAZA STRIP**



Source: Aletihad Newspaper, 2024.

The previous table (Table 7) shows the interactive relationship between the increase or decrease in the number of tourists and global and local events that affect the stability of the region, such as the crisis in Gaza, which causes a decline in the number of tourists in some years. This indicates the direct relationship between tourism in Wadi Rum and the surrounding events, and how this sector is affected by changes that transcend national borders.

Therefore, we can observe that an increase in tourism correlates with higher employment levels, while international conflicts lead to a decline in tourism, which in turn results in lower employment and a reduced gross domestic product. And in the case of Wadi Rum, due to its economy’s strong dependence on tourism, these effects are even more pronounced.

**7. CONCLUSIONS**

Wadi Rum is an important part of Jordan’s tourism sector. Along with Petra, the Dead Sea, Mount Nebo, Madaba and Jerash, it is one of the country’s main destinations.

Although the local population of Wadi Rum maintains some of its primary activities. The tourist influx is not so intense as to force the Bedouin tribes to abandon their handicraft and manual activities, so primary and traditional activities (livestock breeding, cheese making, handicrafts, etc.) are maintained. In addition, the Bedouin culture’s close relationship with the land maintains links with traditional activities.

Tourism in Wadi Rum has become the main driver of the local economy, providing employment and income for the local Bedouin communities residing in and around the nature reserve. Tourism has become a very important source of formal economy. Difficult

environmental conditions (desert climate) together with Wadi Rum's peripheral position in relation to Amman and the more developed areas to the north had made economic development in the area very difficult.

In Jordan, the contribution of the tourism sector accounted for 14.2% of GDP in 2022 (Table 3), highlighting the importance of tourism in the national economy. Along with the weight in GDP, the strong correlation between arrivals and GDP corroborates the close link between tourism and economic growth in Jordan. Moreover, more than 80% of export earnings from services depend on tourism.

Smaller and developing economies demonstrate a more pronounced dependence on tourism as a primary source of economic activity. This heavy dependence highlights Jordan's vulnerability. Thus, fluctuations due to international conflicts affect the economy of Jordan and tourism-specialised regions very severely. In the case of Wadi Rum, the direct effect between visitors and job creation has been noted. The decline in tourism flows in Wadi Rum has been strongly affected by the lack of economic diversification and limited natural resources. In other destinations such as Petra with a strong informal economy, it is affected very strongly by the tourism flow fluctuations. Also, in 2022, Jordan's tourism trade balance was clearly positive, with an inbound to outbound expenditure ratio of 442.3% (Table 3). This suggests that the country effectively attracts more foreign tourism receipts than it spends as outbound tourism, contributing to a positive net balance, which reduces the trade deficit in services exports.

Finally, one of the challenges facing local communities is the loss of traditions and acculturation processes due to contact with tourism. This process may affect the most attractive cultural element of the Wadi Rum tourism experience, which is the contact with Bedouin culture that has been maintained to this day. The increasing economic dependence on tourism, the process of sedentarisation of predominantly livestock-raising people and the abandonment of primary activities augur well for the intensification of this process of cultural change.

## 8. PRACTICAL RECOMMENDATIONS

The research recommends a set of recommendations aimed at promoting sustainable tourism and developing strategies to address current and future challenges due to their significant impact on the Wadi Rum region:

- a) Promote Sustainable Tourism: Focus efforts on preserving the natural environment of Wadi Rum and protecting its unique biodiversity through responsible tourism management. Set limits on activities that might lead to environmental degradation (Hall, 2021).
- b) Develop Infrastructure: Recommend improving tourism infrastructure, including road quality, transportation services, and accommodation facilities to meet the growing needs of tourists, while maintaining the heritage character of the area (Mandić *et al.*, 2018).
- c) Strategic Marketing of the Region: Design marketing campaigns that highlight the beauty of Wadi Rum and its unique history, emphasizing cultural aspects such as Bedouin heritage to attract diverse tourists interested in nature and heritage (Khdeir, 2024).

- d) **Crisis Management:** Suggest a plan for managing tourism crises, especially in light of political events like the current situation in Gaza, to mitigate negative impacts on tourism by offering alternative options and collaborating with tourism companies and the local community to ensure tourism continuity (Bader *et al.*, 2024).
- e) **Engage the Local Community:** Encourage empowering Wadi Rum residents and involving them in tourism activities, whether through training or providing job opportunities, which can contribute to improving the local economy and preserving cultural heritage (Brand, 2001).
- f) **Regional and International Collaboration:** Recommend enhancing cooperation with local and international entities, such as the World Tourism Organization and environmental agencies, to develop sustainable tourism programs that align with global standards (Alsayed, 2024).
- g) **Adapt to Market Changes:** Analyse the impact of various crises, such as the Gaza conflict, and identify strategies to adapt to a decline in tourist numbers or a shift in the type of tourism, which contributes to economic sustainability (Hoffman, 2024).
- h) **Conduct Future Research:** Encourage researchers to continue studying the impact of tourism on Wadi Rum in light of local and regional events, especially regarding climate and political shifts, to provide data-driven recommendations that support tourism development in the region (Yousef, 2024).

## 9. FUTURE RESEARCH

This research will be extended with the development of a survey of tourists and local people, as well as interviews with key public stakeholders in Wadi Rum and entrepreneurs in the tourism sector. This future research and publications will be part of the thesis being developed by Abdallah Al-Jazi.

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