



A region in danger!

Justice between environmental and economic aspects

BIODIVERSITY

in the Arab region

Rajaa El Kassab

Moroccan MP, activist, and researcher

Introduction:

Biological diversity or biodiversity is defined as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”.¹ The preservation of biodiversity is directly linked to the sustainable use of the different components of the ecosystem in order to guarantee that humanity can benefit from them in the long term. However, many human activities contribute to the depletion of biological resources, growing pollution, and climate change, all of which undermine biodiversity in unprecedented rates.

The Arab region, which extends from the Persian Gulf in the east to the Atlantic Ocean in the west, is home to diverse ecosystems that include mountains, forests, drylands, and coastal regions among others. However, these ecosystems are subjected to high risks due to a number of factors that include climate change and subsequent draught, desertification, and wildfires. This deterioration is linked to human activities that result from government policies as well as lack of awareness of the importance of biodiversity and its role in achieving food security and the protection of natural resources. Several plant and animal species in the Arab region have already gone extinct while several others are endangered. As a result, the region is categorized as a biodiversity hotspot, which means that it contains “at least 1,500 species of vascular plants found nowhere else on Earth” and that it “lost at least 70 percent of its primary native vegetation”.²

This paper is divided into three sections. The first tackles the status of biodiversity in the Arab region with special emphasis on Morocco, Yemen, and Iraq. The second section deals with the risks to which biodiversity in the region is subjected and their impact on development with special emphasis on forestlands in Morocco. The third section sums up the most important findings of the research.

¹ Secretariat of the Convention on Biological Diversity (2005). Handbook of the Convention on Biological Diversity Including its Cartagena Protocol on Biosafety, third edition, (Montreal, Canada).

² <https://www.cepf.net/our-work/biodiversity-hotspots/hotspots-defined>

First: Biodiversity in the Arab region:

The Arab region is one of the world's richest in terms of biodiversity. This is mainly attributed to its geographical location, hence including different climate types such as deserts, semi-deserts, plains, wetlands, oases, and steppes among others. The region was also home to the most ancient civilizations, which led to the spread of several plant and animal species from their original habitats to new ones. These include the originally African striped hyenas and the European wild boar.³

The Arab region is home to a variety of plant species such as desert species in the Arabian Peninsula and North Africa, species specific to wetlands and Mediterranean mountain areas in Lebanon, Syria, and North Africa, and unique species in the Greater Sahara in Egypt, Libya, Morocco, and Algeria. The Arab region is also the destination of millions of migrant birds from more than 200 species that settle in the Fertile Crescent and the Mediterranean Basin.⁴

Biodiversity hotspots are regions that are home to diverse animals and plant species that are threatened with extinction. Those species are usually unique to those regions. The number of regions categorized as hotspots in the world amount to 36 and they are home to around 60% of the world's animal and plant species.⁵ More than one third of the Arab region is classified as Mediterranean biodiversity hotspots and include parts of Morocco, Lebanon, Palestine, Algeria, Tunisia, and Libya. Hotspots in the Arab region also include the southwestern Arabian Peninsula and the Horn of Africa while Iraq is part of the Iran- Anatolia hotspot. This section of the paper will focus on three countries that are located in the previously mentioned biodiversity hotspots: Morocco, Yemen, and Iraq.

1. Mediterranean hotspots: Morocco:

The Mediterranean biodiversity hotspot, the world's second, covers over two million square kilometers. It extends from Cape Verde and Portugal in the west to Jordan⁶ and Turkey in the east and includes Arab countries in the southern and eastern Mediterranean in addition to Jordan. This region includes diverse habitats that range from forestlands to swamps and deserts. This region is the world's third in biodiversity and one of the world's most diverse in native plants.⁷

³ "Biodiversity in the Arab world." The World Conservation Union: North Africa Program: <https://www.uicnmed.org/nabp/web/documents/awareness/5.pdf>

⁴ Ibid.

⁵ <https://ar.history-hub.com/ma-hy-nkt-altnoaa-albyology>

⁶ https://www.cepf.net/sites/default/files/mediterranean-basin-2017-ecosystem-profile-summary-french_0.pdf

⁷ Russell A. Mittermeier et al. Hotspots Revisited. Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions. Cemex: 2004.

This region contains a number of small biodiversity hotspots, including Atlas Mountains, coastal wetlands in Morocco and Algeria, the Cyrenaica region in Libya, Lebanon, and Palestine. These areas are home to several native species such as Lebanese cedar, argan, junipers, cork oak, Moroccan spruce, Moroccan acacia, Palestinian jackal, Palestine sunbird, Gilboa iris, marjoram, rose hip, primrose, and sandfish. This region lost more than 95% of its natural habitats as a result of human activities and climate change⁸ as well as changes in agricultural practices especially discarding traditional cultivation methods.⁹

Morocco ranks second in biodiversity in the Mediterranean after Turkey because of different climates. Morocco is home to more than 40 types of ecosystems that constitute the natural habitat of several native and rare species. These ecosystems are distributed among forestlands, halfa grass steppes, agricultural lands, marine ecosystems, wetlands, and desert ecosystems, all home to several endangered species.¹⁰

Morocco is located in one of the ten biodiversity hotspots in the Mediterranean basin. Morocco is rich in vascular plants, 25% of which are endemic, and is home to 24 thousand animal species, 97% of which are invertebrates and marine animals, and 8 thousand plant species. More than 20% of plant species in Morocco are endemic and 11% of animal species. Morocco is home to more than 250 bird species and 40 of the most endangered mammal species. Agricultural ecosystems, which spread over 8.7 million hectares, are the habitats of several local species that are protected through traditional methods.

However, biodiversity in Morocco is endangered. In fact, more than 600 animal species in the country were identified as rare and threatened with extinction. According to studies, out of 8,371 plant species, 1,700 are endangered and/or threatened with extinction and more than 75% of them are extremely rare. This means that 24% of plant species can be lost. Also, there is a remarkable decline in biodiversity in all ecosystems.¹¹

⁸ <https://www.reseau-canope.fr/docsciences/Le-bassin-mediterraneen-un-point-chaud.html>

⁹ Médail, F and Quézel, P “Hot-Spots Analysis for conservation of Plant Biodiversity in the Mediterranean Basin.” *Annals of the Missouri Botanical Garden*, 1997.
Mittermeier et al. Op. Cit.

¹⁰ Amina Hemmi. “Biodiversity: Awareness for preservation [Arabic].” Scientific Institute, Mohamed V University, Rabat, 2011.

¹¹ Biotope Engineering Biodiversity, 2019. Department of Environment, the Ministry of Energy, Mines, Water and Environment, Morocco.

2. Biodiversity in Yemen:

Yemen is located in the Horn of Africa hotspot, which also includes southwestern Saudi Arabia. This area is considered the richest in the Arabian Peninsula since it is home to the natural habitats of several species of plants, birds, animals, and reptiles. Yemen is home to 3,000 wild plant species, 10% of which are native. The island of Socotra alone includes 850 species, 10% of which are native and 27 are rare and/or endangered.¹² Yemen is also home to a large variety of wild animals, including 71 mammal species and 363 bird species, 13 of which are endemic. Rare mammals include Arabian mountain gazelles, goats, Arabian red fox, Arabian baboons, Arabian tigers, cheetahs, hyenas, wolves, and foxes. Seven of the mammal species in Yemen are threatened with extinction, including four species of wild gazelles and goats, including Queen of Sheba's gazelle that is already extinct, Arabian oryx, Arabian tiger, and the Asiatic cheetah, the latter's presence in the peninsula now uncertain.¹³ Birds endemic to Yemen play a major role in environmental tourism in the country, especially the 13 endemic or semi-endemic species in the southern Arabian Peninsula and the six endemic species in the island of Socotra.¹⁴

In addition, Yemen is one of the richest in the Arabian Peninsula in terms of marine life. The number of fish species in Yemeni waters amounts to 969. The island of Socotra is alone home to 733 of fish species. Fish reserve in Yemen is estimated at 850,000 tons.¹⁵

3. Biodiversity in Iraq:

Several parts of Iraq are located in the Iran-Anatolia biodiversity hotspot, which extends over seven countries including also parts of Turkey, Georgia, Iran, Turkmenistan, Azerbaijan, and Armenia. This region is home to different ecosystems that contain diverse plant species, some of which are among the world's rarest. The region is also home to several bird species, some of which are threatened with extinction including the white-headed duck and oriole. Added to that are 140 species of mammals, 10 of which are endemic to the region.

¹² "The national strategy of biodiversity in Yemen [Arabic]." Ministry of Water and the Environment, Department of Environmental Protection, 2004 <https://swideg-geography.blogspot.com/2017/>

¹³ Mohamed El Hakimi. "Yemen: The largest biodiversity in the Arabian Peninsula [Arabic]." Holm Akhdar, May 22, 2020: <https://holmakhdar.org/reports/2282/>

¹⁴ "The national strategy of biodiversity in Yemen [Arabic]." Op. Cit.

¹⁵ Mohamed El Hakimi. Op. Cit.

The Asiatic cheetah is one of the most endangered species in the region and is currently confirmed to live in Iran while in the past it lived in India and the Arab region. Several species of freshwater fish are also endemic to the region.¹⁶

Iraq's location in southwest Asia played a major role in its biodiversity. Iraq is home to diverse natural habitats in lowlands, deserts, plains, mountains, wetlands, coastal areas, and marine life. There are seven land ecosystems, three freshwater ecosystems, and one sea ecosystem in Iraq. There are also 3,300 plants species in Iraq,¹⁷ 100-150 of which are endemic and 99 of which are endangered, in addition to 465 animal species, 16 of which are endemic (14 freshwater fish species and two mammal species) and 374- 413 bird species, five of which are endemic.¹⁸ There are 234 endangered plant and animal species in Iraq. More than 119 invasive species of animals, plants, and insects that entered Iraq through agriculture and commerce threaten biodiversity in the country.¹⁹

Second: Risks to biodiversity in the Arab region: Moroccan forestlands:

Biodiversity plays a major role in sustaining life on earth for it is the source of ecosystems that provide basic human needs and protects from natural disasters and diseases. It also plays an important role in state economies and is the foundation of human culture.²⁰ However, biodiversity is currently endangered, especially in the last two centuries. In fact, extinction rates are 100 to 1000 times higher now than they were in pre-human times, the highest since the extinction of dinosaurs. With one million species at risk, the planet is expected to go through the sixth mass extinction. The extent of the risk becomes clear in the fact that between the years 1970 and 2014, wildlife population across the world declined by 60%.²¹

¹⁶ "Biodiversity in West Asia [Arabic]": <https://ar.history-hub.com/mnatk-altnoaa-alhyoy-fy-ghrb-asya>

¹⁷ "The national strategy of biodiversity in Iraq: 2015-2020 [Arabic]." Ministry of Environment, 2015: <https://www.cbd.int/doc/world/iq/iq-nbsap-01-ar.pdf>

¹⁸ Ibid.

¹⁹ Abdul Hadi Ahmed. "A guideline of biodiversity in Iraq and the protected areas of Dalmaj and Tayeb [Arabic]." International Union for Conservation of Nature, The Regional Office for West Asia: www.iucn/westasia

²⁰ Secretariat of the Convention on Biological Diversity (2005). Handbook of the Convention on Biological Diversity Including its Cartagena Protocol on Biosafety, third edition, (Montreal, Canada).

²¹ "An advocacy toolkit for nature: Biodiversity loss, nature protection, and the EU strategy for nature." European Commission, May 2021: https://ec.europa.eu/info/sites/default/files/biodiversityadvocacytoolkit_web_en_v3.0.pdf

In the Afro-Arabian region, 17% of the endemic mammals in the Arabian Peninsula and the African Sahara are subject to extinction by 2050. In addition, a large number of endemic species are expected to shift from the “least concern” category to the “critically endangered” or “extinct” category in the coming decades.²² Out of 14 species of large vertebrates that were historically present in the region, four have gone extinct such the scimitar-horned oryx. Most of those species also disappeared from 90% of their desert habitats such as the addax, dama gazelle, and the Saharan cheetah, all of which are subject to extinction.²³

In the Levant, several mammals that existed during the Roman era went extinct, including tigers, gazelles, and wild goats in addition to the Syrian bears.²⁴ The Israeli occupation of Palestine led to the extinction of several species such as the European water vole and the jungle cat in addition to several crustaceans and rare fish species. Israeli authorities purposefully transferred several wild animals from their natural habitats such as wild boars that threatened fields. Also, the construction of the separation wall disrupts the flow of biodiversity and blocks the natural movement of several species, especially large mammals.²⁵

The decline of biodiversity is related to global production and consumption modes. This particularly applies to Arab countries which not only imitated those modes and gave up traditional production methods that preserved resources, but also allowed Western countries to exploit them under the pretext of world trade. This exploitation takes different shapes such as overfishing in those countries’ territorial waters or the cultivation of export crops without taking into consideration the depletion of water and environmental resources. It can also take the shape of biopiracy, through which biological and genetic sources are illegally appropriated. This is the case with attempts by Zionist investors in southeastern Morocco to steal the genetic sources of several date species as well as the argan tree to plant in the Occupied Territories.

²² A. Soultan. et al. “Risk of biodiversity collapse under climate change in the Afro-Arabian region.” *Sci. Rep.* 9, 955 (2019).

²³ S. M. Durant et al. “Fiddling in biodiversity hotspots while deserts burn? Collapse of the Sahara’s megafauna.” *Diversity and Distribution: A Journal of Conservation Biogeography* 20, 2013: <https://doi.org/10.1111/ddi.12157>

²⁴ Jean-Denis Vigne et al. *The First Steps of Animal Domestication* (2005)

²⁵ Dana Mosaad. “Wild mammals in Palestine threatened with extinction [Arabic].” *Afaq Environmental Magazine*, issue 59, 2013.

Ecosystems are affected by pollution, unsustainable tourism, urban encroachment, over-cultivation, the depletion of natural resources, the destruction of natural habitats, the extinction of several plant and animal species, excessive use of fertilizers and pesticides, undermining endemic species through invasive ones, overgrazing, and wildfires, among others. All these factors threaten the lives of thousands of species and habitats and endanger human health. In addition, wars, armed conflicts, and political instability in the region are among the most important reasons for the deterioration of biodiversity. This is particularly the case in Palestine where the Israeli occupation shifts the habitats of several animals and plants through changing the natural conditions of several regions. This is demonstrated in the intensive cultivation of quina and pine trees in the Hebron mountains and northern Negev Desert, the construction of settlements on green spaces and protected areas, road construction, the construction of the separation wall, the draining of several lakes and marshlands such as Lake Hula, and transferring several animals from their natural habitats such as wild boars.²⁶

The deterioration of forestlands in Morocco:

Forestlands in Morocco extend over approximately 9.5 million hectares, that is around 14% of Moroccan territories,²⁷ making Morocco one of the best southern Mediterranean countries in terms of forest cover.²⁸ In fact, Morocco is home to the biggest cedar forest in the Mediterranean basin and its Maamoura forest is one of the world's biggest in the production of non-timber products²⁹ and the world's largest cork oak forest (60,000 hectares).³⁰ Moroccan forests are distinguished with their biodiversity. They are home to more than 4,000 plant species, 550 vertebrate species, and 1,000 nonvertebrate species.³¹ Wooded lands in Morocco cover more than 6 million hectares, 71% of which are natural forests with leafy trees (oak, argan, acacia) and 18% gum trees (Atlas cedar, Moroccan spruce, North Africa thuja, pine, juniper) distributed among different climate types that range from semi-dry to wet. The rest of the area is occupied by depressions that result in

²⁶ A. Soultan. et al. "Risk of biodiversity collapse under climate change in the Afro-Arabian region." Sci. Rep. 9, 955 (2019).

²⁷ National Commission of Water and Forests, Ministry of Agriculture, Maritime Fisheries, Rural Development and Water and Forests: <http://www.eauxetforets.gov.ma>

²⁸ Mohamed El Tefrawti. "Moroccan forests between extinction and reclamation [Arabic]," 2009: <http://afedmag.com/web/ala3dadAlSabiaSections-details.aspx?id=430&issue=&type=4&cat>

²⁹ Gmira Najib. "Dendrometric inventory of afforestation of Cork oak in the Mamora forest, Morocco." IJMS - The International Journal of Multi-disciplinary Sciences, 2017, Folder 2-17.

many cases from the deterioration of forests.³² In addition to species endemic to the Mediterranean such as cedar, juniper, and cork oak, Morocco is known for its own species such as Moroccan spruce in rainy and cold areas, argan in arid and semi-arid areas in the western Greater Atlas and the Lesser Atlas, and Moroccan acacia in southern Morocco.³³

The contribution of forestlands in the Moroccan economy is estimated at 1% of the gross domestic product. Forests provide 8-10 million working days annually. They are also the source of 30% of wood used for industrial purposes, provide 18% of energy, and constitute 17% of livestock feed.³⁴ Despite the important role forests play, they are not adequately protected and are always exposed to several hazards that result from both natural and human factors. These include drought, desertification, parasites, overgrazing, illegal logging, and uprooting native plants to make the land suitable for cultivation. The damage sustained by forests in Morocco is mainly attributed to real estate and wood lobbies in collaboration with local and national authorities. The decline of Moroccan forests is estimated at 31,000 hectares annually in terms of tree density. Vast areas of forestland along the Plage des Nations coastline between the cities of Salé and Kenitra were destroyed to construct residential units that overlook the sea. The same happened to the forest along the Dahomey Beach between the cities of Rabat and Casablanca and the Maamoura forest in Kenitra. Several influential real estate companies took part in encroaching upon forests at the expense of sustainable development and without taking into consideration the poor that directly benefit from the services provided by forests. On the other hand, wildfires damage large forest areas every summer (around 0.05% of total forestland).³⁵ While wildfires happen in many cases as a result of the heat, real estate companies can make them up to take the land for touristic projects, which is the case of the Diplomatic Forest beach in Tangiers.

³⁰ Mohamed Fennane, Mohamed Rejdali. "The world largest cork oak Maamora forest: challenges and the way ahead,"2015, Fl. Medit, Folder 25.

³¹ Omar hashi. "Moroccan forests: A biodiversity that necessitates protection [Arabic]." Maghreb Arab Press, 2017: <https://mapecology.ma/ar/>

³² National Commission of Water and Forests, Ministry of Agriculture, Maritime Fisheries. Op. Cit.

³³ Ibid.

³⁴ Omar Hashi. Op. Cit.

³⁵ National Commission of Water and Forests, Ministry of Agriculture, Maritime Fisheries. Op. Cit.

Third: Conclusion:

Biodiversity plays a major role in life on earth. It provides human beings with food, water, energy, natural resources, raw materials, and genetic sources. Biodiversity is also crucial for regulating climate, eliminating pollution, and stopping natural disasters. In addition, it is the source of materials used for medical purposes and caters to nonmaterial needs of human beings such as education, psychological development, and the formation of cultural identities. Frequent natural disasters such as floods, wildfires, epidemics, and locust attacks demonstrate the necessity of protecting biodiversity. In fact, biodiversity is not just an environmental issue, but also a developmental, economic, ethical, and security issue. It is also a matter of life or death.³⁶

The deterioration of biodiversity is an environmental issue because it increases global warming and disrupts ecosystems. It is a developmental issue because it is directly linked with the loss of major resources needed for agriculture, industry, tourism, and healthcare and a security issue because it undermines food security especially in developing countries and could lead to the eruption of wars and civil strife. In addition, it is an ethical issue because impoverished groups are the most affected by the deterioration of biodiversity, hence jeopardizing social justice. It is a matter of life or death because it threatens human existence and could lead to the extinction of several plant and animal species as a result of the disruption of ecosystems as well as conflicts that could result from as well as lead to lack of resources.

³⁶ “Living Planet Report 2020: Bending the curve of biodiversity loss”: <https://livingplanet.panda.org/about-the-living-planet-report>

Local and international factors contributing to the decline of biodiversity are mainly related to climate change, invasive species, the depletion of natural resources, pollution, urban encroachment, and illegal fishing and hunting. Wars and armed conflicts in the region play a major role in destroying natural habitats, hence the migration or extinction of several species. Biodiversity in the Arab region is also threatened by government policies that do not abide by environmental criteria stated in agreements on biodiversity. Added to this is the pressure financial institutions put on Arab countries through imposing trade agreements on them and forcing them to join the International Union for the Protection of New Varieties of Plants (UPOV),³⁷ hence threatening biodiversity and genetic sources in the global South.³⁸ That is why it is necessary to reevaluate those agreements and look into their impact on the basic rights of respective countries. It is also important to respect agreements on biodiversity when signing trade agreements. In addition, countries in the region should modify their constitutions in a way that makes the environmental assessment of projects mandatory, whether these projects are locally or internationally funded.

³⁷ The International Union for the Protection of New Varieties of Plants (UPOV): www.upov.int

³⁸ Rajaa El Kassab. "The impact of fishing on biodiversity in Morocco [Arabic]." Arab Forum for Alternatives and Green Peace, 2021.