

Catfish culture in Southeast Asia

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Catfishes rank fifth in the world in terms of fresh and brackish water fish culture, annual production being around 350,000 tons. Catfish farming is monoculture, polyculture, or integrated with rice and livestock.

Although there are over 2,600 species, only three families at present are farmed in any quantity: Ictaluridae, Clariidae and Pangasidae.

In Asia and the Pacific, family Clariidae (*Clarias* spp.) dominates production, representing nearly 80% of the total 76,000 tons catfish produced in 1991. Among the most cultured species are *Clarias batrachus*, *Clarias macrocephalus* and *Clarias gariepinus*.

C. batrachus is the most extensively cultivated species especially in Thailand. It grows fast and is easy to propagate but its meat is not so tender. *C. macrocephalus* on the other hand is preferred for its better taste and tender meat but its culture is not so widespread because of its slow growth and scarcity of seed.

The African catfish *C. gariepinus* is the only introduced species that had a significant impact on the Asian aquaculture industry. The original introduction was made in 1975 in Vietnam, from where the species spread all over Asia. Although Asians do not prefer its meat quality and its large size, its rapid growth and hardiness made it popular among fish farmers.

MARKET

The domestic market generally absorbs catfish produce in Asia, although high producing countries like Thailand and Vietnam engage in export. Freshwater catfish imports for July 1999 in the United States totaled 475,000 pounds, of which 47% came from Vietnam.

There are two basic markets for catfish: live fish and processed fish. Live fish commands a higher price as compared to the processed form such as fillet. Consumer

preference also dictates the price of certain species. Off-flavor and fatty fish are the major problems in product quality control. Catfish has a "poor image" especially in coastal communities and thus has low acceptance.

In general, the catfish farming industry is still young and growing; but unfortunately, already faced with problems arising from declining availability and increasing price of trash fish and other animal feed ingredients, erratic feed management, and diseases. But improvements are already being studied, such as in culture techniques (induced breeding and nursing, health management, pond management) and in feed formulation and manufacturing.

TOP THREE CATFISH-PRODUCING COUNTRIES

Thailand

The Thai catfishes are locally known as pla duk. There are five species, of which only two are popular: pla duk dan or *C. batrachus* and pla duk oui or *C. macrocephalus*. Both are widely distributed in all types of freshwater bodies. Both are also popular food fishes and command high market prices.

Most of the clariid catfishes in Thailand are cultured in ponds. But about 5% of production reportedly comes from fish culture in rice fields and ditches.

The culture of *Clarias* in Thailand began in the late 1950s, originally in the Bangkok area and later in central Thailand. The country has developed a highly intensive culture for clariids that has since served as a model for other countries in Southeast Asia.

Catfish culture gives a higher annual income than other forms of agriculture. However, their natural habitats are being reduced by industrialization and their availability is declining rapidly.

In 1987, *Clarias gariepinus* was introduced from neighboring Laos. The Department of Fisheries encouraged farmers to raise this species because of its better quality, quicker growth, and improved resistance to diseases. Moreover, *C. gariepinus* can reach 200-250 g average body weight in 3 months and has much better survival rates than the indigenous species.

When *C. gariepinus* and *C. macrocephalus* were successfully interbred, the industry shifted to this hybrid which has enhanced characteristics of both species. In 1997, production reached 52,680 ton worth US\$43,615,000, making Thailand the highest producing country of catfish in Southeast Asia (see table). Most of the catfishes are marketed live.

Indonesia

Indonesia ranks first in Southeast Asia in terms of freshwater production (0.3 million tons in 1995) and catfish is one of the cultured species. *C. batrachus* is native to Sumatra, Java and Kalimantan; however, it was introduced to Sulawesi and Irian Jaya.

Government agencies actively promoted the adoption of induced breeding and intensive pond culture of catfish since the early 1980s, but until the second half of the decade, production of *Clarias* remained below 1,000 tons or 0.5% of the volume of freshwater fish culture. The major constraints were the limited supply of fry and traditional culture techniques which had low profitability.

With the introduction of *C. gariepinus* in mid-1980s and the development of a hybrid (*C. gariepinus* x *C. batrachus*), cultured catfish production reached 4,000 tons in 1991. In 1997, *Clarias* spp. production rose to 12,900 tons.

Malaysia

The culture of catfish in Malaysia is lim-

Catfish production in Southeast Asia and some part of the the Middle East, 1984 - 1997 (courtesy of FAO DataBank)

BY VOLUME (tons)

	Species	1984	1986	1988	1990	1992	1994	1996	1997
Brunei Darussalam	<i>Clarias</i> spp.	--	--	--	--	2	1	<0.5	<0.5
Cambodia	<i>C. batrachus</i>	60	80	170	235	310	280	330	420
	Siluroidei	80	95	200	280	370	330	390	500
China, Hong Kong SAR	<i>C. fuscus</i>	130	110	140	120	110	374	<0.5	0
India	<i>Clarias</i> spp.	--	36,000	36,500	39,260	50,323	50,000	85,127	91,163
Indonesia	<i>Clarias</i> spp.	692	886	2,500	3,739	6,330	9,786	15,627	12,900
Korea	<i>Ictalurus</i>	--	--	--	--	--	--	998	--
	Siluroidei	--	--	--	--	--	1,615	2,206	2,995
Malaysia	<i>Clarias</i> spp.	--	--	183	197	904	827	1,379	4,177
Philippines	<i>Clarias</i> spp.	86	143	100	--	--	2,028	1,075	1,053
Saudi Arabia	<i>C. gariepinus</i>	0	0	0	0	0	0	20	23
Syrian Arab Republic	<i>C. gariepinus</i>	0	0	0	0	0	0	65	45
Taiwan	<i>Clarias</i> spp.	349	58	48	40	69	933	283	196
Thailand	<i>C. gariepinus</i> x	4,598	15,817	12,551	17,900	23,775	34,170	47,711	52,680
	<i>C. macrocephalus</i>								

BY VALUE (x US\$1,000)

	Species	1984	1990	1996	1997
Brunei Darussalam	<i>Clarias</i> spp.	--	--	<0.5	<0.5
Cambodia	<i>C. batrachus</i>	90	423	693	798
	Siluroidei	96	672	916	1,150
China, Hong Kong SAR	<i>C. fuscus</i>	402	324	<0.5	0
India	<i>Clarias</i> spp.	--	78,553	85,127	91,163
Indonesia	<i>Clarias</i> spp.	692	9,348	38,286	32,250
Korea	<i>Ictalurus</i>	--	--	1,697	--
	Siluroidei	--	--	15,00	8,237
Malaysia	<i>Clarias</i> spp.	--	280	1,924	5,227
Philippines	<i>Clarias</i> spp.	93	--	2,078	1,582
Saudi Arabia	<i>C. gariepinus</i>	0	0	56	64
Syrian Arab Republic	<i>C. gariepinus</i>	0	0	358	252
Taiwan	<i>Clarias</i> spp.	459	90	1,184	380
Thailand	<i>C. gariepinus</i> x	5,552	18,905	47,029	43,616
	<i>C. macrocephalus</i>				

Most of the *Clarias* currently cultured in Malaysia is of the hybrid type (*C. macrocephalus* x *C. gariepinus*). The hybrid resembles the local catfish, which is readily accepted by the consumers and fetches a better price. Production in 1988 was only 183 ton but in 1997 it reached 4,177 tons. This increase was attributed to the improved technique of culture with the utilization of formulated floating pellet feed.

Most of the catfish produced is marketed live locally. However, significant quantities are also exported live to Singapore, Hongkong and Taiwan. *Clarias* is rarely marketed in processed or semi-processed form. At the moment, processed catfish meat receives little attention mainly because there is no surplus to be processed.

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ited exclusively to freshwater catfishes, among the most popular are keli kayu (walking catfish) or *C. batrachus*, the keli bunga or *C. macrocephalus* and the keli africa or *C. gariepinus*.

Catfish culture began in the early 1960s with the small-scale culture of keli kayu, mostly small-scale and involving the fattening of stock produced from rice growing areas. Production reached its peak in early 1970s but in early 1980s, production declined due to disease problems. However, the industry was revived in the mid-1980s

when *Clarias macrocephalus* fry was successfully produced by the Freshwater Fish Research Center in Batu Berendam.

At about the same time, *C. gariepinus* became popular. This exotic catfish was a fast grower, highly resistant to diseases and readily accepted by the local people. The African catfish, however, could not match the demand or preference by local consumers for their local species. The African catfish retailed for about RM 4 per kg as compared with the *C. batrachus* and *C. macrocephalus*, both of which commanded market prices in the region of RM 6 per kg.