

## Reserves and their Relationships with Biodiversity: Jordanian Reserves

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### ABSTRACT:

the seven natural reserves in Jordan (Dana, Shaumari, Azraq, Ajloun forest, Wadi Ram, Dibeena, Wadi Mujib), cover over 1200 Square Kilometers, according to the Royal Society for The Conservation of Nature that assume the responsibility of managing and ensuring sustainability of natural reserves in the Kingdom. The area of nine reserves suggested to be constructed within the net of the national natural reserves is estimated to approximately 2884 km<sup>2</sup>. The aim of these reserves is to protect various kinds of animals related to the production of agricultural crops, which used as a food for some animals or for humans. They protect the environmental balance in the nature, where the presence of some plants and animals helps in getting rid of some harm in the nature, in addition to achieving some benefits.

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### I. INTRODUCTION:

A study conducted by The United Nations Environment Programme (UNEP), revealed that the natural reserves are considered as one of the important means to maintain the environmental balance and conservation, with their plants and animal on ground or in sea. In addition to preventing the depletion and deterioration of natural resources so as to ensure the survival and preservation of the biodiversity essential to sustaining life. The study indicated that natural reserves are based on the idea of confining parts of the different terrestrial (land) and aquatic (marine) environments to serve as special natural areas in which the human activity, which leads to the depletion, destruction or pollution of their resources of organisms, is prohibited [1].

### II. RESEARCH PROBLEM AND QUESTIONS:

The deterioration that has been worsened over recent years is one of man-made serious environmental problems, because of irrational handling of the environments, especially environments characterized by fragile ecosystem and highly perishable environmental balance that could be damaged because of mismanagement and irrational exploitation of natural resources of natural plant, water and soil. The disturbance in the natural ecological balance leads to the deterioration, making the environment unable to renew its natural resources and restore balance and well-being to the nature. This disturbance generated by many factors and reasons that have led to the disturbance of the ecological balance and

worsened the bio deterioration, as well as the extinction of many organisms of different kinds. Some areas may be exposed to drainage, which in turn causes the major environmental disaster that changes features of the natural environment, largely impact the ability of ecosystem in achieving ecological balance, and disturbing the biodiversity. In addition, the emergence of many environmental problems, generated by the lack of water resources and the high pollution and salinization resulted from the human and economic activity. In order to preserve the biodiversity, as much as possible, ways to reduce this severe depletion of natural resources should be followed. Natural reserves are an attempt to preserve the natural environment and the biodiversity, through the identification of some areas to protect them and develop their features to use them as a natural reserve. In light of this, the study problem can be identified by the following question: to what extent natural reserves contribute in protecting and conserving the environment and preserving its biodiversity?

### III. THE PURPOSE:

The main purpose of the paper is to clarify impacts and variables resulted from damaging of natural environment, recognize the extent to which natural reserves contribute in protecting and conserving the environment and preserving its biodiversity, and mention the main proper basis to establish, manage, and protect reserves.

#### IV. THE IMPORTANCE:

Over the centuries, human has been exploiting natural resources. However, this is largely done in a random and wrong ways leading to damaging the environment and disturbing the ecological balance, thus becoming weak and unable to meet his requirements. In light of this, promoting the environment again could not be achieved only through the elimination of pollution resources, but through developing resources and improving their usage. Therefore, the importance of this research lies in the demonstration of the significance of resources development and maintenance of their sustainability.

#### V. SIMPLE THEORETICAL LITERATURE:

Natural reserves aim at protecting and preserving the biodiversity, natural and cultural resources through their management in a developmental way that sustain all elements. The ten reserves in Jordan represent all environments, especially the thirteenth plant pattern exist there. These plant patterns are adopted as a base to establish the national nature reserve network [2]. Bio diversity means the total of small or large organisms living on land or in water, and it usually reflects various levels, as well as the diversity of ecosystems, different species, and the genetic diversity within the same species [3].

Biodiversity includes all organisms whether plant, animal, and microorganism. Such organisms represent one part of natural wealth and resources. Therefore, biodiversity can be summarized as the diversity of all forms of life; whether on land, in ground or in water. It guarantee that human achieves a continuous supply of food and countless types of raw materials that the human uses in his daily life to build his present and future, that is systems passed on genetically from these species.

Obstacles to biodiversity protection: Loss of biodiversity is one of the greatest environmental problems that have significant impacts on ecosystems' ability in achieving the ecological balance. Many species have become extinct and disappeared because of the pressure on natural resources, overexploitation of such resources, and lack of their preservation and conservation. The low awareness concerning the importance of the aesthetic value of the natural environment, has resulted in the depletion of the fascinating nature resources, aggression against them, in addition to the lack of and lack of conservation and preservation. This indicates that development and construction processes that were not carried out according to the international developmental standards, would inevitably affect the natural

heritage including the stunning geological components. Forms of threats against biodiversity refer to changing habitats of many organisms, or forcing them to leave their natural environment and move to a new environment, intentionally or unintentionally by human, changing the ecological balance, which may result in the death of such organisms and organisms in their natural environments, as a result of destructing the ecosystem and the biodiversity [4].

There are many problems in keeping the biodiversity, mainly: [5]

- 1- National development goals do not give a value to the biodiversity.
- 2- Living natural resources are exploited to gain benefit for people outside their presence area, and not for the urgent need of local citizens.
- 3- There is a tangible lack in expenses concerning the species and ecosystems, on which human life depends, in addition to the lack of environmental culture and environmental education.
- 4- Failure to exploit and rely on scientific information and carefully studied plans in solving and managing environmental problems and natural resources.
- 5- The absence of bodies holding the responsibility of protecting and conserving resources, and if any, they suffer from lack of funding and the shortage in personnel and equipments.
- 6- The environmental pollution through sewage waste and pollution by pesticides resulted in influencing the biodiversity.

The classified reserves in Jordan: I am going to highlight the biodiversity in the ten classified reserves in Jordan: [6]

- 1- Shaumari Wildlife Reserve: includes many endangered wildlife globally, mainly: the Arabian Oryx and Gortered gazelle. It is one important area for birds in Jordan as it located on one important path of bird migration within the Eastern Desert path.
- 2- Azraq Wetland Reserve: the wetland in Azraq is rich in its biodiversity, and the availability of natural environments for a number of land and marine organisms. It is also considered as a suitable environment for *Aphanius Sirhani* (Azraq Toothcarp), where this reserve is the only natural environment for this kind at the global level. The reserve is a refuge for migratory birds as birds stay there throughout the winter, and in which some of them reproduce making it one of the important areas for birds in Jordan. It is one of the global Ramsar sites and gained its importance for the rareness of its water system. Azraq reserve contains a different plant patterns that increases

the biological animal diversity, as it is an important refuge for hyenas, Jackals and red foxes. It is also a path for wolfs and other small animals, where they live and coexist.

- 3- Mujib Biosphere Reserve: what characterizes this reserve is that it contains aquatic plants, in addition to local plants and animal species that still live in the area, such as rare types of Orchid, date palm and Nubian ibex. This is in addition to the passing of the two most important water valleys through Mujib reserve, which enrich the wildlife in the reserve. the topography of the reserve which make it the most important area for nesting of birds of prey in Jordan, and that it is located in Jordan valley, the most important routes of birds migration in the world. The reserve demonstrates many plant patterns, and these are steppe, tropical, aquatic water, saline and forest Mediterranean vegetation type in small area confined in the eastern and southeastern parts of the reserve.
- 4- Dana Biosphere Reserve: includes more than 700 species of plants, some of which are new. It is characterized by a unique variety of wildlife, including rare species of plants and animals. It is a home for many endangered birds and mammals in the world, such as the Syrian serin, lesser kestrel, griffon vulture, Blanford's fox and Nubian ibex. The reserve is one of the most diversified areas in Jordan, in terms of the plant species, where it is characterized by the Juniperus forests, evergreen Oak, Sand dunes, Forest Mediterranean, Steppe, Acacia and Tropical vegetation type.
- 5- Dibeen Forest Reserve: this reserve is one of the best examples of Aleppo pine forests, where it considered the last extension of these forests on the southeastern level of the world. It contains at least 17 endangered species on the local level, such as the Persian squirrel. The reserve is located within the forest, and trees are distributed according to height level of the forest. In the low area, the Aleppo pine

trees are extensively present, whereas in the middle area, we can find oak and pine. In the upper level of the forest, evergreen oak trees are extensively present. Other types of trees are widespread, such as maple tree, Pistacia tree and wild olive tree.

- 6- Yarmouk Forest Reserve: the importance of this reserve lies in representing and protecting deciduous Oak forests. This type of forests grows at low heights in comparison with other types. It is endangered locally. Oak trees have a national great importance as deciduous Oak tree is considered the national tree in the Kingdom. This type of trees exist in Yarmouk area and considered the largest gathering of Oak trees as a natural forest. The presence of Stone marten and the Palestine viper are recorded in this area.
- 7- Fifa Nature Reserve: plants and animals.
- 8- Wadi Rum Protected Area: is a biodiversity connected with the desert environment and sand dunes. It is a biodiversity enriched with quality abundance.
- 9- Aqaba Marine Park: distinctive fish biodiversity, characterized by the quality abundance (No. of types/ size), in addition to the coral diversity.
- 10- Humrat Ma'een Special Conservation Area: this area represents the tropical vegetation. The valleys located along the north-eastern strip of the Dead Sea coast have a rich biodiversity as it contains rare animals, such as the endangered rock badger. As a part of the Great Rift Valley, Humrat Ma'een is viewed as an ideal natural environment of migratory and resident birds, mainly: cuckoos, Short-toed Snake Eagle, Mourning Wheatear. Rock Hyrax and striped Hyena and Red Fox are among the most important mammals in Humrat Ma'een. In addition to the presence of wild Date Palm trees, Tamarix and Retem plants near water in those valleys to forming a rich biodiversity.

The following table shows name of reserves and animals in each of them:

Climate	No. of plants	No. of animals	No. of recorded birds	Reserve name
Hot and dry in Summer and very cold in Winter	193 types	38 types	96 types	Shaumari Wildlife Reserve
Hot in Summer and cold and low humidity in Winter	150 types	47 types	274 types	Azraq Wetland Reserve
Hot in Summer and warm in Winter in the lower western areas of the reserve.	412 types	Vertebrates: 40-70 types Invertebrates: 20-30 types Freshwater fish:	221 types	Mujib Biosphere Reserve

Climate	No. of plants	No. of animals	No. of recorded birds	Reserve name
		3 types Frogs: 3 types Reptiles: 23 types		
How and dry in Summer and mild and rainy in Winter	727 types	80 types	250 types	Dana Biosphere Reserve
Hot and dry in Summer and cold in Winter	265 types	24 mammals, 23 Reptiles, 1 Amphibians, 122 insects among them 12 type recorded for the first time in Jordan	75 types	Dibeen Forest Reserve
Yarmouk Forest reserve lies within the climate of the Mediterranean Basin characterized by the cold Winter, whereas the Summer is hot and dry where the average temperatures reach 27° Celsius	255 types	41 types, 2 Crustaceans	99 types	Yarmouk Forest Reserve
Fifa Nature Reserve lies within the climate of Sudan, which considered the hottest in the Kingdom. This area is characterized by its Winter where temperatures ranges between 15° Celsius (warm Winter) and 45° Celsius and above (very hot Summer)	90 types	10 types	40 types	Fifa Nature Reserve
Wadi Rum Area is characterized by a dry climate where the highest temperatures reach in Summer 45° Celsius and drops in Winter below 16° Celsius. The annual average of precipitation ranges between 100-50 mm per year and drops in some dry seasons below 50mm.	187 types	138 types	199 types	Wadi Rum protected Area
	Two basic types of shallow Sea grasses from half meter to 40 meters depth.	300 types of hard and soft coral reefs, 512 types of different fish, 3 types of Seaweed	In the aqua park there are many water birds, especially: Gulls and barn swallow birds and	Aqaba Marine Park
Hot in Summer and warm in Winter	124 types belonging to 45 family	25 types (distributed between predators, Amphibians and Reptiles-Snakes)	54 types some of them are resident birds and the other are migratory birds.	HumratMa'een Special Conservation Area

Source: nature reserves in Jordan guide.

## VI. CONCLUSION:

the loss of biodiversity has a significant impact on ecosystems' ability in achieving the

ecological balance. Therefore, the establishment and management of nature reserves is one of the most important methods to keep this

diversity. Thus, it is necessary to connect areas related to reserves with water resources, develop accurate plans appropriate to the environment, in order to protect natural and animal resources, and modernize water stations control networks through developing stations capable of gathering information and controlling water stations. In addition to that and most importantly, establish reserves according to a specified policy and goals adopted by government institutions at the highest level including keeping the resources productivity and maintaining diversity in natural resources. It is important to take into account the choice of the planning team to choose reserves according to a scientific base, conduct comprehensive surveys, as much as possible, to recognize sites deserving to be protected, and adopt environmental projects to preserve and conserve such resources and ensure their continuity. To achieve this there is a need to have staff

specializing in managing reserves through holding different scientific and technical courses and exploiting experiences of developed countries.

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