Geography of The Arabian Peninsula

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The Arabian Peninsula (Arabic: شبه الجزيرة العربية romanized: shibh al-jazīra al-ʿ**arabiyya**', or جزيرة العرب **'Jazīrat al-arab**', the Island of Arabs'), or simply Arabia, is a peninsula in West Asia, situated north-east of Africa on the Arabian plate. At 3,237,500 km^2 (1.25 million sq mi), comparable in size to India, the Arabian Peninsula is the largest peninsula in the world.

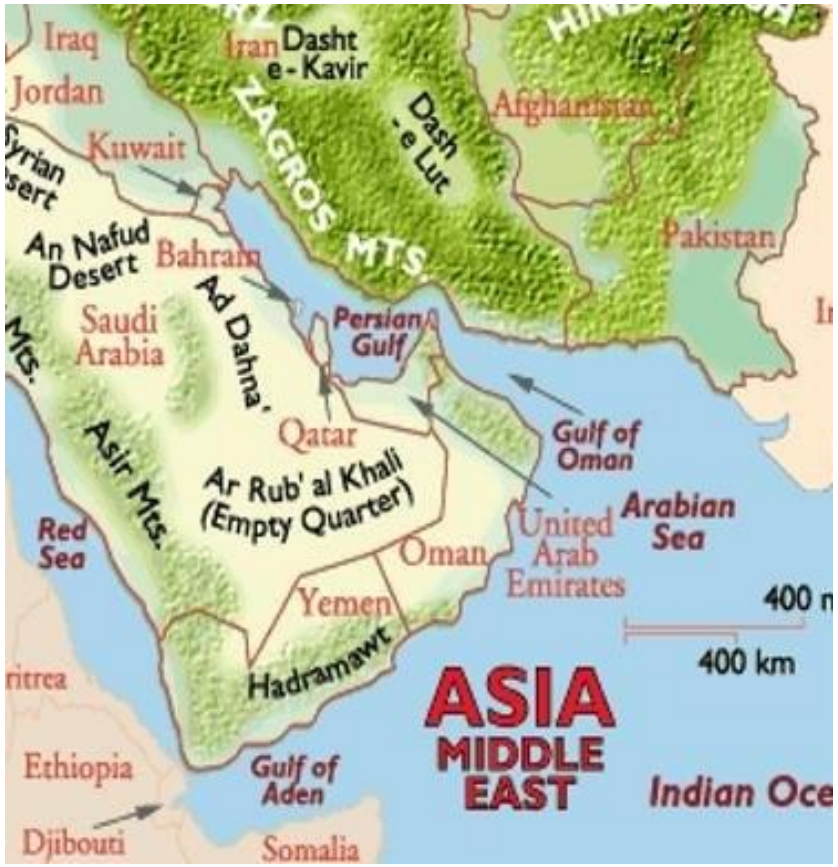
Geography of Arabian Peninsula

Geographically, the **Arabian Peninsula** comprises Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates **(UAE)** and Yemen, as well as southern Iraq and Jordan**.** The largest of these is Saudi Arabia. In the Roman era, the Sinai Peninsula was also considered a part of Arabia.

Physical Geography

Dominated by vast deserts, rugged mountains, and coastal plains.

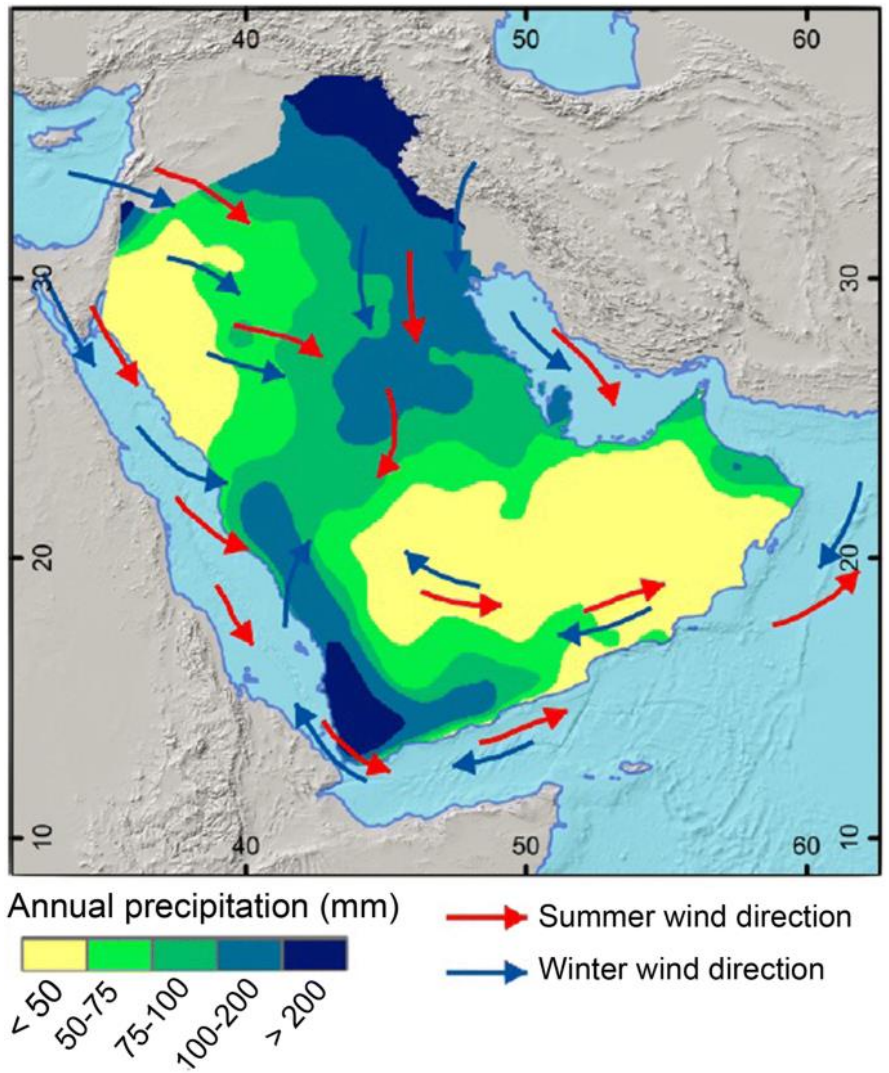
- **Major Deserts:**
  - Rub' al Khali (Empty Quarter) – the largest continuous sand desert.
  - An-Nafud Desert – known for its red sand dunes.
  - Ad-Dahna Desert – a narrow corridor connecting the other two deserts.
- **Mountain Ranges:**
  - Asir Mountains (Saudi Arabia) – experience higher rainfall and support vegetation.
  - Sarawat Mountains – stretch along the western coast.
  - Hajjar Mountains (Oman and UAE) – known for their rugged terrain and biodiversity.



Climate: The **Arabian Peninsula** has an arid to semi-arid climate with generally hot, dry conditions, especially during **summer,** and lower temperatures **in winter,** though coastal areas are often humid. Key characteristics include intense heat, frequent dust storms, and low precipitation, though the mountainous southwestern region receives more rainfall from monsoon influences. The region is vulnerable to climate change, with recent studies highlighting a significant warming trend and the potential for extreme events.

Climate Zones:

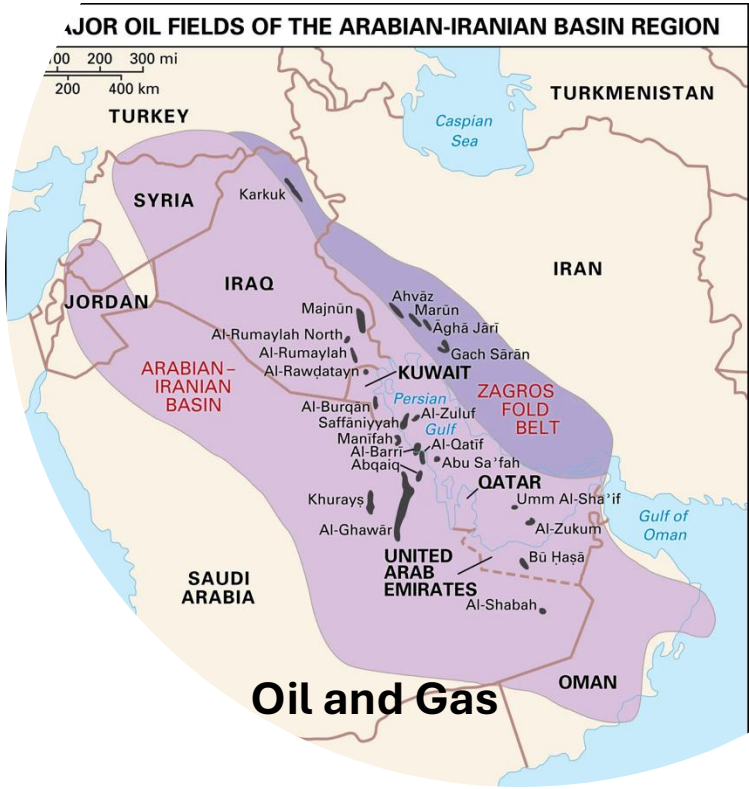
- **Deserts:** Hot days, cold nights, little rainfall.
- **Coastal Regions:** More humidity due to proximity to water bodies.
- **Mountain Areas:** Relatively cooler temperatures and more precipitation.



➢ **Rainfall varies between 50-100 mm annually, mostly in winter.**

Natural Resources

The Arabian Peninsula's primary natural resource is a vast supply of oil and natural gas, concentrated in its eastern regions. The peninsula also has significant mineral deposits, particularly in the western Arabian Shield, including gold, silver, copper, phosphate, bauxite, and rare earth elements.



Key Natural Resources by Type

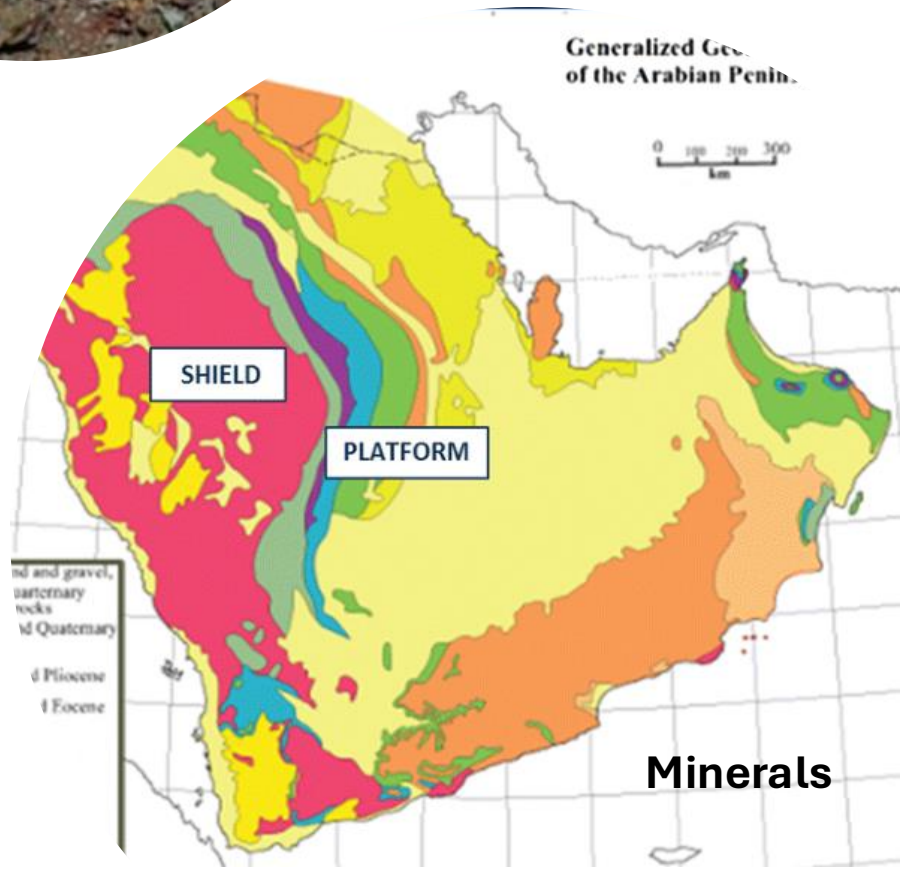
- **Energy Resources:**
- **Oil and Gas:** he Arabian Peninsula, particularly Saudi Arabia, holds significant oil and gas reserves, making it a major global energy producer and a key player in the international oil market. Other countries like Kuwait and the UAE are also major producers.

Natural Resources

➢ **Mineral Resources:**

- **Precious Metals:** Gold and silver are extracted from the Arabian-Nubian Shield in western Saudi Arabia.

- **Base and Industrial Minerals:** Copper, zinc, and phosphates are mined in the Western and Northern regions of Saudi Arabia.



Water Resources

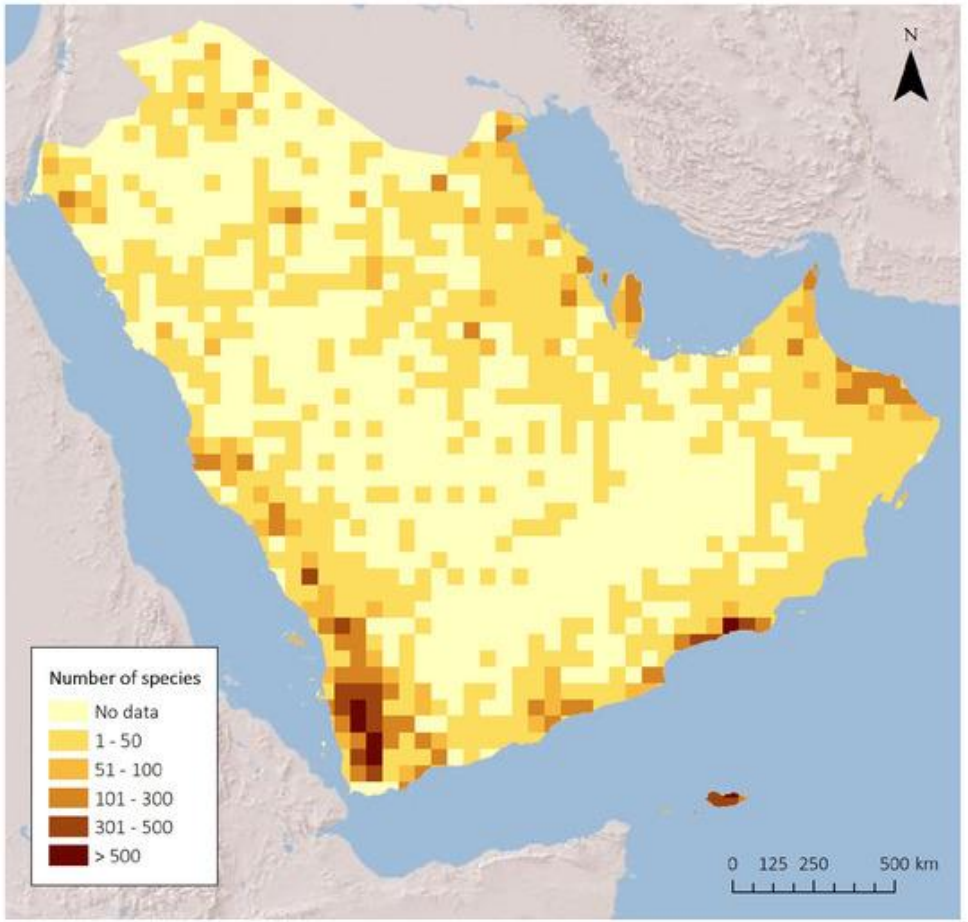
The **Arabian Peninsula's** water resources primarily rely on groundwater from vast underground aquifers and desalinated seawater, as the region is extremely arid with very little natural rainfall and no permanent rivers. Major groundwater sources include the non-renewable Upper Mega Aquifer System, while desalinated water, produced on a massive scale in countries like Saudi Arabia, supplies a large portion of urban and industrial needs.

Governments invest in water conservation and sustainable solutions.

Natural Resources

➢ **Biodiversity and Organic Resources:**

- **Medicinal Plants and Honey:** Found in the forested ecosystems of the southwest mountains, particularly in the Sarawat Mountains.
- **Forests:** Juniper, acacia, and wild olive trees dominate the Sarawat Mountains, crucial for biodiversity.



Species richness in the Arabian Peninsula where most of the endemic species are found

Human Geography

The human geography of the Arabian Peninsula is characterized by **Arab ethnic majorities**, a predominant practice of Islam, and a population concentrated in cities along the coastlines and around oases, influenced by the region's vast deserts and abundant oil wealth.

The peninsula includes several countries: Saudi Arabia, UAE, Oman, Yemen, Qatar, Bahrain, and Kuwait.

Population: Around 80 million people, with high urbanization rates.

❖ Major Cities:

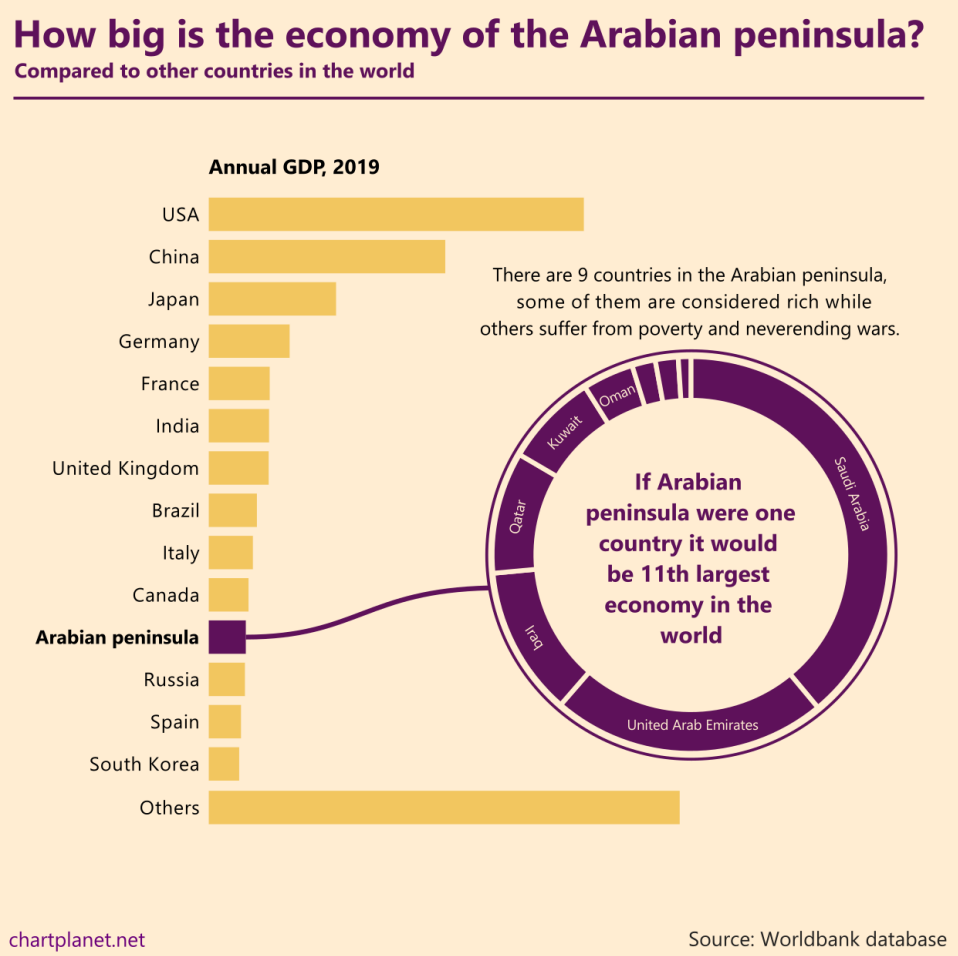
- Riyadh (SaudiArabia) – largest city and economic center.
- Dubai (UAE) – global business and tourism hub.
- Abu Dhabi (UAE) – capital with rich oil resources.
- Muscat (Oman) – important port city.
- Sana'a (Yemen) – historic city with ancient architecture.

❖ Economy

The economy is primarily driven by oil and gas exports.

- **Key Sectors:**
  - **Oil and Gas:** Dominant sector, crucial for global energy supply.
  - **Trade and Finance:** Dubai is a major financial hub.
  - **Tourism:** Includes religious tourism (Mecca and Medina) and luxury tourism.

- Many countries are diversifying economies to reduce dependence on oil.



Cultural Aspects

The culture of the Arabian Peninsula is a vibrant mix of ancient Bedouin traditions, strong Islamic heritage, and a rich history as a major trade route, characterized by a deep respect for family, community, and hospitality.

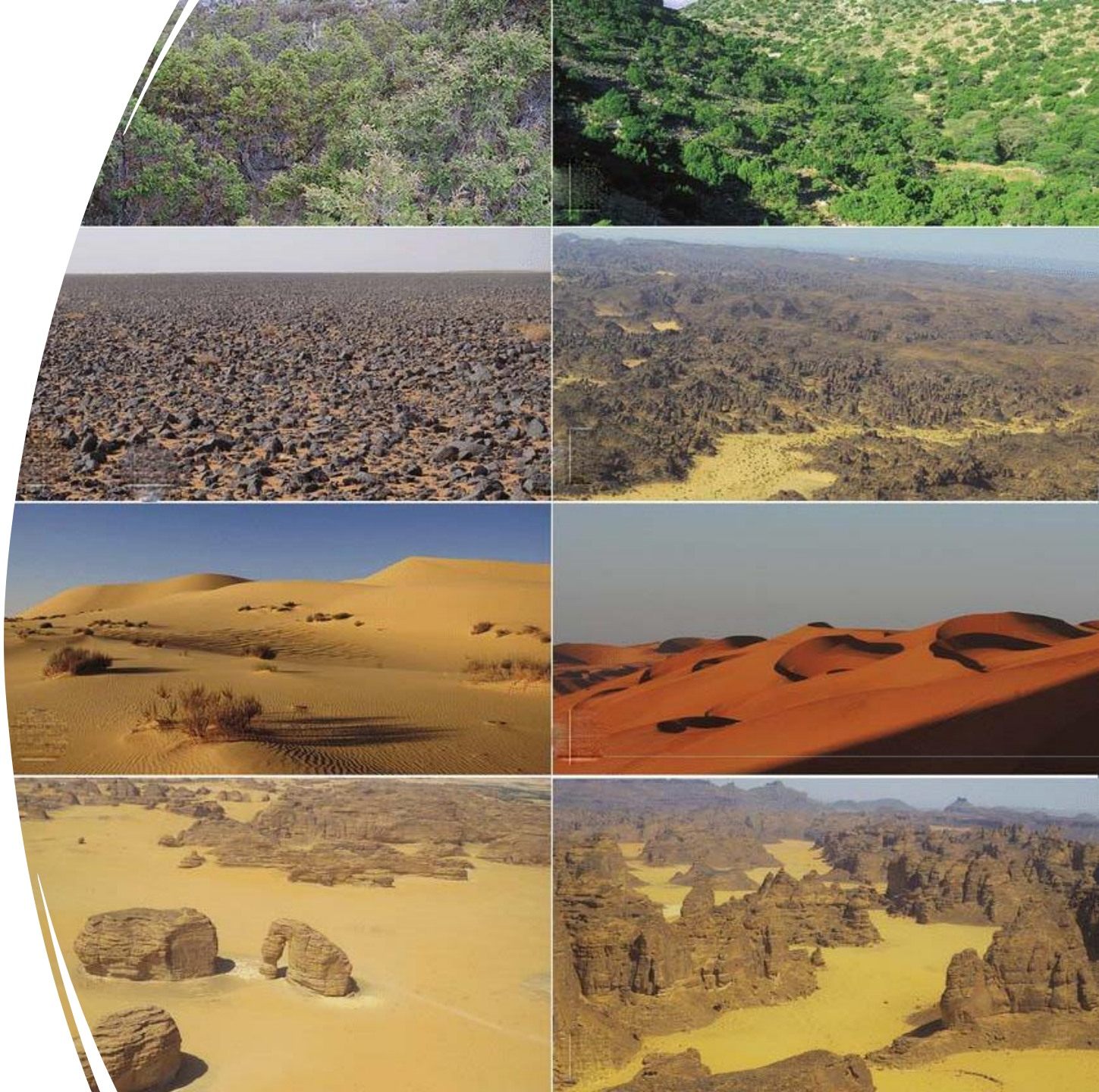
- **Language:** Arabic is the dominant language.
- **Religion:** Islam is the major religion, with Mecca and Medina as significant religious sites.
- **Traditions:** Rich heritage in poetry, music, calligraphy, and architecture.
- **Cuisine:** Features dates, lamb, rice, and coffee as staples.

Environmental Challenges

- **Desertification:** Expanding deserts reduce arable land.
- **Water Scarcity:** Overuse of groundwater and reliance on desalination.
- **Climate Change:** Rising temperatures and decreasing rainfall.

Sustainability Efforts: Renewable energy projects and conservation programs are increasing.

Habitats of Saudi Arabia



Habitats of Saudi Arabia

- Saudi Arabia, located in the **Arabian Peninsula**, has a diverse range of habitats shaped by its arid climate, geological features, and limited water availability.
- Despite the harsh environmental conditions, the country supports a variety of ecosystems with unique vegetation adapted to extreme temperatures, low rainfall, and high salinity.

Habitats of Saudi Arabia

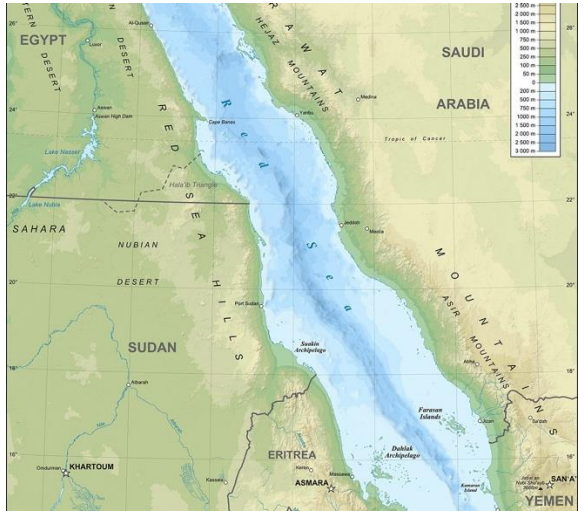
- **Saudi Arabia's habitats** are diverse, encompassing **sandy and rocky deserts**, various **mountains** and **highlands**, fertile **valleys (wadis)** and **meadows**, coastal **sabkhas (salt pans)**, and diverse **marine environments** like coral reefs, seagrasses, and mangrove forests.

- These ecosystems are home to unique flora and fauna adapted to the country's arid climate and varied topography, including the unique biodiversity found in the southwestern Asir region and coastal areas of the **Red Sea and Arabian Gulf**.

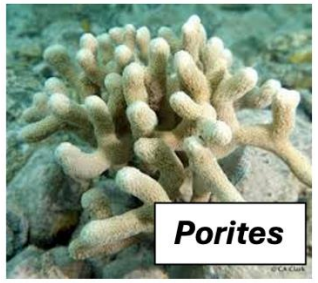
1. Marine Habitat

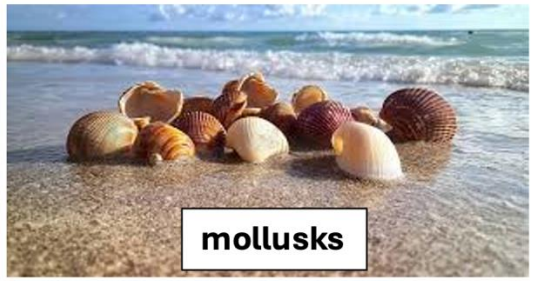
- Saudi Arabia has 2500 kilometers of coastlines along the Red Sea and the Arabian Gulf.

- Marine life is concerned with the plants, animals and other organisms that live in the ocean and seas. Given that in biology; many phyla, families and genera have some species that live in the sea and others that live on land.
- A mangrove is a shrub or small tree that grows in coastal region.
- A halophyte is a plant that grows in waters of high salinity, coming into contact with saline water through its roots, such as in saline semi-deserts, mangrove swamps, marshes and sloughs and seashores.
- 7 genus of the plants have been reported from red sea.
- *Avicenia marina* and *Rhizophora mucronata* found in gulf water only.



Marine Habitat in Saudi Arabia





Saudi Arabia has an extensive coastline along the **Red Sea** (approximately 1,760 km) and the **Arabian Gulf** (approximately 650 km), supporting diverse marine habitats. These marine ecosystems are vital for biodiversity, fisheries, and coastal protection.

Types of Marine Habitats

1. Coral Reefs

- The Red Sea is known for its well-developed **fringing coral reefs**, which are among the most diverse and resilient in the world.
- Coral species such as *Acropora*, *Porites*, and *Favia* are common.
- These reefs provide shelter for marine life, including fish, mollusks, and crustaceans.

Mangrove Forests

- Found along the Red Sea and Arabian Gulf coastlines, particularly in areas like **Jazan, Farasan Islands, and Tarut Bay**.
- Dominated by species such as *Avicennia marina* (grey mangrove), which plays a crucial role in stabilizing coastlines and providing habitat for marine organisms.

3. Seagrass Beds

- Common along shallow coastal waters, especially in the Arabian Gulf.
- Important species include *Halophila ovalis* and *Thalassia hemprichii*, which provide food and shelter for sea turtles, dugongs, and fish.


Halophila ovalis


Thalassia hemprichii

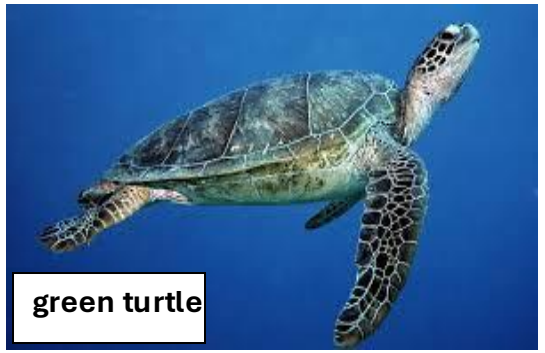
4. Salt Marshes and Sabkhas (Coastal Salt Flats)

- Found in the Arabian Gulf and some Red Sea coastal areas, these hypersaline environments support halophytic plants like *Salicornia* and *Suaeda*.


Salicornia

5. Rocky Shores and Sandy Beaches

- Rocky intertidal zones provide habitat for barnacles, crabs, and mollusks.
- Sandy beaches are crucial nesting grounds for endangered sea turtles such as the **green turtle (*Chelonia mydas*)** and the **hawksbill turtle (*Eretmochelys imbricata*)**.



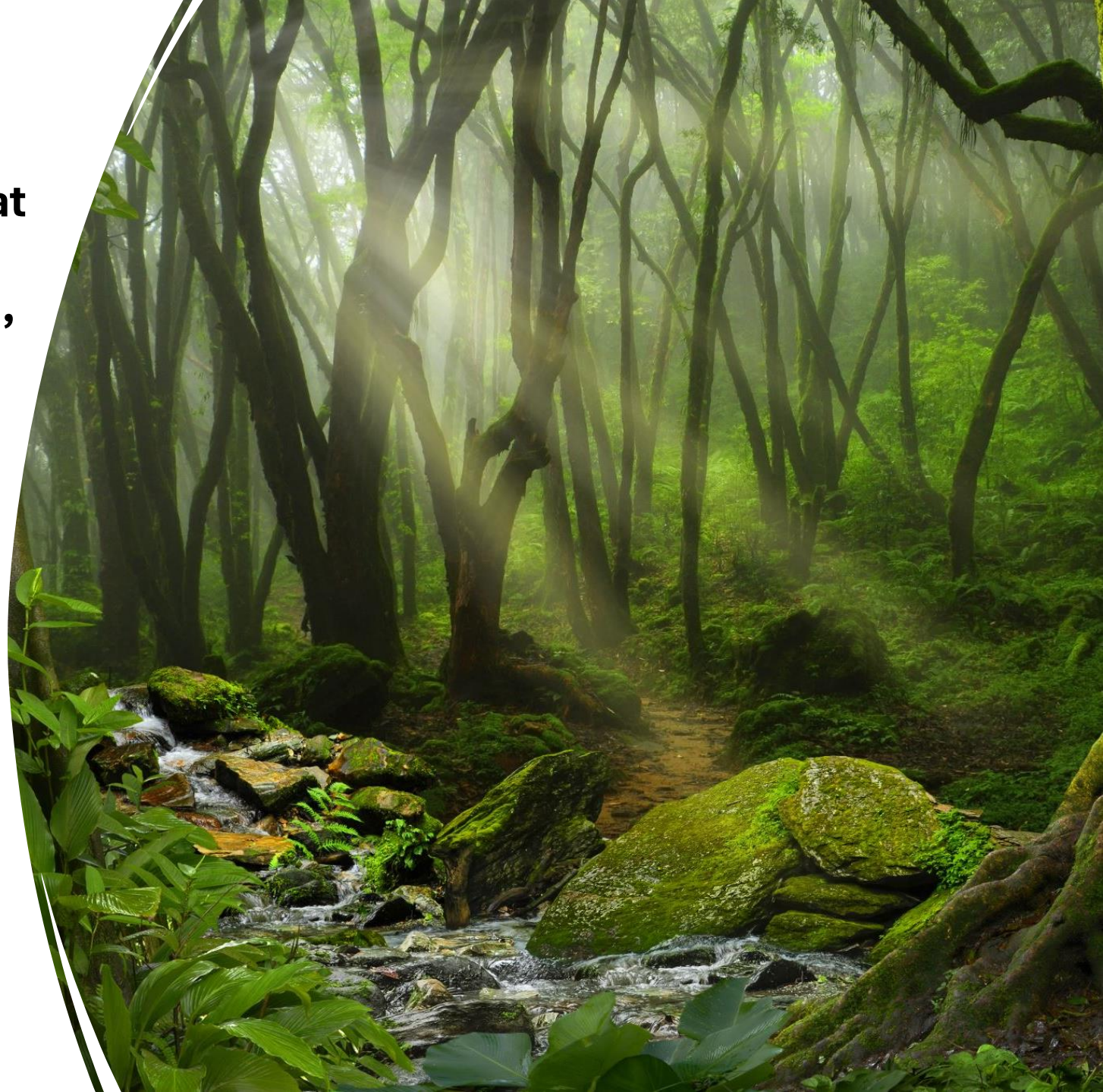
6. Deep-Sea and Pelagic Zones

- The Red Sea has deep-sea habitats, including hydrothermal vents and unique ecosystems adapted to extreme conditions.
- Large marine species like sharks, manta rays, and groupers inhabit these waters.

2. Terrestrial habitats

Terrestrial habitats are ones that are found on land, like forests, grasslands, deserts, shorelines, and wetlands

A. Islands
B. Wet land
C. Vally (Wadies)
D. Mountains
E. Forest mountain regions
F. Al Harat
G. Sandy Deserts

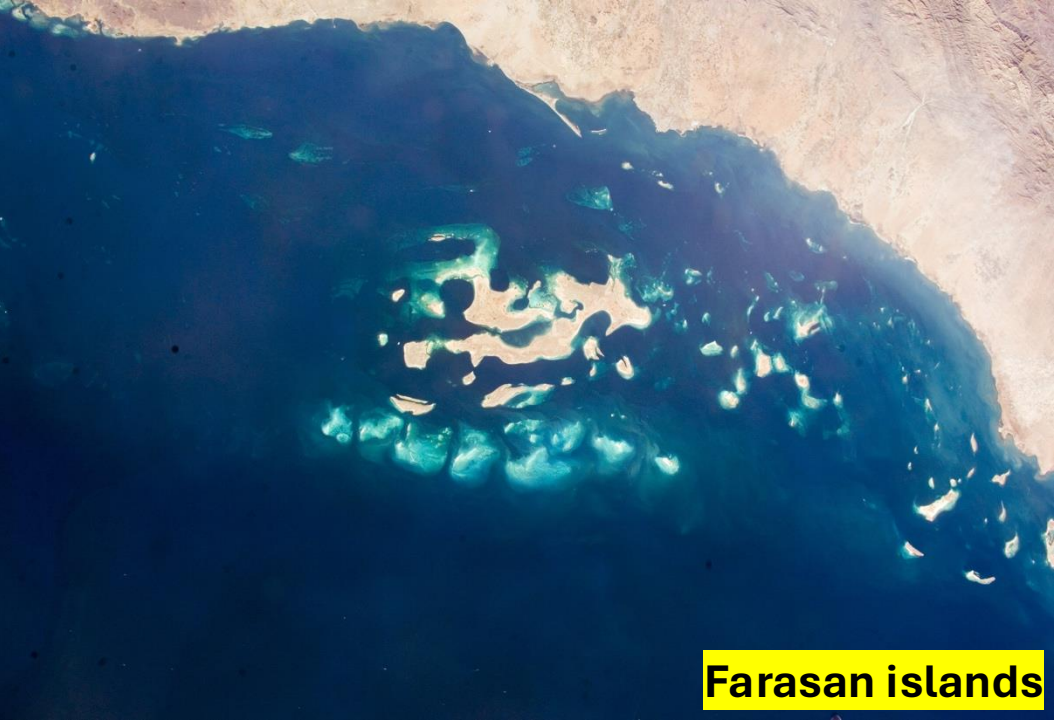


A. Islands

- Tiran and Sanafir islands in Akaba Gulf
- Farasan islands in Red Sea.
- Farasan archipelago, lies in the southern part of Red Sea **(16^0 20` -$17^0$ 20` N, 41^0 24` -$42^0$ 26` E)**, is about **40 km**. away from the Jizan coast and attains a width of approximately **120 km**. in SE to NW direction.
- The flora comprises about **200 species** of flowering plants in **49 families.**

Farasan islands

Tiran and Sanafir



Farasan islands

Mangrove Forest in Farasan islands

1. Red Sea Islands

The Red Sea is home to most of Saudi Arabia's islands, many of which feature **coral reefs, mangroves, and rich marine biodiversity**.

a) Farasan Islands *(Largest island group in Saudi Arabia)*

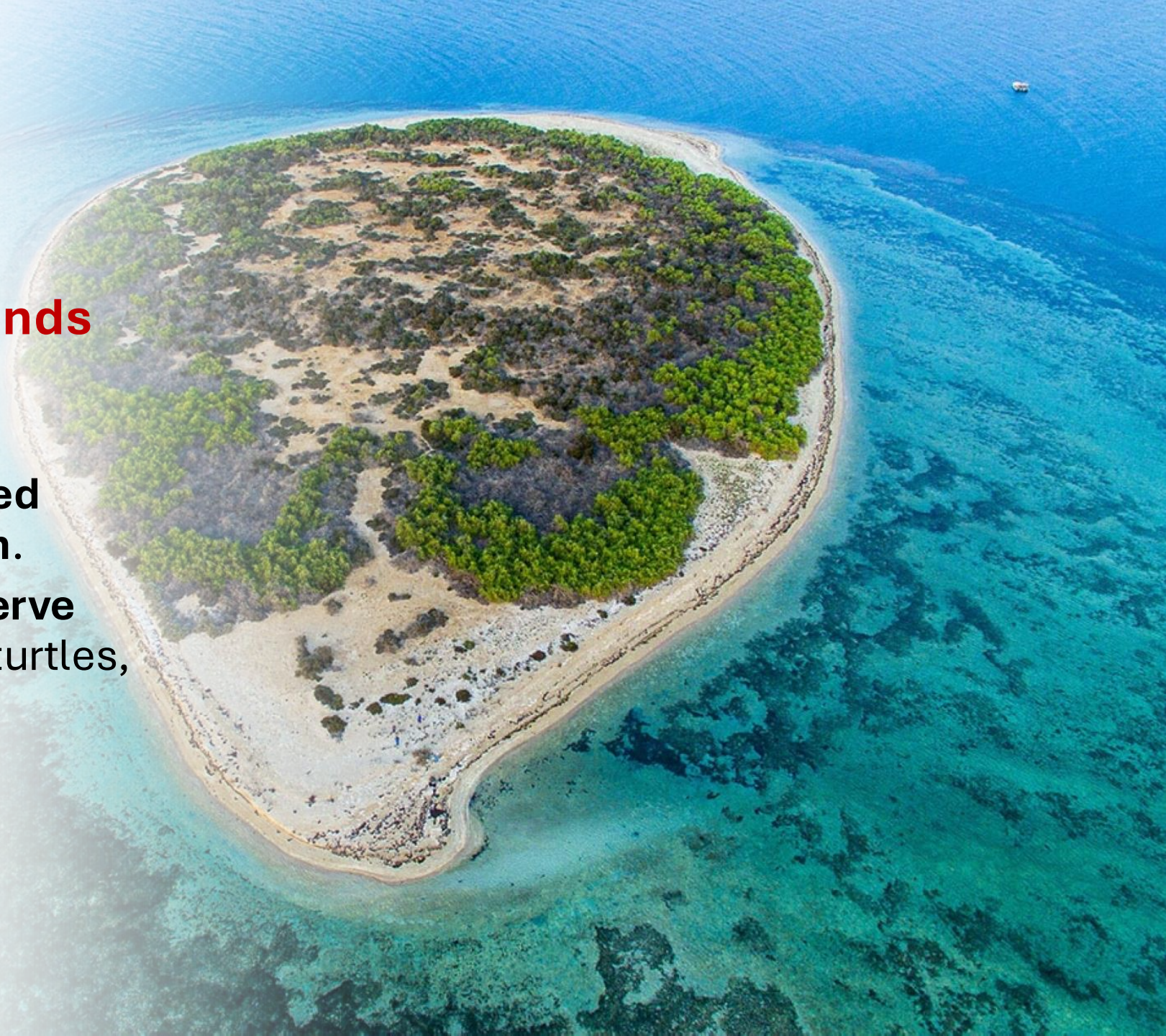
- Located in the **southwestern Red Sea**, near **Jazan**.
- Comprises **over 80 islands**, with **Farasan Al Kabir** being the largest.
- Rich in **coral reefs, seagrass beds, and mangroves**.
- Home to the **Farasan Islands Marine Protected Area**, protecting endangered species like the **dugong** and **Arabian gazelle**.
- Historically significant, with ancient sites from the **Roman and Ottoman periods**.

b) Sanafir and Tiran Islands

- Located near the **Strait of Tiran**, at the entrance of the **Gulf of Aqaba**.
- Known for **pristine beaches and coral reefs**, making them ideal for diving and tourism.
- Recently transferred from Egypt to Saudi Arabia for conservation and tourism development.

c) Umm al-Qamari Islands

- A small but ecologically important group of **protected islands** near **Al-Qunfudhah**.
- Declared as a **nature reserve** for migratory birds, marine turtles, and seabirds.



d) Jabal Al-Lith Island

- Located near **Al-Lith**, south of Jeddah.
- Known for its **untouched coral reefs** and popular among **divers**.
- Home to diverse marine life, including **whale sharks and dolphins**.

2. Arabian Gulf Islands

The Arabian Gulf has fewer islands compared to the Red Sea, but they still hold strategic and ecological significance.

a) Tarut Island *(Largest island in the Arabian Gulf)*

- Located near **Qatif**, Eastern Province.
- One of the **oldest inhabited islands**, with archaeological sites dating back **over 5,000 years**.
- Rich in **pearl diving history**, once a major center for the Gulf's pearl trade.

b) Abu Ali Island

- Located near **Jubail**, known for **mangroves, marine life, and fishing**.

- Important for **bird migration and conservation**.

c) Al-Harqani Island

- A small island near **Khobar**, known for **marine biodiversity and recreational tourism**.

d) Jurayid Island

- An uninhabited island near **Ras Tanura**, with **seagrass meadows** and **nesting sites for marine birds**.

(B) Wet land

- Natural freshwater wetlands are the key biological sites in arid landscapes.
- It includes ponds, streams and springs, as well as artificial wetlands such as reservoirs.
- They attract and support a diverse assemblage of plants and animals. Example *Phragmites* sp. and *Typha* sp.

Wadi Lejab

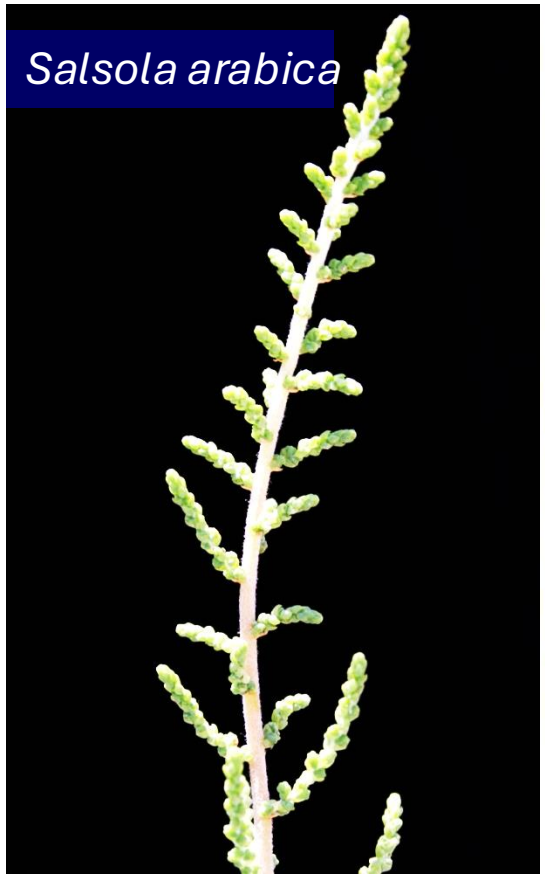
Wadi Disah

Acacia tortilis

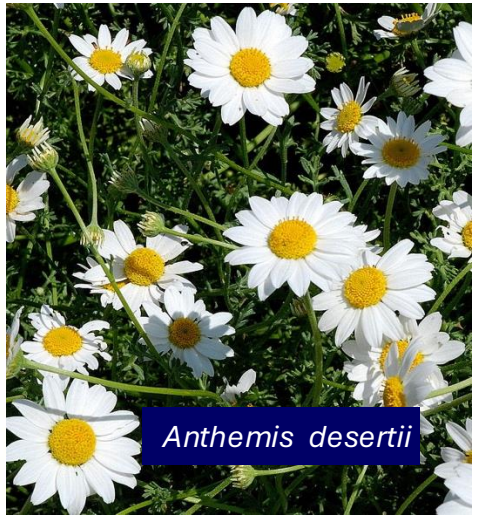
(C) Vally (Wadies)

An elongate depression of the earth's surface usually between ranges of hills or mountains. An area drained by a river and its tributaries.

Calotropis procera


Salsola arabica


Ochradenous arabiucs


Anthemis desertii


Zygophyllum fabago


Capparis spinosa


Lycium shawii


Rhzyya stricta


Ziziphus mucronata

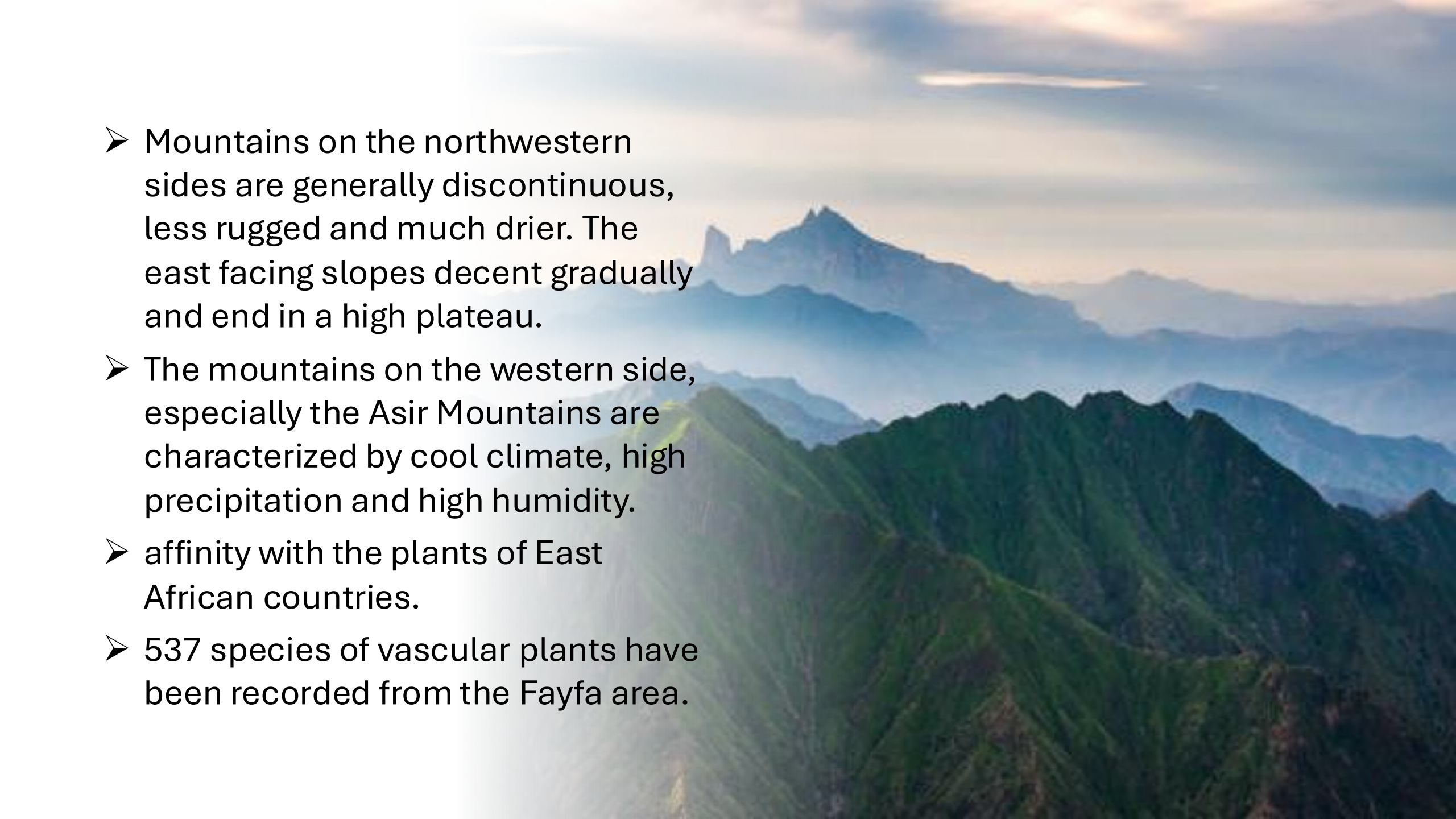

Withania somifera


Launaea angustifolia


Blepharis ciliaris

(D) Mountains

- More then 55 mountain which are above then 2000 meter in height.
- The mountains of southwestern region form a continuous chain of escarpments, extending from Taif to Yemen border.
- The peaks reach elevations of over 2000 m in the vicinity of Taif and extreme south and over 3000 m in the Abha area.
- On the western side of the highlands, the mountains fall in a series of dramatic escarpments and finally merge with the Tihama coastal plain while the eastern sides slop more or less gradually towards the interior parts of the country.



- Mountains on the northwestern sides are generally discontinuous, less rugged and much drier. The east facing slopes decent gradually and end in a high plateau.
- The mountains on the western side, especially the Asir Mountains are characterized by cool climate, high precipitation and high humidity.
- affinity with the plants of East African countries.
- 537 species of vascular plants have been recorded from the Fayfa area.


Jabal Aja, Hail


Asir mountain


Jabal Al Lawz


Argemone mexicana


Mimusops laurifolia


Prunus arabica


Junierpous procera


Rumex nervosus


Prunus arabica

(E) Al Harat

- Lava fields (called *Harrah* in Arabic) are widespread in the western part of Saudi Arabia.
- There are about fifteen lava fields, ranging in size from small to huge.
- Al Harat region of Saudi Arabia is poorly vegetated

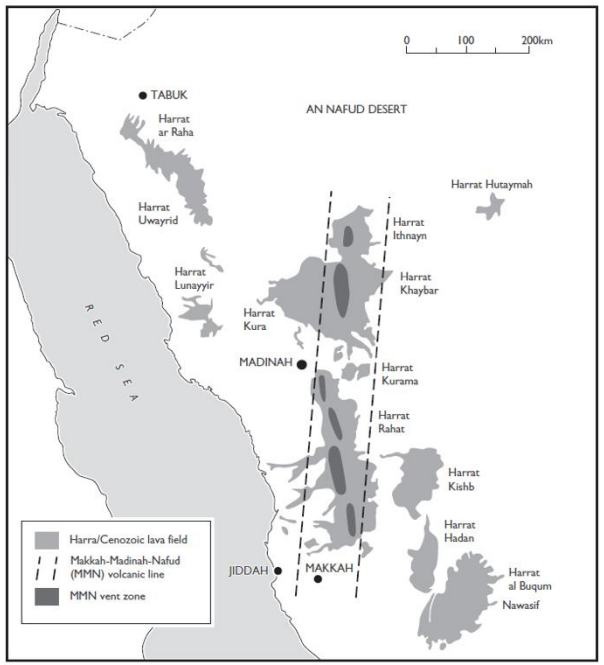
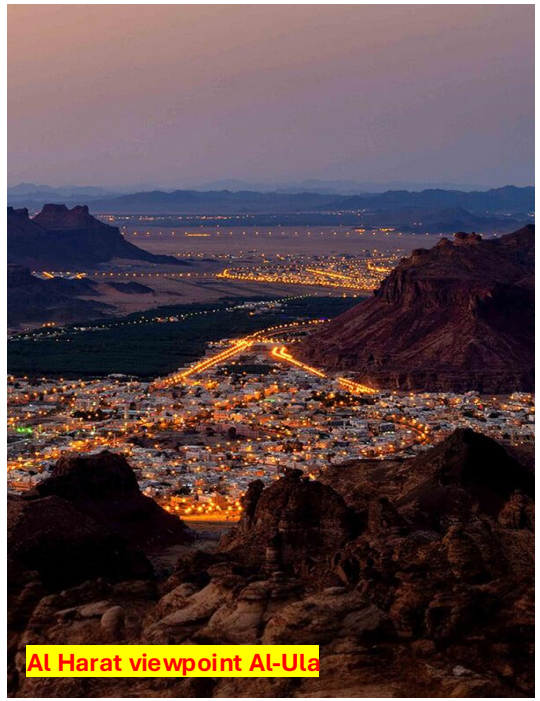
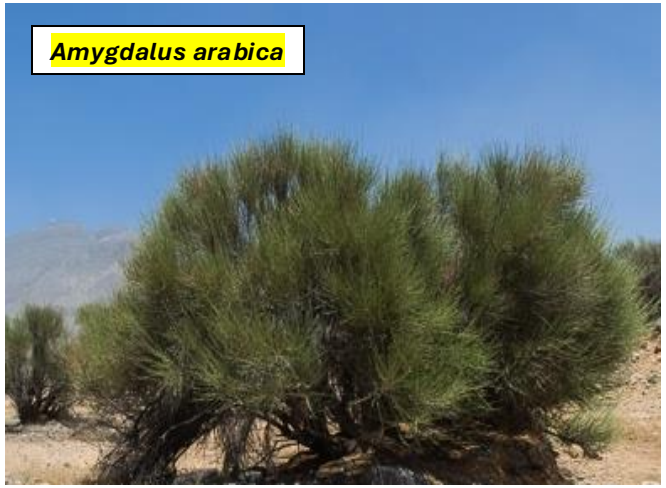


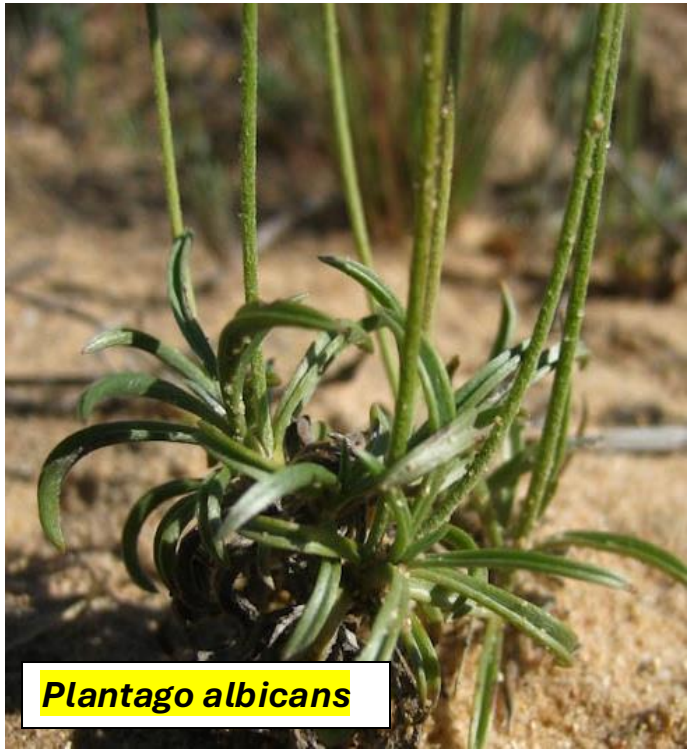
Figure 3.6 The Makkah-Madinah-Nafud volcanic line and main *harraat* (Courtesy: Saudi Geological Survey).




Amygdalus arabica


Zilla spinosa


Haloxylon persicum


Plantago albicans

Deserts (Arid Lands)

Saudi Arabia is home to vast desert landscapes, a major part of the Arabian Desert, the world's fourth largest desert system. The country's deserts cover an area of approximately 635,000 km^2, roughly 33% of its total landmass.

Saudi Arabia's deserts host various adapted flora like *Acacia* trees, *Haloxylon, Ziziphus,* and grasses, and fauna including the *Arabian oryx*, gazelles, sand cats, lizards, and various birds. Plant life relies on rainfall in valleys and wadis, while animals like the Arabian oryx, mountain gazelle, and haire are well-suited to the arid conditions.

Deserts (Arid Lands)

Saudi Arabia's deserts, including **Rub Al-Khali**, **Great Nafud**, and **Dahna**, feature specialized desert plants adapted to arid conditions, such as ***Haloxylon persicum*** (a tree), ***Calligonum comosum*** (a shrub), ***Artemisia monosperma*** (a bush), and perennial grasses like ***Stipagrostis drarii***. Other characteristic species include ***Cornulaca arabica***, *Aerva* ***javanica,*** ***Acacia, Lycium shawii,*** and various sedges like ***Cyperus conglomeratus***.

Major Deserts

Ar-Rub' al-Khali (The Empty Quarter): The largest continuous sand desert in the world, covering about 430,000 km^2 within Saudi Arabia. It is characterized by immense, reddish-golden sand dunes and contains some of the country's most significant oil and gas fields.

An-Nafud Desert: The second-largest desert in Saudi Arabia, spanning 65,000 km^2 in the northern part of the country. Its distinctive red sand is caused by the presence of iron oxide.

Ad-Dahna Desert: A long, narrow strip of reddish sandy terrain that links An-Nafud in the north with Ar-Rub' al-Khali in the south.

Al-Jafurah Desert: Located in the Eastern Province, this desert contains the largest unconventional gas field in the Kingdom.

Major Deserts: Ecosystems & Biodiversity

Despite the harsh, arid conditions, these deserts are home to unique flora and fauna that have adapted to survive.

Flora: Common plant species include shrubs and grasses that can withstand the low rainfall and high temperatures, such as *Calligonum comosum* (a leafless shrub) and *Haloxylon persicum, Artemisia monosperma (a bush), and perennial grasses like Stipagrostis drarii. Other characteristic species include Cornulaca arabica, Aerva javanica, Acacia, Lycium shawii, and various sedges like Cyperus conglomeratus*.

Fauna: Desert wildlife includes the *Arabian oryx*, gazelles, the sand cat, and various species of birds, reptiles, and rodents. Some areas are designated as nature reserves to protect this wildlife.

Haloxylon persicum

Calligonum crinitum

Allium sindjarense

Ifloga spicata

Artemesia monosperma

Zygophyllum mandaville

Major Deserts: Economic importance

Beyond their ecological significance, Saudi Arabia's deserts are of immense economic importance. The oil and gas reserves found beneath the sands, particularly in the **Empty Quarter and Al-Jafurah Desert,** are crucial for the country's economy. The deserts also offer unique tourism and recreational opportunities, such as desert safaris, camping, and visits to oases and archaeological sites.