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Our Environment

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Cover: Toubas area. Photo by Fuad Sawafta, courtesy of Palestinian Assembly for Photography and Exploration.

forthcoming Issues

May 2021
Palestinian Realpolitik

June 2021
This Is Sumud (Steadfastness)

July 2021
COVID-19 and Our Children

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Message from the Editor

These days, few issues carry as much relevance in our lives as the ongoing pandemic, while self-interest and calculation, rather than compassion or even the acknowledgment of responsibility, tend to guide vaccine distribution. The situation in Gaza is dire. The UN Food and Agriculture Organization warns that acute hunger may affect 20 countries, including not only Yemen but also Lebanon and Syria. Still, we tend to neglect the fact that our daily habits cause the destruction of nature, creating the conditions that facilitate the emergence and spread of viruses in the first place. Only 4 percent of mammals on earth are wild animals, 36 percent are humans, and 60 percent are domestic animals that we raise mainly for some form of consumption![*]

This month's issue highlights the beauty of Palestine's environment and draws attention to challenges that Palestine must tackle to preserve this treasure and protect the country's flora and fauna. We wish to thank our authors Zayne Abudaka and Hammam Othman, the directors of research and operations, respectively, at Momentum Labs; Dr. Mazin B. Qumsiyeh, director of the Palestine Museum of Natural History and the Palestine Institute for Biodiversity and Sustainability, and Dr. Issa Musa Albaradeiya, director general of the Environmental Resources Directorate at the Palestinian Environment Quality Authority (EQA); anthropologist Dr. Ali Qleibo; Akram Halayqa, director of the Coastal and Marine Environment Department at the EQA; Hadeel Hisham Ikhmais, who works in the EQA's climate change section; Mohammad Mahassneh, the EQA's director of biodiversity; Dr. Shaddad Attili, an adviser-ranking minister at the Negotiation Department and former water minister at the Palestinian Authority; Roubina Bassous/Ghattas, founder and director general of Pioneer Consultancy Center for Sustainable Development; Majed Ghannam, a program manager at UNDP/PAPP specialized in water resource and integrated water management; journalist Amira Gabarin; Imad Atrash, executive director of the Palestine Wildlife Society, and biology student and volunteer Maha Abu Gharbieh; Dr. Anton Khalilieh, executive director of Nature Palestine Society, and Dr. Yara Dahdal, a project manager at the society specialized in water desalination and wastewater treatment; and Simon Awad, executive director of the Environmental Education Center of the Evangelical Lutheran Church in Jordan and the Holy Land, and Bashar Jarayseh, an active research volunteer at the center.

Our Personality of the Month is head of the EQA Jameel Mtour, Artist of the Month is Mohammed Alhaj, and Book of the Month is *Checklist and Ecological Database of Wild Plants in the West Bank* by Banan Al Sheikh. TWiP Kitchen presents a recipe for *qatayef*, and Ahlan Palestine Postcard takes you to Kifl Haris where you can learn to make *maftoul.* Enjoy the few listed events.

The entire team at TWiP wishes a happy Easter and a blessed Ramadan to all who are celebrating religious holidays this month. We hope that everyone will emerge from this pandemic healthy and well!

[*]https://www.livekindly.co/60-of-all-mammals-on-earth-are-livestock-says-new-study/.

Sincerely,

Tina Basem

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Tackling Environmental Challenges

For a Sustainable Palestinian Future


By Zayne Abudaka and Hammam Othman

Palestinian life is filled with cultural references that tie Palestinians to their "natural environment." The olive tree has become a symbol of Palestinian steadfastness, and hardly a day passes in Palestine without a reference to the land, sea, and air that Palestinians have been denied. Despite the patriotic slogans, however, speaking about the environment and climate challenges is considered to be a luxury in many Palestinian communities. Decades-long occupation has clouded most of the discourse, with many Palestinians considering any other conversation to be secondary or "less important" at best, and "imported" or "Western," at worst.

This understanding of the environment is extremely problematic, mainly because it ignores the importance of environmental and resource sustainability to Palestinian liberation from occupation, dependency, and underdevelopment. While Palestine's contribution to global greenhouse gas emissions is miniscule, the impact of climate change in Palestine is expected to be severe. In Palestine and the region, the combination of rising temperatures and decreased rainfall is expected to dramatically increase demand for water, which is an already scarce resource, inflicting significant harm in agricultural production capacity. Combined with the impact of Israeli restrictions and settlement expansion on the water resources and land area available for agriculture, climate challenges are expected to have catastrophic implications for food security in Palestine. For this reason, efforts that focus on improving food security and sustainability in Palestine and the region are likely to intensify.

Despite the absence of a clear and systematic approach to addressing environmental and climate challenges at the national level, a number of renewable energy, water treatment, and waste management projects have been developed with support from the Palestinian government and international donor organizations that today form the seed for environmental transformation. The development of these projects has mainly been driven by the need to ensure the sustainability of vital resources such as energy and water at an affordable cost. To build on existing efforts, more actors need to pay attention to resource sustainability in the agriculture sector.

Environmentally friendly agricultural ventures can preserve the environment, strengthen resilience against the occupation, and generate income for thousands of Palestinians.

Out of over 5 million Palestinians in the West Bank and Gaza, around a third (1.7 million, mostly in Gaza) are food insecure, and a further 16.8 percent (841,000) are marginally food secure.[i] Food insecurity is only expected to increase due to population growth, increasing international commodity prices, and Israeli restrictions on trade (and associated costs), in addition to the reduced capacity for food production due to shrinking land area and water reserves.

Palestinians in the West Bank and Gaza import most of their food, while their ability to produce their food on their land is increasingly constrained. To ensure food security, Palestinians have little choice but to adopt technologies and practices that can radically improve conservation of soil quality, water resources, and other agricultural inputs. This could enable the sector to grow sustainably to serve a growing population despite the challenges. Adopting more advanced technologies

Plastic bags placed on arcuate *faqqous* grown in the town of Deir Ballout in the Salfit governorate. Photo by Daoud Abdallah, Palestinian Assembly for Photography and Exploration.

As Palestine must deal with occupation-related restrictions and is expected to be particularly hard hit by global climate change, the development of sustainable agriculture value chains is crucial to ensure food security.

and cultivation methods such as hydroponic farming, vertical farming, and fully controlled and monitored environments (greenhouses), can help farmers produce three to six times the amount of produce, with significantly reduced water use and minimal levels of harmful chemicals. Hydroponic cultivation, for example, can save up to 95 percent of the needed water for growing greens and a range of vegetables, including widely consumed, water-intensive crops such as tomatoes and cucumbers.

Despite the great potential of agricultural technology in the Palestinian context, there are several challenges that impede its development. Advanced agriculture is capital intensive and requires tight operational management and specialized expertise, which is often lacking in the local market. The availability of risk capital to invest in agricultural technology development can significantly expedite the pace of transition.

Many Palestinians in the West Bank remember the images of cucumbers being disposed of in empty agricultural areas in Tulkarem during 2020. The dissemination of the images on social media channels triggered a public conversation. Farmers reported their inability to sell their produce as storage costs mounted, leading them to dispose of the produce.

Difficulty in selling produce is a major challenge for farmers in Palestine and worldwide. Farmers often lack access to the networks, knowledge, or time to ensure that their produce reaches customers. Marketing and sales require time

Dumping of agricultural produce in Tulkarem, Palestine, 2021.
Photo courtesy of Ultra Palestine.

and access to networks of resellers, wholesalers, and in some cases consumers directly. When farmers cannot access a feasible sales channel, they dump their produce to avoid costly storage. In addition, the fluctuation in agricultural production, which is mainly caused by seasonality and the inability of markets to allocate produce rapidly and at a satisfactory price for both the farmer and the consumer.

In our region, where the movement of people, products, and capital is restricted by layers of politics and bureaucracy, shortening supply chains could contribute to improved food security and the development of local productive industries, while playing a part in the region's adaptive response to climate change. To allow for this gradual transition towards shorter supply chains, actors should pay more attention to improved efficiency and planning of the cultivation process to improve the management of supply quantities to match the less fluctuating demand.

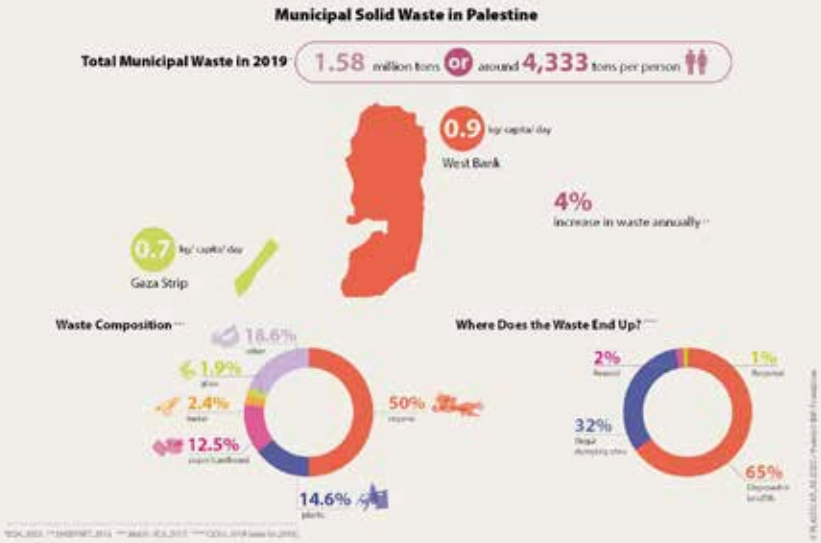
Planning can be further improved through the adoption of advanced cultivation technologies. One advantage of controlled cultivation systems is that they enable farmers to grow crops during most of the year with shorter cultivation cycles. This allows farmers the flexibility to adjust their cultivation strategy throughout the year to smooth fluctuations in demand and supply.

Sector stakeholders should also focus on innovative solutions to boost farmers' access to local markets and reduce the number and control of intermediaries in the supply chain. With improved public access to the digital world, new tools could be leveraged to better link farmers to traders and even to

From the farm to your plate: Palestinian farmers face difficulties in their efforts to gain access to markets.

the end users directly, circumventing traditional open markets where producers have to compete with local representatives of much larger Israeli producers. In addition, using controlled cultivation systems could help farmers produce much higher yields on smaller plots of land, with reduced need for agricultural inputs such as soil, fertilizers, and pesticide. This enables farmers to set up farms closer to the urban markets which they serve.

Importing agricultural inputs remains a significant cost for the Palestinian economy. In 2019, animal feed was Palestine's third largest import in terms of value, with around US$204.6 million (9.6 percent of total import bill and 1.3 percent of GDP in 2019) spent on imported preparations used in animal feed. In addition, conversations with local producers of animal feed indicate that most of the inputs used in local production of animal feed are also imported from or through Israel. In the same year, the value of imported fertilizers reached US$9 million. Although this amount is much smaller when compared to animal feed imports, the official figures are likely to be skewed due to the informality of fertilizer purchases from Israel. Israel currently bans standard concentration fertilizers typically used for intensive agriculture; this continues to be a



Municipal solid waste statistics in Palestine, 2019. Photo courtesy of Heinrich-Böll-Stiftung.[ii]

major impediment to the sector's development and drives farmers to avoid reporting purchases of fertilizers outlawed by Israel.

The increase in input prices is one of the main issues that face the agricultural sector in Palestine and is sometimes the main reason behind the losses incurred by farmers. Farmers report increases in input prices over the previous years with an average annual growth of 10 percent. The reasons behind the increase include the fluctuation of the dollar exchange rate against the Israeli shekel and increases in petrol prices. In addition, trading in pesticides and fertilizers is limited to a number of trade agencies that import heavily from Israel and control final prices for Palestinian users.

Palestinians in the West Bank and Gaza generate a significant amount of organic waste; around 50 percent of the 1.58 million tons of daily municipal solid waste in the West Bank and Gaza is considered organic waste (790,000 tons). Organic waste from both households and the agricultural sector can be an important input to produce some of the most essential products needed to establish a sustainable agriculture sector, such as animal feed and fertilizers.

[Municipal Solid Waste photo]

Developing fertilizers and animal feed products from locally sourced organic waste can unlock a structural challenge for the development of Palestinian food security. Relying on by-product from local industries, resource-dependency on the Israeli market could be challenged while also growing local businesses and creating jobs for Palestinians. The local production of agricultural inputs can also significantly contribute to the shortening of supply chains, which result in savings in time and money required from farmers and a reduction in the carbon footprint associated with transporting produce.

To develop new agricultural inputs locally, a number of efforts need to be coordinated among key sector actors. Seed capital is needed to conduct research and test different combinations of inputs in order to identify products that are at least equivalent to imported options, in terms of price, quality, and nutritional value. To ensure feasibility and scalability, large local actors such as private-sector dairy producers, larger agribusinesses, and the government should be the first to adopt the new local products.

Examples provided in this article are not an exhaustive list of possible interventions nor are they a silver bullet that promises to solve all of Palestine's problems. We believe, however, that by investing in resource sustainability, especially relating to food security, actors will ultimately strengthen the resilience of Palestinians living on their land and provide them with more agency over their own well-being and development.

The road to change is not going to be easy. The transition will require large amounts of capital, specialized expertise, innovative business models, and most importantly, the will and determination of the various actors in the agricultural sector.

To start addressing the challenges cited above and other social and economic challenges in Palestine and the region, we propose a scientific approach, anchored in continuous testing and validation to ensure its fit to the local context. We must strive to understand the problem by researching pressing environmental challenges and measuring their impact on Palestinian society and economy. Sizing the magnitude of the problem and identifying the key affected actors are critical first steps to engaging policy makers and the private sector in efforts to respond quickly and effectively to climate challenges. Efforts must be made to identify potential solutions through studying international similar experiences and drawing lessons from similar contexts. Pilot projects must be developed to test the compatibility of proposed solutions and carefully situate them in the local context. And we must invest in scaling up successful pilots to become sustainable impactful businesses.

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Hammam Othman is the director of operations at Momentum Labs and has extensive experience in operations management, HR management, and start-up development.

[i] "2020 Global Report on Food Crises, Food Security Information Network," available at https://www.fsinplatform.org/sites/default/files/resources/files/GRFC_2020_ONLINE_200420.pdf .

[ii] Nidal Atallah, "Palestine: Solid waste management under occupation," Heinrich Böll Stiftung, October 7, 2020, available at https://ps.boell.org/en/2020/10/07/palestine-solid-waste-management-under-occupation .

The Palestinian Environment: Threats and Opportunities


By Mazin B. Qumsiyeh and Issa M. Albaradeiya

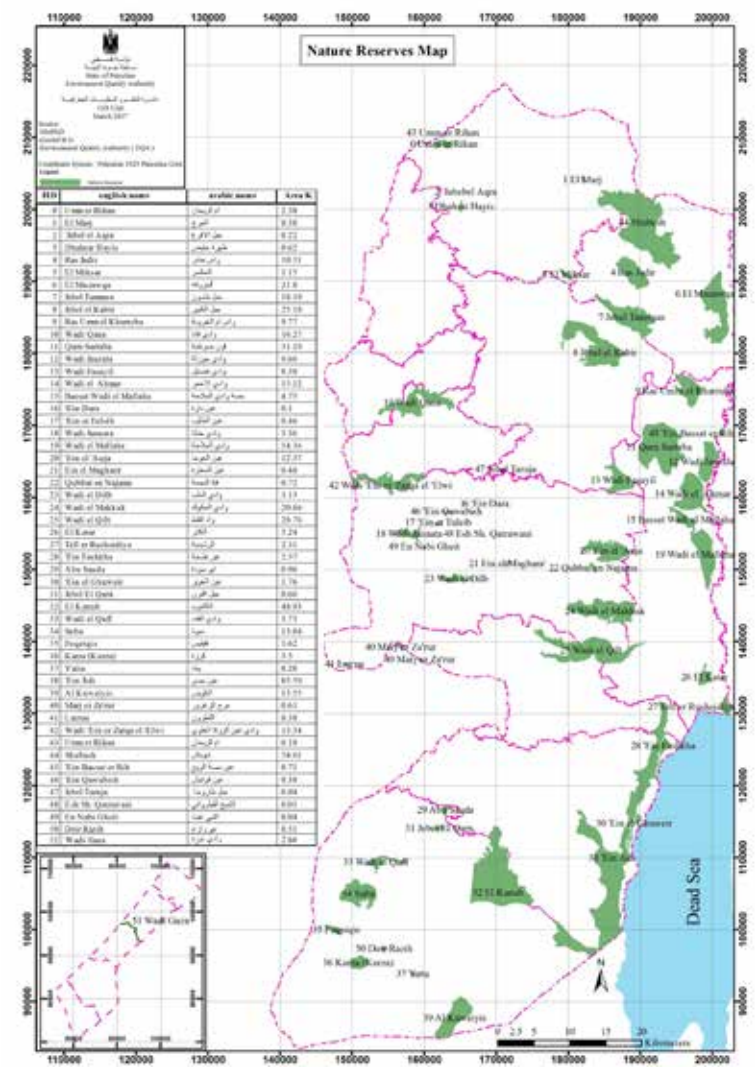
Many nations realize that we must create both international and local instruments (including conventions and laws) to address the significant decline in the state of our environment. The Palestinian environment suffers from some of the same challenges faced by environments in other countries, but our situation has been exacerbated by ongoing colonization. Finding ways to manage this task requires significant thought, planning, and creativity in environmental conservation. This article provides a brief examination of the challenges and opportunities that face the Palestinian Environment Quality Authority, academia, CSOs/NGOs, and individuals.

The Palestinian environment is straining under many challenges that include the loss of natural resources, the excessive use of pesticides/insecticides, climate change, and desertification, which have already led to habitat loss and destruction, documented in many articles in peer-reviewed journals.[i] But even more damaging have been the numerous occupation policies, including the building of walls, bypass roads, and industrial settlements that pollute the Palestinian environment with solid and liquid waste; the ongoing depletion of natural resources; urbanization caused by socioeconomic restructuring and the massive migration of Jews from other countries to Palestine; the bantustanization/ghettoization of the native Palestinian people; and last but not least, the policies and practices that prevent us from managing our environment or protected areas. The resulting habitat loss and decline in biodiversity not only destroys the economic and social benefits from ecosystems but also impacts human health and well-being.

This damage is no different from previous colonial impacts on our native environments. Destructive projects before 1967 include the destruction of native species and native mixed species as well as forestation that used only the European pine tree (Pinus halepensis) rather than native species, the draining of the wetlands in the Hula area and the diversion of water from the headwaters of the Jordan Valley (Lake Tiberias), which dried up the Jordan Valley, destroyed eastern habitats, and altered western habitats in Palestine. The Israeli occupation added further challenges to the Palestinian environment with its system of control that prevents us natives from exercising our sovereignty, including in the areas of managing the environment and natural resources and solving pressing environmental issues. The Palestinian National Authority, established in 1994, was expected by many to gradually acquire state authorities, leading to independence after the interim transition period of five years. Yet under these Oslo/Washington agreements, we were given only limited self-government, which prevented us from really gaining authority over such aspects as natural resources. Numerous studies – including those done by the Palestinian Central Bureau of Statistics, the United Nations (e.g., OCHA, UNEP), and even the World Bank – show that we have

All stakeholders, including the Environment Quality Authority, academia, civil-society and nongovernmental organizations, and individuals must face the existing challenges head-on and bring their efforts together to create meaningful change – and avoid irreversible damage.

Suba Protected Area.



The Palestinian environment has numerous weaknesses and faces many threats.

significantly problematic trends in areas relevant to the environment (such as population health, population growth, water resources, greenhouse gas emissions, a decline in green spaces, etc.).

Even under occupation, Palestine has been ahead of other countries in realizing the importance of the environment. In the 1960s, the early work of Sana Atallah, the first Palestinian zoologist, sprouted systems of education that initially were supported privately and then developed into a number of school-based projects, NGOs, and academic projects. The opportunity for better organization came in the 1990s with the establishment of the Palestinian Authority and its Ministry of the Environment (which morphed into the Environment Quality Authority). Despite the restrictions – as it declared statehood in 1988 from abroad, achieved some semblance of authority on the ground in 1994, and gained the status of nonmember observer state at the United Nations in 2012 – Palestine has proceeded to maneuver as best as it could to get leverage on environmental issues. As a state, Palestine has signed 21 treaties and protocols of international conventions related to the environment, including the Convention on Biological Diversity (CBD), the Paris Agreement under the UN Framework Convention on Climate Change, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and more. These carry with them certain privileges and benefits but also many obligations, some of which are difficult to implement in light of the Israeli occupation.

The State of Palestine has signed 21 treaties and protocols of international conventions regarding the environment, indicating that it seeks to embrace its strengths and opportunities even under occupation.

The Environment Quality Authority (EQA) is the umbrella for all activities and studies related to environmental planning, protection, and control. The EQA's core mission is to protect the environment with all its elements and prevent environmental hazards from threatening any living organism. This work falls under Environment Law No. 7 of the year 1999 and its amendments, which gave the EQA the responsibility for leading the coordination of work related to the environment. Such engagement, however, is not solely the responsibility of the EQA but shared by all other Palestinian ministries, academia, and other governmental and nongovernmental organizations and institutions concerned with the Palestinian environment, based on the principle of partnership and complementary work.

For the past two decades, significant capacity building has been implemented locally in areas related to biodiversity, including the establishment of several new environmental NGOs and at least two academic biodiversity centers (at Al-Najah and Bethlehem Universities), and increasing funds have been spent on environmental projects between 2005 and 2020. These efforts have not only contributed to expanding classical environmental education and awareness but have also led to a mushrooming of research regarding local fauna and flora, published in peer-reviewed journals, and to better conservation on the ground. For example, management plans for Wadi al-Quff were drawn up, and our team (EQA with Palestine Institute for Biodiversity and Sustainability - PIBS) published six research papers

Mr. Jameel Mtour, head of the EQA, signs an MoU with Bethlehem University Vice Chancellor Brother Peter Bray at the newly established Biodiversity Center (funded by the EU Peacebuilding Initiative), at Palestine Institute for Biodiversity and Sustainability. Drs. Qumsiyeh and Albaradeiya are standing directly behind them.

related to Wadi al-Quff in a special issue of the *Jordan Journal of Natural History*.[ii]

But we look now to an even brighter future. EQA strategies have called for the localizing of work, coming up with better action plans, and even the drafting of better environmental laws that are in line with international standards and laws. Let us cite just three examples.

First, PIBS is working on the sixth and final national report in line with Aichi Biodiversity Targets.[iii] While the work contract was assigned to PIBS for facilitation, this is a collective effort and indicates that between 2015 and 2020, significant progress has been made by the State of Palestine in environmental research, education and awareness-raising, and conservation, in line with its own national strategies and Aichi targets.

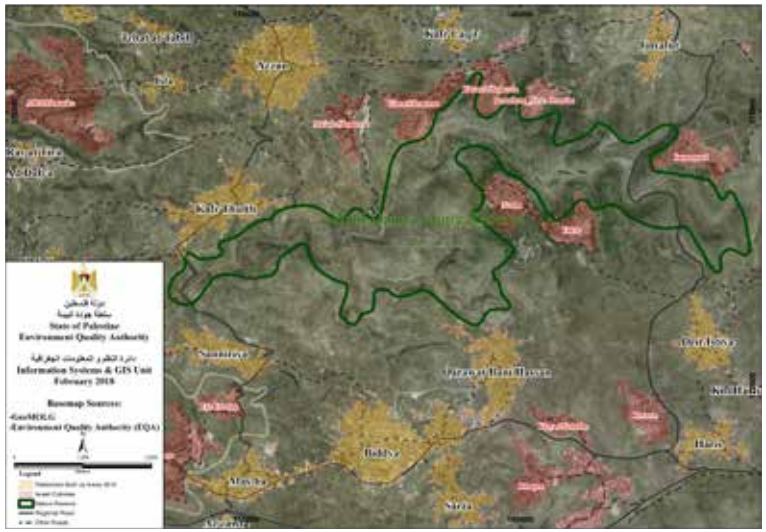
Second, starting in July 2021, we will embark on a project to design the new National Biodiversity Strategies and Action Plans (NBSAP) in a manner that reflects the country's vision for biodiversity as well as the broad policy and institutional measures that the country will take to fulfil the objectives of the CBD, comprising concrete actions to achieve the strategy. The only NBSAP for Palestine was issued in 1999. It is essential that all sectors whose activities affect biodiversity as well as the societal groups that depend on biodiversity be brought into the NBSAP process. This will engender a broad ownership of the NBSAP, whereby all stakeholders in biodiversity are engaged in its development and implementation. It also enables "mainstreaming," which means the integration of biodiversity considerations into relevant legislation, plans, programs, and policy, such as national development plans, national strategies for sustainable development, poverty-reduction strategy papers, strategies to achieve the Millennium Development Goals, national programs to combat desertification, national climate change adaptation or mitigation strategies, and relevant private-sector policies.

Third, the EQA contracted a local team to examine signed and unsigned international treaties and conventions as well as local laws and regulations with a view to making sure that we align local laws with international treaties and conventions, benefit maximally from signed treaties and fulfil our obligations, and look at signing other treaties that could help the State of Palestine protect its environment and human health.

Furthermore, the EQA contracted a local team to develop a national strategy to mitigate and manage the threat of invasive alien species (IAS) in Palestine, including legislation to prevent the introduction of new IAS and the spread of the already present IAS. This includes carrying out a risk analysis, making use of information and communication technology to carry out risk communication, and providing an infrastructure to gather data and combat these species that destroy our native fauna and flora.

For the first time, such national projects engage local experts in leadership positions in close partnership with the EQA. The preliminary study carried out between 2015 and 2020 showed major achievements in environmental conservation, environmental education and awareness-raising, signing and implementing obligations under international treaties, and developing and implementing local conservation strategies and action plans. The action plans being formulated are ambitious for environmental conservation. They cannot be done in isolation. Through funding and technical support from Belgium, for example, we were able to protect a unique rainwater catchment area near Wadi Qana that hosts an endangered ecosystem, including aquatic plants, toads, and crustaceans found nowhere else in the West Bank. Through the European Union we have a project, led by PIBS, where we partnered with the Palestinian Center for Rapprochement between People and the Galilee Society to create a biodiversity center, a human diversity center, and an education center. In partnership with the Royal Society and the Natural History Museum in London, we also built the first molecular labs dealing with environmental DNA. All these and

The Palestinian environment suffers from many environmental stresses, including colonial activities and certain socioeconomic trends. These challenges are difficult to deal with without sovereignty. Yet, we have significant opportunities to exercise our rights and reclaim our sovereignty in ways that ensure sustainability for nature and for our people.



Wadi Qana. Photo courtesy of Environment Quality Authority.

many other projects are participatory, and we urge everyone to get involved. Despite the challenges and obstacles we face, including those created by Israeli colonial activities, we are confident in our abilities to face and shape our future. Respecting ourselves, respecting others, and respecting nature.

Professor Mazin B. Qumsiyeh teaches and does research at Bethlehem and Birzeit Universities. He is the founder and director of the Palestine Museum of Natural History and the Palestine Institute for Biodiversity and Sustainability at Bethlehem University (http://palestinenature.org) and has published over 150 scientific papers and several books on topics ranging from cultural heritage to human rights, biodiversity, and cancer.

Dr. Issa Musa Albaradeiya is the director general of the Environmental Resources Directorate at the Environmental Quality Authority in the State of Palestine and responsible for biodiversity management, water and wastewater resources, the combating of desertification, renewable energy, and information systems.

[i] See, for example, research conducted by the Palestine Institute for Biodiversity and Sustainability and Palestine Museum of Natural History, available at palestinenature.org/research.

[ii] "Biodiversity Conservation of Wadi al-Quff Protected Area (Central Palestine): Challenges and Opportunities," *Jordan Journal of Natural History*, 2016, available at http://www.rscn.org.jo/latest-issue-vol3-2016.

[iii] In the tenth meeting of the Conference of the Parties, held from October 18 to 29, 2010, in Nagoya, Aichi Prefecture, Japan, a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets were adopted for the 2011–2020 period (https://www.cbd.int/sp/).

The Palestinian Cultural Basin

The Valleys of Hebron

By Ali Qleibo

"There is no prototype Bedouin," Dr. Emanuel Marx, expert on Al-Naqab nomadic culture, smiled gently in answer to my query about the authentic characteristics of the "true" Bedouin. "The stereotypical image of the Bedouin as the lonely, rugged nomad with a camel and a tent is merely an adaptation to a particular environment."

Throughout history, our nomadic predecessors' interaction with the environment has been a complex dynamic intellectual process, conditioned by the primordial process of "sedentarization" within the basin of the Mount Hebron valleys as they were inhabited by successive waves of nomadic tribes. The semiarid geographic region, a cultural eco-niche, is a backbone of Palestinian civilization and highlights our ancestral heritage and cultural patrimony, as testified in the extensive archaeological sites that are spread throughout the region.

The pioneering Hurrites' dynamic perception of, adaptation to, and intuitive interaction with the natural environment structured and conditioned the unique socioeconomic system and the religious, ideological, and spiritual legacy to which the diverse Semitic and non-Semitic ethnic waves of invading settlers adapted themselves. The rain-dependent, frail ecosystem that is vulnerable to dramatic climatic changes has prodded an ever-shifting process of adaptations, whereby the environment came to yield infinite resources. This dialectic structured and conditioned the Palestinian unique spiritual legacy that the diverse later religions adopted within the Jewish, Christian, and Muslim discursive narratives.

Long before the Amorites and the legendary arrival of our father Abraham, the Hurrites, and in their footsteps the Canaanites, had forged the first spiritual relationship in Palestine. The Semitic categories of thought, high/low, sacred/profane, male/female, and pure/impure were triggered by the Palestinian topography. The rugged, rocky, mountainous terrain exudes a prescient sense of the holy. Intimations of the "Other," the elusive mystical feeling of a transcendent presence, is inextricably related to the land. The early nomadic settlers' initial confrontation with Palestine's environment – the mountains, caves, water springs, seasonal changes, and trees – have come to imbue the Holy Land with its mythos. Our mountaintops were perceived as the natural habitat of the gods. Chief in their pantheon was El 'Elyōn, which, in English, may be rendered as "God Most High." The contemporary Palestinian mountaintops are dotted with sanctuaries, domed rooms amidst oak groves or huge carob trees. These remote holy shrines, albeit under Muslim mystic Sufi veneer, attest to the pervasive intimations of the other, sensed throughout Palestinian history as residing in high places.

Innumerable *bimot* (Canaanite high religious places) have been absorbed within the classical Judeo-Christian-Muslim tradition and have become part of the Palestinian national cult of St. George, known alternately as Mar Jiries in the Greek Orthodox tradition or Al-Khader in the Muslim narrative. In Greek icons, Mar Jiries may be depicted alone or in conjunction with the rain-bringer St. Elijah, Mar Elias. Alternately, Sufi Islam empowered these high places to become the popular sanctuaries that dot the landscape astride mountaintops, under the generic name of Al-Sheikh Saleh, the good sheikh. They may also survive under the garb of Biblical iconography, such as the sanctuary of Noah in Dura, Lot in Beni Naim, Matthew in Bet Ummar, Esau in Al-Seir, Jonah in Halhul, and Samuel southwest of Jerusalem. The primordial

Prophet Abraham en route to Egypt, portrayed as a nomadic Bedouin with Ishmael and Isaac.

Canaanite precept of Palestine as the Holy Land has played a major role in shaping the human person's relationship to god and that of god to the human person in festivities and fertility rites that celebrate the new season and that punctuate the Palestinian peasant's agricultural cycle, also present in the Greek Orthodox liturgical calendar.

The chasm that separates humans from their divinities parallels the binary opposition of high/low, sacred/profane, and pure/impure. Semites are fundamentally aniconic. Whereas deities dwelled high, humans were restricted

> **"Ethnographical observation does not confront us with the alternative of either a plastic mind passively reflecting the ecology outside, or universal psychic laws unfolding everywhere the same inborn properties, mindless of the ongoing history of each group and of the concrete features of its natural and social surroundings."**
> ***Structuralism and Ecology*, Claude Levi Strauss**

to dwelling below. By extension, the two natures, human and divine, were strictly separated. Aniconism means that rather than using figural images as objects of worship, abstract symbolic forms such as standing stones were used in the representation of deities. The principal sacred object in pagan ancient Semitic religion was the stone, either a rock outcropping or a large boulder, often a rectangular or irregular black basalt stone without representative sculptural detail. Betyls, a Greek anagram of the Semitic word Bet El,

Al-Jurn al-Kabir is a remarkably arid geological formation in the shape of a basin strewn with quartz. For millennia the valley served as an access road between Wadi Araba in the east to Gaza and Asqalan on the Mediterranean.

house of the head of the Canaanite pantheon El, was represented generically in the shape of cubes, cones, triangles, or rectangles. Such stones were thought to be the residences of a god, hence the term for them, employed by Byzantine Christian writers in the fifth and sixth centuries.

In the lengthy process of ecological adaptation to the new environment, the nomadic perception did not merely reflect and react to but also incorporated the new ecological and techno-economic resources, working them into a system that was conducive to the survival of the tribal structure as an integral whole. The complex dynamic process underlies the transformation of the environment into a resource, and can be viewed as the origin of the pragmatic adaptability of the Palestinians to the diverse challenges in war and peace, under contemporary occupation and in the diaspora. Throughout history, Palestinian society has preserved its tribal structure of social solidarity within the clan. Unity within the four-generation family unit is one of its most salient political, economic, and religious structures.

As early as the Bronze, Iron, and Biblical periods and up to the end of the nineteenth century, the valleys of the Hebron mountains have formed a cultural basin into which the diverse tribal nomadic waves from the deserts of Al-Naqab and Sina forced their way into Palestine. Those successive invading nomadic tribes expanded into the mountainous hinterland in endless raids and counter raids (*ghazzu*), looting and stealing livestock and basic stored staples, expanding into new pastureland, usurping power, supplanting tribal chiefs, and replenishing the population. The image of captive chieftains locked in a cave and killed by the invading tribes is a common theme in the Old Testament and haunts Palestinian historical narratives until the nineteenth century when the Ottomans quelled the chaos and built the city Beer al-Sabe' as an administrative center in the heart of Al-Naqab.

The roadway into the hinterland followed the course formed by the three major valley basins. The expansive cultural basin extends from the confluences of the western network of valleys into the Mediterranean Sea and from the eastern valleys into the Dead Sea, and via Wadi Araba to the Red Sea. This geographic cultural expanse marks the homeland for the various tribes from Al-Naqab. In their demographic territorial expansion towards Mount Hebron along the semiarid valleys, the nomadic tribes, their way of life in itself an adaptive strategy, made further readjustments as they moved from a mode of subsistence dependent on animal husbandry to a settled agrarian pastoral mode of production.

Two major valleys radiate westward. Their confluence at the Mediterranean forms Wadi Gaza in Gaza, and Wadi al-Namel in Asqalan (Ashqelon). Eastwards, a third major valley descends, beginning at Bani Na'im via Wadi al-Mintar towards the Dead Sea and Wadi Araba. In this geographic region, at the foothills of Mount Hebron, Early Bronze Age Semitic settlements thrived as city-states; Marissa in Beit Jibrin, Lachish (Tell al-Duweir), Azeka (Zakariya), Dhahiriya, Tell al-Sabe' (Beer Sheva), Beit Mirsim, Debir (Rabud), and Beit Maqdum, to name a few. Our Edomite and Nabatean ancestors developed the small Neolithic settlements of Subeita, Abdeh, Karnaba in the northern Naqab into great trade centers along the spice route from Yemen to Asqalan and to Gaza and thence to Greece.

Nabateans and Edomites used pyramids on top of tombs to connect the dead underground with the gods above. These symbolic liminal stones in association with tombs are referred to as *betyl-nephesh.*

The formidable Wadi al-Khalil (Hebron Valley) drifts southwards through Al-Dhahiriya and past Beer al-Sabe' to reach the Mediterranean at Wadi Gaza. Barely thirty kilometers farther north on the Mediterranean lies Wadi al-Namel in Asqalan. The valley

> **"We witness, and should try to describe, ever-changing attempts to compromise between given historical trends and special characteristics of the environment on the one hand, and on the other hand, fundamental psychic requirements which, at each stage, are the outcome of previous ones. As a result, human history and natural ecology become articulated so as to make up a meaningful whole."**
>
> ***Structuralism and Ecology,*** **Claude Levi Strauss**

Edomite temple reused by Nabateans in the acropolis of Abda. The walled city stood along the caravan spice road from Yemen via Mecca, the Red Sea, and Wadi Araba to Gaza. Abda, one of the chief centers for wine export, had vineyards that were irrigated by an extensive irrigation system that ensured that not a single drop of water was wasted.

begins in Halhul to form Wadi al-Qif that winds through Beit Jibrin and is further enriched by tributaries from the famed Lachish. Each tributary and each twist and turn of these valleys bears a distinct name that is associated with different nomadic tribesmen. The respective names, their genealogical charts, traditional territories, and history are preserved for posterity in the Arabic discourse known as *Ilm al-Ansab*, science of kinship structures.

The Mount Hebron valleys provided the environment that has over the past six millennia served as a cultural niche, replenished the early settlements which straddled mountaintops, and infused the mythos of the land with its spiritual tenor. From time immemorial, Wadi al-Namel in Asqalan, Wadi Gaza in Gaza, and Wadi Mintar in Bani Na'im have been associated with holy shrines of local fame: Al-Muntar of Wadi Namel and Yaqin. Two of these ancient sanctuaries on the Mediterranean, where the mountains meet the sea, were consolidated, updated, and revitalized under a Muslim Sufi veneer by Saladin in the twelfth century as centers of local pilgrimages on par with Nabi Musa near the Dead Sea. Previously, during the Fatimid period (tenth to twelfth century), Wadi al-Namel acquired great prestige as the sanctuary Mashhad al-Hussein, where the head of Al-Hussein, the grandson of Prophet Mohammad, was enshrined for a few years before it was moved to Cairo into the famous Al-Hussein Mosque. The beautiful pulpit of the Mashhad al-Hussein Mosque was moved to its present place in the mosque of Hebron during the Mamluk period when the fortifications of Asqalan were torn down, lest the Crusaders take shelter within them. Unfortunately, the Israelis leveled the mosque after occupying it and forcibly evicting the Palestinians from their homeland during the *Nakba*.

Mount Hebron is a peninsula that juts into Al-Naqab Desert. On the eastern side of Mount Hebron, a third major valley, Wadi al-Mintar, descends from the village of Bani Na'im towards the Dead Sea and forms the trail that is followed by nomadic tribes from Al-Naqab and from the Arabian Peninsula along Wadi Araba, famed for its copper mines that were first excavated by our Edomite ancestors and came to be associated with King Solomon's wealth.

The sanctuary of Yaqin on the outskirts of Bani Na'im, a promontory over the extensive system of valleys winding down to the Araba Valley, provides an insight into the multidimensional aspect of religious-cultural syncretism and highlights the problematic that is involved with using archaeological ethnography to interpret modern cultural expressions: over time, perceptions change.

Each culture is a totalizing, closed system of signification in terms of which the various cultural expressions acquire their referential value. Homology in form does not reflect structural semantic similarity. Merely because a sanctuary or shrine (maqam) is located in a place that corresponds to the Canaanite sacred "high place" and may have been a Canaanite sanctuary (*goren*), we cannot assume that it was used later on in the same way by, for example, the Edomites, even if the present-day people are descended from the earlier ones. Religious symbolism and all aspects of socioeconomic life are closely related to the particular details of the individual culture in a particular time and space.

In Yaqin, which commands a spectacular panorama that includes the Dead Sea, the Muslim discourse situates Abraham in the apocalyptic moment when God unleashed his wrath on Sodom.
As Abraham watches the cataclysmic event, he comes to the firm conviction in God's promise اشهد ان هذا هو الحق اليقين ("I bear witness that this is the truth of certainty," a rough translation of the verse from the Qur'an). The rock sank in the ground and in another spot his foot stamp left a deep imprint in the rock. According to Muslim travelers throughout the ages, the place derived its name from his renewed confirmation of his faith in God, *al-yaqin* in Arabic.

The sanctuary that enshrines the sunken rock leads to a cave underneath where Fatima, the granddaughter of Prophet Mohammad from his cousin Ali ben Abi Taleb, is believed by the locals to be buried.

The contiguous Sina and Al-Naqab deserts merge as the backbone of Palestinian culture, and the geographic basin formed by the major valleys in Mount Hebron presents the ecological context for the onset of the process of "sedentarization" of the Semitic nomads throughout time. This lengthy process in the form of raids and counter raids (ghazzu), which entail stealing, pillaging, and usurping land and water wells and expanding into new territories (diyar) – itself a form of ecological adaptation – may well be the case with the Hurrites, Amorites, Canaanites, Jebusites, Edomites, Habirus, and Nabateans.

A private Edomite villa outside the city walls of Abda. The arch is remarkably similar to the famous arches in Dura.

Wadi Khursa, southwest of Mount Hebron, is one of the many tributaries of Wadi al-Khalil and starts in the village of Khursa.

A few kilometers away stands the sanctuary where Lot is believed to be buried. Until quite recently, Bani Na'im, interestingly, had been famous for the plethora of sacred trees associated with various folk rituals.

Situated within Nabatean and Edomite spheres of religious influence, the sanctuary in Yaqin reveals the multidimensional aspect of the sacred rocks. Betyls for the Edomites and later the Nabateans were erected not exclusively as houses of god but also to mark the burial place, nephesh-betyls. On the other hand, from the Biblical perspective, Jacob's betyl, the ladder to God uniting heaven and earth, derived from a theophany which took place at that spot; the point at which the transcendent is believed to enter the immanent. The tomb, however, may be seen as a liminal point of contact between the worlds of the dead, of the living, and of the gods. Lying betwixt and between, communication between the world of the dead and that of the gods parallels Jacob's ladder to the sky and for the Edomites was consecrated as a connecting link between the different levels of the universe. At this interstice, the followers of the Edomite religion set up the betyl-nephesh in their cemeteries.

The dynamic process of ecological adaptation to the environment, the cultural diversity of which the Canaanite nascent city-states were composed, and the influences of the various peoples with whom the Palestinians mixed, reveals a tapestry of life that has witnessed continued adaptations that structured and conditioned the unique socioeconomic system, religion, and spiritual legacy to which the diverse ethnic Semitic and non-Semitic settlers adapted themselves later on. These peoples are innumerable and include the Hurrites, Amorites, Jebusites, Canaanites, Hebrews, Edomites, Arameans, and Arabs. Ancient non-Semitic peoples were composed of diverse origins: Greeks from Crete, Ionia, the Black Sea, Anatolia, and Lydia were followed by Babylonians, Hellenic Greeks, Roman legions, Persians, Byzantines, Crusaders, Kurds, and Turks. In modern history, Egyptians, British, Jordanians, and Israelis have played an ever-increasing role in reorganizing the ecological system, expanding our resources in new directions, and reshaping Palestinian modern identity. Heirs to all these peoples and cultures, Palestinians can claim neither racial genetic purity nor ontological cultural homogeneity.

Palestinian cultural identity has been produced within the context of Palestinian geography and bears structural continuity with primordial Semitic categories of thought. Throughout history, each period was merely a fleeting moment that in its transient fragility represented a momentary socioeconomic dynamic adaptation of the culture to the available resources, thus ensuring the survival of the family within the tribe.

Palestinians remain a tribal people whose elementary kinship unit was dynamically structured by the early pattern of cave dwellings that formed the ancient cities and hamlets that remained inhabited well into the twentieth century. In modernity, the locus of the extended family, the subunit of the tribe (*hamuleh*) in the Palestinian village, is invariably the *hosh*, the four-generation family-living courtyard.

Wadi al-Namel was the scene of the annual local pilgrimage reinstituted by Saladin following the defeat of the Crusaders in Asqalan. Highly favored as the burial grounds for Al-Naqab nomadic Bedouins, a special sanctuary was built there to mark the meeting place of mountain and sea.

"We witness, and should try to describe, ever-changing attempts to compromise between given historical trends and special characteristics of the environment on the one hand, and on the other hand, fundamental psychic requirements which, at each stage, are the outcome of previous ones. As a result, human history and natural ecology become articulated so as to make up a meaningful whole."

Structuralism and Ecology, Claude Levi Strauss

Anthropologist Dr. Ali Qleibo has lectured at Al-Quds University, held a fellowship at Shalom Hartman Institute, and was a visiting professor at Tokyo University for Foreign Studies and Kyoto University, Japan. As a specialist in Palestinian social history and through his work at the Jerusalem Research Center, he has developed the Palestinian Social and Muslim Tourism Itinerary. Dr. Qleibo has authored many books on Jerusalem and its history. A renowned oil painter, he has held numerous art shows. He may be reached at aqleibo@yahoo.com.

The Dead Sea

A Treasure in Peril

By Akram Halayqa

A natural phenomenon that is unique in the world, the Dead Sea lies in an area that was part of the original homeland of the first humans, a cemetery for the major monotheistic religions,[i] a place where ancient civilizations emerged and flourished, a crossing point for trade routes, and an area that attracted military invasions throughout successive historical eras. The historical and touristic importance of the Dead Sea Basin region is due to the sea itself and its shores, where important archaeological and religious monuments are located, such as Masada, Khirbet Qumran, and the Cave of the Prophet Lot. Moreover, it features natural salt formations and a prevailing desert climate with year-round sunny skies and dry air, all of which make the Dead Sea an attraction for international tourism, especially medical tourism. It is noteworthy that thousands of hotel rooms are concentrated mainly in northeastern part of Jordan and in the country's western part that overlooks the southern basin of the Dead Sea. The area has been nominated as one of the Seven Natural Wonders of the World.

The Dead Sea occupies the lowest area in the Syrian-African Rift Valley, covers about 1,000 square kilometers, and consists of two basins, with the northern basin occupying an area of approximately 756 square kilometers, and the southern basin an area of 244 square kilometers. The salinity percentage of the Dead Sea water is about 30 percent, the highest salinity in seas and oceans worldwide, which is why the Dead Sea is devoid of fish and living organisms.

The Dead Sea is shrinking, and the level of its surface drops approximately one meter per year. It has moved from 394 meters below sea level in the 1960s to 423 meters below sea level in 2012, reducing the total area of the sea by about one-third (from 950 square kilometers to 637 square kilometers).[ii]

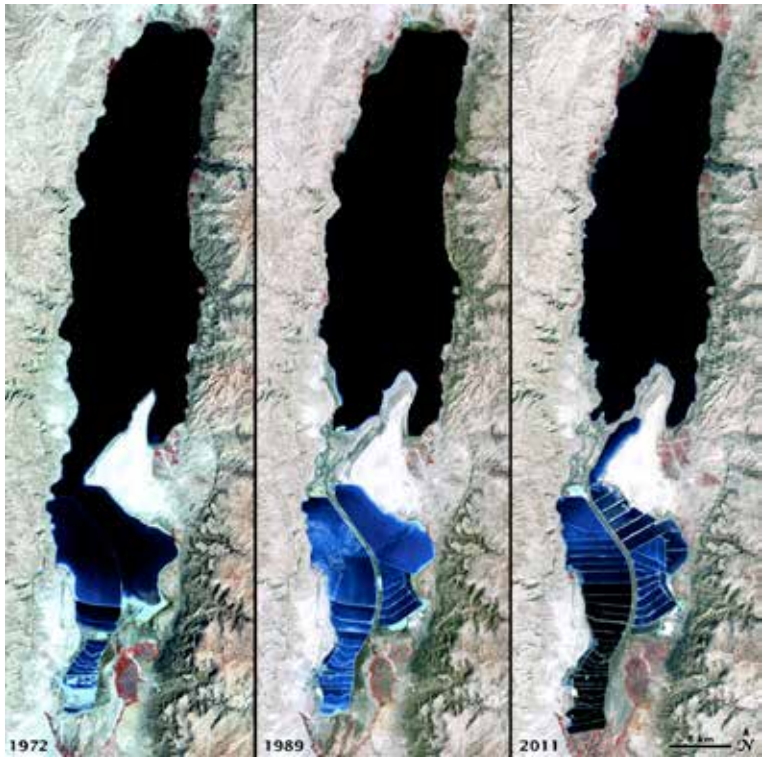
Many factors have contributed to this decline, including the ongoing climate change, witnessed by the world in general and the region in particular, which has led to a state of drought and scarcity of rain. This situation has affected particularly the formative springs of the Dead Sea as well as the rates of evaporation along its tributaries over the last sixty years. But the most important reason for the decline lies in Israeli water projects, implemented to exploit the water of the Dead Sea tributaries to serve Israeli expansion and settlement, especially in the Negev region. Most important among these projects is the National Water Carrier, implemented by the Israeli government in 1964, which diverts the waters of the Jordan River, transporting around 400 million cubic meters (MCM) of water per year. Historically, the amount of water flowing annually from the Jordan River to the Dead Sea is estimated to have reached around 1.4 billion cubic meters.

The surface area of the Dead Sea has decreased significantly over the past seven decades.

But this amount has decreased dramatically during recent decades to around 30 MCM today. Israel has also constructed many dams on the main sources of some Jordan River tributaries, including the Yarmouk River, the main feeder of the Jordan River, and some dams on valleys that block rainwater from reaching the Jordan River.

On the other hand, Jordanian and Israeli industries that extract potash and the various beneficial salts from the Dead Sea consume huge amounts of water from the Dead Sea, estimated at about 200 MCM annually.

The Dead Sea.



Dead sea surface area regression.

The most important problems that have resulted from the decline of the Dead Sea level include the following: The level of groundwater in the surrounding areas has decreased and its quality has deteriorated. Around 4,000 sinkholes have formed along the western coast of the Dead Sea that have caused much damage, such as the collapse of streets and even of hotels and resorts. There has been an increase in the Dead Sea's salinity and in the crystallization and deposition of salts. This affects the springs located along the Dead Sea shore, such as Ein al-Fashkha, and disturbs the area's biodiversity. It has also had a negative impact on tourism and on the aesthetic view.

Overall, the Dead Sea has lost about 90 percent of the amount of water that reached it in the mid-nineteenth century. This has led to an imbalance in the environmental equation of the delicate balance between the amount of water that reaches the Dead Sea and the amount of water that the sea loses as a result of evaporation, keeping the water level semi-static.

Israeli activities in the Dead Sea region have led to the deterioration of plant and animal species, as Israel has established many industrial and tourism projects on the shores of the Dead Sea, fragmentating and maiming this sensitive ecosystem, which has led to the elimination of several species, especially migratory birds. The use of the area as a military training zone has damaged both wildlife and vegetation.

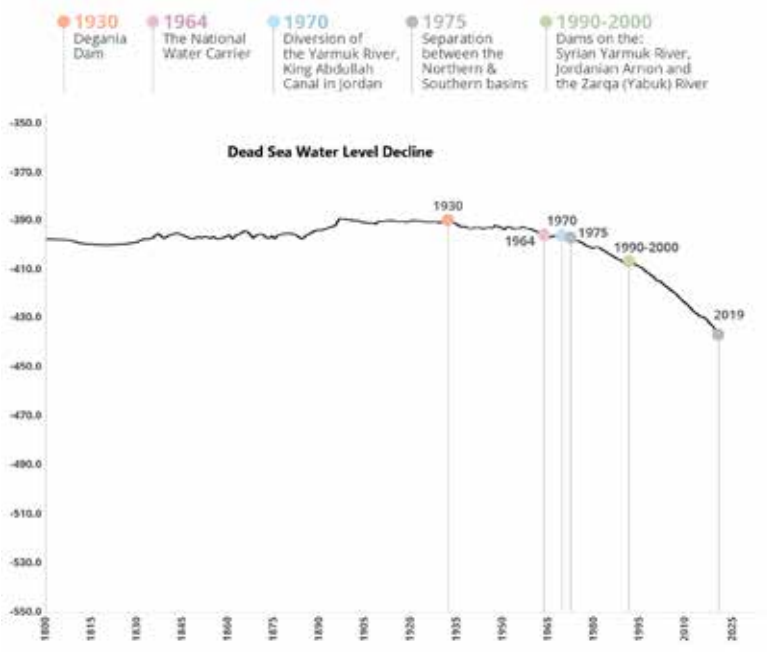
The Dead Sea is of great economic importance because it contains quantities of high-value salts and minerals. Israel extracts and sells potassium, magnesium, and sodium chloride salts, among others, in amounts that in the year 2009 were estimated at 4.1 million tons, generating US$3 billion of annual income from the proceeds.

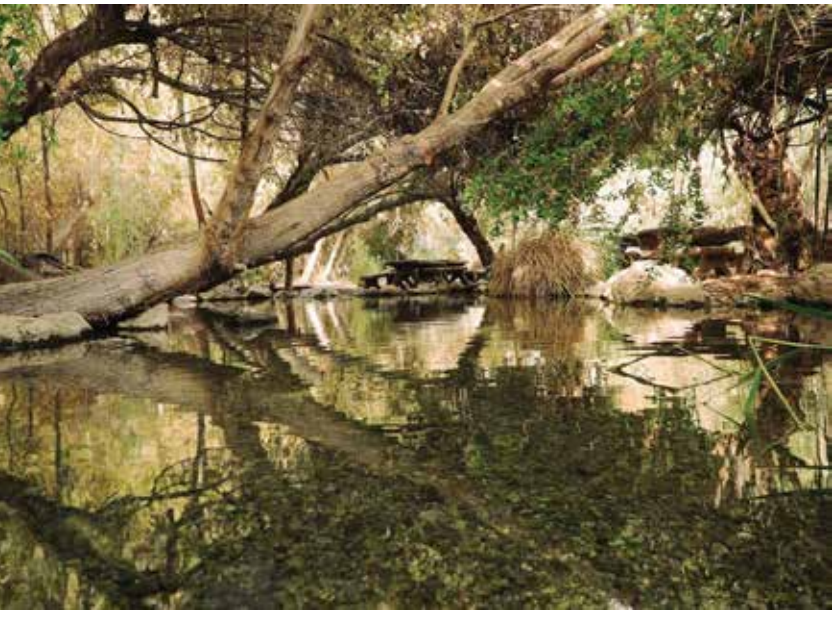
On the eastern and western sides of the Dead Sea, there are a number of nature reserves that house a wide variety of organisms. The most important protected areas located on the western side of the Dead Sea are Al-Fashkha and Ein Gedi.

Al-Fashkha Nature Reserve is located on the northwestern coast

World Bank sources estimate that if the Palestinians were allowed to exploit their natural resources of Dead Sea minerals alone, they would earn an annual income of US$918 million, of which US$624 million would come from the extraction of potassium and US$276 million from the extraction of bromine.[iii]

Dead sea water level decline.





Al-Fashkha Spring

of the Dead Sea and covers an area of about five square kilometers. It forms wetlands that include many fresh- and saltwater springs and is one of the most important and beautiful natural areas of the region. This reserve is considered to be an important home for many plants and animals. Among the most popular plants that grow in the reserve are oleander, reeds, and palm trees, and among the most famous animals that live there are wild goats, mountain gazelles, Nubian ibex, rock hyrax, hedgehogs, porcupines, and desert chukars.

The reserve is also a home and sanctuary for many resident and migratory birds, most famous among them are the Dead Sea sparrow, lesser kestrel, and black eagle. The night heron is considered one of the migratory birds that have begun to reside and breed in the reserve; it is found in the western part of Ein al-Fashkha and on the mountains overlooking the Dead Sea. Finally, there is the white stork that passes over the reserve in very large numbers during the migration season.

The reserve furthermore contains many springs that are considered among the most important and largest springs along the Dead Sea, called Al-Fashkha springs group.

Approximately 21 springs are located along the northwestern coast of the Dead Sea, where the water flows eastwards towards the Dead Sea with an annual flow rate that ranges from 90–106 MCM of relatively saline water.

The Al-Fashkha springs group contains more than ten springs, which are the most important and largest springs along the western coast of the Dead Sea. Al-Fashkha Spring, considered the most significant in that group, is located at an altitude of approximately 390 meters below sea level on the northwestern shore of the Dead Sea, at the bottom of the limestone-rock mountains of the Jordan Valley. The water from the spring flows in seeps that resemble blood that flows from a head wound, an image that is captured by the word *al-fashkha*. The average annual discharge of this spring is about 60–70 MCM.

The Tarraba springs group consists of outbreaks that are concentrated in a small area located several kilometers south of the Al-Fashkha group. The springs of this group flow in the form of veins and thus are similar to the spring of Al-Fashkha in terms of its flow mechanism. The average annual discharge for this group is about 16–18 MCM.

The Al-Ghazal springs group is located several kilometers north of the Al-Fashkha springs at an altitude of about 385 meters below sea level. The waters of this group are similar to the waters of the Al-Fashkha group in terms of quality, but the percentage of dissolved salts is less than in the Al-Fashkha group. The annual rate of discharge of springs in this group ranges from 0.5 to 2.4 MCM.

Al-Ghuwair Spring is located several kilometers south of the Al-Fashkha group at an altitude of about 390 meters below sea level with an average annual discharge of about 11 to 14 MCM.

Tannour Spring is located less than one kilometer south of the Al-Ghazal group at an altitude of

Nubian ibex

Dead sea sparrow

Rock hyrax

Dead sea sinkholes.

Approximately 4,000 sinkholes have formed in the Dead Sea area due to low seawater levels that allow for the intrusion of fresh groundwater that dissolves deep-lying salt layers.

The most important springs located on the Palestinian shore of the Dead Sea are the springs of Ein Fashkha, Al-Fashkha springs group, Tarraba springs group, Al-Ghazal springs group, Al-Ghuwair Spring, and Tannour Spring.

about 380 meters below sea level and has an average annual discharge of about 0.5 to 3.7 MCM.

Sinkholes are defined as circular depressions that occur in the ground, especially in areas composed of karst rocks. Their diameter usually ranges from several meters to several hundreds of meters, while their depth is between several centimeters to hundreds of meters. They can develop slowly and imperceptibly or may collapse instantly and catastrophically. More than 4,000 sinkholes have formed since the 1980s within a 60-kilometer-long and 1-kilometer-wide strip along the Dead Sea's western coast due to landslides in the subsurface voids that are caused by the flow of water through soluble rocks (carbonate, salt, anhydrite). While the decline in the level of the Dead Sea greatly contributed to the formation of these sinkholes, their formation in the region is related to the hydrogeological situation. Three main elements contribute to this process: the salt layer, the aquifers with different salinity and hydraulic conductivity, and the connection between these layers and the salt layer.

The prevailing hypothesis regarding the hydrogeological reasons for the sinkhole formation suggests that the decrease in the Dead Sea water level is accompanied by a decrease in groundwater levels due to the hydraulic connection between the Dead Sea and the aquifer on the Dead Sea's western shore, as the low Dead Sea water level allows for the penetration of low-salinity groundwater into the coastal area. As a result of this incursion, the up-to-20-meter-thick salt layers that are located in the beach area at a depth of 25–50 meters below the earth's surface are being dissolved, causing the collapse of the overlying layers.

Akram Halayqa is the director of the Coastal and Marine Environment Department at the Palestinian Environment Quality Authority.

[i] Konstantinos Politis, "Death at the Dead Sea," *Biblical Archaeology Review* 38:2, March/April 2012, available at http://www.hsnes.org/pdf/BAR%20MA12%20DeathDeadSea.pdf.

[ii] "The Red Sea-Dead Sea Water Conveyer: The Project, the Assessments and Potential Benefits to the Palestinian Territory," Palestine Economic Policy Research Institute MAS, March 2013, available at https://www.mas.ps/files/server/20141911184926-1.pdf; note: there is a mistake in the English translation that cites the reduction as 1 cubic meter, whereas the Arabic original says 1 meter in height.

[iii] Orhan Niksic, Nur Nasser Eddin, and Massimiliano Cali, "Area C and the Future of the Palestinian Economy," The World Bank, available at http://documents1.worldbank.org/curated/en/257131468140639464/pdf/Area-C-and-the-future-of-the-Palestinian-economy.pdf.

Climate Change in Palestine

By Hadeel Ikhmais

The year 2016 heralded a remarkable transformation for Palestine when it became party number 197 in the United Nations Framework Convention on Climate Change (UNFCCC). In the early morning hours of December 13, 2015, during the 21st Conference of Parties (COP) of the UNFCCC in Paris, H.E. Ambassador Dr. Riyad Mansour, Permanent Observer of Palestine to the United Nations, submitted the instrument of accession to UN Secretary General Ban Ki Moon. On March 17, 2016, Palestine became a state party to the UNFCCC. H.E. President Mahmoud Abbas signed and ratified the Paris Agreement on April 22, 2016, in New York. Palestine was one of the first countries to do so. The COP 21 marked a historic climate agreement that showed our responsibility as part of humanity and a responsible state in the global fight against climate change.

Shortly after becoming a party to the convention, Palestine was able to chair the Group of 77 and China, the largest negotiation group in the climate change intergovernmental process. Najla Latif pointed out: "Less than four years after being recognized as a state party at the United Nations' climate change negotiations, Palestine is now leading the UN's largest group of developing nations."[i]

The active role of Palestine in climate change was marked ten years ago, however, before joining the convention, when a strategy for adaptation to climate change was developed in 2010. The Climate Change Adaptation Strategy and Program of Action for the Palestinian Authority has identified water and food security as the most vulnerable issues in Palestine with knock-on implications for all sectors. The Israeli occupation substantially reduces Palestine's adaptive capacities in many issues, thereby compounding climate vulnerabilities. These capacity limitations are most prevalent in Area C, which covers 61 percent of the West Bank, and in the Gaza Strip, but the Israeli occupation also increases vulnerabilities everywhere else all over Palestine.[ii]

Winter in Gaza. Photo by Sharif Sarhan.

Being particularly vulnerable to the impacts of climate change, with severe implications for its economy, living standards, and environment, Palestine is committed to ensuring that its emissions pathway is in line with the objective of UNFCCC and the Paris Agreement and aims to stabilize greenhouse gas (GHG) emissions at a level that limits the ongoing temperature increase to less than 2°C relative to pre-industrial levels. In its National Determined Contribution, submitted in August 2017, Palestine committed to reduce its GHG emissions by 12.8 percent by 2040, relative to the business-as-usual levels under a scenario where the Israeli occupation continues (status-quo scenario), and by 24.4 percent by 2040 under a scenario where the Israeli occupation ends (independence scenario). This reduction is conditional on international support.[iii]

The total estimated cost of the State of Palestine's adaptation actions included in the National Adaptation Plan for all sectors amounts to US$ 3.544 billion.

The climate change impacts that affect Palestine include decreased precipitation, significant warming, more frequent extreme weather events, and a rise in the sea level. These could lead to greater water scarcity, reduced agricultural productivity, decreased food and water security, and saline water intrusion. Specifically, the impacts on the agricultural sector will include more frequent droughts and increased desertification, changes in the economic viability of crops, increased water requirements for crops, a decline in grazing ranges and livestock, and higher food prices. For the water sector,

Floods in Gaza. Photo by Sharif Sarhan.

In 2011, emissions from the waste sector amounted to 751.7 Gg of CO_2 eq. Emissions of CH_4 dominated, followed by N_2O. Emissions of CH_4 arose from waste decomposition and wastewater treatment, whereas N_2O emissions arose during biological nitrogen removal in wastewater treatment plants. A very small amount of CO_2 was also emitted, which arose from the burning of waste.

climate change will exacerbate the effects of Israel's current control on regional water sources. In addition, there is a grave concern over the potential impact of climate change through decreased precipitation and sea-level rise on the coastal aquifer in Gaza. This could severely affect communities that rely almost exclusively on the coastal aquifer for their water needs. Thus, if Palestine can successfully address climate change and lessen the related impacts, these measures will help improve the country's energy security and overall food production, the environment, and people's living conditions and health.

As it will increase physical and/or socioeconomic challenges, it is expected that climate change will most severely impact Palestine's most vulnerable populations, including women, children, young women and men, refugees, young parents, parents of young children, the elderly, female-headed households, persons with disabilities, families with member(s) in detention, and poor or underserved communities.

Adaptation to the adverse impact of climate change is considered among the high priorities of the Palestinian government. In order to address expected climate change impacts, Palestine has adopted a list of proposed adaptation actions in 12 different sectors, including the water, agriculture, food, industry, local government, energy, gender, health, tourism, and transportation sectors. Regarding the water sector, these adaptations include developing rainwater harvesting technologies. For the agriculture sector, they include adopting climate-smart agriculture practices. To help the energy sector, a focus on the use of solar PV and solar water heating technologies is advised. Although solar water heating is used extensively in the residential sector, its capacity is still limited in sectors such as service provision and industry. Increasing energy efficiency is another approach proposed to decrease energy demand. This is essential, considering the differing needs and requirements of women and men and their subgroups as related to climate change. The impact of climate change by gender has not been fully analyzed or addressed in current climate change adaptation actions, this gap was addressed in many other projects that were concluded recently.

For future actions, Palestine's nationally determined contribution (NDC) clearly identified specific climate actions that are implementable in case the means for implementation can be secured from international resources, especially with regard to technology transfer, capacity building, and financial resources. The estimated financial resources needed to fully implement the NDC are US$14 billion for all adaptation and mitigation actions from now until 2040. The implementation of the NDC started by granting US$23 million from the Green Climate Fund to a water banking project in northern Gaza that is being implemented by the French Development Agency in partnership with the United Nation's Food and Agriculture Organization, the Palestinian Water Authority, and

Israel's occupation and the continuous growth of its illegal settlements, exacerbated by offensive activities carried out by settlers in the West Bank, including East Jerusalem, heavily pollute and deteriorate the natural ecosystems and the environment of the State of Palestine. In 2011, around 541,824 illegal Israeli settlers lived in the State of Palestine, emitting approximately 5,798 Gg CO_2 eq. These emissions are higher than the total emissions of the State of Palestine.

the Ministry of Agriculture. As of recently, a number of concept notes for projects in seven sectors are under preparation, aiming to enhance Palestine's NDC implementation.

To enable such implementation, possible donors for climate change mitigation projects must be identified. We must solicit their interest and potential to support the country through measures that include considering the donor's priorities, access criteria, instructions and guidelines, and barriers to funding.

In 2011, the energy sector emitted 1997.7 Gg of CO_2 eq., as CO_2 dominated the greenhouse gas emissions in the State of Palestine, with relatively very small emissions of CH_4 and N_2O. All the emissions arose from fuel combustion.

Photo by Sharif Sarhan.

The open burning of solid waste, although still occurring, has decreased substantially since 2012. With illegal dumping sites closing down and waste being shifted to sanitary landfills, waste burning has become a less common method of disposal.

Hadeel Hisham Ikhmais, originally from the village of Beit Nattif, near Hebron, which was occupied in 1948, lives in Bethlehem. She holds a bachelor's degree in biology and medical technology and a master's in environmental studies, and has been working in the climate change section of the Environment Quality Authority since 2016.

A young man surveying the damage caused by an Israeli attack. Photo by Sharif Sarhan.

[i] Najla Abdellatif, Palestine Leading International Climate Negotiations, Heinrich Böll Stiftung, January 13, 2020, available at https://ps.boell.org/en/2020/01/13/palestine-leading-international-climate-negotiations.

[ii] Initial National Communication Report, submitted to UNFCCC in 2016, available at https://unfccc.int/documents/81488.

[iii] *National Determined Contributions (NDC) submitted to UNFCCC* (with Palestine listed as State of Palestine), United Nations Framework Convention on Climate Change, available at https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx.

The Status of Invasive Alien Species in Palestine

By Mohammad Mahassneh

The term invasive alien species (IAS), i.e., a nonnative, nonindigenous, foreign, exotic species, refers to a species, subspecies, or lower taxon that is or has been introduced outside of its natural range (in the past or present) and carries dispersal potential (i.e., might spread outside the range it occupies naturally or could not occupy without the direct or indirect introduction or care by humans). According to the definition issued by the International Union for the Conservation of Nature (IUCN) in 2000, it includes any part, gametes, or propagule of such species that might survive and subsequently reproduce.

The increasing commercialization, globalization, and modernization of travel are causing environmental changes, including climate change, and facilitate the arrival and establishment of IAS. Thus, IAS – including plants, animals, and microorganisms – present a growing environmental and economic threat to biodiversity and affect agricultural crop production, threatening human livelihoods and biodiversity globally. Moreover, IAS are among the most significant drivers of species extinction and ecosystem degradation. These species negatively impact ecosystem services and human well-being and are considered the second-greatest agent of species endangerment and extinction after habitat destruction.

The disturbance of natural habitats promotes the establishment of IAS. On a global scale, the most relevant disturbance factors are the expansion of agriculture, changes in the composition of native communities as a result of climate change (biome shifts), and increasing occurrences of wildfire. Biological invasions are considered a direct driver of biodiversity loss and have a pronounced negative impact on supporting, provisioning, regulating, and cultural services. Both the numbers and distribution of invasive species are increasing in many parts of the world, to the extent that the biogeographic distinctiveness of different regions is becoming blurred.

According to IUCN Red Lists, IAS are responsible for more extinctions that have occurred worldwide than any other agent. Globally, almost 20 percent of vertebrates are thought to be in danger of extinction or threatened in some way by invasive species. The impact of IAS extends beyond biodiversity loss to include effects on ecosystem services, agricultural and fisheries production, and water quality and supply – the majority of which are associated with the provisioning of food security (agriculture, fisheries, etc.). The ecological impacts of IAS include habitat alteration, competition and predation, disease transmission, and genetic dilution. While not all alien species have the potential to become invasive or cause problems, there are many that can significantly alter habitats and affect the associated biota or result in a reduction in the quality of economic services.

The global costs of IAS are currently estimated at about US$50 billion per year.

IUCN assessments find that one-sixth of the global land surface is highly vulnerable to invasion, including substantial areas in developing economies and biodiversity hotspots. The dominant invasion vectors differ between high-income countries (imports, particularly of plants and pets) and low-income countries (air travel). Uniting data on the causes of introduction and establishment can improve early-warning and eradication schemes. Most countries

Photo by Firas Jarrar, Palestinian Assembly for Photography and Exploration.

have limited capacity to act against invasions. In particular, a clear need for proactive invasion strategies has been revealed in areas with high poverty levels, high biodiversity, and low historical levels of invasion.

To demonstrate a strong reactive capacity in controlling the spread of already introduced IAS, countries must first recognize that IAS are threatening that country's environment and economy. They must furthermore have identified the IAS already present and show evidence that an IAS policy can be turned into management actions. To have a strong proactive capacity, countries must attempt to prevent the introduction of IAS that are new to that country and control species that are already established and are beginning to emerge as problematic IAS. Thus, demonstrating proactive capacity requires comprehensive border-control policies and programs for research, monitoring, and public engagement.

The Convention on Biological Diversity (CBD) highlights the adverse effects of IAS. Article 8(h) stipulates: "Each contracting Party shall, as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species." The Aichi Target 9, made under the CBD, also states that "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment."

To implement this obligation and the related global initiatives (e.g., the Global Invasive Species Database GISD), Palestine, as a contracting party of CBD in 2015, shall set up a national strategy on IAS. It must develop legislation to prevent the introduction of new IAS and the spread of the already present IAS, carry out a risk analysis that uses the available information and communication technology, and provide infrastructure for the control of IAS. The control of IAS is the most cost-effective and frequently feasible only during the lag phase. The future spread of these species threatens the unique assemblage of plants within this world-renowned site, a cost that is difficult to quantify in monetary terms. But its potential constitutes an unquantifiable loss to our biodiversity and natural heritage. Considerable attention should be focused on the various plant and animal species that have been introduced, whether intentionally or accidentally, over the last 100 years or so. Moreover, significant efforts should be directed towards preventing the establishment of cross-border invasive species, which means that we must move towards the development of a national strategy and provide guidance on the control and eradication of the main problematic species.

The typical pattern of establishment for IAS involves an initial lag period after their arrival, followed by the rapid spread. The vectors that facilitate IAS movement also determine their subsequent geographic spread.

Furthermore, an overview of the IAS present in Palestine is needed and must include the detailing of the main vectors of spread and the pathways for the various species, also indicating their impact on biodiversity and the associated socioeconomic implications. A proposed strategy for managing IAS at the country level is urgently required. The investigation of IAS in Palestine should follow the hierarchical approach that incorporates three key elements: prevention, early detection and eradication, and control and long-term containment and management.

Red anemones dot the hills during spring.
Photo courtesy of Palestinian Assembly for Photography and Exploration.

An ongoing national project on IAS is proceeding with main objectives that include the survey of IAS present in Palestine, the pathways of introduction, the vectors of spread, the techniques to combat and eradicate IAS, and the development of a national strategy to deal with IAS.

There are three main strategies for controlling invasive alien species:

• Their introduction should be prevented in the first place. There should be a ban on intentionally keeping, breeding, cultivating, transporting, placing on the market, and importing invasive alien plants and animals.

• When IAS are introduced unintentionally, the animals must be removed from the environment as quickly as possible. Plants must be destroyed.

• If invasive alien populations are so large that they can no longer be caught or eradicated, measures must be taken to stop them from spreading further.

It is urgent to raise awareness among people working in the fields of animal and public health, making them aware of the need to consider IAS as a health threat. Awareness and action will be influenced by and must consider the wider public perspective, not just researchers and institutions. Initiatives that aim to sensitize citizens about the health threats associated with IAS are needed to promote responsible behavior when crossing borders and to improve the general public attitude toward IAS-control and eradication programs.

IAS may host pathogens that are absent in the area of release and may cause their establishment and subsequent spillover to local species, possibly resulting in an increase of disease risk for humans, domestic animals, and native wildlife. An increase of the local disease risk may also occur if the introduced IAS is susceptible to, and able to transmit, local pathogens. Pathogens acquired by IAS may be amplified and possibly spill back to humans and local species. A first major constraint in addressing the issue of disease emergence connected to IAS is given by the lack of comprehensive data on pathogens that affect IAS. In this sense, we recommend the gathering of an ad hoc database that includes all the available information on IAS pathogens that affect human and animal health, including their geographical distribution and prevalence in IAS populations in both native and introduced ranges. It would also be advisable to improve our understanding of the key epidemiological events and factors that drive the emergence of infectious diseases following IAS establishment. There is an urgent need for research efforts that aim to develop transparent and flexible tools that might be able to prioritize IAS based on the risk of transmitting pathogens with the potential to impact the health of humans, production animals, and native wildlife.

Many of the 100 most dangerous IAS worldwide are established in Palestine, exerting significant threats and adverse impacts on biodiversity, public health, and socioeconomic conditions. Some of these IAS are introduced below.

***Acridotheres tristis*:** The common myna or Indian myna, sometimes spelled mynah, is a member of the family Sturnidae, native to Asia. An omnivorous open woodland bird with a strong territorial instinct, the common myna has adapted extremely well to urban environments.

Ligustrum robustum: Bora-bora, Ceylon privét, Sri Lankan privet, tree privet grows as a shrub or small tree up to 10 meters (30 ft) tall, though old specimens of more than a hundred years have been observed with a height of 15 meters (50 ft). The fruit of the shrub is an ellipsoid berry, bluish-purple when fully ripe, that can reach 7–10 mm × 4–5 mm in size.

Myocastor coypus: The coypu, also known as nutria, Bewerrot, Biberratte, coipù, or coypu, is a large, herbivorous, semiaquatic rodent. Classified for a long time as the only member of the family Myocastoridae, Myocastor is now included within Echimyidae, the family of the spiny rats. The coypu lives in burrows alongside stretches of water and feeds on river plant stems. Originally native to subtropical and temperate South America, it has since been introduced to North America, Europe, Asia, and Africa, primarily by fur farmers. Although it is still hunted and trapped for its fur in some regions, its destructive burrowing and feeding habits often bring it into conflict with humans, and it is considered an invasive species.

Rattus rattus: The black rat, also known as the roof rat, ship rat, or house rat, is a common long-tailed rodent of the stereotypical rat genus Rattus, in the subfamily Murinae. It likely originated in the Indian subcontinent but is now found worldwide as an invasive species.

Ailanthus altissima: Known as Chinese sumac, tree of heaven, or stinking, this is a very aggressive plant and a prolific seed producer (up to 350,000 seeds in a year) that grows rapidly and can overrun native vegetation. It also produces toxins that prevent the establishment of other plant species. The root system is aggressive enough to cause damage to sewers and foundations.

Ambrosia artemisiifolia, also known by the common names common ragweed, annual ragweed, and low ragweed, is a species of the genus Ambrosia, native to regions of the Americas. Ambrosia artemisiifolia is a widespread invasive species and can become a noxious weed. Its windblown pollen is highly allergenic.

Prosopis juliflora var. juliflora (Sw.) DC. Known as Prosopis, Mathenge (Kenya), mesquite, algarroba, ironwood eterai (Turkana), this species belongs to the family Fabaceae (Leguminosae) and the subfamily Mimosoideae. Prosopis juliflora is invasive in parts of Palestine, mainly the Jordan Valley. Prosopis juliflora thrives in most soils, including sandy, rocky, poor, and saline soils within an altitude range of 300–1,900 meters above sea level. Its deep taproots help it access subsurface waters.

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Photo courtesy of Palestinian Assembly for Photography and Exploration.

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Towards a Green New Deal in Palestine

By Shaddad Attili

As the world fails to curb rising temperatures, the consequences of global warming pose a serious threat, particularly in regions that suffer from water and food scarcity, political conflict, instability and insecurity, and financial inability, such as Palestine, among many others. Not all countries contribute equally to greenhouse gas (GHG)[i] emissions or are equally vulnerable to climate change, and the responsibilities and duties to mitigate the situation vary from one country to another. The achievement of the 17 Sustainable Development Goals and their 169 targets is becoming increasingly difficult. Responsibility lies mainly with the industrialized countries, including the United States, China, India, Europe (mainly Germany and France), and the Gulf petroleum countries as the heavy users and producers of fossil fuel.

Efforts to reduce GHG emissions have led to the United Nations Framework Convention on Climate Change (UNFCCC) and its extensions: the Kyoto Protocol of the 1990s, superseded by the Paris Agreement that entered into force in 2016. As of 2020, the UNFCCC has 197 signatory parties, and the Conference of Parties (COP) meets annually to assess progress in dealing with climate change. In 2020, despite countries' engagement in efforts to address climate change and a slowdown in industrial activities due to COVID-19, CO_2 showed the highest concentration in the past 800,000 years.

The United Nations Global Green New Deal (GGND), announced in 2008, comprises various sets of policies that aim to make systemic change to reduce GHG emissions. Measures include transitioning away from fossil fuels, introducing higher energy standards, and undertaking massive industrial projects to scale up green technology. The GGND calls on governments to allocate a significant share of funding to green sectors and sets out three objectives: economic recovery, poverty eradication, and reduced carbon emissions and ecosystem degradation.

In 2009, following the announcement of the GGND, the World Bank[ii] and Amnesty International[iii] published two reports that highlight how Palestinians are denied access to water and sanitation and face Israeli restrictions on the development of their water sector. As the State of Palestine is considered among the least developed countries that must bear the consequences of climate change, there is a great need for adaptation and mitigation measures. Palestinians in Gaza have been living under siege for more than a decade, in conditions that a UN report has deemed unlivable.[iv] In the occupied West Bank, Palestinians live under military control and face water apartheid, as reported by the French National Assembly,[v] enclaved by hundreds of Israeli settlements and outposts. Palestinian access to water and natural resources is restricted, and Palestinians face movement and access restrictions in 60 percent of the West Bank territory where they are unable to build structures or implement development projects, and frequently must undergo a lengthy and complicated process to enter equipment in particular to

From Kyoto to the Paris Protocol, the world has faced a dilemma that has lasted half a century.

Flooding in Gaza. Photo by Sharif Sarhan.

Gaza, where it may be refused under the pretext of dual use. Reports by the World Bank and United Nations have repeatedly affirmed that the occupation is the main obstacle that prevents the Palestinian state from attaining a viable economy that could lead to prosperity and self-reliance. Many international reports affirm that Israeli policies and practices undermine the resilience of Palestinians and increase their vulnerability to climate change.

Palestine has committed to the 2030 Sustainable Development Goals, but little has been achieved in terms of reaching these goals and targets. Many economic, financial, and social indicators show that the State of Palestine has been crippled in fulfilling its commitments and inspired objectives, showing high rates of poverty, food insecurity, and poor health conditions.

One example of how the occupation hinders development efforts is the denial of permits to develop clean energy projects in Area C. This prevents Palestine from advancing and implementing its strategy to diversify energy resources, causing the country to fail in its commitment to generate ten of its energy needs from renewable sources. The Palestinian Energy Authority announced in 2020 that the country currently relies on renewable energy for only 3 percent of its energy needs.

Israel's control of Area C hampers Palestine's plans for the diversification of energy resources.

The Palestine Water Authority has failed to facilitate the reuse of treated wastewater in agriculture due to the lack of permits for projects in Area C. Only 1 percent of treated wastewater has been reused in the West Bank. Palestinians are allowed to use only 15 percent of the groundwater in the West Bank aquifers and are given no access to the waters of the Jordan River or the Dead Sea. Gaza under siege is hampered in efforts to treat wastewater by a severe lack of energy, yet it manages to reuse 9 percent amidst a severe shortage of fresh water. Access to water and a solution to Israel's control over the Jordan River and the shared groundwater aquifer remain issues pending permanent status negotiations.

On November 29, 2012, the United Nations General Assembly issued Resolution 67/19 that considers Palestine a nonmember observer state in the assembly. This decision paved the way for the State of Palestine to accede to international conventions that strengthen Palestine's position in the international arena.

There is a fundamental political benefit to Palestine joining international legal frameworks to which Israel, the occupying power, is a member. These agreements, such as the Convention on Biological Diversity and the Basel and Paris protocols, set a new environmental reality in the region, especially regarding the relation between Palestine and Israel. When both states are members in the same environmental agreement, it can be understood that they have agreed on sets of rules, principles, and obligations that aim to address the threats and challenges associated with pollution, climate change, and environmental protection. In the region's political reality, many consider water and environmental issues as less political in nature, allowing Israel and Palestine to reach a form of understanding and advance towards shared efforts to tackle issues related to climate change. Despite the ongoing political conflict, the two countries could work together, sign a memorandum of understanding, and develop environmental protocols. No one, despite the political conflict, would disagree that we all share in the pain. Why not share in the benefit of working toward minimizing the risks and threats of climate change?

Clean water is a rare resource in Gaza. Photo by Sharif Sarhan.

The Palestine Green New Deal initiative strives to mitigate climate-change-related damages in the absence of a peace agreement with Israel and despite the ongoing occupation and denial of Palestinian rights.

A recent initiative published by EcoPeace Middle East has called upon Israel in a proposed Green Blue Deal for the Middle East[vi] to resolve the issue of water rights, restore Palestinian water rights, enable access to shared resources, cooperate in addressing climate-change-related challenges, and advance cooperation over the nexus of water, food, and energy.

This initiative falls in line with a recent debate, facilitated by the Palestinian Center for Policy Research and Strategic Studies MASARAT, in which Palestinian water experts discussed and debated water rights and proposed not to delink water from the conflict but rather to adopt a phased approach in resolving the conflict under the motto "Water Comes First." This approach would help all, provide an example of goodwill, and constitute a step that could encourage further engagement in issues of conflict between Israel and Palestine.

Arava Institute for Environmental Studies, in collaboration with the Palestinian NGO Damour for Community Development and in cooperation with Oxford Martin School of Oxford University, is advancing a Track II Dialogue for the environment in the Middle East and the region. This endeavor has received assistance from large, internationally well-known figures and actors and aims to advance the agenda of addressing climate change resilience in the vulnerable Middle East region, with water and energy at the top of its agenda.

All stakeholders behind these initiatives wish to solve the Israeli-Palestinian conflict based on the two-state solution and international law; they agree that pollution and climate change know no borders (with the COVID-19 pandemic serving as "proof of the concept": the region and its populations are not safe until all are safe, as the pandemic knows no borders).

After rain in Gaza. Photo by Sharif Sarhan.

Cooperation in such issues is a must and should not in any way prejudice the outcome of political dispute, in particular the Palestinian right to self-determination and independence and to a viable and sovereign state. All parties have made efforts to bring about a just solution, even if they are acting against the political will of many others.

Israel, like many other countries, including the United States, the European Commission, and other European countries, has appointed an ambassador for climate change. Palestine should do the same to participate in and lead internal and international debates and orientation efforts to implement projects that foster the development of a green and circular economy. Such ambassadors of climate change must push the regional agenda towards a comprehensive action plan, solicit and facilitate project implementation and financing, and enhance local and regional connections and cooperation.

Taking the Basel Convention as an example, signed by Israel and Palestine, the parties to the convention can reach arrangements regarding the transboundary movement of waste, provided that these do not dilute the convention's requirements or stipulate provisions that are less strict.

To align with the signed international environmental agreements, Palestine has to receive full political and financial support – and dedicated development assistance – in implementing and administering a system that enables it to fulfill its commitments. Palestine must also harmonize its local laws and regulations, provide training and capacity building, and secure the tools necessary to implement, monitor, and follow up on projects and the enforcement of environmental laws.

With Palestine joining the 1992 UN Convention on the Law of the Sea, it has acceded to a comprehensive regime of laws that is applicable to the world's oceans and seas and establishes rules that govern the use of their resources, the delimitation of state boundaries, environmental control, economic and commercial activities, and the settlement of disputes between states. Palestine can use the convention to defend its rights in the coastal waters of the Gaza Strip.

A specific legal right provided by the Law of the Sea gives coastal states sovereign rights in a 200-nautical-mile exclusive economic zone over natural resources and regarding

Among the international agreements and protocols to which the State of Palestine has acceded following its recognition as a nonmember observer state at the United Nations are several important water and environmental conventions such as the Convention on Biological Diversity, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the United Nations Convention on the Law of the Sea, the United Nations Framework Convention on Climate Change, the Paris Agreement on climate change, the UN Convention to Combat Desertification, the UN Convention on the Law of the Non-Navigational Uses of International Watercourses, and many others.

Solar panels.

certain economic activities. Palestine's economic future and the corresponding well-being of its people could immensely benefit from the exploration and development of natural gas offshore the Gaza Strip, as all Palestinians have the immediate need for access to additional sources for power supply. Access to our natural gas would greatly improve the power supply conditions in Gaza, which suffers from a lack of energy, as Gazans must cope daily with the most severe shortages. Moreover, gas is less polluting compared to other fossil fuels. Responding to Gaza's energy requirements will also ensure the functioning of the various sewage treatment plants that are currently paralyzed due to a lack of power. Many have remained out of order for many years, contributing to the polluting of the aquifer whose waters have become unfit for human consumption as well as to the pollution of the Mediterranean Sea along Gaza's shores. As Israel forced the desalination facility to stop twice in 2018, ensuring the functioning of Gaza's wastewater treatment facilities will contribute to fulfilling our responsibility to environmentally protect the Mediterranean. The development of our gas field will also secure the energy requirements for the future desalination facility for the Gaza Strip. The West Bank will benefit from swapping energy with neighboring countries such as Jordan and Egypt or Israel.

Importantly, Palestine also has become a signatory to the Law of the Sea Convention and the 1997 draft UN Convention on the Law of Non-Navigational Uses of International Watercourses (UN Watercourse Convention) that is based on the principle of equitable and reasonable utilization of transboundary water while also promoting environmental protection of international watercourses, thereby encouraging regional integration and sustainable development around the world. The State of Palestine cannot be viable without access to an "equitable and reasonable" share of its freshwater resources.

In conclusion, the Palestine Green New Deal joins the world effort of going green[vii] by delinking the environment, particularly climate change, from the political conflict; striving to reach a bilateral understanding between Israel and Palestine that aligns with both states' commitment to signed international agreements; working to reach a mutual understanding regarding the SDG targets related to climate change by enabling projects of resilience, adaptation, and mitigation; enabling Palestine to fulfill its obligations as well as benefit from being a member to key environmental treaties and conventions; enabling access to financial environmental instruments and encouraging a circular economy and clean energy in various sectors; pressuring Israel to enable projects that address clean energy, treated wastewater reuse, sustainable consumption, and fair allocation and joint management of shared water resources; making Palestine's voice heard through assigning a climate change ambassador to ensure internal and inter-sector discussion and external outreach that addresses climate change at local and regional levels; and securing financing in different sectors to facilitate a clean circular economy.

Joining conventions that Israel has acceded to gives the State of Palestine increased leverage in securing the implementation of their recommendations and stipulations.

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[i] A greenhouse gas (GHG) is a gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect responsible for global warming. GHGs come from many sources, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (HFCs, PFCs, and SF_6). CO_2 makes the largest contribution to global GHG emissions.

[ii] *Assessment of Restrictions on Palestinian Water Sector Development*, The World Bank, Apil 2009, available at http://documents1.worldbank.org/curated/en/775491468139782240/pdf/476570SR0P11511nsReport18Apr2009111.pdf; see also *Toward Water Security for Palestinians*, World Bank Group, 2018, available at http://documents1.worldbank.org/curated/en/684341535731512591/pdf/Toward-Water-Security-for-Palestinians.pdf.

[iii] *Troubled Waters – Palestinias Denied Fair Access to Water*, Amnesty International, 2009, available at https://www.amnesty.org/download/Documents/48000/mde150272009en.pdf.

[iv] *Gaza in 2020: A livable place?* UN Country Team in the occupied Palestinia territories, 2012, available at https://www.unrwa.org/userfiles/file/publications/gaza/Gaza%20in%202020.pdf.

[v] Lionell Luca, Jean Glavany, "La géopolitique de l'eau" (The Geopolitics of Water), French National Assembly, October 5, 2010, available at https://www.assemblee-nationale.fr/13/pdf/rap-info/i4070.pdf.

[vi] Gidon Bromberg, Nada Majdalani, and Yana Abu Taleb, *Green Blue Deal for the Middle East*, EcoPeace Middle East, December 18, 2020, available at https://old.ecopeaceme.org/wp-content/uploads/2020/12/A-Green-Blue-Deal-for-the-Middle-East.pdf.

[vii] Such as the US Green New Deal and the European Green Deal that comprise sets of policy initiatives with the overarching aim of making these countries climate neutral by 2050.

Palestine in Focus

Wetlands in the Eastern Mediterranean Region

By Roubina Bassous/Ghattas

The Eastern Mediterranean region includes the southern Levant and part of Mesopotamia – encompassing Palestine, Jordan, Lebanon, Syria, and Iraq – and is known for its rich base of ecosystems and biodiversity hotspots[i] where unique endemics and species mix are found.[ii] In general, the region is characterized by riverine ecosystems with small lakes, coastal lagoons, aquatic systems, and single large river systems. The freshwater eco-region includes the upper Tigris and Euphrates, the Orontes, the coastal Levant, and the Jordan River. This eco-region covers a narrow coastal plain backed by mountain ranges up to 3,000 meters high. The coastal Levant eco-region includes the coastal strip of the Levant that ranges from the western slopes of the Jabal an-Nusayriyah Mountains in Syria to the Lebanon Mountains, the Central Highlands in Palestine, and the Sinai.

The Jordan River is an internal river of 360 kilometers in length that originates at the Syria-Lebanon border. Its tributaries are the Hasbani, which flows from Lebanon, the Banias River, which emerges from a spring at Banias at the foot of Jabal as-Sheikh (Mount Hermon), and the Dan River, also sourced at the base of Jabal as-Sheikh. The Jordan River then flows through Buhaira at-Tabariyya (Lake Tiberias) before it receives its main tributaries, the Yarmouk River and the Zarqa River. Due to the diversion of the Jordan River's flow, however, it has become not more than a stream. Wadis – valleys with intermittent watercourses – that flow into the Jordan include Wadi Mujib, Wadi Mousa, Wadi Hassa, and Wadi Zarqa. The river's waters feed into the Dead Sea, the hypersaline lake located in an elongated depression in the Jordan Rift Valley. The wetlands around the Dead Sea are home to the indigenous bird called the Dead Sea sparrow (*Passer moabiticus).*

The Eastern Mediterranean Wetlands are among the important ecosystems that enrich the region with unique biodiversity and contribute to human well-being and livelihood with valuable ecosystem services. These areas are known to contain water in whole or in part or a high percentage of moisture and water throughout the year or for a temporary period. They are divided into natural wetlands, such as lakes, rivers, swamps, marshes, and stretches with fresh or salty surfaces, and artificial ones such as dams and others. Wetlands across the Eastern Mediterranean region provide a wide variety of ecosystem services, including water, food, and income. The main services provided by wetlands include reed-plant harvesting, with reeds being used as fodder and material to make roofs, baskets, and fences; they constitute a key source of income in the area. Furthermore, they run water-powered grain mills, as local communities traditionally used water to generate energy to grind their harvested wheat. In addition, they are a source for sea salt harvesting, as salt ponds adjacent to the Dead

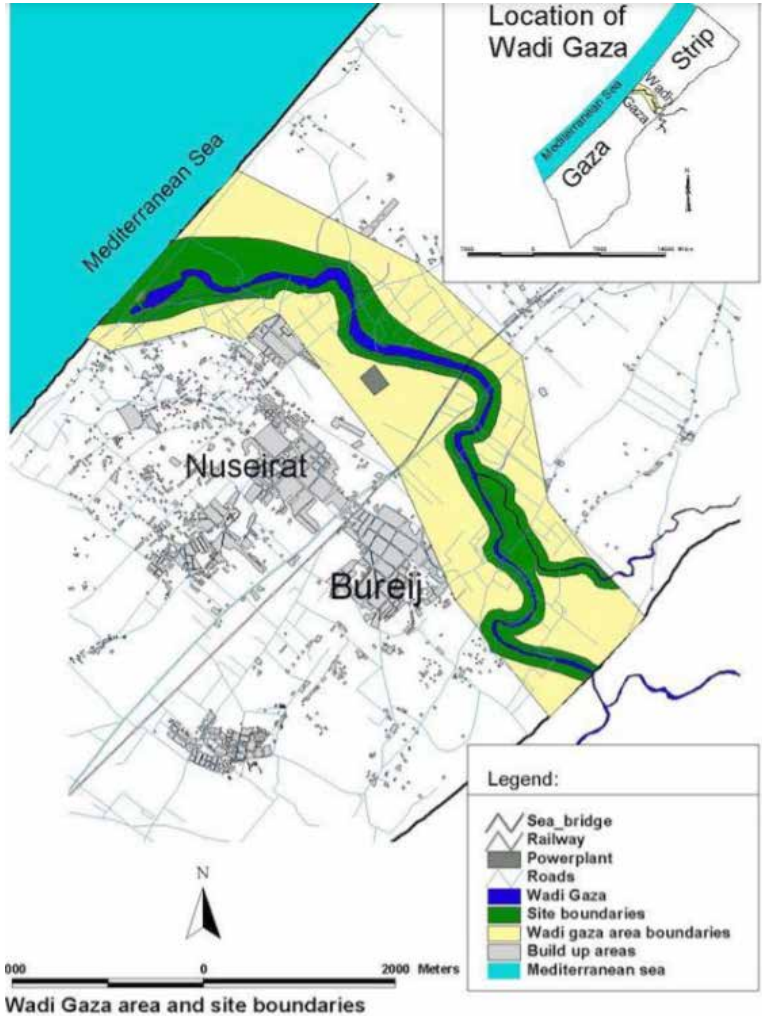
Wetland habitats are important ecosystems of unique biodiversity that contribute to reducing soil erosion, controlling floods, and decreasing their adverse impact.

Wadi al-Badan. Artwork by Anwar Al-Fares.

Sea are used for the production of salt and hence provide employment for local communities. The saltpans secure a safe breeding location for flamingos (*Phoenicopterus roseus*) in several sites along the Eastern Mediterranean wetlands. The wetlands provide runoff management services, as the sedimentation of eroded soil increases the soil fertility in valleys, and groundwater is purified from sediments and organic pollutants. Rivers function both as corridors

There are a number of wetlands in Palestine.

that contribute to the maintenance of ecological continuity in natural systems and as high-quality leisure and recreation areas between urban areas and within cities. They are habitats for a diversity of freshwater fish and other species:



Wadi Gaza area and site boundaries

of the 1,236 species studied by IUCN[iii] of freshwater fish, mollusk, odonate (dragonfly and damselfly), freshwater plant, bird, amphibian, crustacean, and mammal, up to 29.8 percent are endemic to the Eastern Mediterranean region.[iv] Finally, there is the indirect value of the Eastern Mediterranean wetlands that provide flood control, groundwater recharge, and climate change mitigation.

Palestine is characterized by its great ecological diversity, dense vegetation, and wide wildlife base. It is an essential crossing-land for migratory birds between the continents of Europe, Asia, and Africa. Among the ecosystems available in Palestine is the important wetland system that comprises interconnected habitats for the rarest or most endangered birds and other freshwater species. However, Palestine's multiple surface-water resources, including the Jordan River and the permanent and nonpermanent valleys that flow into the Mediterranean Sea, the Jordan Valley, and the Dead Sea, are now considered scarce, as there is currently a limited number of surface-water sources in the West Bank and Gaza Strip, as most valleys flow for only a few weeks a year, usually in the form of temporary flash floods, and this source is difficult to collect and exploit. In most valleys, complex geological/geographic characteristics are transformed due to the absence of major natural storage dams (few plains and an underground layer of limestone). There are many regions that are considered wetlands of interest, and some of them are of international importance. These areas include the Jordan River, Wadi al-Badan, Wadi al-Qelt, Ein al-Fashkha, Marj Sanur, Ein Qinina,

Wetlands gain economic importance as they are considered productive natural wealth that provide livelihood materials for people, services, and ecological and environmental functions for various living organisms. In addition, they are a continuous renewable source of groundwater.

Wadi al-Malih, and Wadi Gaza and Gaza beach, among others. Some famous wetlands of aesthetic and ecological value are described below.

Wadi Gaza extends along the eastern borders of the Gaza Strip. Its springs lie in the Negev hills and the southern heights of Hebron. The tributaries that feed Wadi Gaza have their sources in the central mountain areas, the low heights north of the Negev, and the west and southwest parts of the Hebron Mountains. The feeding and drainage basin of the valley covers an area estimated at 3,391 square kilometers, while the wadi's length is about 105 kilometers from its source to the coast where it discharges into the sea. Its circuitous route from the Strip's eastern border to the sea is 7 kilometers, with a maximum elevation of 30 meters above sea level. Thousands of ducks, herons, storks, cranes, flamingos, waders, raptors, quails, passerines, and other birds have been reported

to pass through Gaza. The most common endemic bird is the Palestinian sunbird (*Nectarinia osea*) found throughout the year. Studies show that there is an urgent need to protect Wadi Gaza and its surrounding vegetation communities, as these habitats contain the highest value for the flora and fauna. The threats to these habitats are quite severe, and Wadi Gaza faces many environmental problems that affect public health, as it is used as a collection point for sewage from the refugee camps in Gaza's central area and as a dumping site for solid waste. Thus, Wadi Gaza has been placed on the Tentative List of UNESCO's World Heritage List Nominations.[v]

Wadi al-Badan is located in the Nablus governorate. It is an area that attracts tourists because of its natural beauty and distinctive scenery, the diversity of its terrain, its vegetation, and the abundance of water springs. There are seven permanent springs in the village of Al-Badan, distributed through streams that all converge to form Wadi al-Badan. As a result of the abundant availability of water, about 12 ancient water mills were built in the past that were used to grind grain. Streams and water channels cover the permanent vegetation, especially reed trees, which are still exploited in handicrafts and used in parks or to make mats and roofs for sheds. In the village of Al-Badan there is an eight-kilometer-long walking path that enables tourists to see the picturesque landscapes throughout the year, as it passes along many rocky slopes and through varied vegetation. The path also sheds light on the Palestinian culture in the village of Al-Badan, where one can see the lands planted with almonds and citrus fruits, in addition to the existing natural forests in the surroundings. However, the area needs appropriate environmental and conservation measures to sustain the natural resources, landscapes, and the tourism sector that it relies on.

Wady al-Badan. Mahmiyat.

Marj Sanur is an inland valley with an area of about 583 square kilometers, located in the Jenin governorate in the West Bank. Several villages and towns overlook the valley and share ownership of its lands, namely, Sanur, Mithloun, Jerba, Musalla, Sir, Al-Jadida, and Siris. Marj Sanur is located to the southeast of Jenin and is famous for its fertile land, as there are water wells that support vegetable farming. At times, it is completely filled with water and looks like a beautiful lake. The *marj* sometimes brings great losses to the inhabitants due to the flooding of a large portion of its lands with rainwater and the consequent loss of the agricultural season, in addition to the spread of insects and rodents. More than 26,500 Palestinians depend on the water and economic resources of this area, and it is an important tourist area especially when the *marj* is full of water.

> Wetlands preserve the gas balance in the air and the hydrological and chemical balance of water; they also support other habitats and food chains.

Eín al-Fashkha.

Ein al-Fashkha, located on the western side of the Dead Sea, is home to the springs called Oyoun al-Fashkha. They are small, but they are considered to be a refuge for many migratory birds, as large plants grow in the area, the most important of

which is the reed. The water of *al-ain* emerges from the ground very close to the Dead Sea. Thanks to this spring, the spot was transformed into agricultural land, which has been exploited by the Israeli occupation to obtain agricultural products and foodstuffs. Previously it had been an important resource for the Palestinians living near the area. It is worth noting that this area, which is rich in economic and vital resources, cannot be accessed or used by the Palestinians.

Wetlands are considered to be particularly sensitive to activities that affect them. On the level and quality of water, wetlands suffer from a reduction in their water volume, planting along their borders, and neighboring urban development, in addition to the excessive exploitation of their resources. Despite the significance of these areas, few are aware of their importance and the need to preserve them as an integrated ecological and biological system.

Passer moabiticus.

These areas are among the most important characteristics of the country, as they maintain an integrated and homogeneous environmental system. But their environmental and strategic importance has not spared them the risk of neglect and erosion, as their existence is threatened by sewage water and other human excesses.

There is an urgent need to study these areas and declare the most important of them to be natural protected areas, a task for the relevant stakeholders, mainly the Environment Quality Authority. It is of importance to equip the governing and/or managing bodies with the necessary mechanisms and tools to achieve sustainable management of these areas. We must obtain support through the signing of the International Ramsar Convention[vi] to help ensure the conservation and sustainable development of these areas and hence become registered under the International Wet Zone List. This will contribute to the continuous evaluation of the status of these areas as well as to their rehabilitation, the elimination of pollution causes, and the conservation of plant and animal species that depend on them, while focusing on their value in order to preserve their natural components for maintaining and sustaining environmental, social, and economic balance.

A Ramsar site is a wetland site designated to be of international importance under the Convention on Wetlands, known as the Ramsar Convention, which is a UNESCO-established intergovernmental environmental treaty that came into force in 1975.[vii]

Roubina Bassous/Ghattas is the founder and director general of Pioneer Consultancy Center for Sustainable Development (PCC). She holds a master's degree in biological sciences from Birmingham University, United Kingdom, and has extensive experience in nature resource management and conservation, food security, livelihood enhancement, and agriculture sustainability. PCC aims to provide expertise/services in diverse fields, including heritage and biodiversity conservation, climate change adaptation, clean environment, and green solutions. It also works to generate economic/educational benefits and empower local communities. Contact PCC at roubina@uems.ps.

[i] Hotspots are regions that contain at least 1,500 species of vascular plants (> 0.5% of the world's total) as endemics, and have lost at least 70 percent of their original habitat. For more information, please visit the webpage *The Mediterranean Red List of the International Union for the Conservation of Nature (IUCN)*, available at https://www.iucn.org/regions/mediterranean/our-work/biodiversity-knowledge-and-action/biodiversity-status-and-trends/mediterranean-red-list.

[ii] For an outline of the area, visit the interactive map provided by the organization Fresh Ecoregions of the World, available at https://www.feow.org/ecoregions/details/436.

[iii] K.G. Smith, V. Barrios, W.R.T. Darwall, and C. Numa, eds., 2014, *The Status and Distribution of Freshwater Biodiversity in the Eastern Mediterranean*, Cambridge, UK; Malaga, Spain; and Gland, Switzerland: IUCN, pp. xiv+132.

[iv] They are found nowhere else in the world (https://www.iucn.org/regions/mediterranean/our-work/biodiversity-knowledge-and-action/biodiversity-status-and-trends/mediterranean-red-list).

[v] Wadi Gaza Coastal Wetlands, UNESCO Tentative List, available at https://whc.unesco.org/en/tentativelists/5722/.

[vi] Ramsar organization's website is available at https://www.ramsar.org/.

[vii] For more information, please go to Ramsar organization's website at https://www.ramsar.org/.

Greening Moonshot

By Majed Ghannam

Achieving the ambition of the 2030 Agenda for Sustainable Development requires a new approach to everything we do: the more disruptive we are, the more transformational the solutions will have to be. UNDP knows from experience that incremental change is not enough. We have to be committed to "walking the talk," adapting the way we operate internally to mitigate, minimize, and offset the impacts of our own operations and programs, and challenge ourselves to define new standards both in the UN and beyond.

One of UNDP's commitments is to be green, sustainable, and just. While UNDP has been climate-neutral in its global operations by procuring carbon credits since 2015, offsetting is not enough. Over the years, colleagues throughout the organization have developed innovative and effective approaches to reducing UNDP's environmental footprint, from introducing policy and procedural measures needed to support a 100 percent green electricity target to upgrading UNDP's fleet to electric vehicles, making UNDP operations paperless, and developing "green" criteria for UNDP facilities. Hence came the launch of the "Greening Moonshot" initiative.

The first round of the Moonshot Facility call for proposals, targeting UNDP country offices, was launched in order to support this transformation and incentivize contributions to the Moonshot targets.

As UNDP's Programme of Assistance to the Palestinian People, we were ready to replicate and scale existing initiatives, using what we have learned and enabling transformations so that we can operate in an environmentally sustainable manner. We competed with other UNDP Country Offices across five regions, and our business case was among those selected to receive support from the Greening UNDP Moonshot Facility.

Our business case focused on our office building in Gaza and the chronic electricity crisis facing the Strip. The idea was to take initial steps towards transforming the building into a smart UN facility. One way to improve energy supply and reduce deficit was to find new sources of electricity. With Gaza enjoying 300 days of sunny weather per year, solar energy is most promising to add new resources to the electricity grid.

On average, the office has access to the electricity grid between 4 and 12 hours per day. Therefore, to meet the consumption demands, the office uses three generators of 500-kVA, 250-kVA and 65-kVA capacity that use diesel as fuel, and the cost of diesel for the generators is US$0.7/liter.

To credibly claim climate neutrality, UNDP is committed to reducing greenhouse gas emissions from global operations by 25 percent by 2025 and by 50 percent by 2030, implementing the best waste management in all UNDP premises and minimizing the use of resources.

© UNDP/PAPP – Abed Zaqout.

The proposed solution will not only reduce the carbon emissions but also significantly increase the reliability and the electricity supply to the premises, cover the critical load while reducing dependency on generator fuel, and increase the autonomy of the energy asset in case of outages. The solar PV installation, supported by a storage system, will generate 60 KWp and provide a battery storage capacity of up to eight hours.

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Energy scarcity and lack of access to energy are among the major constraints to Palestinian socioeconomic development, particularly in Gaza. Clean energy can provide affordable solutions that are in line with climate targets and that can help mitigate the effects of the COVID-19 crisis on people's livelihoods and the local economies.

With economic savings being strongly dependent on electricity and diesel fuel prices, we estimate an annual cost saving of around US$19,000 or 71 percent of generator diesel usage reduction, respectively. Switching to renewable energy also has strong environmental incentives. The proposed system can save approximately 75 tons of CO_2 emissions yearly, effectively reducing the carbon footprint on the environment.

The project is expected to be completed in May 2021, followed by a commissioning and testing phase for the whole system, and accompanied by staff training for its operation and maintenance.

Since our office in Gaza does not only host UNDP staff, other UN agencies can also benefit from implementing a green energy solution, compared to a traditional setup. It will also encourage the local community to adopt a similar approach and contribute to the achievement of the sustainable development goals.

UNDP, through its projects in Gaza, has already generated approximately 2.5 MW of solar energy in educational, health, social, and wastewater treatment facilities, with a total investment of more than US$6 million, thanks to the support of multiple partners, including Japan, Norway, Islamic Development Bank, Qatar Fund for Development, Saudi Fund for Development, and OPEC Fund for International Development.

Majed Ghannam holds a master's degree in water resource management and conducted advanced studies in integrated water management. He has been working as a program manager at UNDP/PAPP since 2011. Prior to that, he worked as a water and wastewater facilities quality assurance manager in several countries, including Kuwait, Yemen, Jordan, and Canada. Majed has extensive experience in water, energy, renewable energy, and environmental projects, in addition to the social, health, and educational infrastructure sectors.

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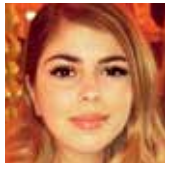
Palestinian Olive Trees

An Environmental Tragedy or a Tragedy of the Conflict?



By Amira Gabarin

Olive trees have a special place in the heart of every Palestinian. Not only do they provide an economic lifeline for the more than 80,000 families that grow them in the West Bank alone,[i] they also serve as a symbol of steadfastness and political resistance as olive trees that are thousands of years old link our people to their land in one of the greatest and most beautiful living examples of Palestinian identity and cultural heritage. Olive tree farming goes back almost 6,000 years in the MENA region, and of course, olive-based products are also a key ingredient in Palestinian cuisine.

This article includes the insight of two people who appreciate both the national importance of olive trees and the many obstacles that face those who grow and cultivate them. Dr. Husam Zomlot, is the Palestinian ambassador to the United Kingdom and has previously served as the head of the PLO mission to the United States. Mohammed Ruzzi is the manager of the Palestine Fair Trade Association (PFTA), a nongovernmental organization founded in Palestine in 2004 as a union for all Palestinian fair trade farmers and those interested in working in fair trade.

> "If the olive trees knew the hands that planted them, their oil would become tears."
>
> Mahmoud Darwish

Historically, Palestine's Mediterranean climate with long, hot summers and cool but mild winters has been ideal for olive trees to grow and prosper. While the natural environment might imply that the conditions in Palestine are near perfect, various environmental challenges have had severe consequences for olive trees and the farmers, many of whom rely on them for their survival. Even though olive trees are resilient, climate change has had a negative impact. The *Olive Oil Times* reported in late 2020 that production dropped by nearly 70 percent in the current crop year, moving from 39,500 tons in 2018–2019 to 12,000 tons in 2019–2020. Global olive oil production was also predicted to be at its lowest level since 2016–2017. This is a regional and indeed global problem that affects other Mediterranean countries as well.

Mohammed agrees that lack of rain, caused by the warming of the Sahara Desert and Mediterranean Sea, is among the greatest environmental obstacles that Palestinian farmers face. While irrigation could help improve this, it requires water which farmers don't have. As we discuss what appears to be an environmental challenge, Mohammed reminds me that it has a political component: "It's difficult to find water in Palestine. We are not allowed to dig wells because Israel controls everything below the ground. If a farmer digs a well, the Israeli authorities will destroy it, forcing the farmer to pay for the destruction." The occupation authority's restrictions on access to water, Mohammed explains, affect

> "Olive trees represent both our history and our future." Mohammed Ruzzi, manager of PTFA.

Photo by Emile Ashrawi.

In the fields of Deir Ballout. Photo by Daoud Abdallah, courtesy of Palestinian Assembly for Photography and Exploration.

not only olive trees but all kinds of crops. Possible solutions have been advocated regionally. But whereas in Tunisia, farmers are advised to grow olive tree species that resist dry weather and focus their efforts mainly on the parts of the country where there is more rain, Palestinian farmers cannot follow such advice due to the tight confines to which they are restricted, particularly in Area C, where the majority of farmlands are located.

On a positive note, although olive trees have suffered in recent years due to climate change, some researchers and agronomists believe that climate change impacts them positively, predicting that an increase of the average yearly temperature by 1.8 degrees Celsius might increase olive production among 97 percent of the olive oil producers in the world.[ii] This study also argues that higher temperatures might alleviate the problem of fruit flies damaging oil production because these pests would thrive less in higher temperatures.

While the environmental challenges that result from global warming are shared by nations all over the world, most damaging and heartbreaking to Palestinian farmers and the Palestinian people collectively is the intentional uprooting and destruction of their olive trees. The destruction of ancient and precious olive trees is more than a symbolic blow. Described by journalists as a "war on the environment," 2020 was the harshest year for farmers so far, as over 8,400 olive trees were uprooted or burned.[iii] The first months of 2021 have shown no signs that this destructive trend might be slowing down, as Moataz Bisharat reported to Anadolu Agency on January 27, 2021: The military destroyed over 10,000 forest trees and around 300 olive trees in a nature reserve of over 98 acres in Ainun area in the city of Tubas.

It is important to clarify that the destruction of olive trees is not just an act of extremist settlers who attack all types of Palestinian property. While this happens on a daily basis, the more shocking attacks are systematic, as the Israeli military and state frequently engage in orchestrated attacks. Dr. Zomlot states, "What the uprooting of olive trees in occupied Palestine represents is the attempt by Israel – the settlers and the occupying military that protects them – to rid themselves of the land's indigenous population. They wish to defeat our struggle for freedom, statehood, and justice." Between 2001 and 2012, the Israeli military and settlers have collectively destroyed at least half a million olive trees.[iv]

> "The uprooting of trees is not just a crime against the trees or the Palestinian people, it also harms the environment and undermines the natural habitats of our environs, setting back the global struggle against climate change."
>
> Dr. Husam Zomlot

Mohammed also mentioned a recent incident in Deir Ballut village near Salfit, where much of the land is located near settlements and the separation wall. "Last month, Israeli bulldozers uprooted more than 3,500 trees. No reason was given. If you asked the Israeli authorities, they would say that they were planted in Area C which is under full Israeli control. The Israeli authorities informed the farmers that they were planning to uproot the trees. The farmers appealed, but no legal decision has been made so far, and the army uprooted the trees anyway."

An important dimension is the financial significance of the olive market and its importance in the Palestinian struggle to achieve economic sovereignty. As many farmers depend mainly on olive trees for income and financial security, the State of Palestine National Export Strategy reported that the olive sector employs over 15 percent of working women[v] and is worth between US$160 million and US$191 million.[vi]

Understanding the economic power that olive tree cultivation brings to the Palestinian people, Mohammed asserts that the PFTA has a positive impact on farmers by encouraging sustainability, fair prices, and the existence of Palestine unions. The PFTA works with over 1,200 farmers as direct beneficiaries in over 50 West Bank villages. "Our role includes helping farmers produce high quality products with added value, which includes fair trade and organic certification." They export to over 19 countries internationally. PFTA engages to ensure that farmers obtain better prices for their products if they are of the finest quality and produced under fair trade conditions. This benefits all farmers by driving up the market price. Mohammed reminds me that in 2005, the market price for olive oil was 8 shekels per liter and the fair trade price was 16 shekels, whereas now, the minimum fair trade price is between 25 and 30 shekels.

PFTA's work benefits not only the producers of olive-based products but also the environment. Through the Trees For Life program, created in 2006, it has distributed free

Palestinian farmers inspect the damage done to their olive trees that were cut down by Israeli settlers. Issam Rimawi /Anadolu Agency.

of charge thousands of almond and olive trees in Palestine. The program targets people from all walks of life, including young couples, poor families, and women. "Anyone interested can apply. In the last planting season, more than 230,000 olive and almond trees were planted in the West Bank, and thousands of farmers benefited from our program that was funded by fair trade partners and supported by international solidarity efforts," Mohammed explains.

Protecting olive trees and the environment in Palestine is also a form of resistance. The PFTA works with Zaytoun, a nonprofit social enterprise founded to support Palestinian farmers who plant new olive trees daily in the places where trees have been uprooted. "Planting the trees is risky," Mohammed admits, "but we need to plant and link the farmers with their lands. It's important that farmers go to their land every day and show the Israelis that we own this land. Ownership of land is the soul of the conflict between Palestinians and Israelis." Mohammed also urges farmers to keep careful records, including notes on what grows, when it was planted, who planted it, and so on. Agreeing with Mohammed on the importance of replanting trees, Dr. Zomlot also stresses the importance of "international scrutiny and accountability, given the role of the Israeli military in protecting these settlers."

Olive oil from Palestine is considered among the highest quality olive oil worldwide.[vii] As global warming threatens olive trees everywhere, it is likely that this oil will become even more precious in the coming years. Moreover, the assault on olive trees is an assault on history as some of the destroyed trees are thousands of years old. Historians should be as outraged about their destruction as they are when Daesh destroys ancient churches or libraries in Iraq.

The protection not only of olive trees but of all Palestinian property and, most importantly, of people is intrinsically connected to peace and the end of the illegal Israeli occupation. Palestine must face the environmental challenges of global warming as it tries to navigate the military occupation. Given that Netanyahu continues to lead Israel, it is difficult to see how change could come from the inside. Dr. Zomlot stresses, "We are constantly reminding the international community of its responsibility to hold Israel accountable, raising the issue of settler violence with governments and parliaments worldwide with specific demands for protection and accountability, and appealing to the International Criminal Court for justice." Consumers can help this along by supporting Palestinian fair trade products and continuing to support the BDS movement. To protect the environment, we must also support those who are trying to protect it.

Protecting Palestine's natural environment is a historical, religious, environmental, and human

> **"If environmental questions were not about politics, then governments all over the world would have taken much stronger action much earlier. In Palestine, the occupation masks a multitude of sins, one of which is that resources are diverted from efforts to secure the proper care and protection of the environment in a manner that would befit our heritage and treasures and preserve the natural environment."**
>
> **Dr. Zomlot**

Stolen harvest, photo courtesy of Grassroots International.

Palestinian farmers protest after Israeli security forces uprooted olive trees reportedly located within Area C in the occupied West Bank village of Deir Ballut.

rights issue. While the creation of trade unions is a step towards functioning statehood, the PFTA and the Palestinian unions are also essential in our resistance to Israeli aggression, enabling us to voice our needs and represent our citizens. Asked for his advice to farmers, Dr. Zomlot replied, "Remain steadfast and have faith. We have survived wars and the attempt to wipe us out. We will survive this. Whenever we can, we work together to ensure that farmers and all citizens can enjoy their land and its fruits in freedom and peace."

Amira Gabarin is a 23-year-old journalist based in London. She writes for a range of publications, including The Telegraph *and* CBS News*. She is passionate about charity work and international affairs.*

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Photo by Firas Jarrar, Palestinian Assembly for Photography and Exploration.

The National Flower of Palestine
Faqqua Iris


By Imad Atrash and
Maha Abu Gharbieh

The concept of protecting Palestine's natural environment has been gaining prominence in Palestinian society, at both regional and global levels. The Environment Quality Authority (EQA) was established in 1996 and united in partnership with the Palestine Wildlife Society in 2001. Both organizations work with civil and official institutions in the fields of nature protection and awareness raising regarding the value of Palestine's nature and Palestinian cultural heritage.

Since 1967, Israeli occupation authorities have aimed to separate Palestinian society from its natural surroundings while presenting themselves as the protectors of the environment. However, many Palestinians were determined to preserve nature long before the Palestinian Authority was established following the Oslo Agreement. In 1999, 13 Important Bird Areas were identified in the West Bank and Gaza Strip and recognized nationally. Most recently, 15 Key Biodiversity Areas in the West Bank have been proposed and are waiting to be approved at the national level.

Despite the Israeli occupation and the associated destruction of natural areas, grassroots organizations and NGOs in the West Bank and the Gaza Strip as well as the EQA have succeeded in identifying and protecting natural sites and their creatures. Thus, Palestine's national bird, the Palestinian sunbird (*Cinnyris osea* عصفور الشمس الفلسطيني), and the national flower, the Faqqua iris (*Iris haynei* سوسن فقوعة) are now considered to be intrinsic symbols of the State of Palestine.

Faqqua irises thrive in the special climate of the Faqqua mountains where they bloom in an area distinguished by natural diversity and beautiful terrain. In general, they exist in ranges from Marj Ibn Amer to the Bisan mountains and valley, the eastern foothills of the Jordan Rift Valley, and the slopes of the mountains east of Jerusalem. Our field survey found that the Faqqua iris is widespread in the mountains surrounding the village of Faqqua after which the flower is named.

Iris haynei is also called the "royal iris" because it grows only one flower at the top of the stem that dies while standing straight. It is a tuberous ground plant that grows 30 to 60 centimeters tall and may even reach 75 to 80 centimeters in height, depending on the amount of rain in a particular year.

The concentrated iris area is found in between Arabuna village and Deir Ghazaleh, and from the village of Faqqua to the borders of Jalboun village in the south. This area has a view of the Nazareth mountains, and its original borders are the lands of Bisan and Jabal Tabor. It includes the villages and towns of Deir Abu Daif, Al-Mughayir, and Zababda. The specific area of dense iris fields is within the borders of the village and mountains of Faqqua, covering no more than 20–25 square kilometers; the only country in the world that possesses such a dense field is Palestine. That particular area is a fascinating display of natural terrain, with hills rising 450 meters above sea level, the highest in the eastern region of the mountains of Marj Ibn Amer. It rains at the high rate of 500 mm annually, and its fertile soil and attractive rocks permit the iris to grow comfortably. In

addition, it exhibits great biological diversity, featuring a wide variety of plants and natural land. It is on the path that global migratory birds take on their seasonal journeys between Europe and Africa in autumn and spring.

More than a century ago, the English botanist John Gilbert Baker (1834–1920) insisted on naming the unique flower of the iris family with its distinct colors and scent after the name of the village that he visited for the first time.

In 2016, the Palestinian Council of Ministers declared the Faqqua iris the national flower of the State of Palestine, according to EQA recommendations. In 2017, the first Iris Celebration was held with 50 participants; in 2018, more than 500 people attended; in 2019, more than 10,000 people from various parts of the West Bank and around the world participated in the flower season.

Furthermore, the Palestine Wildlife Society was able to obtain funds for two consecutive projects to support the conservation and sustainability of the iris at both the national and global levels. The first project was implemented through the Small Grants Programme, the Global Environment Facility program, and the United Nations Development Programme (GEF-SGP-UNDP-PAPP) to support the iris's conservation at the national level in partnership with the EQA. This successfully led to the establishment of a field laboratory that specializes in irises in Faqqua village.

The second project is currently in progress, supported by Birdlife International's Critical Ecosystem Partnership Fund, and carried out by EQA in cooperation with An-Najah University, the Arab American University, and in cooperation with Dr. Magda Abi Daher at Saint Joseph University in Lebanon. In addition, the World Forum for Nature Protection and the village council of Faqqua provided donations to protect its land. This project focuses primarily on research regarding the iris's reproduction processes. Amer Brahma, a master's level student, works with researchers Munir Salah and Ahmed Al-Omari to prove that this flower can reproduce through seeds, whether in the laboratories of local universities or directly in nature. This is critical to prevent the decimation of this iris and the loss of the national flower of Palestine.

According to the standards of the largest institution for the protection of nature and the categories of the International Union for the Protection of Nature (IUCN), the Faqqua iris is placed at the top of the list of vulnerable species. The number of irises has decreased dramatically, and there is a high possibility of extinction. Therefore, the Palestinian community must make an effort to unite with the official and civil authorities to develop a plan to protect it as much as possible. Realizing that *Iris haynei* is a vulnerable species, the IUCN has directed its attention to efforts to improve the circumstances that are threatening its survival.

When the public was given information about the iris and the village, the Palestinian Authority issued a Palestinian stamp with its image, and tourist paths were marked for visitors. Mr. Barakat Al-Omari, head of the Faqqua village council explains that for many years, Faqqua village had not been placed on the Palestinian tourism map. But with EQA support, the village has benefited from several projects, including being connected to a water network, the construction of agricultural roads, and more. The village has flourished and been revitalized as the local community welcomes visitors with a passion for nature paths, plants irises in a variety of different colors, and strives to coexist with the wide biological diversity of its natural surroundings. Hence, the Faqqua iris was never abandoned. It has been introduced into the educational curriculum and gained attention at the highest international levels of cooperation even though it is not yet as widely mentioned as it deserves.

Today, the Faqqua iris is considered to be an element of Palestinian national heritage and efforts are under way to raise national awareness of the importance of protecting the environment. Our natural environment and national heritage must be safeguarded from theft and counterfeiting in efforts that demonstrate the strength of Palestinian civil society.

The Faqqua iris can be found in poetry and music. Famous singers and artists such as Tariq Abu Obadiah, Abdullah al-Hajj, Hawa Hassan, Fairuz, and others mention it in their songs.

Imad Atrash is the executive director of the Palestine Wildlife Society, an organization that engages in the conservation and enhancement of Palestinian biodiversity and wildlife through the protection and management of species and habitats. For more information, please visit https://www.birdlife.org/middle-east/partners/palestine-palestine-wildlife-society-pwls.

Maha Abu Gharbieh is a student of business administration at Bethlehem University and a volunteer with the Palestine Wildlife Society.

Birds of Palestine

Status, Threats, and Conservation

The griffon vulture is among the largest flying birds in the world, with a wingspan of up to three meters. The breeding population of this vulture is extinct from Palestine, but some individuals can be seen during migration or dispersing from nearby countries. It can soar up to a height of 10,000 meters while migrating or foraging.

By Anton Khalilieh and Yara Dahdal

Since the outbreak of the COVID-19 pandemic, most of our meetings have been held online, as is the case for many people. The other day, during one of these meetings, an old ecologist friend who lives abroad remarked: "It seems you live in a good and healthy place. I can hear birds singing in the background." His comment reminded us that we often forget how blessed we are to live in such a rich and diverse spot of the world.

Birds continue to be the most varied group of land vertebrates in our globe, and Palestine has a good share of this wealth due to its distinct location in the heart of the Middle East, as well as at the junction of the three continents of Asia, Africa, and Europe. Furthermore, four different biogeographic zones (Mediterranean, Irano-Turanian, Sudanian penetration, and Saharo Arabian) are packed within a small area that is directly linked to the rich flora and fauna within. Palestine is characterized by various natural habitats that include natural and manmade forests, a desert and coastlines, plains and cliffs, rocky slopes and cultivated fields, and mountains and hills, each accommodating distinctive bird species.

According to our comprehensive survey at Nature Palestine Society, there are 367 bird species that inhabit our surroundings at various times of the year. Around one-third of them breed in Palestine. Breeding birds may stay all year long, such as the chukar, spectacled bulbul, and Palestine sunbird, the national bird, and are usually referred to as "exclusively resident breeders." Others come only during the spring to breed and raise their chicks, and afterwards migrate by the end of the summer. These are usually identified as "exclusively summer breeders" and include the lesser kestrel, woodchat shrike, and long-eared owl. Finally, there are species that are a mix of both, categorized as "complex breeders," such as the Spanish sparrow. Around 150 bird species, such as the stonechat, visit Palestine during the winter season to enjoy its mild cold weather. In addition, there are more than 220 species that pay a visit to Palestine twice a year on their epic spring journeys of migration from Africa to Europe, and vice versa during the autumn season. It is worth mentioning that Palestine sits on the second most important migration flyway route, as 500 million birds pass through our skies. Sometimes they stop for a few days or weeks to feed and rest at what we call stopover sites, attracting birdwatchers, birders, scientists, and nature lovers from all over the world during the migration seasons.

The Palestinian environment in general faces major threats and challenges that are directly reflected in birds' habitat, well-being, and diversity. Habitat fragmentation and urban expansion are destroying birds' nesting sites and foraging territories. The unsustainable use of pesticides and other chemicals in agriculture is poisoning birds and decreasing their numbers tragically. Climate change and its consequences (rising temperature, dryness, and shifting in seasons) affect the annual lifecycle of birds and their ability to nourish and reproduce. Anthropogenic disturbances by wildlife photographers, hikers, and curious individuals constitute a major threat to nesting parents and their chicks. Moreover, bird capturing, nest poaching (eggs

The Palestinian environment faces threats that directly affect the habitats, well-being, and diversity of birds.

and chicks), and hunting habits embedded in our culture exacerbate the war that authorities, civil society organizations, and nature lovers must wage every day.

If readers are still not convinced about the importance of bird conservation efforts, the following numbers should change their minds. Studies show that on the national level, eight bird species are critically endangered, seven bird species are endangered, nineteen bird species are vulnerable, eighteen bird species are near threatened, and seven bird species are extinct. This means that more than 35 percent of the total number of breeding bird species in Palestine are in the red zone. Conservation efforts will help to protect many of these species from extinction.

Numerous conservation efforts are being channeled towards conserving birds in Palestine, all with the support of the Environmental Quality Authority (EQA) and the help of the Environmental Police. The authorities are constantly following up on complaints concerning captured birds that are then inspected by ornithologists, freed when possible, or rehabilitated if needed before setting their wings free.

One of the most exciting and successful efforts was the rehabilitation and freeing of the critically endangered majestic Bonelli's eagle. The story begins when one of the nature lovers learned about an eagle that had been captured by hunters. Initially, he was not aware of the importance of the bird (currently only two pairs reside in the West Bank), but his sense of duty urged him to approach the Nature Palestine Society. After some negotiations, the hunters agreed to hand over the ill bird. The eagle suffered from dehydration, malnutrition, and broken talons. After months of rehabilitation, a GPS telemetry was installed on the back of the bird for the first time in Palestine. The eagle was freed in Tamoun Nature Reserve during a large event under the auspices of the EQA that included local authorities in the Tubas governorate and community members. The eagle has been free for two years now, flying over 20,000 square kilometers. The eagle seems to like both the east and west banks of the Jordan River (see map that tracks its movement).

A golden eagle, another critically endangered species with only one pair remaining, was handed to the Nature Palestine Society by another responsible environmental activist. This eagle suffered from lead poisoning due to tens of bullets that were shot at him by hunters (see X-ray image). The long rehabilitation process was successful, and the eagle was freed back into nature, carrying our hopes and wishes that it would soon find its spouse.

In 2020, the Nature Palestine Society succeeded in rehabilitating and freeing 50 different bird species, an effort that would not have been possible without the close cooperation and coordination between the EQA, the Environmental Police, local authorities, nature lovers, and our amazing volunteers. The journey has started, and we are proud of our achievements. But achievements must always be accompanied by responsibilities. Nature Palestine Society has a mission to maintain and sustain.

Much work remains to be done to preserve bird habitats in Palestine.

Despite all the conservation efforts, more needs to be done. Authorities, civil society, stakeholders, and every member of the Palestinian family must work hand in hand to maintain bird habitats and natural areas. Development is unavoidable but must be done in a sustainable way to minimize harm to nature and its components. There is still room for more research to better evaluate the status and distribution of bird species in Palestine. Additional public awareness campaigns need to take place in order to educate the community about the importance of birds to our environment and health. Stakeholders must engage society in their conservation efforts and activities to encourage a sense of responsibility, especially among the younger generations. The governing environmental law in Palestine should be revised, modified, and updated to be able to address current environmental challenges and to comply with signed international conventions and treaties. The revised environmental law should contain deterrent penalties against nature crimes and outline reinforcement mechanisms. Finally, the establishment of a well-equipped national bird rehabilitation center must be the ultimate goal among all players in Palestine's environmental sector.

Conservation efforts are direly needed, as 35 percent of bird species in Palestine are in the red zone of threat or near extinction.

The Palestine sunbird is the Palestinian national bird. It is a small *Nectariniidae* bird that feeds mainly on flower nectar, but during the breeding season it feeds the fledglings on small insects. The plumage of breeding males is mostly black but appears a glossy mixture of blue and green in the light.

The Egyptian vulture is a medium-sized scavenger raptor that used to breed in Palestine until 2007. It is one of the Old World vultures and the only member of the genus *Neophron*. The adult bird is recognized by its white plumage with black flight feathers in the wings, while those that are immature can be recognized by their dark brown color. The vulture can be seen in small numbers during migration seasons.

The little owl is a member of the typical or true owl family *Strigidae*. It is a small species, cryptically colored for camouflage and mainly nocturnal, but it can be seen during the daylight standing on a rock or a short tree. It usually feeds on insects, earthworms, other invertebrates, and small vertebrates such as rodents.

The European roller is the only member of the roller family of birds to breed in Palestine, and the number of breeding pairs is decreasing at an alarming rate. The bird is mainly blue with an orange-brown back. It is usually seen perching prominently on trees, poles, or overhead wires, watching for the large insects, small reptiles, and rodents that they eat.

The white stork is a large bird in the Ciconiidae family. It is characterized by its mainly white plumage, black feathers on the bird's wings, long red legs and long pointed red beak in adult birds, and long neck. It passes over Palestine in large flocks twice a year during the spring and autumn migration seasons. This migratory species spends between a few days and a few weeks at stopover sites to feed and rest in Palestine.

The golden eagle is the largest true bird of prey that breeds in Palestine and belongs to the family *Accipitridae*. The adults are dark brown in color, with lighter golden-brown plumage on their crowns and napes that gives the species its common name. These birds have powerful feet and massive, sharp talons to snatch up a variety of prey.

Photo by Ala'a Kan'an.

A pair of common kestrels being freed after they had been confiscated by the EQA and the Environmental Police and rehabilitated by the team of Nature Palestine Society on the hills of Wadi Fasayel Nature Reserve.

Map of the Bonelli's eagle flight route. Photo by Wasem Dawwas.

Article photos by Anton Khalilieh.

Dr. Anton Khalilieh is the executive director of Nature Palestine Society an environmental NGO that aims to research, protect, conserve, and educate about nature, biodiversity, and environment in Palestine. He holds a PhD in ecophysiology, ornithology, and nature conservation. He is also a birdwatcher and wildlife photographer. Anton has much experience in environmental assessment and conservation projects. He can be reached at anton@naturepalestine.org.

Dr. Yara Dahdal holds a PhD in water desalination and wastewater treatment. She has two postdocs, the first in water contamination and the second in science diplomacy. Yara is currently the projects manager at Nature Palestine Society. She is an active member of the scientific basis task force in the East-Mediterranean and Middle East Climate and Atmosphere Research Center led by the Cyprus Institute. She can be reached at yara@naturepalestine.org.

Owls in Palestine


By Simon Awad
and Bashar Jarayseh

Birds have inspired mythologies and religions throughout history and been rendered in drawings, poems, mottos, and social beliefs that have played a role in forming the folklore of many cultures and societies. The eagle is associated with a positive image and serves as a symbol of pride and strength. Adopted in most Arab countries as well as in Palestine as a symbol of the state, it is also the main emblem in most communication and postal systems worldwide. Other birds are not associated with such positive images. The owl is among the most popular birds in human heritage and is considered a symbol of wisdom and optimism, on the one hand, especially in Indian folklore and most Western cultures. On the other hand, and in most African and Middle Eastern cultures, this bird is deemed a symbol of death and associated with bad luck. In Palestinian folklore, owls are believed to bring bad luck. In addition, many Arabic proverbs mention owls as a sign of doom, for example, "Like the shriek of an owl that foretells disaster."

Owls are considered nocturnal birds of prey that are active primarily at night, but some of them continue to be active during the day as well. Owls in general are characterized by their large heads, round bodies, and camouflaged plumage. They are carnivorous and primarily hunt rodents, insects, and birds, though they occasionally eat reptiles, such as lizards and snakes. They catch their prey by launching a rapid surprise attack, and with the aid of their extraordinary hearing and vision, they can locate the prey accurately even in the dark of the night. Moreover, owls have special structures on the edge of their primary feathers that reduce the sound of air rushing over the surface of the wing feathers, enabling them to fly silently. Owls' heads are perfectly adapted to facilitate their senses. They have elliptically shaped facial feathers to collect and direct sound towards the ears, big eyes located at the front of the skull, and a neck that is able to turn 270 degrees. All these features make owls very specialized and successful for life at night.

In Palestine, ten species of owls have been recorded. Today, nine of them are still present in the Palestinian environment after the extinction of the Brown Fish Owl (*Bubo zeylonensis*). These species represent six genera and two families. Environmental Educational Centre (EEC) researchers recorded all owl species and ringed (band) five species. The following are some characteristics of owl species found in Palestine.


Photo by Simon Awad.

• Brown Fish Owl (*Bubo zeylonensis*): A large owl with a flat broad head, mostly brown in color with pale streaked underparts. It hunts fish from rivers or lakes by a sudden attack from a perch or by flying low over water with its legs dangling. Before its extinction in 1975, the Brown Fish Owl used to live in wetland habitats in the north of the country. The EEC's Natural History Museum has a rare specimen of this species.

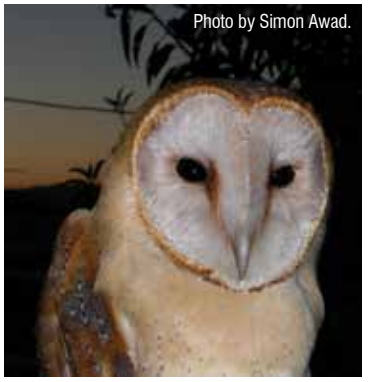


Photo by Simon Awad.

• Barn Owl (*Tyto alba*): It is the only species representing the *Tytonidae* family. It is an elegant medium-sized bird with a distinctive white heart-shaped face, white underparts with black spots, and brown and grey upperparts. It feeds mostly on rodents, and it is estimated that a pair of Barn Owls consumes more than 1,000 rats a year. Therefore, many projects focus on using Barn Owls in biological pest control in agricultural areas. The Barn Owl is resident mainly in the north and center of the county. It prefers open fields and cultivated farmland with scattered trees, and it rarely resides in mountainous areas.


Photo by Simon Awad.

• Eurasian Eagle Owl (*Bubo bubo*): A huge owl that is between 59 and 73 cm in length, with a wingspan that reaches 170 cm, it is considered the largest owl species to be found in Palestine. It preys on rodents, hedgehogs, hares, and some birds. The Eagle Owl is an uncommon resident in the Mediterranean climate, rare in the desert and semidesert areas. It inhabits rocky slopes, valleys, and farmlands. It is one of the species that is most affected by the illegal trapping of nestlings.

• Tawny Owl (*Strix aluco*): A medium-sized owl with a bulky body and black eyes. It is considered an uncommon resident especially in the northern parts of the country. It prefers woodlands and forests.

• Hume's Owl (*Strix butleri*): Also called Desert Owl or Desert Tawny Owl, this is a medium-sized owl with yellow eyes and pale sandy-brown plumage. It is an endemic species to Palestine, Jordan, and parts of Sinai and the Arabian Peninsula. It is an uncommon resident that inhabits rocky wadis, cliffs, and canyons in the desert. The Hume's Owl is very difficult to see because of its shy nature and the remote harsh habitats it lives in.


Photo courtesy of EEC.

• Long-eared Owl (*Asio otus*): A medium-sized owl with distinctive long ear tufts, long wings, and a narrow body. An uncommon resident, rare passage migrant, and winter visitor, it is observed mainly in the Mediterranean climate in the north and center of the country.

• Short-eared Owl (*Asio flammeus*): A medium-sized owl with very long and narrow wings, it has very short ear tufts and heavily streaked pale-brown plumage. It is considered a rare migrant and winter visitor, mainly recorded in autumn. This species prefers meadows, open agricultural fields, and marshes. The short-eared owl feeds mostly on small mammals and can detect the presence of its prey in flight through hearing.


Photo by Bashar Jarayseh.

• Little Owl (*Athene noctua*): A small and compact owl with bright yellow eyes, long legs, and a short tail, it is the most common owl species in Palestine. Its popular Arabic name is *Um Quwaik*. Found almost everywhere from forests, mountains, and rocky wadis to the harshest parts of the desert, it is also commonly found near humans in villages and cities. This species is partly diurnal, which means that it is often seen active and hunting during the day.


Photo by Bashar Jarayseh.

• Eurasian Scops Owl (*Otus scops*): The smallest owl species in Palestine with a length of only 19–21 cm, it feeds mainly on insects and invertebrates. A common migratory bird in Palestine found mainly in the spring migrating season, it is an uncommon breeding summer visitor and a very rare winter visitor. The Scops Owl is observed in a wide range of habitats, from open areas and farmlands with scattered trees to thick forests and woodlands. It is very difficult to see this species because of its plumage that blends perfectly with the bark of trees where it sleeps during the day.


Photo by Bashar Jarayseh.

• Pallid Scops Owl (*Otus brucei*): Very similar to the Eurasian Scops Owl, but with paler color and duller appearance, it is a resident bird and can be found along the Jordan Valley and around the Dead Sea, especially in palm tree farms and cultivated areas.

The presence of owls in nature is significant for a healthy and balanced ecosystem. They control the number of smaller rodents and insects, which are considered pests. Unfortunately, owls face many threats in Palestine, the most common of which are illegal hunting and trapping. For example, many owls fall victim to illegal hunting in rural areas, yet some people kill them to deter "bad luck," and in the best cases keep them in cages, especially their young owlets. Another common threat that owls face is the intensive use of pesticides, which affects owls by reducing the available food resources or poisoning them when they consume prey contaminated with these chemicals. The EEC is collaborating with the Environment Quality Authority (EQA) to reduce the threats that face wild birds. EEC experts work hard on the rehabilitation of trapped or injured birds of prey after the environmental police confiscate them from people who keep them illegally. The EEC has been able to release many owls, falcons, and buzzards back into nature after rehabilitation. In addition, EEC has also been working on raising public awareness, especially in schools and in the local community, about the importance of protecting birds in general and owls in particular.

Simon Awad is the executive director of the Environmental Education Center of the Evangelical Lutheran Church in Jordan and the Holy Land. An environmental activist and wildlife conservationist, he is an expert in birds (ornithologist) and the first person to hold an international license to identify birds in Palestine and the Arab world. He has authored and co-authored several books on the environment and on human rights issues.

Bashar Jarayseh is an active research volunteer in ecology and biodiversity, with special interest in birds at the Environmental Education Center. In addition, he is a biology student at Bethlehem University.

Jameel Mtour

From Life Imprisonment to Environmental Conservation

Jameel Mtour was appointed head of the Environment Quality Authority in July 2020. Born in Sair, Hebron, Palestine, on May 3, 1961, Jameel holds a degree in public health from Bethlehem University. During his university studies he was elected to the student council and also played an important role in promoting the student youth movement, contributing as well to the establishment of youth committees for social work. But in 1986, immediately after graduation, he was arrested and sentenced to life imprisonment for his participation in resisting the illegal Israeli military occupation.

Inside and outside of prison, Jameel has held many positions, including being a member of the Prisoner Central Committee, cultural director in Junaid Central Prison, coordinator of the Struggle Committee in Nafha Prison, and editor of political magazines. He authored many studies, some of which have been published, whereas others are still waiting for publication. His writings include (in Arabic) "The September Revolution," "Behind the Bars of Oppression," "Zionist Racism between Theory and Practice, "The Desire for Independence," "The Uprising of Prisoners in the Occupation Prisons," and "Rules of Behavior in Detention," as well as many articles in a number of local newspapers and magazines.

Among the many hunger strikes in which Jameel participated to achieve his and other prisoners' rights was the 1992 strike in which 12,000 prisoners participated. During the solidarity actions that were carried out to support the prisoners, Jameel's brother, Anwar Matour, was killed by the Israeli occupation army. Yet, Jameel persevered in his conviction that peace based on justice is achievable, and he participated in many dialogue sessions with the various delegations, visiting the prisoners alongside his fellow leaders in prisons.

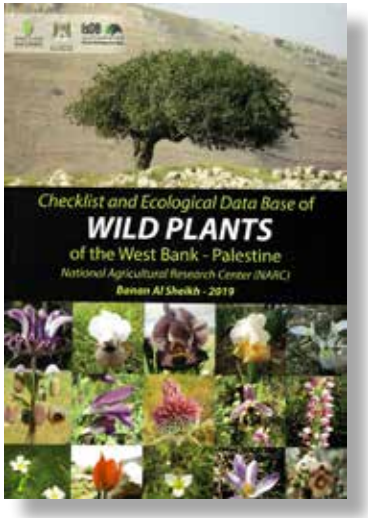
In 1999, after the agreements made between the PLO and Israel, Jameel was released from prison and joined the Environmental Quality Authority, getting involved in environmental inspections. He got married (and now has three sons and a daughter), completed a master's degree in public health at Birzeit University in 2004, and rose within the ranks of the EQA until he was appointed vice chairman and served in that position for almost ten years before being appointed as head of the EQA.

Jameel's contribution to Palestinian efforts in environmental conservation is impressive. He chaired the delegation of the State of Palestine in many prominent regional and global conferences in the environmental field that produced significant decisions in support of Palestine. He served as a member of the Higher Planning Council, the Technical Committee for National Spatial Planning, the Palestine Higher Green Buildings Council, the Palestinian Industrial Estates and Free Zone Authority Board, the Traffic Higher Council, the Environment and Health Committee for Jerusalem, the Palestinian National Water Council, and the board of the Palestine Standards Institution. He headed the Preparatory Committee for the Second Palestinian Environmental Conference in Palestine and the Environment Quality Authority Work Team of the National Reform and Development Plan; served as coordinator of the Environment Committee for Negotiations and the Jerusalem National Popular Conference; and was the EQA representative in the PLO's Coordination Committee for the Monitoring Group in the Palestinian Negotiations Affairs Department.

Under Jameel's leadership, the EQA's capable team is embarking on important initiatives such as preparing the 6th National CBD report, a new National Biodiversity Strategy, various action plans, and much more.

Mr. Jameel Mtour, chairman of the EQA, freeing a pair of common kestrels. Photo by Ala'a Kan'an.

Checklist and Ecological Database of Wild Plants of the West Bank – Palestine By Banan Al Sheikh



By Banan Al Sheikh

National Agricultural Research Center, Jenin, 2019
229 pages, 240 color images

Available at the Palestinian Museum of National History, NIS 50

The few books that address the flora of Palestine were written primarily by either international visitors (during the period of the Palestine Exploration Fund in the nineteenth century, for example) or by Israelis. It is rare to find locally produced books on the fauna and flora of Palestine. Banan Al-Sheikh's contribution is a welcome addition, especially for the growing list of nature enthusiasts in Palestine. As more people become interested in Palestine's natural beauty, there is a need for authoritative books that provide an understanding of the rich natural environment and encourage its protection. This updated checklist of Palestine's flora is the result of more than two decades of the author's research and experience. The book focuses on only a part of historical Palestine – the Israeli-occupied West Bank. Despite its small size of 5,856 square kilometers, the West Bank contains over 1,612 species of vascular plants in 117 families. The species occur in habitats that range from the Sudanese/Ethiopian areas around the Jordan Valley, through semi-arid regions of the Jerusalem eastern slopes to the mountainous Mediterranean habitats.

This is indeed the most comprehensive reference that details the flora of the West Bank and will be valued by both professionals and interested lay people. This checklist of all the wild plants in the West Bank includes their scientific names and common Arabic names. For each species, the author also gives scientific synonyms, family names, blooming periods, and some ecological and growth indicators, such as whether they are annual or perennial, geophyte (having tubers/bulbs), chamaephyte (dwarf shrub), shrubs, trees, aquatic plants, or vines. The author also notes abundance: whether the plant is rare or common and in which climatic zone the species grows naturally, namely, Mediterranean, semi-arid, desert, or high mountains. The book includes 420 color pictures arranged according to flower color, which greatly facilitates the finding of species even by nature lovers who have no botanical knowledge.

Mohammed Alhaj

Displacement Series, *Untitled #6,* 100 x 80 cm, acrylic on canvas, 2020.

Displacement Series, *Untitled #8*, 100 x 80 cm, acrylic on canvas, 2020.

The experience of Mohammed Alhaj is typical for many Palestinian artists, which has implications for the status of contemporary art in Gaza. This small area does not exceed 365 square kilometers yet is a locus for numerous economic and political complications. Gaza has suffered from two wars in the last decade, and, most importantly, under siege has been almost entirely disconnected from the other Palestinian cities, the Arab World, and the world.

The son of refugees displaced from the village of Kawkaba during the *Nakba*, Mohammed Alhaj was born in Libya in 1982. He returned to Gaza in 1995, where he finished his schooling and obtained a bachelor's degree in art education from Al-Aqsa University in 2004. The works of Kamel Al Moghani, Ismail Shammout, Suleiman Mansour, and other great Palestinian artists strongly influenced him. Yet like that of any young artist, Mohammed's artistic practice explored various schools as he moved from abstract painting to other expressive styles, tackling local issues in his choice of subject matter. He was passionate about experimenting with different materials and techniques and keen on including Palestinian heritage symbols in his various artworks.

Kawkaba Village, 70 x 50 cm, mixed media on wood, 2014. Collection: Lana and Nasser Abdel Hadi.

In recent years, Mohammed's interest and research have focused on topographical maps. Inspired by his father's descriptions and poignant memories of his hometown of Kawkaba, he aims to create relationships between these maps and the demographic expansion of the population, thereby illustrating the transformations caused by the 1948 *Nakba* in which many Palestinian were forced to leave their homes and have remained displaced.

The temporal dimensions have a strong presence in the virtual remedy for the fate of deserted Palestinian villages whose inhabitants have left, leaving no traces or remains and carrying with them nothing other than memories. The artist thus makes visible the topographical and demographic changes that result from a political reality whose effects we are still witnessing today. These works pose questions about the fate of this village that is representative of many villages that have been exposed to similar conditions.

In his last exhibition, titled *Displacement*, Mohammed broadens his view and poses questions about the fate of places and people in the entire Arab region, as many have been forced to leave their homeland in the last decades in search of safe and suitable locations, far from conflicts.

Since 2007, Mohammed Alhaj has participated in many solo and collective exhibitions, both locally and regionally. For more information, please visit his page on *traces* at https://gazatraces.wordpress.com/mohammed-al-haj/.

Qatayef

By Riyam Kafri AbuLaban

As I try to make sense of the world, the kitchen seems to be the only place I have control, and the aroma of fresh *qatayef* makes me feel safer and more at home than ever before.

Servings: feeds an army, or the neighborhood

Tools: blender

Ingredients

- 260 g flour
- 100 g semolina
- 1 tsp baking powder
- 1 tsp yeast (I use instant yeast)
- ¼ tsp baking soda
- Dash of salt
- 1 tbsp sugar
- 1 tbsp milk
- 2 tbsp rose water
- 750 ml warm water

Filling

- 2 cups coarsely chopped walnuts
- 1 tsp cinnamon
- ½ kg sweetened Palestinian goat cheese.

***Qater* (simple sugar syrup)**

- 2 cups sugar
- 2 cups water
- 1 tbsp lemon juice
- 1 tsp orange blossom water

1. Pour the water, milk, sugar, and yeast into the blender, mix with a large spoon, then leave it for ten minutes (bubbles should form).
2. In another bowl, whisk together the flour, semolina, baking powder, baking soda, and salt.
3. Slowly add the flour mixture to the water mixture in the blender and blend well, adding the rose water at the end. Pour the batter into a bowl, cover, and store in a warm, draft-free spot for at least 30 minutes.
4. Heat a large nonstick pan or a pancake griddle until it is rather hot (I preheat mine on medium heat for 15 minutes). Pour small amounts of the batter (¼ cup) into the center of the pan. Watch as bubbles form and pop. If the pan is too hot, the qatayef won't have time to form bubbles and will cook too quickly. If the pan is too cold, the batter will stick and not cook all the way through. Play with the heat until you get the perfect setting, watching the qatayef closely. When all the bubbles have popped, remove the *qatayef*, place them on a large plate, and cover them with a towel. Repeat until the batter is finished.
5. Take the *qatayef* in your hand, make a small pocket, place a teaspoon of crushed walnuts and cinnamon in the middle, then bring the edges together by pinching the dough between your fingers to seal the *qatayef* closed. Do the same for cheese.
6. Make the *qater* by bringing to a boil the sugar and water in a saucepan on medium heat. Allow sugar to dissolve completely, and leave it to boil until it thickens slightly. Turn off the heat, stir in the lemon juice and orange blossom water.
7. Preheat the oven to 180° C. Generously brush the filled pockets with butter, place on a baking sheet, and bake in the preheated oven until they are a deep golden color and the center is crunchy. Remove and soak them in lukewarm *qater*, serve immediately. Note: Many choose to fry *qatayef*, which is equally delicious. Heat some oil and deep fry them, then quickly transfer them to the *qater*.

On weekends, Riyam's kitchen smells of za'atar, cinnamon, lemon, and honey. Her writing and food adventures can be found on www.riyamoskitchentable.com and on Instagram @riyamoskitchentable.

Ahlan Palestine Postcard

By Malak Hasan and Bisan Al-HajHasan

Learn to Roll Palestinian Maftoul in Kifl Haris

Since we launched Ahlan Palestine and began to tour villages, cities, and refugee camps to share with the world what it truly means to be a Palestinian, we have been introduced to more than just picturesque landscapes, nature reserves, and historical sites. We have also become friends with many Palestinian women who have shared with us and taught us how to make the most famous and iconic Palestinian dishes.

In this postcard, we share our experience of learning how to prepare Palestinian *maftoul,* a traditional festive food that is closely associated with our culture and a must for tourists looking for an authentic experience of Palestine and its cuisine.

Maftoul is a traditional Palestinian dish after which many annual festivals are named, a perfect winter dish, comforting and hearty, loaded with aromatic spices. Associated with both the Levant and the Maghreb, it is similar to Moroccan couscous but made with flour instead of semolina – and might have been brought to Palestine by Moroccan migrants.

When we decided to visit the village of Kifl Haris in the northern West Bank, located six kilometers west of Salfit, we were invited to a local family's home to eat *maftoul*. We were delighted over the invitation but even more excited when we entered the kitchen to see a woman hunched over a big silver bowl, about to prepare the *maftoul* from scratch.

Kefaya welcomed us with motherly affection and invited us to sit next to her as she rolled the *maftoul,* encouraging us to roll up our sleeves and dig in.

There are different methods to make *maftoul*. Kefaya started by drizzling olive oil in the bowl, sprinkling white flour over it, and then using her fingertips and palms to lightly roll the mix. Adding a touch of water and another sprinkle of white flour, she repeated the process, rolling and mixing the ingredients until we started to see small balls forming. When a portion of the mix became the right size, she gently scooped it into another bowl and continued the process.

Sitting crossed-legged on the floor, with our hands and arms covered in white flour, we talked about life in Palestine, our dreams and ambitions, our families and work, joking continuously about our poor *maftoul*-rolling skills. The atmosphere made us appreciate why our grandmothers considered *maftoul* a festive food and frequently prepared it on special occasions and holidays when the whole family gathered. To prepare large quantities, women used to sit together for hours, sharing stories and memories and singing traditional songs. We felt blessed to have had the opportunity to connect with our heritage and learn this skill, considering that more and more Palestinians, including our own families, are now buying ready-made *maftoul* rather than making it at home.

Kefaya then steamed the *maftoul* in a steamer pot over a deliciously aromatic chicken broth with chickpeas, but not before burying one chopped onion, coated in a mix of cumin, salt, black pepper, and mixed spices, in the *maftoul*. She explained that this is a special trick to give the dish more flavor. And how right she was!

Once the *maftoul* was fully cooked, we scooped it onto a platter, soaked it with the seasoned chicken broth, and sprinkled the cooked chickpeas on top. Kefaya served it with pickled cucumbers, olives, and the cooked chicken she had basted with olive oil and roasted in the oven.

This experience encouraged us to explore our Palestinian cuisine even further and share it with anyone who is traveling the world in search of the best culinary experience. We are so proud of our Palestinian mothers and grandmothers who are preserving our heritage every time they cook a meal for their loved ones.

Malak and Bisan are the founders of Ahlan Palestine, a travel blog that promotes tourism in Palestine. You can watch them roll maftoul *step by step if you visit their Instagram page @AhlanPalestine.*

RAMALLAH

BOOK LAUNCHES

Saturday 10

17:30–18:30 *A Garden among the Hills: The Floral History of Palestine* is the museum garden catalogue that documents the floral variety found in the Palestinian Museum gardens and provides information about each plant's history, etymology, biology, and medicinal and aesthetic benefits, as well as other popular uses. It also details the plants' national and cultural significance, thus shedding light on their association with Palestinian identity. Like the Palestinian Museum gardens themselves, this catalogue recounts the floral and horticultural history of Palestine across different eras. English and Arabic editions are available and are opened with forewords by Dr. Omar Tesdell and writer and poet Zakariya Mohammad. The event will be in Arabic and moderated by Dr. Omar Tesdell, with speakers Dr. Jamil Harb, Dr. Munir Nasser, and Lara Zureikat. Broadcast via https://zoom.us/j/91704751441.

Wednesday 21

16:00–17:30 *The launch of Thorough Surveillance: The Genesis of Israeli Policies of Population Management, Surveillance and Political Control towards the Palestinians* in its translated Arabic edition by Professor Ahmad Sa'di, published by the Arab Center for Research and Policy Studies. This book presents a thorough analysis of the Israeli policies enforced to manage and control the Palestinian population that remained on the lands occupied in 1948 during the military rule period that was imposed by Israel from the Nakba until 1966. Sa'di chronicles the living conditions of the Palestinians who remained in the country while tracking the Israeli discourse towards them and outlining how the four years that followed the Nakba were foundational to the formation and establishment of that discourse. The event will be in Arabic and moderated by Dr. Honida Ghanem. Broadcast via https://zoom.us/j/92680643119.

SPECIAL EVENTS

Friday 23

17:00–17:20 Yoga in the Palestinian Museum Gardens is a yoga sequence that is specially designed to relieve stress as well as shoulder and neck tension. Organized by the Palestinian Museum in collaboration with Shadana Yoga, the event is in Arabic. Broadcast via the Palestinian Museum social media platforms and Shadana Yoga YouTube channel.

SYMPOSIA

Saturday 10

17:00–20:00 "Social Protection in the Cultural Sector" is the second part of a symposium presented by Khalil Sakakini Cultural Center in 2020. For registration, please contact info@sakakini.org.

GAZA

SPECIAL EVENTS

Thursdays 1, 8, and Saturdays 3, 10

15:00–18:00 Seaborne Dreams is a workshop series with sessions in creative writing and art workshops for children from 9 to 13 years old. Held with the participation of the artists Mumen Khalifa (origami), Ahmad Muhanna (Arabic calligraphy), Maher Daoud (creative writing), and Mahmoud al-Haj (video), it explores manifestations of the Palestinian coast as a material and emotional geography in our everyday lives. The works created by the participating children will be presented as an art installation in the museum's upcoming exhibition that aims to evoke a sense of being present on the coast while also illuminating the worlds that are dreamt up in its absence or amidst its siege. The installation will be accompanied by representations of these worlds in Palestinian narratives. Organized by the Palestinian Museum in partnership with Hope Foundation. Tejwal Centre, Khan Younis. For registration, please contact activities@palmuseum.org.

Rawabi

ACCOMMODATIONS

Rawabi Hotel Rental Apartments
Rawabi 666, Palestine
Mobile: 059 420 4378
rent@rawabi.ps

RESTAURANTS

Artoos
The Art of Gelato
Q Center, Rawabi 666, Palestine
Tel: 02 282 5599
https://www.facebook.com/QCenterRawabiOfficial/

Lilac
Pizza, Pasta, & Pastries
Q Center, Rawabi 666, Palestine
Tel: 02 282 5599
https://www.facebook.com/QCenterRawabiOfficial/

Qburger
Burger
Q Center, Rawabi 666, Palestine
Tel: 02 282 5599
https://www.facebook.com/QCenterRawabiOfficial/

Shrak
Shawerma & Falafel
Q Center, Rawabi 666, Palestine
Tel: 02 282 5599
https://www.facebook.com/QCenterRawabiOfficial/

Siroter
French Café & Bakery
Q Center, Rawabi 666, Palestine
Tel: 02 282 5599
https://www.facebook.com/QCenterRawabiOfficial/

عالسريع
Quick sandwiches, fresh juices and cocktails
Q Center, Rawabi 666, Palestine
Tel: 02 282 5599
https://www.facebook.com/QCenterRawabiOfficial/

ATTRACTIONS

Fun Factory Rawabi
Spacious indoor amusement park that introduces fun, comfort, and happiness for all ages.
Q Center, Rawabi 666, Palestine
Tel: 059 594 9026, https://www.facebook.com/funfactoryrawabi/

Rawabi Extreme
Exciting outdoor games in the beautiful nature of Palestine.
WaDina, Rawabi 666, Palestine
Tel: 059 420 4377, https://www.facebook.com/RawabiExtreme

You've Got a Friend

When you're down and troubled
And you need some love and care
And nothing, nothing is going right
Close your eyes and think of me
And soon I will be there
To brighten up even your darkest night

You just call out my name
And you know wherever I am
I'll come running, to see you again
Winter, spring, summer or fall
All you have to do is call
And I'll be there
You've got a friend

If the sky above you
Grows dark and full of clouds
And that old north wind begins to blow
Keep your head together
And call my name out loud
Soon you'll hear me knocking at your door

You just call out my name
And you know wherever I am
I'll come running, running, yeah, yeah, to see you again
Winter, spring, summer or fall
All you have to do is call
And I'll be there, yes, I will

Now, ain't it good to know that you've got a friend
When people can be so cold?
They'll hurt you, yes, and desert you
And take your soul if you let them, oh, but don't you let them

You just call out my name
And you know wherever I am
I'll come running, running, yeah, yeah, to see you again
Winter, spring, summer or fall
All you have to do is call
And I'll be there, yes, I will
You've got a friend
You've got a friend

From Carole King's song *You've Got a Friend (Tapestry, 1971)*
https://www.youtube.com/watch?v=eAR_Ff5A8Rk

Long Live Palestine!

Sani Meo
Publisher

Filistin Ashabab

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We make the change

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