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Characteristics, structure and resources of the sector

Summary

The United Arab Emirates (UAE) is one of the pioneers in aquaculture among the countries of the Gulf Cooperation Council (the GCC was founded in 1981 and includes Saudi Arabia, Kuwait, Bahrain, Qatar, the Sultanate of Oman). The country is endowed with many natural lagoons, bays and creeks, most of which are encircled by mangrove swamps providing ideal spawning and nursery grounds for a wide variety of fish and shrimp species.

With a view to utilizing this natural environment for the development of fisheries, the Ministry of Environment and Water (MOEW) established the Marine Environment Research Department (MERD) in Umm Al Qaiwain on the west coast of UAE in 1984. Aquaculture is one of the main developmental activities undertaken by the MERD since its inception. Fingerlings of locally popular fish species such as white-spotted spinefoot (Siganus canaliculatus), orange-spotted grouper (Epinephelus coioides), largescale mullet (Liza macrolepis) and Sobaity seabream (Sparidentex hasta) are produced during their natural spawning season at this experimental research station.

In compliance with the policy of the Government, a major part of the fingerlings produced at MERD is released at suitable locations along the coastal waters of UAE.

In 2014 within initiatives of sheikh khalifa for infrastructure The Ministry of Environment and Water (MOEW) was opening the sheikh khalifa Marine Research Center-Hatchery (SKMRC) which will be the motivation for the development and promotion of aquaculture in UAE. The number of Commercial scale aquaculture in UAE raise to 9 farm in 2014 where varied projects finfish, crustaceans, and oyster ect.

Mainly aquaculture species are Sparus aurata, Tilapias, Dicentrarchus labrax, Acipenser baerii, pearl oysters and it’s expected to increase number of aquaculture projects and species. The MOEW has been promoting aquaculture by offering fingerlings and imparting technical know-how to those who are interested. The environmental
conditions in the country are favourable for aquaculture projects and the authorities hope to attract more investors in the coming years.

### History and general overview

Aquaculture activities in UAE started with the establishment of the Marine Environment Research Department (MERD) in 1984. The Department was initially supported with the technical co-operation from the Japan International Co-operation Agency (JICA). The role of the MERD includes conservation, replenishment and development of marine resources in the territorial waters of the country. Between 1985 and 2014, regionally important marine finfish species such as the white-spotted spinefoot (*Siganus canaliculatus*) and the orange-spotted grouper (*Epinephelus coioides*) and seabream species, *Rhabdosargus sarba* and *Acanthopagrus latus*, were also cultured. Fingerling production of the Sobaity seabream (*Sparidentex hasta*) and largescale mullet (*Liza macrolepis*) were selected for fingerling production. The International Fish Farming Company (Asmak) started the first commercial cage culture farm in 1999 and Mubarak fisheries is the second. And the biggest investment was the Caviar Farm, producing Sturgeon for the caviar and Meat for the first time in UAE and biggest in GCC.

The MERD has been producing post larvae of the locally predominant shrimp species *Penaeus semisulcatus* and *Penaeus indicus* since which were brought from the red sea 1993, to study the economic feasibility of shrimp farming in UAE. The release of fish fingerlings produced annually at the Department makes a partial contribution to compensate for the loss due to exploitation by the capture fishery sector. Other than this MERD had also doing experiments on coral reefs restoration through culturing and transplanting.

The MERD has also been providing the necessary assistance for establishing aquaculture facilities in the private sector in UAE.

### Human resources

The 2013 records of the Ministry of Environment and Water indicate that the UAE has total annual catch of 73,203 tonnes. Since aquaculture in the UAE is still in its infancy, the workforce engaged in aquaculture activities is limited compared to other fields of the industry. The workforce employed in the various aquaculture activities consists entirely of men, with the presence of skilled workers, graduates and post-graduates. The total staff in commercial aquaculture of 144 persons.

### Farming systems distribution and characteristics

The Marine Environment Research Department occupies a land area of 127,000 m² (latitude 25° 30' north; longitude 55° 30' east) on the western side of the main sea channel of the Umm Al-Qaiwain Lagoon. The facilities available at the Centre include four culture ponds, each with a capacity of approximately 2,500 m³, six 100 m³ larvae rearing tanks, five 50 m³ broodstock tanks, twenty six 8 m³ and ten 5 m³ fibreglass tanks for the culture of algae and other micro-organisms.

The existing finfish cage culture project is located in the sea off Dibba (latitude 25° 37' north; longitude 56° 15' east) on the east coast of UAE.

### Cultured species

The main species currently selected for aquaculture purposes at the MERD are the white-spotted spinefoot (*Siganus canaliculatus*), the Sobaity seabream (*Sparidentex hasta*) and the orange-spotted grouper (*Epinephelus coioides*). The aquatic species commercially cultured in the UAE are the gilthead seabream (*Sparus aurata*), Tilapias, *Dicentrarchus labrax*, *Acipenser baerii*, pearl oysters, and its expected to increase aquaculture projects and number of species.

### Practices/systems of culture

At the MERD, fish larvae are produced either through natural or induced spawning. The larvae are then reared to fingerling size in 100 m³ tanks and later transferred for grow out in ponds. A series of research activities is
being conducted to stock the larvae for further rearing directly in larger culture ponds of 2,500 m³. The results achieved so far have been encouraging, probably as a result of better environmental conditions prevailing under pond culture. A large number of fingerlings are released annually to the sea under a sponsored governmental policy.

In the cage culture project at Dibba, fingerlings are stocked in cages and farmed to commercial sizes. In general, the hydrographical conditions along the east coast of UAE are favourable for commercial aquaculture. At present about 20 circular sea net cages measuring 19 metres in diameter (depth: 12 metres). The nearest cage is located approximately 1.5 km off the coast of Dibba.

Recirculating aquaculture systems (RAS) use in two project first Emirates aquatechnology caviar factory LLC and the second plant farm fish farm for red tilapia.

**Sector performance**

<table>
<thead>
<tr>
<th>Production</th>
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<tr>
<td>The graph below shows total aquaculture production in United Arab Emirates according to FAO statistics:</td>
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<tr>
<th>Market and trade</th>
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<tr>
<td>There are numerous fresh fish markets built with modern amenities located in different cities, villages and in some of the main fish landing facilities in the UAE. The well developed road network in the Country ensures rapid transportation of the fish to the markets ensuring that quality and freshness are retained and Most production mainly for local market.</td>
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<th>Contribution to the economy</th>
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<tr>
<td>UAE has achieved food security through the availability of fresh fish. The Government feels that the Aquaculture development and promotion of in UAE is making helps the economy. In addition, the export of fish through private enterprises is contributing to the country's economy.</td>
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<th>Promotion and management of the sector</th>
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<tr>
<td>The Ministry of Environment and Water (MOEW), headed by a Minister, and the Executive Managers, is the supreme authority that controls the fisheries and aquaculture sectors in the UAE. There are two main Departments in the Ministry, the Marine Environment Research Department and the Fisheries Department.</td>
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<tr>
<th>The institutional framework</th>
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<tr>
<td>During 1999, the Ministry of Environment and water, introduced the Federal Law No.23 regarding the exploitation, protection and development of the living aquatic resources in the waters of the United Arab Emirates. This is a comprehensive regulation governing many aspects concerning fisheries, fishing activities, coastal zone management, marine resource and environmental protection, conservation of endangered marine species and coral reef areas. Aquaculture activities are also covered by this law under Articles 34 to 38 (Reference No. 7, Section 2.5). Accordingly, firms engaged in aquaculture should not cause pollution to the environment, are not allowed to introduce alien species without prior permission from the Ministry and should follow recognized hygienic procedures in handling, stocking, packing and transportation of fish.</td>
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| Applied research, education and training |

FAO Fisheries and Aquaculture Department
Since its early days, the MERD has been carrying out experimental studies on selected marine finfish species. Fingerlings produced through aquaculture are used for most of these experiments. Some of the research activities include (i) growth and survival rates of fingerlings fed with different kinds of feeds; (ii) optimum protein ratios for maximum growth and best feed utilization of white-spotted spinefoot fingerlings; (iii) effect of dietary fibre and dietary fat levels on the growth of white-spotted spinefoot; and (iv) growth rate of cultured fish in growout ponds. The results of these studies are regularly published in scientific papers and circulated to interested parties.

**Trends, issues and development**

The MERD and SKMRC established by the Ministry of Environment and Water in order to boost fisheries development in the country. One of the main priorities of the MERD and SKMRC development of aquaculture, involving such diverse issues as conservation, replenishment and development of the marine resources of the UAE, research and experimental trials in species and culture practices. Another instance of the importance given to sustainable aquaculture is the requirement that the major portion of the fingerlings produced at MERD and SKMRC are released at suitable locations along the UAE coastline. There has been an increase in the fish fingerling production at MERD during the last few years and, correspondingly, a progressive increase in the number of fish released in the wild. This is a part of the government's efforts to maintain sustainable fisheries regionally and is expected to fetch positive results in the future.

Freshwater aquaculture is limited to a few irrigation channels, ponds and tanks adjacent to agriculture farms. Expansion is likely in the future as people are becoming aware of the dual benefits of rearing fish such as tilapia in such facilities which will not only produce fish but also fertilize the irrigation water.

Finfish cage culture has a recent history having started in 1999 by a private company, with a production of 1,206 tonnes in 2008. Assessments indicate that the hydrographical conditions along the eastern coast of UAE are favourable for commercial aquaculture so it is possible that this sector may expand in the future.

**References**

### Bibliography

FAO publications related to aquaculture for the United Arab Emirates.


Yousif, O.M., Osman, M.F., Anwahi, A.A. & Cherian, T. 1996. Optimum protein to energy ratio two size

Related links

FAO FishStatJ – Universal software for fishery statistical time series
Ministry of Information and Culture, UAE.