Aquaculture

Boosting fish supplies

Aquaculture, a relatively new potential for fish resource in several Arab States, is currently being expanded to boost local landings

Fish landings from marine, brackish and fresh waters or from aquaculture provide a vital source of food, employment, recreation, trade and economic well-being for people throughout the world, for both present and future generations.

Fisheries resources from the waters bordering the 22 Arab States as well as from inland waters and mariculture are considered a very important sector for development. If rationally and scientifically exploited, fisheries could play a much more important role in meeting increased demand for food, and in improving the economies of several countries.

The coastlines of the Arab States total just over 23,000 km in length and have a continental shelf area of about 608,000 sq km. Inland water bodies are estimated to have an area of about 7.2 mn hectares, consisting of deltas, water marshes, water reservoirs, lagoons, rivers, lakes, etc. Marine waters border the Arab countries from all sides: the Arab and Oman Gulfs in the east, the Arabian Sea, Gulf of Aden and the Indian Ocean in the south, the Mediterranean Sea in the north and the Atlantic Ocean in the west. In addition, the Red Sea and various smaller gulfs, rivers—mainly the Nile, the Tigris and the Euphrates—the natural lakes and man-made lakes—mainly Lake Nasser in Egypt, Lake Nubia in the Sudan and Lake Assad in Syria—which constitute inland water resources, afford the Arab States very important potential for increased fish landings. Furthermore, the Exclusive Economic Zone (EEZ) expands Arab marine waters to rich international fishing grounds. Aquaculture, in marine and freshwater bodies, which is a relatively new fish resource potential available to several Arab States, is another source that is currently being expanded to boost local landings.

Fish landings by all Arab States from all sources in 2000 totalled 2.5 mn tonnes or about 1.9 per cent of world fish landings of 130.4 mn tonnes in the same year, as estimated by the Food and Agriculture Organization of the United Nations (FAO). The contribution of fish from aquaculture to Arab fish landings from both marine and fresh waters has been quite significant in recent years. In 1997, the total aquaculture production from marine and freshwater sources was 98,000 tonnes, increasing to 170,000 tonnes in 1998, followed by an even larger increase in 1999 and 2000 to 252,000 tonnes and 366,000 tones, respectively, that is, an increase of 49 per cent and 45 per cent, respectively. Considering that the 1984 production was only 22,000 tonnes, these landings show real progress in aquaculture in the Arab world.

Aquaculture is important in meeting the demand for fish as food from a rapidly growing world population and to counter the dwindling catches from marine and freshwater capture fisheries. Aquaculture's importance the world over is clear, as it grows each year at an increasing rate—accounting for 28 per cent of total world catches in 2000.

Freshwater resources

The Arab world is no exception to this trend. Several States with freshwater resources—such as Egypt, Iraq, Sudan and Syria—have practised aquaculture for many years, although on a subsistence basis. However, in recent years, such practices have been widely commercialized. Other States—such as Tunisia, Morocco, Saudi Arabia, Kuwait and Bahrain—where freshwater resources are scarce are currently engaged in

Table 1: Marine Aquaculture Production in Arab Countries (tonnes) 1997-2000

Country	1997	1998	1999	2000
Algeria	81	64	65	74
Bahrain	4	4	5	12
Egypt	64,417	123,897	190,871	303,573
Jordan	0	117	449	489
Kuwait	204	220	264	376
Morocco	1,129	954	1,160	862
Oman	4,698	4,081	6,454	4,851
Qatar	2	0	0	0.5
Saudi Arabia	892	1,861	1,390	2,086
Tunisia	865	944	287	719
United Arab Emirates	0.5	0.5	0.5	0.5
Total	72,292.5	132,142.5	200,945.5	313,043

Table 2 : Freshwater Aquaculture Production in Arab Countries (tonnes) 1997-2000:

Country	1997	1998	1999	2000
Algeria	241	219	185	201
Egypt	9,037	15,492	35,406	36,520
Iraq	3,400	7,500	2,183	1,745
Jordan	200	176	66	80
Lebanon	300	400	300	400
Libya	100	100	100	100
Morocco	1,055	1,150	1,560	985
Saudi Arabia	3,798	3,240	3,662	3,918
Sudan	1,000	1,000	1,000	1,000
Syria	5,596	7,233	6,079	6,797
Tunisia	1,010	898	808	834
Total	25,737	37,408	51,348	52,580

Table 3: Aquaculture Production in Arab Countries (Marine and Freshwater) (tonnes) 1997-2000

Country	1997	1998	1999	2000
Algeria	322	283	250	275
Bahrain	4	4	5	12
Egypt	73,454	139,389	226,276	340,093
Iraq	3,400	7,500	2,183	1,745
Jordan	200	293	515	569
Kuwait	204	220	264	376
Lebanon	300	400	300	400
Libya	100	100	100	100
Morocco	2,184	2,104	2,720	1,847
Oman	4,698	4,081	6,454	4,851
Qatar	2	0	0	0.5
Saudi Arabia	4,690	5,101	5,052	6,004
Sudan	1,000	1,000	1,000	1,000
Syria	5,596	7,233	6,079	6,797
Tunisia	1,875	1,842	1,095	1,553
United Arab Emirates	0.5	0.5	0.5	0.5
Total	98,029.5	169,550.5	252,293.5	365,623

mariculture activities by farming fish in cages along their coastlines.

Countries such as United Arab Emirates (UAE) and Oman have also established research centres with the aim of developing mariculture in their waters. Egypt and Saudi Arabia are leading the other Arab States in commercial shrimp culture along their coasts on the Red and the Mediterranean Seas.

Some research centres, especially in the Arabian Gulf region, are experimenting on farming shrimp, as in UAE. The results of their research work are being passed on to the private sector, considered the main potential investor in this sector.

The main species farmed are those indigenous species that are popular in each individual State. In Egypt and the Sudan, tilapia is farmed. Tilapia is also being grown in Saudi Arabia, where Egyptian and Sudanese minorities live.

In Egypt, carp is farmed in rice fields. In most of the States of the Gulf Co-operation Council (GCC), namely, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE, *Seirranidae* spp. (groupers) are farmed. Also, *Siganus* (rabbit fish) is especially popular, particularly in Bahrain. Shrimp (mainly *Pennaes semisilcatus*) is being commercially farmed in Egypt and Saudi Arabia.

In addition to the above commercial operations, there are several experimental projects aimed at developing commercial cage farming of sea bass and sea bream on the Mediterranean coast in Egypt, with the aim of exporting production to European countries to generate hard currency earnings. Some farms are also being established in desert areas in Egypt, using underground water resources. It is expected that when research studies on fish farming show better investment feasibility, and the technology knowhow becomes more readily available, fish from aquaculture production will expand even more substantially.

The FAO World Food Summit held in Rome in 1996 defined food security as existing "...when all people at all times, have a physical and economic access to safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life".

With this definition in mind, fish may play an important role in supplementing the minimum diet of the populations at large, and, in particular, sectors having low purchasing power.

Source of income

In addition, fish has a role to play in food security even if fishworkers themselves cannot afford to eat fish, as long as the fishery provides them with an income sufficient to buy other foods.

In many developing countries, fish plays a significant role in food security through its contribution to people's well-being and incomes, including hard currency earnings from exports, and as a readily available food supply. This is more evident with populations living in coastal areas and around population concentrations living around rivers, lakes and reservoirs. To feed themselves, these concentrations engage in aquaculture activities of locally demanded fish species through small enterprises that also supply surplus catches to nearby markets for immediate consumption by consumers living in the same communities. Besides providing income for fish farmers, such farming also provides fish at low prices for consumers. Such aquaculture by small holders of fish farms is being practised in States like Egypt, Iraq, Sudan, and Syria. Its possible expansion will undoubtedly boost fish supplies in rural areas and ensure more fish enters the markets in urban areas. That will also help conserve much-needed hard currencies by reducing fish imports. It will also make protein available cheaply for the masses.

While it is generally believed that most marine and inland capture fisheries resources are fully exploited, there is an urgent need for the Arab States to increase domestic fish production, and engage more in aquaculture production from marine and freshwater resources. In countries where there are heavy population concentrations, like Egypt, Iraq and Sudan, aquaculture is most beneficial if practised also at the community level (as a cottage industry), especially in communities living around coastal areas and inland water bodies.

The total fish landings attributed to the Arab States from marine, freshwater and brackish water have stabilized over the last few years at around 2-2.5 mn tonnes a year, amidst increasing population growth, and this level of production may continue for years to come. Though long practised for subsistence purposes in some States (mainly Egypt), on a commercial scale, aquaculture is a relatively new development. An increase in production from capture fisheries is still possible through better management and conservation and will probably occur in response to intensified fisheries activities. However, it is very unlikely to keep pace with population growth; nor is the supply of the most sought-after and easily caught fish species likely to be maintained. The challenge here is organizing and stimulating production from fish resources so that the per capita supply of fish for food does not decline in the face of population growth, but, rather, increases.

No roots yet

Aquaculture is yet to take strong roots in most of the Arab States, especially those with substantial fish imports, like Egypt

and Saudi Arabia. In order to sufficiently develop aquaculture, governments and research institutions concerned will need to increase and improve research, whose findings could then be applied inland and along the long coastlines.

The involvement of the governments' research centres is essential to establish the feasibility of projects and to encourage the private sector and industry to invest in such projects. Research in aquaculture must address improvements in technologies, contribute to a reduction in the cost of production, and consider the increasing need to ensure that aquaculture is environmentally safe and that farming indigenous and popularly demanded species—as well as the possible introduction of new species—can be achieved without endangering the ecological balance.

Sustainable aquaculture development calls for certain measures to improve the quality of water used by fish farmers, and farm management technologies, as well as environment-friendly coastal and inland water sites. If these are ensured, aquaculture projects can be efficiently, effectively and profitably implemented.

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