

# Where Wise Birds Stay Awhile

## Qeshm Island: Geoheritage Pearl vs Gasfields in the Persian Gulf

Photo: B. Dareinsnoori, OFA, used with permission.



This Indian roller is one of the 200 bird species that live on or migrate through.



Eroded and tilted Late Neogene / Pliocene sediments in the Star Valley

**Standing on the bird migration highway between Europe and Africa, this jewel of an island offers more than a supreme 'twitching' experience. Qeshm aims to be a major ecotourism destination as well as an upstream player.**

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In the far south of Iran, next to the Hormuz Strait, is a little-known island that epitomizes the rich Persian culture, with archaeological remains from ancient civilizations and outstanding natural features that form an excellent basis for eco- and geotourism. An astonishing eroded landscape of Miocene to Holocene sediments awaits the visitor while the cultural history is exotic and enticing.

Qeshm (pronounced Kesh'm, sometimes with silent 'm') is the biggest island in the Persian Gulf, five times the size of Singapore. This island is on a major transit route for over 15,000 ships yearly through the stretch that carries over 40% of global oil. Qeshm is about 120 km long and on average only 18 km wide, some 195 km<sup>2</sup> of which in the central north is occupied by the protected Hara marine mangrove forest, a UNESCO

Satellite image courtesy of NASA



Fish or dolphin-shaped Qeshm Island in Persian Gulf has a surface area of approximately 15362 to 1600 km<sup>2</sup> accounting for intertidal differences.

Biosphere Reserve. This is the largest concentration of mangrove forest in the Persian Gulf and Sea of Oman and represents the most westerly extension of the Indo-Pacific biozone.

Surrounded by blue subtropical seas, the island is an attractive mix of wind- and 'flood'-eroded mountains, springs, sea forests, reefs and wildlife. Low flat-topped hills no more than 200 m high contrast with plains, which run up narrow tongues into the hills. Adven- ▶



©Ahmad Bazmandegan, Qeshm Island photographer.

Qeshm city.



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Photo: Susan Turner

Salt mining has occurred for centuries; banded salt with old mining works.

The Global Geopark is mainly in the more arid western area.

ture might be wandering with camel herds, chasing a desert fox away from a laying turtle or your first taste of whale shark oil or local fish. And, if bird-spotting is your delight, try Qeshm in late winter.

## Environmental awareness

The QFA has factored in industrial, commercial and touristic growth. Qeshm now has a population of approximately 100,000 people and attracts some 700,000 visitors, most coming from the mainland. With such island growth, this might be a recipe for ecological disaster in this sensitive environment, except that the administration chose a sustainable development plan. And, proclaimed to UNESCO in 2005 by Dr Abdholazim Haghipour, former Director, Iran Geological Survey, Qeshm became the site of the first Iranian Geopark.

Bijan Darehshoori, naturalist, author of (1998) 'Nature of Iran', spent over a decade moulding Qeshm into an environmentally sustainable island, creating work for future generations. His vision brought sustainable use and recycling, a turtle hatchery, and protected and extended mangroves giv-

ing habitat for birds and fish alike. As QFA environmental manager he gave birth to the Geopark.

## Qeshm's Geopark

The western end of the island has little vegetation, exposing a continuous mid-Tertiary to Holocene fossiliferous succession and containing a major salt dome with a Precambrian-Palaeozoic record. The *Kish Kuh* area is given as 1300 ft above SL but is rising a few centimetres a year.

The Gulf coast, with its heavy humidity is crossed by warm, damp eroding winds, the shamal, out of the Arabian Desert. Conversely, rainfall is sparse, 155 mm on average and in the recent drought with as little as 10-20 mm, so desertification has set in. The climatic regime has created a unique geological and natural status over the past millennia that have produced fantastic eroded structures.

The first geological mapping was done early in the last century mainly by Englishmen working for Anglo-Persian or the British Government, mostly in search of oil and gas.

What they found was salt, and they smelt lots of sulphur and saw lumps of asphalt washed up on the shore. All the rocks were placed in the Miocene to Pliocene Fars series, with the massive salt dome 'Kuh-E-Namkdan' then thought to be Jurassic or Triassic at most. Qeshm's salt, long known to island visitors and invaders as the purest in the Persian Gulf was exported in the 19th century as blocks destined for Calcutta and east Africa; now Qeshm's hidden gas may take the same routes.

Modern mapping by the Iranian Geological survey has shown that the Namkdan Salt Formation is an old (Late Precambrian

to Early Palaeozoic) complex exposed in the tectonically active plug structure within the western part of the Qeshm Geopark area.

The Geopark management decided to restrict salt mining to methods not using explosives and to keep it away from geoheritage features such as the salt caves. Exploration of these in 2006 showed them to be several kilometres long, some of the longest in the world.

## Natural Gas

The Persian Gulf region is synonymous with the extraction of oil and now gas. Qeshm is a major player in Iran's upstream activities and has yielded two enormous anticlinal gas fields. There are offshore oil reserves between Hormoz and Larak and between Larak and Hengam – all these islands and related structures, as in Qeshm Geopark, are salt domes, a key to petroleum resources. On Qeshm the dome is forcing up the island strata tectonically.

The central N-S anticline, farthest from the salt dome has been developed and gas is piped to the mainland. 'Gavarzin' field went onstream in 1983 for the power plant at Bandar Abbas.

Salakh, the giant gas field in the central west, was discovered in 1961. Its recoverable reserves have been estimated at over 12 TCF. Because of high acidic gas and Nitro-

## Water in a world of salt

Water is the key to Qeshm's history, no less now for tourism or industry. The traditional system of land ownership is based on watersheds and using the geology to trap fresh water. Ancient Persian dams have been upgraded into modern times. But with more rapid use many of 350 wells now yield salty water suitable only for irrigation of mangrove and date palms. The island uses desalination plants as well as grey water recycling.



Looking across the centre of the Salakh anticline.

Photo: Sharif Rangbar/Qeshm Environmental Office

gen content it did not become operational. In 2005, the QFA made the staggering decision to protect the field against development in the foreseeable future, making it a major part of the Geopark, providing scientists with an open-air lab on the affects of such a structure.

## What of Qeshm's future

In 2007 interest in boosting oil and gas production on Qeshm was revived. Gas condensate and crude oil refineries, with capacities of 120,000 bpd and 160,000 bpd respectively, will be built. A crude oil conveyance pipeline will go from Qeshm to the Bandar Abbas refinery and gas from Siri island is now connected to west of Qeshm by pipeline. A joint project by the private sector and the Oil Industry Investment Company (OIIC), the pipeline is expected to come on stream in early 2008.

Authorities also report that the QFA and NIOC are discussing with several foreign firms for the development of Salakh gas field. The aim is to supply markets in India and East Africa. An estimated US\$ 500 million would be needed for the development and so the QFA government will not start extracting soon but as with the planned bridge across the strait, there are now concerns that gas industry infrastructure might detract from the island's ecotourism credentials.

So what of Qeshm's future? Sustainability by keeping Salakh for research within the Geopark or more immediate resource development benefits, and are the two incompatible?

## Free economy



Qeshmi women wear sari-like dress of beautiful fabrics and embroidery.

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In 1990 the Iranian government designated Jazireh-ye Qeshm as a Free Area (QFA) – a special economic zone that offers a secure, stable environment with tax concessions, tax holidays, unimpeded circulation, convertibility, and freedom and repatriation of foreign currency and capital. The government is prohibited by law from confiscating property and there is an independent forum to adjudicate disputes. Specific incentives for foreign business include visa-free entry, 100% ownership possibility, exemption from customs and duty and streamlined issuance of work permits.

Modern infrastructure and facilities have brought American, Asian and European companies to work alongside Iranian counterparts, investors and industrialists. A tunnel has been mooted and a pilot study for a bridge is in the investment level estimation phase.

Northern Qeshm faces the Zagros Mountains and is separated from the mainland by the 2.5km Khurân Strait. The close proximity to the mainland and its geographical location also make Qeshm a gateway to Asia. Situated within a short 220-km flight across the Gulf to Dubai and near other oil-rich countries, it is in international waters and accessible by commercial shipping.

But what really makes this island is the Qeshmi people, a mix of ancient Persian, Gulf and ocean-going wanderers such as the Portuguese and British who passed through as empires waxed and waned. With their distinctive culture, dress and more relaxed lifestyle than the mainland, the locals have survived this salt-infused environment by adapting with the ups and downs of the coastline and now harvest rainwater using the geology.