

Tim Huntington



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Tim Huntington is a director of Poseidon Aquatic Resource Management Ltd., a United Kingdom-based consultancy specializing in aquaculture and fisheries management.

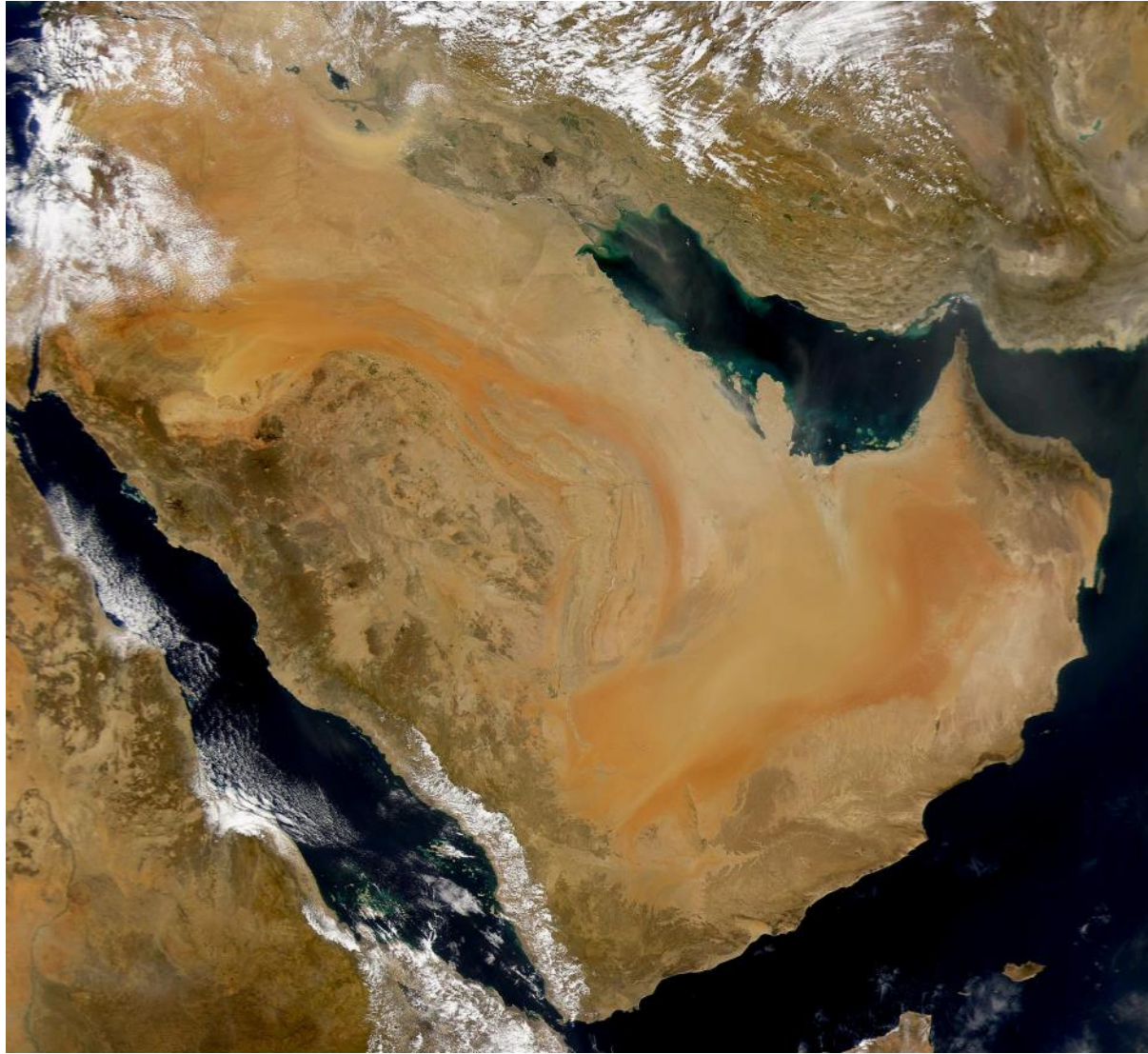
Since 2011, he has been chief technical adviser on a project to produce a 20-year aquaculture and fisheries plan for Saudi Arabia.

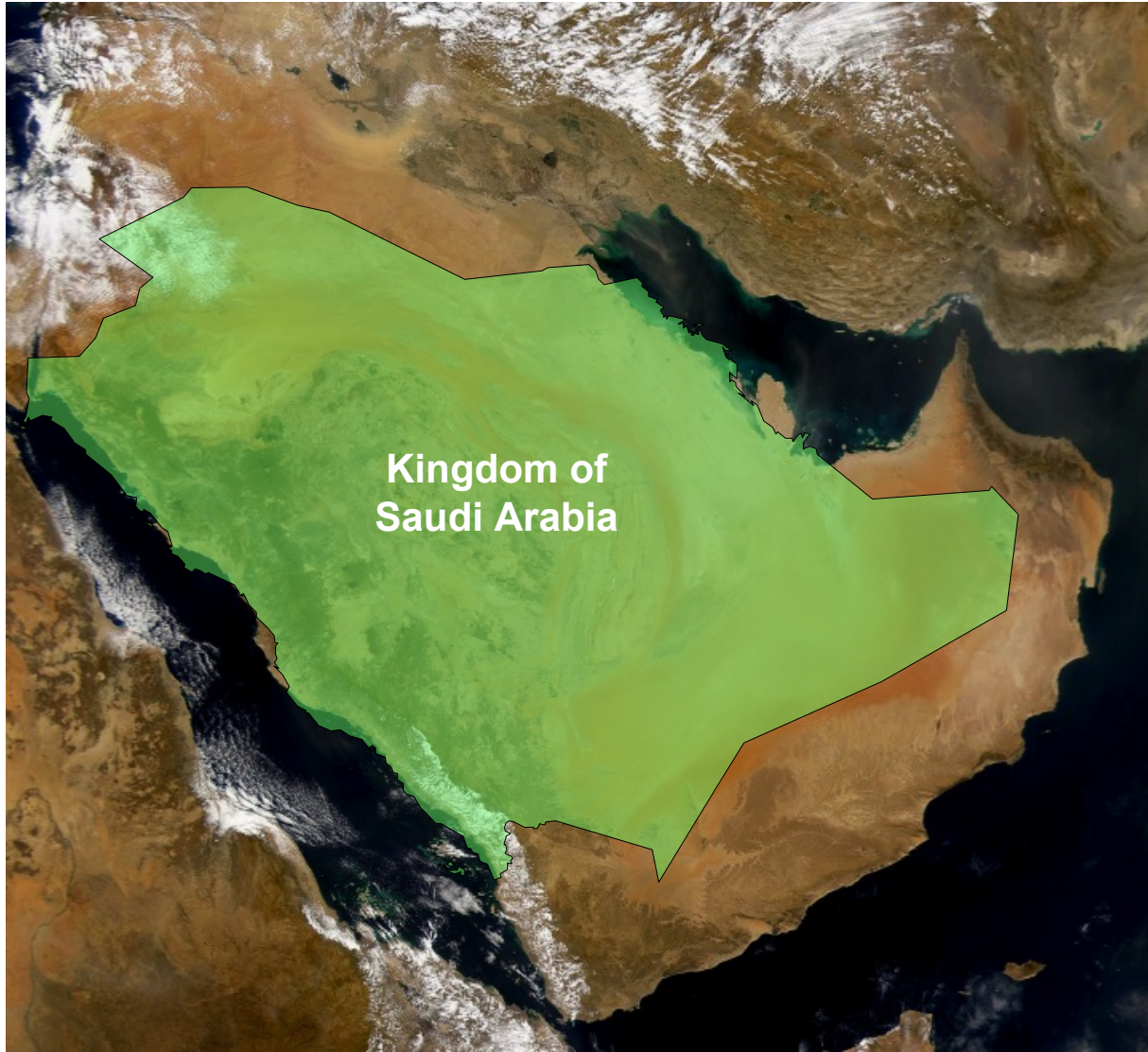
Other projects address zoning for the Red Sea and Gulf, and technical protocols for aquaculture licensing. He has also conducted studies for the World Bank and World Wildlife Fund.



Aquaculture status in Saudi Arabia and Yemen

Tim Huntington





Kingdom of
Saudi Arabia



The Kingdom of Saudi Arabia



Saudi Arabia

Some basic facts

- Land area: 1.95 million km²
- Coastline: 3,800 km (inc. islands)
- Freshwater bodies: 223 reservoirs (835 million m³)

- Population: 27.1 million
- GDP: USD\$ 921 billion (6.8% CAGR)
- GDP per capita: US\$ 31,800 / per person
- Seafood consumption: 12 kg yr⁻¹/ per capita

Saudi Arabia

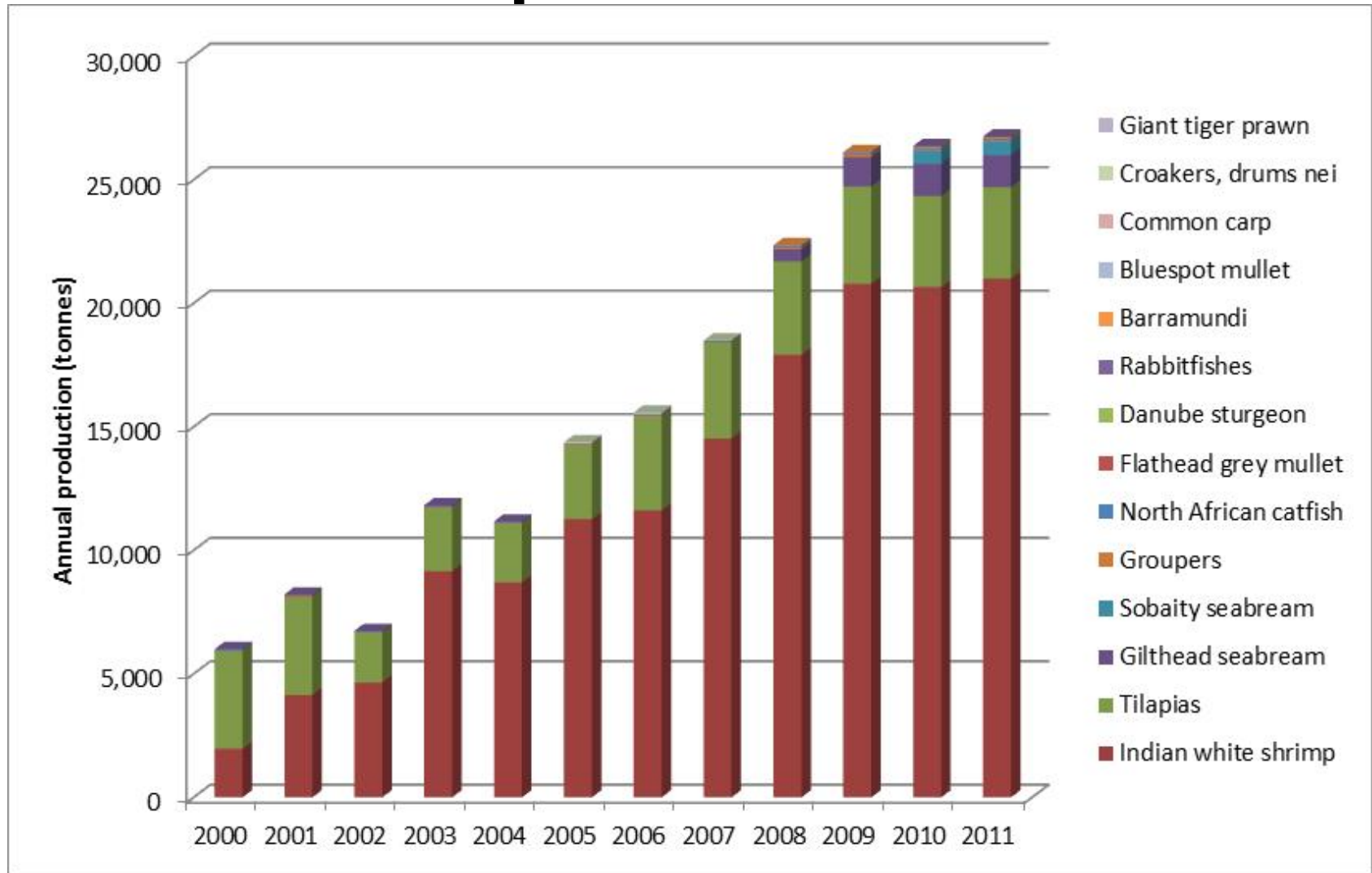
The aquatic environment

Sea	Geography	Key facts	
Red Sea coast & islands	Coastal plain & subkha Coastal lagoons & deeper water	N	Sea surface temp: c. 24 - 27° Salinity: 39 - 41 ppt Tidal range: 0.6 m Nutrient status: Oligotrophic
		S	Sea surface temp: c. 26 - 32° Salinity: 37 ppt Tidal range: 0.9 m Nutrient status: Oligotrophic
Gulf	Coastal plain Extensive subkha Shallow lagoons and sea areas	Temp range: c. 22 - 32° Salinity: 40 - 50 ppt Tidal range: 1.5 – 2 m, with strong flows Nutrient status: Oligotrophic, but prone to local eutrophication	

Saudi Arabia the journey so far



Saudi Arabia – production 2000 - 2011



Saudi Arabia

Key institutional players

Deputy of Fisheries Affairs (Ministry of Agriculture)

- Aquaculture Department of MoA (ADMA): **permitting & management**
- Fisheries Research Center, Jeddah: **research**
- Fish Health and Safety Laboratories (Dammam & Jeddah): **biosecurity and quality assurance**

Saudi Arabia

Aquaculture planning

- A major aquaculture (& fisheries) sector review and development plan until 2029 is in process
- New aquaculture legislation and supporting protocols are being drafted
- GIS-based sea and coastal zoning in preliminary stages
- Biosecurity strategy

Saudi Arabia

Other key institutions

The '5 Member' Committee

- Ministry of Agriculture
- Presidency of Meteorology & Environment
- Ministry of Finance
- Coast Guard
- Municipality Authorities



Saudi Arabia

Academic Research

- King Abdul Aziz University, Jeddah
- King Abdullah University for Science & Technology: KAUST, Thuwal
- King Abdulaziz City for Science and Technology (KACST), Riyadh
- King Faisal University, Al Hasa

..... but there is a need for a unified, industry-led national aquaculture research plan

Saudi Arabia:

The next stage of the journey

Species	Systems
<ul style="list-style-type: none">• Yellowtail kingfish (<i>Seriola lalandi</i>) or amberjack (<i>Seriola dumerelli</i>).• Red sea bream (<i>Pagrus major</i>)• Meagre (<i>Argyrosomus regius</i>)• Asian sea bass (<i>Lates calcarifer</i>)• Mullet (<i>Mugil cephalus</i>)• White leg shrimp (<i>P. vannamei</i>)• Sea cucumber (<i>Holothuria</i> spp.)• FW prawn (<i>Macrobrachium</i> spp.)• Microalgae species	<ul style="list-style-type: none">• Marine cages• Recirculation systems• Solar algal culture• Aquaponics• Nucleus estates

Saudi Arabia

Strengths, Weaknesses, Opportunities & Threats

Strengths

- Long and varied coastline
- Range of environmental conditions favour a variety of species
- Strong fisheries heritage
- A major regional market
- Low fuel costs
- Good infrastructure

Weaknesses

- Complex permitting & land tenure
- Limited number of trained Saudis / dependence on foreign expertise
- Need to pump seawater to maintain salinity
- Strong afternoon winds
- Limited freshwater resources
- Lack of raw materials for feeds
- Poor coordination of research

Opportunities

- Low trophic aquaculture e.g., seaweed, shellfish, etc.)
- Environmental degradation
- Nucleus estate projects
- Recirculation and other efficient technologies

Threats

- Competition for land from tourism, urban development, etc.
- Oil & other pollution
- Red tides
- Climate change

Yemen

Location



Yemen

Some basic facts

- Land area: 529,968 km²
- Coastline: 1,906 km
- Freshwater bodies: None of significance

- Population: 25.4 million
- GDP: USD\$ 60 million (0.1% CAGR)
- GDP per capita: US\$ 2,300 / per person
- Seafood consumption: 2.4 kg yr⁻¹/ per capita

Yemen

The aquatic environment

Area	Geography	Key facts
Red Sea coast & islands	Coastal plain & subkha Coastal lagoons & deeper water	Sea surface temp: c. 26 - 32° Salinity: 37 ppt Tidal range: 0.9 m Nutrient status: Oligotrophic
Gulf of Aden coast (inc. Socotra)	Coastal plain Deeper water	Temp range: c. 15 - 28° Salinity: 36 ppt Tidal range: 1.5 – 2 m Nutrient status: Subject to seasonal upwell

Yemen

Current aquaculture production

- Despite several attempts by private and public sectors, aquaculture in the coastal areas of Yemen remains embryonic
- One private shrimp farm on the Red Sea coast producing up to 400 t of *Penaeus indicus* & *P. monodon* from 50 x 1 ha of ponds
- Some research-based production for the *Aquaculture Research Center* (ARC) in Little Aden

Yemen

Future prospects for aquaculture

- There is a strong need to increase fish production in the face of declining wild catch (2011 is 60% of 2004)
- The long, largely un-developed and environmentally-diverse coastlines suggests considerable potential
- The Government too is keen on aquaculture the National Fisheries Strategy 2012 – 2025 sees aquaculture development as essential to augment coastal livelihoods and food security

Yemen

Strengths, Weaknesses, Opportunities & Threats

Strengths

- Long and varied coastline
- Range of environmental conditions favour a variety of species
- Strong fisheries heritage
- Adjacent to major regional markets

Weaknesses

- Insufficient legal/regulatory frameworks for aquaculture governance & planning
- Uncertain permitting & land tenure
- Unsuitable operational utility tariffs
- ARC's limited technical/ financial capacity
- Current security climate

Opportunities

- Low trophic aquaculture e.g., seaweed, shellfish, etc.)
- Private partnerships with ARC
- Nucleus estate projects

Threats

- Further internal security issues
- Poor economic growth
- Poorly planned and unsustainable aquaculture development

In summary

- **Both the Yemen and Saudi Arabia have long coast lines, with a wide variety of environmental conditions favouring a variety of species**
- **Saudi aquaculture is growing rapidly, with a second wave of aquaculture likely in marine cage farming**
- **But common problems exist, especially over convoluted permitting and land tenure arrangements, as well as biosecurity issues**

Thank You!

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