

The role of environmental impact assessment of natural resources within tourist sites to achieve sustainable development

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Abstract: The prevailing traditional view of tourism development processes was limited to the presence of any tourist resource or tourism component, but our current time requires looking at everything that is a real, tangible resource. It is important to realize what is present in Syria in terms of natural, geographical and cultural resources because they are a real wealth in any development process, so what if We had many diverse tourism resources that made the process of sustainable tourism development achievable, as it became necessary to have harmony between development and the environment with planning and considering the tourism development process and the negative impact on natural resources and archaeological monuments, in order to reduce pollution and excessive use of natural resources within tourist sites and projects, In addition to the fact that projects within tourist sites depend on the foundations of the ecological environment, such as the availability of stunning views and natural reserves, which requires the preservation of natural resources of water, energy, plants, and natural organisms to ward off any danger of pollution and deterioration problems. This process requires knowledge of the environmental impact occurring and It is evaluated continuously because the performance of the resources within those sites will determine the effectiveness of the sustainable development process, whether it is achieved or not. The research aims to shed light on the role of assessing the environmental impact of natural resources within tourist sites, which is considered an important input in achieving the sustainable development process within many global transformations, environmental, biological, climatic and social studies that limit the role of these resources, study the environmental impacts resulting from human activity that occurs in tourist sites, and set some important points that develop the tourism development process in balance while maintaining the sustainability of resources and reducing their depletion. This research paper will study how to use environmental impact assessment as a tool to develop the development process and preserve resources with a minimum environmental balance.

Keywords: Environmental impact assessment, Sustainable Tourism Development, Natural Resources, Tourist Sites

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دور تقييم الأثر البيئي للموارد الطبيعية ضمن المواقع السياحية لتحقيق التنمية المستدامة

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الملخص:

كانت النظرة التقليدية السائدة عن عمليات التنمية السياحية محدودة بوجود أي مورد سياحي أو مقوم سياحي لكن وقتنا الحالي يتطلب النظر لكل ما هو مورد حقيقي ملموس ومن المهم إدراك ما هو موجود في سوريا من موارد طبيعية وجغرافية وثقافية لأنها ثروة حقيقة في أي عملية فكيف إذ كنا نمتلك الكثير من الموارد السياحية والمتنوعة التي تجعل عملية التنمية السياحية المستدامة قابلة للتحقق، حيث أصبح من الواجب وجود تناسق بين التنمية والبيئة عند التخطيط والنظر لعملية التنمية السياحية و التأثير السلبي على الموارد الطبيعية والمعالم الأثرية وذلك للحد من التلوث والإسراف في استخدام الموارد الطبيعية ضمن المواقع والمشاريع السياحية بالإضافة إلى كون المشروعات ضمن المواقع السياحية تعتمد على مرتكزات البيئة الإيكولوجية من توافر مناظر خلابة ومحميات طبيعية، الأمر الذي يفرض المحافظة على الموارد الطبيعية من ماء وطاقة ونباتات وأحياء طبيعية لدرء أي خطر من مشاكل التلوث والتدهور، فتتطلب هذه العملية معرفة الأثر البيئي الحاصل وتقييمه بشكل مستمر لأن أداء الموارد ضمن تلك المواقع سيحدد مدى فاعلية عملية التنمية المستدامة فهل تتحقق أم لا، فيهدف البحث الى تسليط الضوء على دور تقييم الأثر البيئي للموارد الطبيعية ضمن المواقع السياحية و التي تعتبر مدخلا هاما في تحقيق عملية التنمية المستدامة ضمن العديد من التحولات العالمية البيئية والبيولوجية والمناخية والاجتماعية التي تحد من دور هذه الموارد ودراسة الأثار البيئية الناتجة عن النشاط البشري الذي يحدث في المواقع السياحية ، ووضع بعض النقاط الهامة التي تطور عملية التنمية السياحية بالتوازن مع الحفاظ على استدامة الموارد والتقليل من استنزافها . وستدرس هذه الورقة البحثية كيفية استخدام تقييم الأثر البيئي أداة لتطوير عملية التنمية والحفاظ على الموارد بالحد الأدنى من التوازن البيئي.

الكلمات المفتاحية: تقييم الأثر البيئي، تنمية السياحة المستدامة، الموارد الطبيعية، المواقع السياحية.

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1-Introduction:

Considering natural resources in the tourism sector is one of the most important steps to activate their role and shift towards sustainable and responsible tourism development. The failure to protect these resources within the development process of tourist destinations has led to a variety of negative outcomes, both historical and recent, that require classification and study in order to conserve the available resources. This is because if tourism is not conducted through proper mechanisms, it will rapidly deplete these resources

2-Statement of the Research Problem:

In light of the growing environmental concerns, there has become an urgent need to achieve an environmental balance between the rates of tourism development and the negative impacts on natural resources and archaeological sites, in order to reduce pollution and the overuse of natural resources. Due to the lack of proper local development plans, several tourist destinations have emerged, including large-scale tourism projects, which have led to the degradation and depletion of natural resources in these areas. Some of these projects were implemented without clear environmental assessments, resulting in more severe negative effects.

3-The aim of the research

The objectives of the research are based on two main pillars:

- Identifying the environmental impacts associated with human activities within tourist sites.
- Determining the role of environmental impact assessment of tourist sites on natural and tourism resources.

4-Research Hypothesis:

Continuous evaluation of the environmental impact of tourism and natural resources in tourist sites will enhance the process of sustainable tourism development. Studying this is of great importance due to its impact on the natural environment and the proper understanding of ecosystems in general, as it may reveal the available potential they offer

5-Theoretical Framework:

How to achieve sustainable tourism development by assessing the environmental impacts of natural resources within tourist sites:

By knowing the following:

1. Natural resources.
2. Tourist sites.
3. Sustainable tourism development
4. The concept of environmental impact assessment.

5.1-Natural resources

5.1.1-The concept of natural resources:

- They are natural phenomena that humans have no role in their existence, but they depend on them in their lives and are affected by them and influence them. They are the total resources that make up the environment, including mass, energy, biological things, and living things called the general balance (Saleh, 2018).

- We can define natural resources as: “What nature provides of materials and natural stocks that humans have no role in their existence, and are required for human survival or used to build their civilization; they are affected and influence them. In general, they are the resources that make up the environment and benefit humans. Examples include various energy resources, mineral wealth, soil, water, forests, and many others. (Al-Ghandour-201

5.1.2-The importance of natural resources:

- Natural resources are the cornerstone from which many aspects of resources (human resources, civilizational resources) are issued. Natural resources are an essential element of human resources in order to benefit from them and build human civilization.
- Environmental natural resources are a very important component in progress as it depends mainly on the natural resources that meet its demands and satisfy many of its needs.
- Understanding and understanding the available natural and environmental resources is the basis for achieving the goals of any tourism or economic planning in the region and knowing how to exploit them.
- Natural resources help determine the individual income rate and standard of living in countries and regions to a large extent based on the quantity and quality of natural resources they possess.
- This is as explained by both Lashin (2017) and Nasser (2016).

5.1.3-Natural Resource Classifications:

Resources are classified according to their continued availability into 3 categories:

A- Permanent Resources:

They include the components of the biosphere with a fixed quantity, which are air, water, and solar energy.

B- Renewable Resources:

These are natural resources that have the property of self-renewal and can be enriched and reproduced. They include living organisms such as fish, trees, soil, and water.

C- Non-Renewable Resources:

These are natural resources that are not renewed during a person's life, i.e. those that take millions of years to renew. They are non-renewable in source, and are usually taken from the earth's interior, such as coal, oil, and mineral ores, or from fossil waters, and they have a limited stock, and include oil, natural gas, coal, and minerals. These environmental resources are subject to depletion and exhaustion, because their rate of consumption exceeds their rate of replacement, which is very slow, such that a person does not realize it in his short life, and hence these resources are called non-renewable resources (Al-Muqaddadi 2006).

5.1.4-The concept of using natural resources:

The use of environmental natural resources is the way in which these resources are exploited in different fields or all the activities that humans practice to benefit from these natural resources present in the environment, and they include tourism activities such as enjoying the beaches and practicing marine activities such as swimming, diving, rowing, etc., and the use of these natural resources and benefiting from them in any area represents the natural result of the ecological interaction between humans and their natural environment (Basma Muhammad et al. - 2021).

5.2-Tourist sites

In order to be able to determine what tourist sites consist of and how they are classified, we must know the following as stated in (piriou-2018):

A- Primary tourist areas on a local scale:

Dominated by tourism, i.e. places where tourism is the main activity of the place, and this is the case of the tourist site, the tourist resort.

B- Tourist areas on a regional scale:

Identifying places on a regional scale The constitution of places built on a regional scale as a whole is somewhat cohesive, which forms tourist clusters, which are the tourist city, extended linear clusters that ensure their urban continuity in terms of proximity to services, jobs, or even urban complexes, each place is integrated, whether they are resorts, or cities to which tourist sites are added..

5.2.1 -The tourist site: It is an integrated group of tourist, cultural and commercial activities in addition to the area of workers' population and the service area in a functionally integrated urban complex. As for the site in the tourism industry, it means the promotional natural resources and promotional human resources in a region or country, which constitute the basic foundation for establishing tourism development, no matter how simple or complex, sophisticated or primitive..

5.2.2 -Classifications of tourist sites:

- Natural tourist site The site can be considered as a natural area, beach, nature reserve, distinctive forests, or a waterway.
- Archaeological or historical tourist site Ancient archaeological material landmarks.
- Tourist sites with a modern character with human intervention such as resorts, hotels, museums, shopping centers, and tourist attractions with different functions.
- Tourist sites related to the type of tourism present in the region, so not all tourist sites have the same tourist status in the world, but the tourist site can also be organized according to its natural state or historical impact.

5.2.3 - Factors affecting tourist satisfaction in tourist sites:

Natural sites, climatic conditions, tourist attractions and equipment, accommodation, information, transportation, marketing, available income and customer choice, social and political attitudes of the places visited, and its environmental condition.

5.3-Sustainable tourism development:**5.3.1- The concept of sustainable tourism development:**

- Its implementation begins after a complete scientific study within the framework of integrated planning for economic, social and environmental development within the country as a whole, or within a region that combines the components of tourism development from natural and cultural attractions.
- Developing the concept of traditional tourism development by adding the attribute of sustainability, and considering that the tourism development process is a process of satisfying the psychological needs of tourists and obtaining their requirements without prejudice to the rights of future generations of tourists in their needs to enjoy the environment, meaning that sustainable tourism does not express a specific tourism content, as it is not a tourism product and is not a new way to sell a specific activity or determine how to pay, but rather it is a model for development. (Al-Bakri - 2019).

5.3.2- Principles of sustainable tourism development:

1. Achieving the greatest benefit from the natural environmental resources in the region, which constitute a fundamental factor in tourism development and their optimal exploitation without causing harm and preserving ecological processes by protecting biological diversity and natural and cultural heritage.
2. Creating new opportunities and economic diversification, increasing national income, improving infrastructure and public services in host communities, meeting the basic needs of the human element and raising living standards, and effective use of land and planning land areas in a manner consistent with the surrounding environment

3. Contributing to solving the problem of poverty in the host community by ensuring long-term economic growth and providing economic and social returns and distributing them fairly to the host community and contributing companies

4. Raising environmental awareness and environmental issues among tourists, workers in the tourism sector and host local communities, creating standards for environmental accounting and monitoring negative impacts on tourism, and achieving justice between individuals of the same generation and between different generations in terms of the right to benefit from economic and environmental resources. (Basma Muhammad and others 2021)

5.3.3- Dimensions of sustainable tourism development:

Environmental dimension: Sustainable tourism in its environmental dimension includes:

- Optimal use of natural resources, including sources of biodiversity.
- Mitigating the effects of tourism on the environment
- Overexploitation of these resources means deterioration of the ecosystem.
- Human interaction with its environmental surroundings lives in a huge system of environmental values that must be invested in because they constitute the components of tourist attraction.

Social dimension:

- Optimal exploitation of available resources and capabilities in an effective and balanced manner environmentally and socially in a way that serves the various areas of tourism development.
- Achieving a balance between the needs of tourists and host tourist areas, while emphasizing the participation of local community members in the development process.

Economic dimension:

- The relationship between the economy and tourism development is clear, as rapid growth is achieved at the expense of the environment.
- Tourism is considered one of the most important economic sectors because it is the most important source of foreign currencies.

5.4-The concept of environmental impact assessment:

It is environmental feasibility studies when establishing new projects, or carrying out replacement or renewal operations in any of the projects through which the cost and environmental return of the project or the required replacement or renewal process can be calculated

Environmental impact assessment is a study of the potential positive and negative effects of the project on the environment from all its aspects: natural, biological, economic and social, and estimating these effects with expenses and social returns and environmental impacts as a criterion for choosing between the 3 proposed alternatives) Latifa and Murad - 2017).

5.4.1- Definition of environmental impact assessment:

The environmental impact means the effects resulting from the establishment of all stages of the project that affect:

- Human health, living conditions and well-being.
- Soil, water, air, climate, living organisms and biodiversity.
- Community structure, buildings, landscapes, urban aesthetics, cultural heritage.
- Uses of natural resources. (Latifa-Murad-2017)

There are several definitions of environmental impact assessment:

Environmental impact assessment is the study of the potential positive and negative impacts of a project on the environment from all aspects: natural, biological, economic and social, and the estimation of these impacts through expenses, social returns and environmental impacts as a criterion for choosing between the proposed alternatives. (Qureshi 2012)

It is defined as a method for identifying the potential health, social and environmental impacts that may appear and arise as a result of the proposed development, in an attempt to evaluate these impacts environmentally, biologically, economically and socially within a framework that helps in making a logical and rational decision, to reduce the negative impacts by finding alternatives to the development process or areas of its implementation. (Latifa-Murad-2017).

Among the tourist sites are a group of projects, and the impact of these projects on natural resources falls within the following effects that have been classified by the World Bank, development projects according to their negative impact on the environment into **four categories**, which are:

Category A: Includes projects that have a direct impact on the environment on a large scale, such as: dam projects, water reservoirs, river course modification, nuclear power plants, large ports, and international power transmission lines.

Category B: Includes development projects that affect the environment and society, such as: establishing power plants, large sewage treatment plants, extending main roads, establishing new communities and industrial cities, transporting fresh water to reclaim deserts, agricultural development in its various forms, and tourism development projects that are the subject of the study.

Category C: Includes state projects that affect society, and thus affect the environment, such as education and family planning projects, etc., except for services (water, electricity, sewage), which fall under category B.

Category D: It includes small and specific projects that do not affect the environment, such as fisheries, afforestation around cities, nature reserves, and public parks...

5.4.2-The elements that are taken into account when conducting an environmental impact assessment of development activities and projects are as follows:

- Physical characteristics: soil, water, air, climate, land uses and properties
- Environmental characteristics: communities, races and species, rare species.
- Patterns of human activity: population, labor structure, transportation... - Infrastructure: electricity, gas, sewage, housing, waste, communications, roads.
- Existing pollution: water and air pollution, noise, visual pollution, radioactivity (Al-Yazid Al-Rasoul - 2008).

5.4.3-Objectives of Environmental Impact Assessment and its Dimensions:

The objectives of environmental impact assessment are as follows:

- Ensuring the protection and preservation of the environment and natural resources, including aspects related to human health, through the process of improving the scientific environmental quality to protect the environment and the necessity of preserving it without deterioration or depletion, so that it remains always capable of developing and sustaining life. (Oulmi - 2008)
- Predicting potential problems, raising them and dealing with them at an early stage of planning development projects; which helps project owners achieve goals more successfully while avoiding negatives related to the environment (Al-Asfour 2008).

Environmental impact assessment is an important means of comparing different alternatives of projects, activities and policies, and through this the possibility of achieving them by identifying the most effective and least harmful alternatives to the environment. The study aims to analyze and compare alternative sites, cleaner technologies, simpler inputs, and means of mitigating, treating or reducing environmental problems, in addition to appropriate programs for environmental monitoring and management, while calculating the cost and economic and environmental return of the different alternatives until the best of them is chosen.

5.4.4- The concept of environmental impact assessment of tourism projects in tourist sites?

The environmental impact assessment of a tourist facility is a predictive study of the total environmental impacts surrounding the site of the tourism project in the planning phase, before starting to take any executive steps that may not enable the project to achieve developmental sustainability. Environmental impact assessment studies for tourism projects cover the following:

- Potential natural impacts of existing natural resources such as air, water and soil pollution.
 - Expected social and economic impacts of the project.
 - Biological impacts on living organisms living in the area where the tourism project is to be cated.
- The importance of the environmental impact of tourism projects stems from the fact that they are a tool for activating ecotourism, especially if these projects are to be established in areas of special environmental importance such as nature reserves, rivers, lakes, coasts and beaches, mountains, oases, forests..., and given the effects they can cause that threaten the balance and biodiversity there as a result of the migration of organisms living there, the loss of large parts of land, hunting, and increased consumption of many resources such as water, energy and food. Therefore, the environmental dimension is supposed to be considered a means of tourist attraction when establishing tourism projects, and thus contributing to achieving sustainable development. (Latifa et al. - 2017)

5.4.5- How to prepare an environmental impact assessment study for tourism projects:

1. The owner of the tourism project assigns one of the environmental consulting offices approved by the Ministry of Environment to prepare the study.
2. Evaluating the environmental impact of the project and that the study covers the following aspects: Natural resources: monitoring the quality of air, soil, water, seawater and beaches, mountains, nature reserves, rivers, adjacent to the project site, in terms of biological, chemical and physical indicators, in order to build an environmental background for the project site, and estimate the measures that must be taken to ensure the sustainability of the project.
3. Determining the extent of the environmental impacts resulting from site preparatio and the stages of construction and completion of the project, then its operation stage and how control the negative impacts resulting from it.
4. The availability of resources supporting the operation of the project, including water, energy and food, and the impact of providing the project with these services on the site from a health and environmental perspective, in terms of the compatibility of the water source with the various uses of water within the tourist facilities, **through the following procedures:**
 - In the case of projects that will desalinate water, it is necessary to determine how to dispose of the salts resulting from the desalination process, and the extent of their impact on the receiving environment, in addition to determining the environmental monitoring method that the project will adopt to reduce the negative effects of this.
 - Connecting the project to sources of electrical energy and respecting health and environmental standards.
 - Expected emissions from power plants in the project Food suppliers respect the nature of the area in which the tourism project is located, and commit to not making noise, and adhere to health standards for storage and transportation.
 - Use environmentally friendly means of transportation that operate on batteries or solar energy, which workers and tourists use to move around the tourist sites in the tourism project, to reduce site pollution resulting from the use of cars and trucks, especially sites adjacent to natural reserve areas. And reuse them in irrigation in the project.
 - Availability of sewage services and the possibility of treating water consumption.
 - Rationalizing energy consumption by relying on environmentally friendly technology.
 - Availability of trained workers and how to house them and the living services provided to them, with the need to ensure that they are free of infectious diseases.

- The impact of the project on neighboring areas with a special nature such as archaeological and historical areas and natural reserves from the natural and biological environmental aspects.
- The impact of neighboring and existing population activities on the sustainability of the tourism project.
- The extent to which population activities benefit from the new tourism project.
- The job opportunities that the project provides to the community in the surrounding areas.
- Opportunities for popular and community participation and how the project works to maximize this participation and develop the community economically and socially. (Latifa - Murad 2017)

6- Methodology:

After knowing the literature and theoretical studies of our research, we can identify the most important general stages of the process of assessing the environmental impact of natural resources present within tourist sites and areas. The process includes the tourism impact, i.e. the impact resulting from human tourism activities and their relationship with resources using tourism impact assessment

6.1 Advantages of using this type of assessment TIA:

- The application of TIA does not require an expert, so it can be used by a wide range of actors related to the field such as community members, government, institutions or non-governmental organizations;
- It can be used to assess both potential impacts and impacts that have already occurred;
- It relies on the perception of local experts who are in constant interaction with environmental components;
- It does not take into account the perceptions of users, giving priority to environmental conditions over user experiences;
- It is a flexible and practical tool that can be easily used as part of a monitoring program to guide tourism management and avoid reversible degradation.
- The application of this method can lead to better tourism planning and management aimed at preserving the components and functions of nature reserves. (Canteiro-2018)

6.2 The four steps of TIA: (Canteiro-2018)

Step 1: Identifying pressures (tourism activities):

The first stage consisted of identifying all tourism-related activities in the study area and reviewing management plans, or draft management plans for tourist sites/conducting interviews with managers, stakeholders and officials responsible for the area where the tourist site is located

Conducting interviews on the ground and by sending electronic questionnaires

Step 2: Selecting environmental components:

The ecosystem of tourist areas that could suffer from tourism pressures was divided into four components, two abiotic (soil and water) and two biotic (biodiversity and vegetation). However, it is important to note that the definition of environmental components can be as comprehensive as each area requires to be useful for its management. This allows for more flexibility in the context of adaptive management.

Step 3: Identifying and describing impacts:

From steps 1 and 2, a Leopold matrix of pressures versus components was constructed. The result of the matrix enabled the identification of the effects of each pressure on each component. After identification, a clear description was provided for each Impact

Step 4: Setting Criteria for Assessing the Size of the Problem:

The size of each impact was determined by integrating the intensity of pressure, the vulnerability of the component and the ability to manage the protected area. Thus, the size of the impact decreases

with increasing intensity of pressure and vulnerability of the ecosystem; while the size decreases with the human capacity of the area. The intensity of pressure is related to the frequency and extent of tourism activity.

The vulnerability of the ecosystem depends on the sensitivity of living organisms, as determined by the number of endangered, priority or rare species present and then expert consultations.

After we have learned about the methodology for assessing the environmental impacts of tourism projects within tourist sites, we can have an idea about the methodology for assessing the environmental impact of resources within those sites, which tourism activities will be part of the assessment process and the impact of each activity on the tourism resource available within the site. Thus, assessing the impact of those activities will show a tool to know the extent of the environmental impact of resources and whether they are degraded or not?

There are many challenges related to tourist and coastal areas, such as:

- Degradation of natural resources and decline in environmental quality, especially in the fertile coastal plain, the shoreline, marine waters and aquatic habitats.
- Random urban sprawl outside the organization and the concretization of agricultural and natural lands and beaches, and the depletion of lands due to the pressures of the summer movement from different parts of Syria and a number of Arab countries, and the distortions occurring in the general natural landscape, and the failure of planning and organization processes to keep pace with the expansion of various urban and economic activities.

The most important challenges directly related to natural resources and their depletion within tourist and protected sites were highlighted. Therefore, the aspiration to mitigate these negative impacts will develop the process of sustainable tourism development within tourist areas and sites towards a positive direction within the goals of sustainable development. Therefore, using the principle of environmental impact assessment will determine those impacts resulting from the repetition of human activity, even if it is seasonal, i.e. at certain times of the year, but the expansion of activities is sufficient to deteriorate resources. In the previous experiment using the Leopold matrix, the direct relationship between human tourism activities shown in Table No. (1) and their effects on resources was clarified. We chose four axes (soil - water - biodiversity - vegetation cover) with a group of human tourism activities that form the basis for the process of sustainable tourism development within tourist sites and projects, as shown in Table No. (02).

Table (01) shows the tourist activities:	
Hiking and visiting	Hiking in traditional or non-traditional ways. It requires a certain degree of physical effort and generally does not exceed one day.
Boating:	Recreational navigation on sea, lakes or rivers, in large combustion-engined or sail-driven boats,
Mountain biking:	Off-road cycling, often over rough terrain, using specially designed mountain bikes.
Sun and beach tourism:	The use of beach areas for recreational purposes and activities such as sunbathing, sports, walking and/or bathing.
Motorsport rallying	Which takes place on highways or roads in specially designed vehicles.

Animal watching:	Viewing animal species in their natural habitat. This can be done from an observation point or directly in their habitat.
Camping:	An outdoor recreational activity that involves overnight stays in a mobile shelter. Specific locations may be established for this activity.

Source: Canteiro 2018

Potential Negative Impacts of Human Activities	Natural Resources			
	Biodiversity	Water	Soil	Vegetation
Hiking and visiting	Human disturbance	Loss and pollution with damage and removal and solid waste	Erosion and	Solid Waste Pollution Organic Overload
Boating Trips	Vehicle disturbance		Surface runoff	Pollution (Engines, Solid Waste, and Liquid Waste)
Horseback Riding	Direct disturbance threatens biodiversity	Loss and pollution with damage and removal and solid waste		Pollution (Engines, Animal Waste)
Sport Fishing	Direct disturbance threatens biodiversity		Erosion, erosion and pressure	Pollution (Engines, Solid Waste, and Liquid Waste)
Mountain Biking	Human disturbance	Loss and pollution with damage and removal	-	Solid Waste Pollution Organic Overload
Non-Motorized Water Sports	Human disturbance	-	Erosion, erosion and pressure	
Sun and Beach Tourism	Human disturbance	Loss and pollution with damage and removal	--	Solid waste pollution
Gathering	Vehicle disturbance	-	Erosion and pressure	Engine pollution
Gliding	Human disturbance	Loss and pollution with damage and removal and solid waste	Erosion and pressure	-
cave exploration	Vehicle disturbance	-	-	Pollution (engines, solid waste, and liquid waste)
Watching animals	Human and vehicle disturbance	-	-	-
Camping	Habitat reduction, disturbance from human activity, and disturbance from motor	-	-	Pollution (engines, solid waste, and liquid waste)

	vehicles.			
Infrastructure / Services	habitat reduction disorder	-	Erosion and pressure	-
Urbanization	Human and vehicle disturbance	Loss and pollution with damage and removal	Erosion, erosion, pressure and pollution	sustainable consumption

Researcher's conclusion based on data from the second source (Canteiro 2018)

After identifying and studying the activities and environmental impacts affecting natural resources within tourist sites, it is necessary to determine the work matrix and the methodology followed

6.3 -Leopold matrix:

- 1- All activities are defined and these definitions are placed at the top of the matrix and the columns are titled, while the rows are written with the current conditions.
 - 2- Each square is divided into two halves, and at the top corner of the square the value of the impact (Magnitude) is placed, while at the bottom of the square the importance of the impact (Importance) is indicated.
 - 3- To simplify the value of the impact in some research from the result of dividing the value in the case of operation by the value in the determinants.
 - 4- The numbers are placed so that they range from one to ten, where (1) is the lowest value and (10) is the highest value, and zero is not placed.
 - 5- A (+) sign is placed if the impact is positive, and a (-) sign if the impact is negative.
 - 6- The two halves of the square are multiplied by each other and added to the result of the square that follows it, and so on. This is done horizontally and vertically in order to count the negative and positive points for each of the rows and columns, and then know the total number of points, (Dawoud-2014)
- As shown in Table No. (3):

Table (03) shows an example with hypothetical numbers for the environmental impact assessment process:

Environmental impact / Ingredients and resources	Impact of human tourism activities	Solid Waste	Liquid Waste	Gases	Noise Pollution	Tourism Projects Sites	
Soil	Type Density	8 5-	4 6-	7 5-	9 8-	5 6-	196-
Water	Subterranean Surface	8 3-	4 6-	7 5-	9 8-	5 6-	185-
Land Use	agricultural Residential	8 5-	6 7-	5 2-	7 2-	9 2-	124-
Vegetation	Vegetation Types	5 2-	5 4-	8 4-	3 5-	5 6-	105-
Climate	Wind Rain	7 6-	8 9-	7 2	6 2-	5 6-	170-
Labor	Employees Experts	3 2	5 6	3 2	2 8	8 6	106+
		162-	212-	132-	221-	150-	

Researcher's conclusion based on data from the second source (Canteiro 2018)

7-Results and recommendations:

- Follow up on the environmental impacts of projects in the tourism sector to ensure their compatibility with the surrounding environment and its preservation, and the necessity of identifying the impacts that may appear in the tourism development process.
- Use the environmental impact assessment process with regard to natural resources within sustainable tourism development because it develops the development process and increases its results and enables it to direct resources to become less damaged and exposed to the risk of environmental degradation. The assessment process, as we noted previously, is arranged in several stages, as every human activity related to resources will cause an impact either on the vegetation cover or on the soil or on biodiversity and on habitats and water and others.
- Use an environmental impact assessment tool such as the Leopold matrix, which is one of the methods for determining the environmental impact to show us results that enable us to know the extent of resource damage and the effectiveness of the sustainable tourism development plan and the preemptive avoidance of those impacts by developing appropriate methods and correct ways to reduce environmental degradation.
- Emphasizing the direct interest in natural resources within the tourism process and highlighting their essential role.

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9-References:

1. Al-Ghandour, Ahmed, (2015), Protection of Palestinian Natural Resources from the Perspective of International Environmental Law, Fatwa and Legislation Bureau, Gaza.
2. Al-Maqqadi, Kazem, (2006) from the Basics of Environmental Science course, Faculty of Administration and Economics, Department of Environmental Management, Arab Open Academy in Denmark.
3. United Nations, (2013-14 and 15 March), Sustainable Tourism: Contribution to Economic Growth and Sustainable Development, Expert Meeting on the Contribution of Tourism to Sustainable Development, Trade and Development Board, Geneva.
4. Al-Rasoul, Ahmed Abu Al-Yazid, (2007) Sustainable Development Dimensions and Methodology, Bustan Al-Ma'rifa Library for Printing and Publishing, Alexandria.
5. Al-Jadoua, Heba Faisal (2023), Matrices Method in Environmental Impact Assessment, Predicting and Analyzing Impacts, Scientific Article, National Private University.
6. Bodiar Zahia -Wajbari, Shawqi, (2008 - October 21 and 22) Environmental Impact Assessment of Projects, Fifth National Forum on Environmental Economics and its Impact on Sustainable Development, University of Out Skikda.
7. Bakri, Sherif Sayed Saber (2019) A proposal for sustainable development using spatial analysis and geographic information systems techniques) An applied study in the Safaga area, the Red Sea, PhD thesis, Institute of Environmental Studies and Research, Ain Shams University.
8. Abdel Wahab, Sami (2002) Environmental assessment of tourism projects on the coast of the Gulf of Aqaba, Development and Environment Symposium in Egypt, Department of Geography, Faculty of Arts, Cairo University.
9. Dawoud, Fadhila Salman - Salman, Hiba Naji, (2014), Presenting the environmental impact using the Rapid Impact Assessment Matrix (RIAM) for the Amsco Drilling Rig, 204, Master's thesis in Environmental Sciences, College of Administration and Economics, University of Baghdad.
10. Oulmi, Basma (2008), Environmental assessment mechanism and the role of local communities in achieving sustainable development in Algeria, the fifth national forum on environmental economics and its impact on sustainable development, University of August 20, Skikda.
11. Abdel Razzaq, Ibrahim-Boudyar, Zahia, (2010-17 and 18 May), Environmental impact assessment of establishments as a tool for achieving sustainable development, the first national forum on: Prospects for sustainable development in Algeria and the requirements for environmental rehabilitation of the economic institution, University of Guelma.
12. Lashin, Abdel Aziz Samir Amin (2017), The role of natural resources in the development of Singapore, Master's thesis, Institute of Asian Studies and Research, Zagazig University.

13. Fouad Abdel Moneim Al-Bakri, (2004 - October 21 and 22), Tourism development in Egypt and the Arab world, Alam Al-Kutub Egypt.
14. Mohamed, Basma Sayed Saleh, Narmin Al-Shahat Nasr, and Rasha Ahmed Mohamed Khalil (2021), Environmental Natural Resources Management in Light of Sustainable Tourism Development, Scientific Article, Journal of the Association of Arab Universities for Tourism and Hospitality, Department of Tourism Studies, Faculty of Tourism and Hotels, Suez Canal University.
15. Quraishi, Youssef - Kahli, Salma Aisha and Salima Ghadir Ahmed, (2012) Economic Costs of Environmental Problems and the Most Important Environmental Assessment Methods Used, International Scientific Forum on: The Behavior of the Economic Institution in Light of the Stakes of Sustainable Development and Social Justice, University of Qasdi Merbah, Ouargla, November 21-22, p. 465.
16. Nasser, Mohamed Nasr Mohamed (2016), The Impact of Natural and Human Resources on Tourism in Korea, Master's Thesis, Institute of Asian Studies and Research, Zagazig University.
17. Ministry of Public Works and Housing, General Authority for Regional Planning, Syrian National Framework, (2019), Damascus.
18. Marcelo Canteiroa, Fernando Córdova-Tapiab , Alejandro Brazeiroc (2018) : Tourism impact assessment: A tool to evaluate the environmental impacts of touristic activities in Natural Protected Areas -Tourism Management Perspectives journal.
19. Piriou- Jerome- (2018) la région touristique: Une co-construction des acteurs du tourisme (book).