

Spotlight **GREEN & BLUE**

QUAIL MIGRATION ROUTE

Start: Europe and Central Asia

Stopover: Saudi Arabia (Haradh, Jizan, Tihamah)

End: Africa

COMMON QUAIL

Scientific name: *Coturnix coturnix*

Size: **16-18 cm**

Weight: **70-155g**

Wingspan: **32-35 cm**

LEGAL PROTECTION

Compensation value: **SR3,000 (\$800)** per bird

Hunting fine: **SR1,500**

HARLEQUIN QUAIL

Scientific name: *Coturnix delegorguei*

Size: **16-19 cm**

Weight: **49-95g**

Status in Saudi Arabia: Resident breeder found year-round in Tihamah grasslands and Sabya, Jizan region.

LEGAL PROTECTION: Hunting fine: SR 1,500 (\$400) per bird; Compensation: SR 7,000 (\$1,866)

Status in Saudi Arabia: Migrant species crossing the Kingdom in spring and fall; partial breeder in Haradh where habitat allows nesting.

SAUDI ARABIA

A small bird with a big story

Quails play a vital role in the Kingdom's ecosystems, but rising threats have prompted efforts to protect the species

Nada Hameed Jeddah

At dawn over the Arabian Peninsula, the sky comes alive with birds tracing ancient migratory paths through Saudi Arabia — a natural crossroads linking East Asia, Europe and Africa.

They are more than mere travelers. They serve as sensitive indicators of ecosystem health, playing vital roles in seed dispersal, plant pollination and insect control — all essential for maintaining ecological balance.

Among the many species passing through is the small but mighty quail. Though modest in size, quails carry outsized environmental and cultural significance.

"Quail" is a general term referring to various genera of small, ground-dwelling birds in the order Galliformes — the same group that includes chickens, leading Saudi ornithologist and biodiversity expert Hany Tatwany told Arab News.

"Quails are similar in size to doves, and their rounded shape resembles that of a partridge," said Tatwany. "They typically

live in social groups called coveys, especially outside the breeding season."

Saudi Arabia serves as a critical stopover on both legs: "They cross the Kingdom on both journeys," said Tatwany.

Tatwany highlighted how quails call and crow nonstop while hiding, "indicating their presence in the area" to other birds. "If alerted, the rapid flapping of their wings produces a distinctive sound," he said.

Unfortunately, these traits have made quails vulnerable to hunters. Rising threats have prompted Saudi Arabia to

DID YOU KNOW?

1 Quails live in "coveys," social groups of adult pairs and their young that flock together in dense grasslands.

2 They respond to each other's calls, a behavior exploited by illegal hunters using calling devices.

3 Commercial quail farming began in Saudi Arabia in the 1980s, initially to feed falcons and later as a culinary delicacy.

introduce laws to protect both quail species.

"In the Kingdom, hunting quail is illegal," said Tatwany.

The fine for failing to comply is SR1,500 (\$400) per bird, while the estimated compensation value is SR3,000 for the common quail and SR7,000 for the harlequin quail.

"In Saudi Arabia, two species of quails have been recognized: the common quail, known scientifically as *Coturnix coturnix*, and the harlequin quail, *Coturnix delegorguei*," said Tatwany. Quails have a long history of interaction with

humans, especially as a food source. The common quail remains the primary type used in farming. "This breed has more meat and lays more eggs than the others," said Tatwany.

Efforts to protect quails are part of a broader initiative led by the Saudi National Center for Wildlife. Its Bird Management Division surveys bird species across the Kingdom.

By studying migration routes, species abundance, and spatial distribution, the division aims to ensure the long-term sustainability of Saudi Arabia's avian biodiversity.

Shifting tourism from preservation to regeneration

RASHID ALHATILAH

Since COVID-19 restrictions were lifted, tourism has rebounded rapidly. According to the World Travel and Tourism Council, it is expected to hit record levels in 2025. But this growth demands an urgent reassessment of how tourism impacts the natural world.

A new model is emerging: regenerative tourism. Rather than focusing solely on preservation, it aims to restore and enhance these ecosystems.

Rooted in science, innovation and careful planning, regenerative tourism offers a new relationship between people and place — one that strengthens biodiversity, supports communities, and creates lasting value. At Red Sea Global, this approach

is applied across every stage of development, using data, design and ecological insight to show how tourism can contribute to long-term environmental recovery.

The Red Sea and AMAALA, two of our flagship destinations, are developed with this question in mind: How can we leave a place healthier than we found it?

In Al-Wajh Lagoon, for example, development is limited to just 22 of more than 90 islands, with nine designated as conservation areas. At AMAALA, development is capped to accommodate no more than 500,000 guests per year to protect delicate habitats from overuse.

Together, such projects reflect our broader goal of delivering a 30 percent net conservation benefit across The Red Sea



Rashid Alhatilah is the group head of environment at Red Sea Global

and AMAALA by 2040. Our environmental restoration programs go beyond conservation — they aim to rebuild ecosystems at scale and boost their long-term resilience.

We have launched an extensive seagrass restoration initiative, recognizing the critical role these underwater meadows play in nurturing marine biodiversity.

At Red Sea Global, technology is a core part of the infrastructure for regeneration. From real-time marine sensors to nature-based solutions, innovation helps us make smarter, faster decisions and expand our impact across sectors.

The Corallium Marine Life Institute lies at the heart of our regenerative approach. As both a research center and visitor experience hub, Corallium

enables marine species to reproduce in controlled environments that replicate the Red Sea's natural conditions.

Collaboration is key to our progress. We work closely with the King Abdullah University of Science and Technology, the Coral Research and Development Accelerator Platform, and innovation platforms such as WAVE to support ocean-positive solutions.

Looking ahead, global platforms such as The Ocean Race 2027 will bring international attention to the urgent need to protect ocean health.

The opportunity is clear: to make regeneration the baseline — setting a new standard for tourism to build smarter, travel better, and help restore what has been lost.

About one in seven plant and animal species in the Kingdom and the Arabian Peninsula can be found nowhere else on Earth.

Chris Boland
Environmental consultant



Business

NATURAL PEST CONTROL

Guardians of the desert ecosystem

How wildcats control pests, protect public health and support environment

Haifa Alshammari Riyadh

During the summer of 2024, two desert lynx kittens were born in Taif as part of Saudi Arabia's efforts to protect and increase the population of caracals.

Although caracals are critically endangered, wildcats in general play a vital ecological role in the Kingdom. They act as natural pest control, and Saudi Arabia is committed to conserving these species while boosting their populations.

Despite the Kingdom's harsh, arid climate, conditions allow wildcats not only to survive but also to flourish.

Among the terrestrial species in Saudi Arabia are sand cats, Arabian wildcats, and the desert lynx.

Felis margarita, or sand cats, are small — around 40-60 cm — with pale sandy fur that helps them blend into the desert. They have broad heads, large ears, and long hair on the bottoms of their feet to walk on hot sand.

"It is small in size and does not mate with other cats. It is the only cat species in the world with hair on the soles of its feet instead of skin to prevent it from sinking into the sand," said Obaid Alouni,

WILD CATS OF SAUDI ARABIA

CARACALS (Desert lynx)

- Known locally as Al-Washaq.
- Reddish-tan coat, long legs, long and black-tufted ears.
- Feed on birds, rodents, and small antelope.
- Excellent jumpers (3 to 4 meters high) and fast (reaching over 80 kph).

SAND CATS (*Felis margarita*)

- Have dense fur on paw soles for hot surfaces.
- Coloration and low ears aid stealth.
- Feed on desert rodents and reptiles.
- Hard to spot in the wild.

ARABIAN WILDCATS (*Felis lybica*)

- Have thick, sandy- to grey-brown fur with faint stripes or spots, and ringed tails with blunt tips.
- Feed on rodents, birds, reptiles, and insects.
- Found near wadis, mountains, and villages.

IN NUMBERS:

12-17

Caracals live up to 12 years in the wild and 17 years in captivity.

27,264

sand cats estimated in Asia and Africa.

a Saudi environmentalist.

Raising sand cats as domestic pets is gaining popularity, Alouni said, but adoption is easier when they are kittens, as they remain wild animals.

Arabian wildcats (*Felis lybica*), found across the Arabian Peninsula, also play a vital role.

"They are wild cats that live independently without human intervention," Alouni told Arab News.

They resemble domestic cats but have thicker, sandy to grey-brown coats with faint stripes or spots and ringed tails with blunt tips.

Alouni warned that pure populations could be threatened by hybridization with domestic cats.

The caracal, or desert lynx, is critically

DID YOU KNOW?

1 Sand cats are the only cat species with hair on the soles of their feet, allowing them to walk on hot sand without sinking.

2 Caracals, locally known as Al-Washaq, are native and endangered, capable of jumping 3 to 4 meters in a single leap.

3 Pure populations of the Arabian wildcat are at risk due to hybridization with domestic cats.

endangered. "The lynx is classified in size between large and small, and is distinguished by its jump, which can reach 3 meters or even 4 meters in the sky," Alouni described.

Locally known as Al-Washaq, desert lynx have reddish-tan coats, long legs, and black-tufted ears, feeding on birds, rodents, and sometimes small antelopes.

They are protected under Saudi law.

Saudi Arabia regulates grazing to preserve nature

MESHAL AL-HARBI



Meshal Al-Harbi is director general of the General Department of Natural Rangelands at the National Center for Vegetation Cover Development and Combating Desertification.

In a strategic move that underscores the Kingdom's commitment to safeguarding its natural resources and preserving one of its most significant cultural legacies, Saudi Arabia is advancing with determination the regulation of its grazing sector, as part of a national approach aimed at achieving a balanced integration of environmental, economic and social development.

Grazing is no longer regarded as simply a traditional activity; it has emerged as a fundamental component of national sustainability policies. Natural rangelands account for approximately 73 percent of the Kingdom's land area and represent a critical resource for the support of livestock production and the rural economy.

Reflecting the commitment of the wise Saudi leadership, a directive has been issued to designate 26 grazing sites across the Kingdom's regions, covering a total area of approximately 8 million hectares (80,000 sq. km).

The National Center for Vegetation Cover Development and Combating Desertification aspires to play a vital role in helping to realize this ambitious vision, by safeguarding these sites and conducting rigorous scientific studies to assess the condition of vegetation cover and determine grazing capacity.

To date, these studies have been completed at 10 sites and serve as the scientific foundation for issuing grazing permits, and defining authorized grazing periods and designated areas.

Grazing regulation in the Kingdom is implemented within specific seasons that respect the natural life cycle of vegetation.

This scientific approach to grazing management enhances the sustainability of rangeland and helps achieve a careful balance between the benefits of grazing and the preservation of natural resources for future generations.

In practice, the regulation of grazing has delivered notable outcomes that affirm its economic and social viability.

In Jabla National Park, located in Al-Dawadmi governorate in Riyadh region, a pioneering experiment was carried out to regulate camel grazing through the issuance of official permits to their owners. After only one grazing season, a field survey indicated a 76 percent reduction in

the cost of manufactured feed as a result of the increased reliance on rich, natural rangelands and improved productivity.

In the Ma'ila rangelands of the Northern Borders Province, sheep grazing was organized for approximately 7,000 animals. This resulted in a 100 percent reduction in feed costs during the grazing season.

Such models have strengthened the trust between herders and the center, by demonstrating that environmental protection can result in direct economic benefits for local communities.

The center has launched an electronic system for issuing grazing permits through its "Nabati" platform, marking a step forward in the comprehensive automation of grazing-regulation processes.

Without reliable scientific information about the ongoing environmental crisis, we can never hope to overcome it.

Audrey Azoulay
UNESCO director general



Spotlight GREEN

SAUDI ARABIA

From awareness to action

Eco-journalism takes center stage as the Kingdom's environmental watchdog advances Vision 2030 goals

Haifa Alshammari Riyadh

As a nation moving toward a greener future, Saudi Arabia is building bridges between the public and officials, raising awareness, and designing campaigns that promote sustainable development.

These efforts, in line with Vision 2030, seek to educate people about how they play a role in protecting ecosystems. To support these goals, journalism is one of the most effective tools.

From reporting on ecological issues to empowering communities to take part in Vision 2030, Saudi Arabia needs more environmental journalists. Yet the field remains relatively unknown in the country.

Recognizing this gap, the National Center for Environmental Compliance has begun taking steps to advocate for and support eco-journalism.

"I think we had been noticing for the past years ... a decade ago that there wasn't really this professional, specialized media... in the Arab world," Saad Al-Matrafi, NCEC's executive director of media and communication and official spokesperson, told Arab News. Al-Matrafi noted that while political, business, and sports journalism are quite popular, environmental

journalism lags far behind.

"Here at the center we're concentrating on actually bringing up a specialized generation, to be well-focused, well-informed, and educated about the environment," he said.

Al-Matrafi explained that environmental journalists should not only report on events but also take part in wider conversation.

"If we relate that to our

DID YOU KNOW?

1 The National Center for Environmental Compliance monitors air quality and emissions at the source and protects marine and coastal environments.

3 In the first seven months of 2025, the center evaluated more than 11,000 environmental tests, including 8,124 water samples and 3,618 soil samples.

strategy at the NCEC, part of that is improving the quality of life of citizens and the visitors and the tourists of the Kingdom," he said.

For him, compliance programs and inspection systems are not simply about monitoring firms and factories. They are also about ensuring safer conditions for workers, their families and communities.

Al-Matrafi stressed that NCEC's purpose is not to



detect violations and issue penalties, but to save lives.

He described operations the center oversees, such as preventing and managing oil spills, which, if neglected, could cause severe health and environmental damage.

Al-Matrafi also highlighted

the NCEC's national oil spill drills. "We have two national oil spill drills a year — the last one was in Yanbu in July," he said. "It was drill number 17 ...

"It goes from 40 to 60 entities in the country who actually participate ... that covers government entities,

private sector, and even non-government sectors like institutes, universities."

Journalists, he noted, are central to these exercises. "We have journalists on the boats to see what is going on, and we have them in the media center, they write, they take

shots, and they record."

Al-Matrafi concluded that no matter how much effort a nation invests in tackling environmental challenges, raising awareness is just as important. "It's awareness, enlightenment, instructions, and good journalism."

Finding a clear legal definition for environmental crime

AMAL ALBAWARDI

Often overlooked and dismissed as a minor issue, "environmental crime" remains undefined in international law, even though it is acknowledged as one of the fastest-growing areas of illicit activity worldwide.

Yet the absence of a definition has led countries and institutions to adopt their own interpretations, undermining international cooperation.

For now, environmental crime exists as a fragmented legal concept that hinders global enforcement coordination and policy harmonization because it lacks universal recognition comparable to piracy or terrorism.

The varying definitions have created

obstacles to establishing mutual understanding. While several nations support creating a new treaty or recognizing ecocide as an international crime, others continue to focus on strengthening existing frameworks.

While this global discussion continues, Saudi Arabia has worked to establish domestic legal certainty through the Environmental Law of 2020, supported by complementary regulations that codify a wide range of environmental crimes and their penalties.

Key classifications include industrial pollution and hazardous waste, covering unlicensed discharges, dumping, or mishandling of dangerous materials, and illegal hunting and trading of wildlife.

Enforcement is shared among specialized institutions, including the National



Amal Albawardi is general manager of the General Department of International Agreements and Cooperation at Saudi Arabia's National Center for Environmental Compliance.

Center for Environmental Compliance, which oversees compliance and regulations, and the Special Forces for Environmental Security, responsible for field enforcement.

These also include the National Center for Wildlife, which manages biodiversity and protected areas, and the Public Prosecution, tasked with bringing serious environmental crimes to court to hold offenders accountable. These institutions show that the Kingdom treats environmental protection as integral to its law, sovereignty, and security.

In 2025, Saudi Arabia participated in the first meeting of the UN Intergovernmental Expert Group on Crimes that Affect the Environment, held in Vienna. This demonstrated its commitment to global governance through international policy work that protects national sovereignty

while creating equitable partnerships.

The Kingdom's position builds on Vision 2030 domestic reforms, which place environmental sustainability at the center of national transformation.

Saudi Arabia's approach demonstrates both national commitment and international responsibility.

Domestically, the Kingdom enforces laws that punish pollution, wildlife trafficking, deforestation and illegal oil drilling. Abroad, it actively engages in shaping the conversation on how to confront these crimes collectively.

The Kingdom demonstrates its position as a global leader through clear domestic policies and active international relations. Environmental crime exists beyond borders, and so does the commitment to fight it.

If children don't grow up knowing about nature, they will not understand it. And if they don't understand it, they won't protect it.

Sir. David Attenborough
British broadcaster and biologist



Business

CONSERVATION IN ACTION

The future of the Arabian wolf

Exploring the predator's role in the region's heritage and ecosystem

Haifa Alshammari Riyadh

Wolves are often portrayed in Western literature as dangerous predators. In Saudi Arabia, the view is more nuanced.

Wolves are admired for their intelligence, resilience, and role in the natural environment. The Arabian wolf, or *Canis lupus arabs*, is one of the Peninsula's iconic predators.

For centuries, it shaped ecological and cultural landscapes across Saudi Arabia, Yemen, and Oman. Its population declined in recent decades, but the National Center for Wildlife is now working to protect and restore the species.

Saudi regulations make it illegal to display, sell, or transport wolves without authorization. NCW studies wolf genetics, develops breeding programs, raises public awareness, and imposes fines of up to SR80,000 (\$22,000) for unlicensed hunters.

Historically, the Arabian wolf thrived in deserts, mountains, and valleys. Unlike wolves in colder regions, it evolved to survive extreme heat, scarce water, and fluctuating prey populations. "Saudi Arabia's vast and diverse ecosystems have enabled many wildlife species to thrive, including the Arabian wolf," NCW notes. It controlled populations of rodents and weak animals, maintaining ecological balance.

DID YOU KNOW?

1 In Saudi Arabia, hunting wolves without a proper license can result in fines of up to SR80,000.

2 Mexican wolves, locally known as 'El Lobo,' are critically endangered, despite ongoing reintroduction efforts.

3 While recent figures for Saudi Arabia's wolf population are not available, a 2004 report estimated their numbers at 500-600.

However, urbanization, agriculture, habitat loss, and hunting have pressured the species. Injured wolves are often rescued and rehabilitated, reflecting ongoing challenges.

Culturally, the Arabian wolf inspires both admiration and caution. In Bedouin tradition, it symbolizes independence and intelligence.

"Two cultures in the world share a similar view of the wolf: Native American and Arab cultures," said Obaid Alouni, a Saudi environmentalist. "They admired wolves and respected wolves. For example, when they see a wolf and someone has a gun, they don't kill it even though they could."

Alouni added: "There was a kind of coexistence in the Arabian Peninsula," even though wolves preyed on livestock, creating tension. "Arabs have always sought positive qualities

in wolves. For example, one of their characteristics is that wolves understand their pack and sacrifice themselves for them. They do not betray their pack and fight for it, in addition to their loyalty to it."

Weighing 18-25 kg and measuring 100-110 cm, the Arabian wolf has large ears, a sandy-gray coat, and a diet of small mammals, birds, and occasionally livestock. Hybridization has reduced purebred populations, but NCW is working to restore the original species.

TYPES OF WOLVES

CONSERVATION STATUS

 Least concern

 Endangered

 Critically endangered

1 **ARABIAN WOLF**
Scientific name: *Canis lupus arabs*.
Habitat: Deserts and semi-arid regions of the Arabian Peninsula (Saudi Arabia, Oman, Yemen).
Size: 18-25 kg, 100-110 cm long, smaller than most wolves.
Conservation status: Endangered.
Features:
• Has large ears to release heat.
• Typically travels in small packs or pairs.
• Scavenger and hunter of small prey.
• Light gray or sandy coat adapted to desert heat.

2 **ARCTIC WOLF**
Scientific name: *Canis lupus arctos*.
Habitat: Arctic regions (Canada, Greenland, and northern North America).
Size: 34-60 kg, 100-180 cm long.
Conservation status: Least concern.
Features:
• Thick white coat for insulation.
• Shorter snout and ears to minimize heat loss.
• Survives in extreme cold with little food.
• Hunts musk oxen, Arctic hare, and caribou.

3 **INDIAN WOLF**
Scientific name: *Canis lupus pallipes*.
Habitat: India, Pakistan, Iran, and the Middle East—grasslands, deserts, scrublands.
Size: 20-30 kg, 103-145 cm long, slender body.
Conservation status: Endangered.
Features:
• Brown-gray coat.
• Known for stealth and endurance.
• Smaller pack sizes.
• One of the most endangered wolf subspecies due to habitat loss.

4 **ETHIOPIAN WOLF**
Scientific name: *Canis simensis*.
Habitat: Ethiopian highlands above 3,000 meters.
Size: 13-18 kg, 84-102 cm long, fox-like build.
Conservation status: Endangered.
Features:
• Reddish coat with white markings.
• The world's rarest wolf (fewer than 500 remain).
• Specialized hunter of rodents.
• Lives in open Afro-alpine environments.

5 **MEXICAN WOLF**
Scientific name: *Canis lupus baileyi*.
Habitat: Southwestern US and northern Mexico—mountain forests, grasslands.
Size: 23-40 kg, 140-170 cm long, smaller subspecies of the gray wolf.
Conservation status: Critically endangered.
Features:
• Distinctive gray-brown coat with black markings.
• Known as "El Lobo."
• Strong pack behavior and territorial instincts.

6 **GRAY WOLF**
Scientific name: *Canis lupus*.
Habitat: Forests, tundra, grasslands, and mountains across North America, Europe, and Asia.
Size: 30-80 kg, 150-180 cm long.
Conservation status: Least concern.
Features:
• Largest wolf species.
• Highly social, lives in packs.
• Color varies from gray to white to black.
• Apex predator with complex communication (howling, body language).

COP30 makes resilient architecture a global mandate

FAISAL AL-FADL



Faisal Al-Fadl is secretary-general of Saudi Green Building Forum.

Three decades of climate negotiations have culminated in a new global mandate: buildings must now demonstrate resilience, safeguard water, and protect communities as climate risks intensify.

After 30 years of climate talks, COP30 has pushed the environmental agenda into a new phase — one defined not by promises but by implementation. The outcomes from Belem place the built environment squarely on the frontlines of climate adaptation.

Countries agreed that adaptation indicators should be voluntary, country-driven, and non-prescriptive. For the Middle East and the Gulf in particular, this flexibility is long overdue. It allows governments and

developers to prioritize heat resilience, water sufficiency, dust tolerance, and urban systems capable of withstanding prolonged climate stress.

The outcome also affirms a wider truth: no single solution fits all climates. What works in tropical regions cannot simply be applied to arid environments. This is where conformity becomes essential.

A credible conformity system ensures that diverse local solutions still meet one global expectation for transparency and resilience. Solutions may be local, but standards must remain universal.

This shift reflects principles long championed by the Saudi Green Building Forum. Its sufficiency-based saaf® framework has emphasized for years that resilience should be demonstrated at the

level of buildings and communities, not through bureaucratic reporting. COP30 now reinforces this direction.

Developing countries rejected adaptation indicators tied to national spending and instead called for simple, measurable outputs at the project scale. The saaf® Composite Sufficiency Index aligns directly with this approach.

COP30 also delivered a clear message on adaptation finance. Proposals ranged from tripling global adaptation funding by 2030 to creating a dedicated \$150 billion facility for vulnerable regions. For Gulf developers, municipalities, and regulators, this opens the door to attracting adaptation finance through certification systems like saaf®.

In this new global landscape,

architecture will be judged not by aesthetics or standalone efficiency but by its capacity to protect people.

Buildings must maintain safe temperatures during extreme heat, secure access to water, and remain operational during climate shocks. As risks intensify, the built environment will determine how communities endure under changing climatic conditions.

For the Gulf, the opportunity is historic. The region faces some of the world's harshest climate challenges yet also possesses the vision to lead in climate-responsive design. With COP30's new mandate and the momentum of Vision 2030, the path is clear: build for resilience, measure sufficiency, and set global benchmarks.

The presence, or absence, of dugong tells us a lot about the health of an ecosystem.

Mirey Atallah

Head of the UN Environment Programme's Climate for Nature Branch



Spotlight GREEN & BLUE

SAUDI ARABIA

A safe harbor for the dugong

How the Kingdom is protecting sea cows, safeguarding fragile habitats, and ensuring species survival

Haifa Alshammari Riyadh

Once mistaken for mermaids by weary sailors, the dugong — shy, slow-moving marine mammals — now face a very real threat of extinction.

Their closest relative, Steller's sea cow, vanished in the 18th century after relentless hunting. Conservationists warn that unless strong protections are put in place, dugongs could meet the same fate.

But in Saudi Arabia, herds of this elusive species are finding refuge. Along the Red Sea and Arabian Gulf coastlines, dugongs graze peacefully in seagrass meadows — a vital habitat that the Kingdom is determined to safeguard.

"The presence, or absence, of dugong tells us a lot about the health of an ecosystem, its diversity and levels of pollution," said Mirey Atallah, head of the UN Environment Programme's Climate for Nature Branch, commenting on regional conservation efforts.

Dugongs, nicknamed "sea cows," feed exclusively on seagrass in shallow waters. They have fusiform bodies, dolphin-like flippers, and broad tails, but their most striking trait is their reproductive pace.

Females give birth only once every three to seven years, and calves stay with their mothers for

up to two years. This slow cycle makes dugongs highly vulnerable to population collapse.

Saudi Arabia is one of the few countries where their survival is being actively secured. The National Center for Wildlife has introduced satellite tracking and long-term studies to monitor dugong movements.

Red Sea Global, the developer behind regenerative tourism projects The Red Sea and AMAALA, has also made

DID YOU KNOW?

1 A dugong can consume up to 40 kg of seagrass daily, maintaining the health of marine plants.

2 Dugongs are between 2 and 3.5 meters in length and weigh 300 to 500 kg.

3 They have thick skin, a dolphin-like tail, and live in small groups.

dugong protection part of its environmental commitments.

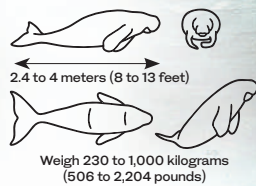
"Dugong are a threatened species and, ecologically, highly distinctive. There is no other similar species in the region," RSG said in a statement.

Its scientists are studying foraging grounds and migratory pathways, using drones and even testing machine-learning tools to detect dugongs in aerial surveys. With its extensive seagrass beds, RSG believes the

CHARACTERISTICS OF A DUGONG

Large herbivorous marine mammals of the order Sirenia, closely related to manatees.

APPEARANCE
Fusiform bodies, paddle-like flippers, and fluked tails like those of dolphins.



REPRODUCTION
Females give birth every 3 to 7 years, and calves stay with their mothers up to 2 years, making populations vulnerable to decline.

LIVING SIRENIANS



DUGONG
(*Dugong dugon*)
Habitat: Shallow coastal waters of the Indo-Pacific such as Red Sea, East Africa, Southeast Asia, Northern Australia.
Classification: Family Dugongidae; Order Sirenia.



WEST AFRICAN MANATEE
(*Trichechus senegalensis*)
Habitat: Rivers, estuaries, and coastal waters of West Africa (from Senegal to Angola).
Classification: Family Trichechidae; Order Sirenia.

RELATIVES WITHIN THE ORDER SIRENIA



WEST INDIAN MANATEE
(*Trichechus manatus*)
Habitat: Warm coastal waters, rivers, and estuaries of the Caribbean, Gulf of Mexico, and Florida.
Classification: Family Trichechidae; Order Sirenia.

EXTINCT CLOSE RELATIVE



STELLER'S SEA COW
(*Hydrodamalis gigas*)
Status: Extinct in the 18th century.
Habitat: Cold waters of the North Pacific, near the Commander Islands (Russia).
Classification: Family Dugongidae; Order Sirenia.

area could become a regional stronghold for dugongs.

The Kingdom's coasts are among the species' last global sanctuaries. The Red Sea offers vital feeding grounds, while the Arabian Gulf is home to one of the world's largest populations, estimated



Dugong are a threatened species and, ecologically, highly distinctive. There is no other similar species in the region.

at around 7,000 animals.

These numbers reflect the Gulf's rich seagrass meadows and favorable conditions for seasonal migration.

To ensure their safety, Saudi authorities have introduced strict legislation; hunting or harming dugongs can incur fines

of up to SR1 million (\$266,465).

If conservation succeeds, future generations may continue to glimpse dugongs gliding through Saudi waters — reminders of how legends of mermaids were born, and of how human care can keep myth and nature alive.

Saudi Arabia's water sector turns scarcity into opportunity

ARIF ALKALALI

Green water refers to moisture held in soil and consumed by plants, while blue water describes water in lakes, rivers and aquifers. In Saudi Arabia, both are scarce. Yet despite this extreme aridity, the Kingdom has emerged as a global leader in water governance.

The UN-Water body recently recognized Saudi Arabia as the SDG 6 Country Acceleration Case Study for its progress on integrated water resource management, represented by SDG 6.5.1. That recognition is supported by measurable progress.

Between 2020 and 2023, the Kingdom's score on this indicator jumped from 57 percent to 83 percent — a remarkable leap achieved not by changes in climate,

but by the strength of its management, governance and long-term planning.

These improvements are enshrined in Vision 2030, which sets water security at the core of sustainable development.

Saudi Arabia's journey of water innovation dates back more than a century. The late King Abdulaziz ordered the construction of Red Sea water condensing machines in the early 20th century, a prescient recognition that science and technology were essential.

Political commitment has remained constant; the Basic Law of Governance anchors the principle that resources must be developed for the benefit, security and prosperity of society, within a sound scientific framework.

That principle now drives the National Water Strategy, which brings



Arif Alkalali is a senior water consultant at the Saudi Ministry of Environment, Water and Agriculture

together 10 programs spanning policy, emergency planning, resource development, research and innovation.

The strategy has created a uniquely integrated and coordinated system, with clear institutional mandates and sustainable financial models.

This coherence has produced tangible results. Since the strategy's launch, Saudi Arabia has nearly doubled drinking water production, doubled the capacity of its water conveyance and storage systems, and achieved clean water access for almost 100 percent of the population. At the same time, the reuse of water has nearly tripled.

Privatization is central to sustaining these gains. The Saudi Water Partnership Company now oversees investments worth SR47 billion (\$12.5 billion)

across the water supply chain, creating opportunities for innovation, efficiency and private-sector participation.

By driving down the cost of desalination and investing in clean energy, the sector has reduced its carbon footprint in line with the Kingdom's pledge to achieve net zero by 2060.

Innovation underpins this transformation. Saudi Arabia is developing plans to reuse 90 percent of urban and industrial water, mining wastewater for precious metals, experimenting with lower-salinity seawater for agriculture, and deploying groundwater metering.

Each of these steps reflects a broader ambition: To transform water scarcity into a platform for technological progress and economic opportunity.

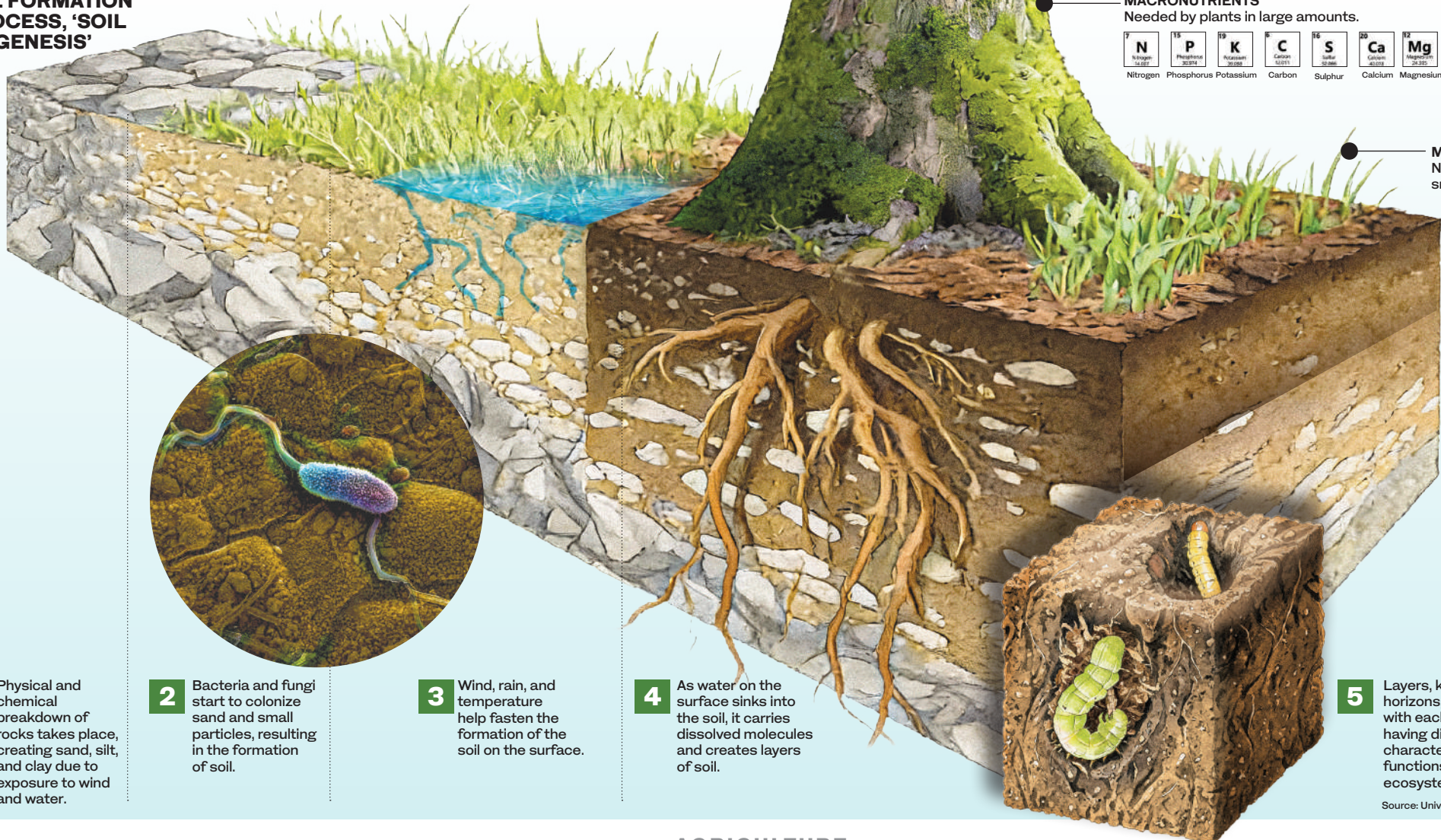
The role of soil includes structural stabilization, providing nutrients and a communication medium for plants.

Basil Nasir
Soil lead at engineering consultancy
William Sale Partnership



Business

SOIL FORMATION PROCESS, 'SOIL GENESIS'



MACRONUTRIENTS
Needed by plants in large amounts.

| | | | | | | |
|----------------------|------------------------|-----------------------|--------------------|---------------------|----------------------|------------------------|
| N Nitrogen | P Phosphorus | K Potassium | C Carbon | S Sulphur | Ca Calcium | Mg Magnesium |
|----------------------|------------------------|-----------------------|--------------------|---------------------|----------------------|------------------------|

USEFUL NUTRIENTS FOR SOIL

MICRONUTRIENTS
Needed by plants in small amounts.

| | | | | | | | |
|-------------------|-----------------------|---------------------|-------------------|------------------------|-------------------------|---------------------|-------------------|
| B Boron | Cl Chloride | Cu Copper | Fe Iron | Mg Magnesium | Mo Molybdenum | Ni Nickel | Zn Zinc |
|-------------------|-----------------------|---------------------|-------------------|------------------------|-------------------------|---------------------|-------------------|

1 Physical and chemical breakdown of rocks takes place, creating sand, silt, and clay due to exposure to wind and water.

2 Bacteria and fungi start to colonize sand and small particles, resulting in the formation of soil.

3 Wind, rain, and temperature help fasten the formation of the soil on the surface.

4 As water on the surface sinks into the soil, it carries dissolved molecules and creates layers of soil.

5 Layers, known as horizons, are formed, with each layer having different characteristics and functions in the ecosystem.

Source: University of Minnesota Duluth

AGRICULTURE

Soil secrets of the Kingdom

Palm trees, root crops, and coastal plants all tell the story of the land that nurtures them

Haifa Alshammari Riyadh

Saudi Arabia's varied landscapes — from deserts and valleys to mountains and coastlines — play a decisive role in shaping agriculture across the Kingdom. Alongside geography and climate, soil conditions determine what can grow and how crops can be sustained.

Explaining the country's soil diversity, Turki Almutairi, senior environmental specialist at the National Afforestation

Center, said: "The dominant soil in the Kingdom are sandy desert soils, alongside calcareous soils in the central region. Rocky and stony soils are present along mountainous and hilly landscapes."

"Alluvial soils are common in wadies (valleys), while saline and sodic soils are located in depressions (Sabkhas) and along coastlines. Pockets of clayed soils can be also found around few sites along the Kingdom."

These variations allow different crops to thrive depending on location. "Soil is the growing medium for plants.

The role of soil includes structural stabilization, providing nutrients and a communication medium for plants," said Basil Nasir, soil lead at William Sale Partnership.

According to Nasir, understanding soil use is key to determining fertility. "The soil used for trees differs from the soil used for ornamental plants and from the soil used for aquatic plants. It varies according to the specific needs of each plant, and based on this, we determine what the soil requires and assess its fertility," he said.

Soil characteristics are shaped by mineral particles

DID YOU KNOW?

1 Saudi Arabia cultivates around 1 million hectares, mainly in Riyadh, Qassim, Hail, and Jouf.

2 Farming follows the seasons: Winter brings onions, garlic, and carrots, while summer yields watermelon, tomatoes, and cucumbers.

3 The Kingdom is a top date producer, with over 31 million palm trees generating nearly 1.54 million tonnes, especially in Riyadh and Qassim.

such as sand, silt and clay, as well as water, air and organic matter. Their balance affects physical properties, including water-holding capacity.

"If the soil is like dunes, adding water will cause it to run off, but if the soil is clay, its ability to retain water will be very high. If you add water and return the next day, you will find that the water is still there," Nasir said.

Chemical properties also matter. "What determines whether a plant is suitable for a particular environment is primarily the plant's nature. For example, some

plants have fibrous roots and therefore do not require well-draining soil," he added.

"Soil is considered fundamental for the National Greening Program's objectives. Understanding the soil variability along the Kingdom is a precondition for fostering sustainable soil management," Almutairi said.

"In this line, the NGP is working toward the establishment of the Saudi Soil Information System, which consists of mapping soils and its functional properties in the Kingdom using state-of-the-art technology."

Mapping Saudi Arabia's soil diversity

ADNAN MASOUDY, HASSAN ALZAIN

Artificial intelligence is advancing at unprecedented speed, yet its energy appetite is growing just as rapidly. Data centers consumed around 415 terawatt hours of electricity in 2024, and global demand could surpass 1,000 TWh by 2026 — roughly Japan's annual consumption.

Beyond electricity, AI expansion strains water resources, generates e-waste, and pressures land and local grids. These externalities highlight the need for climate-aligned governance alongside technological growth.

The risks emerge amid a warming world. Over 2.4 billion workers face unsafe conditions due to heat, with climate change already costing hundreds

of billions annually in lost output.

An AI boom adding further emissions could exacerbate challenges for countries already struggling with climate impacts. Strong adaptation, mitigation, and nature-based solutions are essential for ensuring that AI innovation supports long-term stability.

AI can also advance climate solutions, optimizing electricity grids, improving weather modeling, accelerating low-carbon materials discovery, and aiding decision-making across food, water, and energy systems.

As experts note, durable outcomes depend on cross-sector collaboration and integrating sustainability into investment and corporate strategy.

Saudi Arabia is emerging as a central



Adnan Masoudy is manager of corporate sustainability, environment, and biodiversity at Ma'aden.

Hassan Alzain is author of the award-winning book "Green Gambit."

force in climate-smart AI. Under Vision 2030, AI is projected to add over \$135 billion to GDP by 2030.

The Kingdom aims to source at least 50 percent of its power from renewables by 2030, expanding capacity to roughly 130 GW, including 58.7 GW from solar and wind.

Recent initiatives include Humain's joint venture with AMD and Cisco to build renewable-powered data centers starting at 100 MW and scaling to 1 GW, and xAI with NVIDIA developing a 500 MW AI facility deploying 600,000 processors nationwide.

Human capital development is also pivotal. The "One Million Saudis in AI" program has trained over 1 million people — 52 percent women — ensuring

expertise to design, regulate, and maintain sustainable AI systems.

Nuclear energy and green-hydrogen projects, including NEOM's \$8.4 billion hydrogen plant, further support low-carbon AI expansion.

Saudi Arabia can lead the global race for climate-aligned AI by ensuring clean power for AI clusters, setting environmental standards for data centers, embedding green skills in AI training, advancing global digital infrastructure standards, and embedding emissions accountability in investments.

With these strategies, the Kingdom can showcase a rapidly growing AI economy powered by green energy, governed transparently, and aligned with planetary limits.

The Kingdom holds an exceptional opportunity to become a global leader in organic honey production.

Mansour Al-Mgaslah
Supervisor of the Mangrove Honey Production Initiative



Spotlight GREEN

SAUDI ARABIA

From nectar to national asset

Beekeepers are combining traditional knowledge with organic practices to grow a cleaner, greener honey industry

Afshan Aziz Jeddah

Saudi Arabia's honey sector is experiencing a quiet revolution, one that blends centuries-old beekeeping traditions with the precision of modern sustainable agriculture.

Among the leading figures shaping this transformation is Jassim Almughrabi, Saudi Arabia's first certified organic honey producer and owner of Mughrabi Apiaries.

"After the government showed strong interest in organic agriculture, things became much more comfortable for us," Almughrabi told Arab News. "I had already registered as an organic honey producer, but when the Ministry of Agriculture started giving support and donations to beekeepers who wanted to convert from conventional to organic, our production improved significantly."

At the heart of Saudi Arabia's beekeeping heritage lies a deep knowledge of traditional methods.

For centuries, beekeepers used hollowed logs to house bees, drawing from nature to sustain their practices. While this still holds cultural value, a shift began when the ministry encouraged farmers to adopt modern beehive systems.

This has transformed the industry, making Saudi honey a highly sought-after commodity.

DID YOU KNOW?

1 Over 15,000 Saudi beekeepers now use modern Langstroth hives instead of traditional hollow logs.

2 Indigenous bees like the Arabian honeybee outperform imported species in resilience and honey yield.

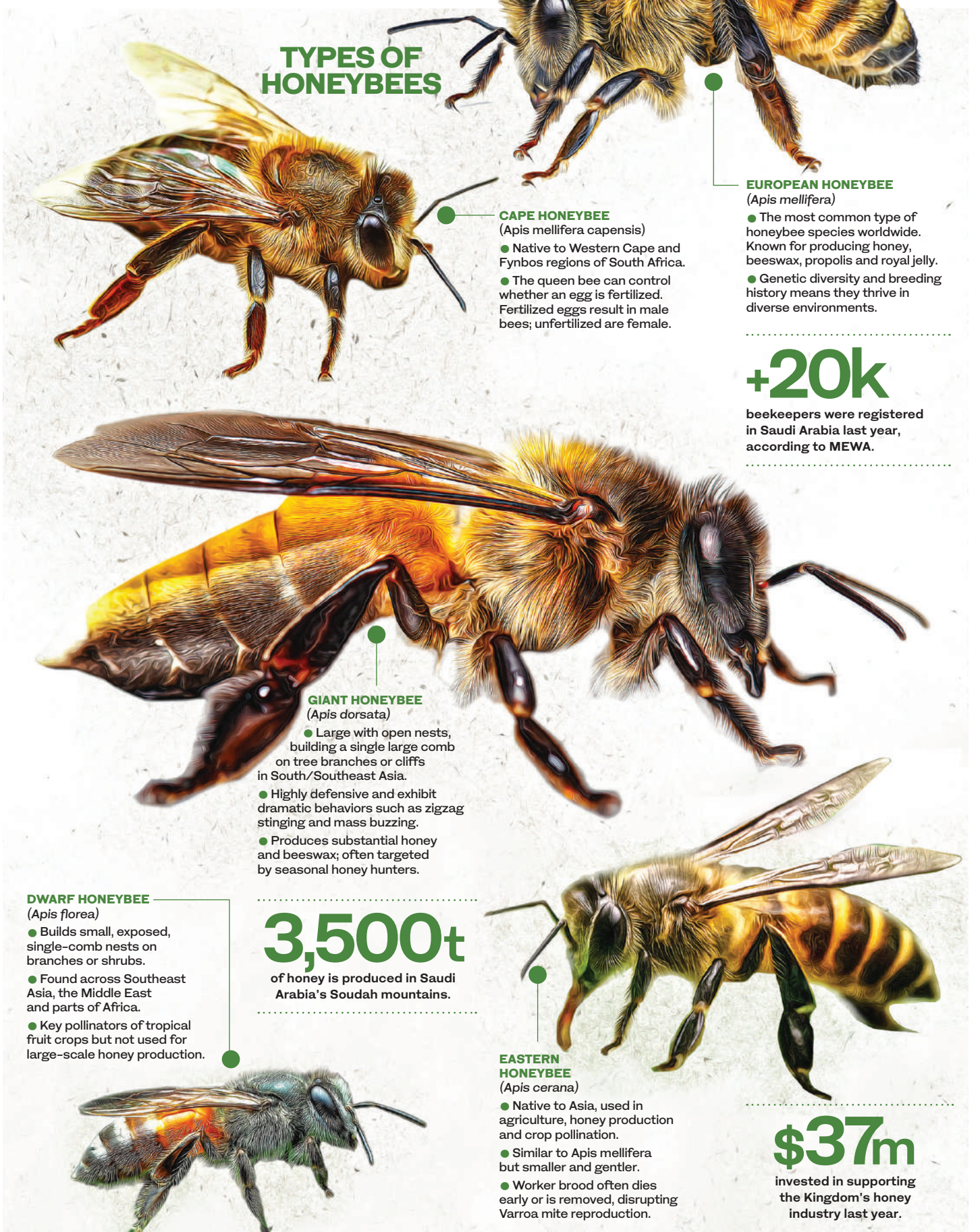
3 Organic certification demands pesticide-free pastures, natural feeding, traceability and strict documentation.

Mansour Al-Mgaslah, beekeeper and supervisor of the Mangrove Honey Production Initiative said: "The honey sector in the Kingdom has witnessed a remarkable transformation in recent years, driven by a growing awareness of the importance of sustainable beekeeping practices."

By encouraging vegetation restoration and reducing chemical dependencies, beekeepers can help preserve ecosystems that bees and honey production rely on.

"Sustainable beekeeping helps restore ecological balance by preserving bees as sensitive and effective environmental indicators," said Al-Mgaslah.

The cornerstone of Saudi Arabia's sustainable honey movement is its organic certification system, monitored by



the Ministry of Environment, Water and Agriculture. The process includes criteria such as pesticide-free pastures, natural nutrition without antibiotics or sugar, and complete traceability from hive to shelf.

"To be certified organic in the

Kingdom means that your honey is free from any chemical or industrial interventions at every stage," said Al-Mgaslah. "Beekeepers must meet strict environmental and documentation standards, and the certification is granted only through authorized,

ministry-recognized bodies."

With international demand for clean, traceable, and eco-conscious products on the rise, both experts believe Saudi Arabia is poised for a golden era in honey exports.

"The Kingdom holds an exceptional opportunity to become a

global leader in organic honey production," said Al-Mgaslah.

"Thanks to its unique botanical diversity, rich heritage, and government support, Saudi honey can meet the growing global demand for authentic, natural products."

Unlocking Saudi Arabia's geothermal potential

HAUKUR HARDARSON

As Saudi Arabia makes progress on Vision 2030, a defining opportunity is emerging: to transform how its cities are powered, cooled and sustained through one of the most promising yet underutilized renewable resources — geothermal energy.

By tapping into the natural heat beneath our feet, the Kingdom can unlock a greener, healthier and more resilient future — one that not only reduces emissions but also supports thriving, livable urban environments.

The global shift toward clean energy is well underway. Today, renewable resources generate nearly 30 percent of electricity worldwide — a share expected to exceed 50 percent by 2040.

Geothermal energy, with its round-the-clock reliability and minimal land footprint, is gaining recognition as a vital part of the transition.

More than 16 gigawatts of geothermal capacity — roughly equal to the electricity demand of the Netherlands or the Philippines — is already in operation globally. With the right policies and investment, this figure could grow fiftyfold by mid-century.

Unlike solar or wind, geothermal is a baseload energy source, producing constant, steady output day and night, regardless of the weather. This makes it especially valuable in the Gulf, where high electricity demand, particularly for cooling, coincides with high outdoor temperatures and energy-intensive urban growth.

In Saudi Arabia, cooling can account



Haukur Hardarson is the founder and chairman of Arctic Green Energy.

for up to 70 percent of daily electricity consumption, most of it currently met by natural gas. Geothermal-powered district cooling offers a clean, efficient and cost-effective solution to ease pressure on gas supplies, lower emissions and improve long-term energy security.

With expertise in drilling, subsurface engineering and energy infrastructure, Saudi Arabia has a strong foundation for geothermal development.

Up to 80 percent of geothermal project investment overlaps with technologies and skills already standard in the oil and gas sector, offering a natural pathway for industry diversification and workforce transition. Existing infrastructure can be repurposed to reduce both cost and time to deployment.

But the opportunity goes beyond cities and utilities. In regions like AIUla and NEOM, geothermal energy can support place-based developments aligned with the Kingdom's tourism and sustainability goals.

To realize this potential, continued collaboration will be essential. A supportive regulatory framework, access to project finance and targeted investment in building local capacity will help scale geothermal across the Kingdom and beyond.

Geothermal energy offers more than an environmental solution. It offers a commercial, scalable and regionally adapted path to economic diversification, industrial innovation and energy resilience.

As the Kingdom looks to chart a sustainable and prosperous future, geothermal should play a central role.