

FISHERY COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/CRO
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RESUMEN INFORMATIVO SOBRE LA PESCA POR PAISES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	

THE REPUBLIC OF CROATIA

I. General geographic and economic data

Area:	56 500 km ²
Length of coastline:	145 835 km
Continental	1 777 km
Population (2006):	4.44 billion
GDP current (2006):	\$US 42.93 billion
Agricultural GDP (2006):	\$US 7% of GDP

II. Fisheries data *

2003	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes live weight				kg/year
Fish for direct human consumption	27 551	71 870	33 697	65 119	14.7
Fish for animal feed and other purposes	605	-	-	-	-

* FAO statistics

Estimated Employment (2006):	about 20 000
Trade (2005)*:	
Value of fisheries imports:	\$US 103 164 000
Value of fisheries exports:	\$US 96 920 000

* FAO statistics

FISHERY SECTOR STRUCTURE

Overall fishery sector

The fisheries sector in Croatia includes marine capture fisheries, marine aquaculture, freshwater aquaculture, freshwater capture fisheries, and fish processing. The marine fishery is conducted in the eastern part of the Adriatic, and freshwater capture fisheries centre on two major river systems, the Sava and the Danube and their tributaries. Marine fisheries have an artisanal character, and can be in general divided into coastal (inland, from coastline to baseline, and channel areas associated with the numerous islands in Croatia) and more open waters. Trawling is the key activity in coastal fisheries, while trawling and purse seining dominate in the open seas. The fishery sector in Republic of Croatia accounts for less than 1 percent of GDP. The coastal community and islands are highly dependent on the fishery sector, while fisheries, particularly fish farming, have been strongly linked with the development of rural tourism. In general, this sector is considered strategically important. Total Croatian annual consumption of fish and fish products is low relative to other Mediterranean countries, at an estimated 8 kg per person. Total production in marine fisheries (capture and farming) in 2006 was 52 037 tonne. Marine farming produced 14 200 t, and freshwater farming production amounted to 5067 t. According to the Trade Court Register, there are 334 companies registered for activities in fisheries, including capture fisheries and farming. This number does not include individual fishers, who are not registered with the Court but with the Crafts Register. In 2005, 3 720 fishers were directly engaged in fisheries (MAFWM-DF data).

Marine subsector

Catch profile

Total catch in 2006 amounted to 37 837 t, of which 31 646 was small and large pelagics¹.

Table 1. Breakdown of marine capture catch in 2006 in Croatian waters.

	Catch (tonne)
Pelagic species	
sardine	16 950
anchovy	11 850
tuna	1 022
other	1 824
Sub-total	31 646
Demersal fish species	

¹ All numerical references in the text and all data provided, unless otherwise referenced, are from the Croatian State Bureau of Statistics.

hake	920
mullet	805
other	3 132
Sub-total	4 857
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Crustaceans	
lobster	6
Norway lobster and other	292
Sub-total	298
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Shellfish and cephalopods	
oysters, mussels	132
cuttlefish	212
squid	71
octopus and other	621
Sub-total	1 036
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Grand total	37 837
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Landing sites

Generally, there is a lack of well-developed coastal infrastructure in Croatia. When not unloaded at a processing plant site (equipped with some port infrastructure), catch is usually unloaded at public ports, since there are no designated fishing ports in Croatia at the moment. Due to geographical constraints and conditions (numerous islands), catch is landed at numerous small landing places along the coast. Distribution of landings depends on the area and the target species. In the Istrian region (Umag, Poreč, Rovinj, Pula), landings include mainly demersal species, with a predominance of cephalopods, flatfish (sole) and sardines. Northern Adriatic channel areas are served by Rijeka, Krk (island), Rab (island) and Cres (island), and landings include small pelagics, hake and Norway lobster. Zadar, Kali (island), Ugljan and Biograd in Zadar county are the main landing sites, with landings composed mainly of pelagic species. In the Šibenik area, main sites include Šibenik, Vodice, Tribunj, Murter and Jezera, and the major part of the landings is demersal catches. Dalmatia is covered by Split, Trogir, Hvar (island Hvar), Stari Grad (island Hvar), Jelsa (island Hvar), Vis (island Vis), Komiža (island Vis), Postira (island Brač), Sućuraj (island Hvar), Makarska and Podgora, with small pelagics, hake and mullet constituting the bulk of the landings. Dubrovnik, Cavtat, Vela Luka (island Korčula), Korčula (island Korčula) and Ston are the main locations in southern part of Croatian coast, where landings are dominated by small pelagics (MAFWM-DF data).

Fishing production means

The Croatian fleet is characterized by small and relatively old fishing units, averaging 66 kW engine power and 11 GRT (MAFWM-DF data), indicating the large dominance of very small coastal units. However, most of the commercial marine fishers are purse seiners or trawlers. A significant proportion of the fleet is represented by multipurpose vessels (62%), while trawlers and purse seiners comprise some 14% each. According to the latest available data, there are 3 692 vessels in total, but the fleet register is currently under revision so this number is subject to change (MAFWM-DF data).

MAIN RESOURCES

The main stocks exploited include sardine (*Sardina pilchardus*), European anchovy (*Engraulis*

encrasicolus), hake (*Merluccius merluccius*), mullet (*Mullus barbatus*), Norway lobster (*Nephrops norvegicus*), octopus species (*Eledone* spp.), breams (*Pagellus* spp.) and various flatfish. Atlantic bluefin tuna (*Thunnus thynnus*) is the targeted species in tuna fishery, governed by ICCAT Recommendations in terms of season, size and quota.

Management applied to main fisheries

The main strategic goal in fisheries management is securing the sustainability of both the resource and the activity as such, aiming at providing the best livelihood possibilities for fishery-dependant communities. Protection and management of the resources is undertaken through implementation of numerous technical measures, control measures and effort-related measures, while structural support to the sector and stakeholders is achieved through support schemes in aquaculture and through structural funds and rural development mechanisms. The main resource management measures include minimum landing sizes, closed seasons for numerous species, and temporal and spatial restrictions for gears. Trawling is prohibited in a zone less than 1 n.mi. from the shore, and as of 31 December 2009 to be extended to 3 n.mi. or less than 50 m. Channel areas are under a strict regime of temporal closure, resulting in a large area of Croatian internal waters being under a no-fishing regime. Elaborate mesh size regulations are in place for different gears (some mesh sizes are shown in Table 2).

Some 20 areas considered particularly important as nursery or spawning areas are defined in Croatian territorial waters, where special management measures apply. Input controls into fisheries are governed through the licensing scheme. Logbook obligation has been introduced since 2001, with the obligation to report all catches regardless of the quantity or species caught. The fleet register is the main mechanism of effort control, in terms of engine power and GRT fleet capacity. There are no TACs in Croatia, apart from tuna fishery, which is governed by ICCAT.

Table 2. Some net mesh size limits.

Bottom trawl net	48 mm/40 mm
Purse seine for small pelagics	16 mm
Beach seine for sardines	16 mm
Gillnet for smelts (<i>Atherina hepsetus</i>)	20 mm
Gillnet for small pelagics	32 mm
Gillnet for coastal demersal fish	62 mm
Trammel net	80 mm (middle layer) and 300 mm (outer layer)

Fisher communities

Coastal areas, and particularly the islands, in Croatia are characterized by numerous fisher communities, where the majority of the population is employed in fisheries. In some areas, fishers are organized in cooperatives (two larger cooperatives in Istra), trying to secure the best possible outcome for their activities. With the development of tourism, traditional fisher communities are difficult to identify, and generally there is still a rather low level of larger fisher organization, such as cooperatives or other types of joint management.

Inland subsector

Commercial fisheries on freshwater inland systems is governed by relevant management mechanisms, but is considered rather traditional and today represents only more a cultural or traditional activity. Commercial catches in 2004 amounted to 45.5 t (MAFWM-DF data). Most activity is on the Danube river, where most of the fishermen are located (19 out of 25 licences are on the Danube). Generally, more activities in inland fisheries are realized through recreational fishing. They are organized in associations, and are given managements over a concessioned area of water body. Concessions are issued based on management plans, and their implementation is verified through regular inspections of the Ministry of Agriculture, Forestry and Water Management (MAFWM), through the Directorate of Fisheries (DF) (MAFWM-DF) fisheries

inspectors.

Recreational subsector

Croatia differentiates between sport and recreational fisheries at sea, and governing mechanisms for both elements are in place. Sport fishery is linked with competitions, and membership in sport unions. Spear guns are allowed in this category, but in no other. Both types are subject to licensing: daily, weekend, monthly and annual licences. Annual licences are restricted to residents of Croatia. Daily catch limits are in place for both categories (5 kg). Freshwater recreational fisheries are also subject to numerous technical regulations, including licensing. The total number of sport and recreational fishers both at sea and on rivers is estimated at some 40 000. In addition, Croatian legislation allows for a special “subsistence fisheries at sea” category, allowing catch of marine organisms for personal consumption only, with a daily limit of 5 kg, and this activity is also subject to licensing and technical limits on gear. It is estimated that currently there are some 11–12 000 subsistence fisheries licences issued, but a far lesser number are actually active in this fishery.

Aquaculture subsector

Aquaculture in Croatia comprises freshwater and marine segments. The main species in freshwater aquaculture include carp (*Cyprinus carpio*) and trout (*Salmo trutta* and *Onchorhynchus mykiss*), with respective production in 2006 of 2 309 t and 1 865 t. Total production from freshwater aquaculture in 2005 amounted to 5 067 t of market-size fish, and 1 480 t of fry. Production is either in ponds (carp) or flow-through installations (trout). In marine aquaculture, cage culture is the dominant technology, and bass (*Dicentrarchus labrax*) and bream (*Sparus aurata*) are the main finfish species. Tuna (*Thunnus thynnus*) is the species with most economic importance. Mussels (*Mytilus galloprovincialis*) and oysters (*Ostrea edulis*) are also produced. Total production in 2006 amounted to 14 200 t, of which 6 700 t was tuna, 3 500 t was bass and bream combined, and 4 000 t was oysters and mussels. Aquaculture activities are subject to strict environmental rules and licensing.

POST HARVEST USE

Fish utilization

The major part of the catch (small pelagics) is either sold to tuna farms as fish feed for tuna, or to the processing industry. Processed products include canned sardines, salted or marinated anchovies, and salted or marinated sardines. These commodities form the bulk of post-harvesting utilization of fish. The largest growth in production has been in salted anchovies (total production of salted products in 2005 was 6 110 t; canned products were 6 920 t; frozen fillets were 1 935 t; and other products were 1 980 t (MAFWM-DF data). Recently, some new products have been developed, such as salads or prepared products of Norway lobster and shrimp tails. Aquaculture products are mainly sold direct and not processed, but some recent initiatives include production of smoked filleted sea bass and sea bream. Raw material (catch) is delivered direct to tuna farms or processing plants, being landed at the site of the farm or plant. In some cases, fish is unloaded in ports, and then transported by road (chilled or frozen) to production sites (processing plants).

Fish markets

There are no large wholesale fish markets in Croatia yet, but two were scheduled for opening in 2007 (Istria region), with some planned for other areas. Several smaller markets are located along the coast, in all major cities (Pula, Rijeka, Zadar, Šibenik, Split, Dubrovnik) and in areas with intensive fish activities (islands, wider Šibenik and Zadar area). Fish is either sold direct to producers (processing, tuna farms) or to markets, and there are several buy-off stations located

mainly on the islands and in Istria, Zadar, Šibenik and Split wider area. Fish sold to buy-off stations is either shipped to larger fish markets (Zagreb, Split, Rijeka), to market chains or exported fresh or chilled. A large part of the small pelagic catch is landed at tuna farms (8 licences issued by the end of 2005 (MAFWM-DF data), all of which are located in the Zadar and Split-Dalmatia area or delivered to processing plants (located in Istria-Rovinj, Zadar county – Sali, Long island and in wider Zadar area, in wider Split area – mid-Dalmatian islands), and only a small proportion is delivered fresh or chilled to fish markets for direct consumption, or is exported chilled or frozen (to Italy or Slovenia). Demersal catches are sold either for direct consumption in Croatia (to markets or to buy-off stations), or exported (mainly to Italy). Aquaculture species (bass and bream) are sold on farm, exported (mainly to Italy), sold to large market chains or processed (small extent, mainly in Istra region). Tuna is sold fresh or frozen to Japan (MAFWM-DF data). Generally, there is a lack of coastal infrastructure in Croatia, in terms of both fish markets and fishing ports.

FISHERY SECTOR PERFORMANCE

Economic role of fisheries in the national economy, and demand and supply

The fisheries sector accounts for a small portion of the national GDP (0.23% in 2004) but it provides around 20 000 jobs and thus plays a significant socio-economic role, with traditional fishing dominating commercial. Almost 70 percent of fishing, farming and processing take place on the islands, where alternative income sources are limited. Combined households, particularly on Croatian islands, are a particular and unique opportunity of finding compatibility between marine aquaculture and other activities. This primarily refers to tourism. According to the Department of Agricultural Marketing at the University of Zagreb, estimated annual per capita fish consumption in the capital is some 9.0 kg, divided into household consumption at 8.3 kg (7.8 kg marine, 0.5 kg freshwater) and restaurant consumption at 0.7 kg. The key to increased consumption is seen to be making fish more price competitive compared with substitute foodstuffs by reducing the number of intermediaries in the distribution chain, and improving product quality. Related areas are identified as limiting the informal market in fish and fish products and improving infrastructure in landing places and the distribution chain.

Trade

Croatia imports more in quantity than it exports, but this is partly a result of imports of frozen herring as fish feed for the tuna farming sector. High value exports include the sale of tuna, exported direct by ship to Japan, and canned fish. Tuna farming is the only food producing industrial activity that has a positive balance (high export values, amounting to US\$ 89 million in 2006). Overall export value of marine fisheries, including fishery products, in 2006 amounted to US\$ 159 million (29 452 t). Of this value, the major share comprised tuna exported to the Japanese market alone. Import values in 2006 were higher on the quantity side (51 287 t) but lower in value (€ 103 million). This is due to imports of greater quantities of low-value small pelagic species (herring, pilchard) and export of high-value products. In addition to Japan, the main export markets include the EU-member states (fresh and chilled products) and Bosnia & Herzegovina and Serbia (canned and processed products). In 2005, the trade in fishery products between Croatia and the enlarged EU was US\$ 45.8 million (16 307 t) exported from Croatia and US\$ 56.6 million (38 172 t, of which 18 687 t was frozen herring) imported from EU member states.

Fishery sector development

Constraints

Croatia's fleet is characterized by a large number of small, rather old vessels. As the status of the resources allows for only a certain level of fishing effort, modernization of the fleet is rather difficult and a very sensitive issue. Generally, there is a lack of capital investment in both production activities (farming, processing) and in infrastructure (lack of coastal support, infrastructure, ports and markets). Adequate support on land and further development of post-harvest practices are absolute preconditions for further development of the sector, as this will facilitate both the production activities and increase the level of reliability of catch statistic data.

Development prospects and strategies

The Government of Croatia adopted a Fisheries Development Strategy in 2002, identifying the main areas of development. Increased consumption of fish in the domestic market, sustainable development of aquaculture and sustainable development of capture fisheries were identified as the main guidelines. Value-adding to fisheries products is seen as the main development potential, particularly for aquaculture production, where development guidelines include diversification of farmed species and post-harvest processing (diversification of final products). Development of capture fisheries is seen through minimizing of discards and by-catch, increasing safety at sea and development of different social schemes.

Research

The main research institution for fisheries biology in Croatia is the Institute of Oceanography and Fisheries (IOF), in Split. The institute deals with demersal, pelagic and coastal resources and is involved in numerous projects: AdriaMed Trawl Survey, MEDITS, National Demersal Monitoring (DEMMON), National Pelagic Monitoring (PELMON), and AdriaMed Acoustic Survey. IOF participates in numerous other environmental and ecological projects, at both international and national level. In addition, the Institute for Coast and Sea in Dubrovnik provides insight into the status of demersal fish communities and ecology. The Institute Ruđer Bošković supports research activities in fisheries in the area of environmental sciences and ecology.

Education

In terms of formal education, Croatia has a high school with the curriculum targeting people interested in working in fisheries. Also, faculty curricula for fisheries biologists and technologists have been developed, and have been successfully used to train experts for over 10 years now. Vocational training in fisheries is still not sufficiently developed, but recently initiatives for training courses have been presented.

Foreign aid

Currently, there are several international projects dealing with fisheries ongoing in Croatia. The EU-funded PHARE 2005 framework project in fisheries contains several smaller individual projects (technical assistance, supplies, services, twinning and works). Most parts of the project are aimed at assisting MAFWM-DF and capacity building, with the final goal of enabling the administration to fully manage and comply with the requirements of the EU *acquis* in the field of fisheries. Also, this framework provides for the construction of two fishing ports and assistance for producer organization establishment. Furthermore, the FAO regional project AdriaMed assists the scientific institutions and the administration, forming a network of cooperation to secure better management measures at basin level. Some INTERREG framework projects are also active, or have recently been either closed or initiated. These target local government and stakeholders through direct aid. One of the INTERREG initiatives was directed towards construction and setup of the wholesale fish market in Rjeka.

SAPARD pre-accession funds for direct assistance to producers were made available for the fisheries sector (processing) in 2006.

Fishery sector institutions

The main body responsible for fisheries issues in Croatia is the Ministry of Agriculture, Forestry and Water Management (MAFWM), with the Directorate of Fisheries (DF) being the responsible department. DF has a central office in Zagreb, and seven field offices in the coastal counties of Croatia. Internally, the DF has several segments (divisions) responsible for different aspects of management. Currently (2007) there are 4 departments: Department for marine resources management; Department for freshwater resources management; Department of fisheries inspection; and Department for international cooperation and projects. The DF is headed by a Director General, who is also an assistant Minister for Fisheries. Each Department is headed by a Head of Department. Within each department there are units responsible for more specialized tasks (7 units in all). The main responsibility of the Department for marine resources management is drafting relevant regulations and management of licences and statistics from capture fisheries and marine aquaculture. The Department for freshwater resources management does the same thing with freshwater issues, while the Department for international cooperation and projects coordinates activities with international bodies and partners (GFCM, ICCAT, FAO, Eurofish) as well as the assistance projects funded by the EU (CARDS, PHARE) or through bilateral cooperation. The Department of fisheries inspection is responsible for the control of the implementation of management measures through direct inspection and control.

The work of the MAFWM-DF is supported by the assistance of the Croatian Agriculture Extension Institute (CAEI), which represents a direct link with the producers. The main role of the CAEI is to communicate with the producers on all legal and practical issues, as well as to advise on possibilities of development. Croatian producers in fisheries and aquaculture are organized in two chambers, Croatian Chamber of Economy (CCE) and the Croatian Chamber of Crafts and Trade (CCT). The CCE gathers legal entities (companies), while the CCT gathers individual small producers and fishers. Within the chambers, the producers have respective organizations and unions. Both chambers are involved in the process of preparation of legal instruments and are consulted for management measures.

In terms of fisheries research, the Institute of Oceanography and Fisheries in Split (IOF) provides the scientific inputs for management measures.

GENERAL LEGAL FRAMEWORK

The basic fisheries legislation in Croatia is the Marine Fisheries Act of 6 October 1994, with subsequent revisions (Official Journal – OJ, www.nn.hr – 57/96, 46/97 – consolidated text, 48/05). It has been supplemented by a Regulation on Commercial Fishing of 2006 (OJ 6/2006, 46/06, 66/07), which gives the main management measures in commercial fisheries, as well as with a Regulation on fishing gears and tools in commercial fisheries (6/06, 46/06, 93/06). These constitute the main management instruments in marine fisheries. The Marine Fisheries Act provides a legal basis for other management elements, such as licences, fleet register, protection of species, surveillance and control and logbooks. These are in turn regulated in details in respective implementing regulations (Regulation on commercial fishing licences and fleet register, 155/05, 135/06; Regulation on logbook, catch report and data submission in commercial fisheries, 95/07, Regulation on fisheries monitoring and surveillance, 62/06, 135/06; Ordinance on protection of fish and other marine organisms, 101/02). The Act also provides for regulatory mechanisms in marine aquaculture, defining the issuing of licences and data submission in marine aquaculture (Regulation on licence for marine fish farming and licence register, 29/02, 42/04, 134/05; Regulation on farming logbook, 66/03).

In terms of freshwater fisheries, although they have mainly traditional and cultural importance

nowadays, management measures are governed by the Freshwater fisheries act of 26 November 2001, which has also been amended several times (OJ 7/03, 174/04, 10/05 and 49/05 – consolidated text). The main implementing regulation in this area is the Regulation on commercial freshwater fisheries (OJ 82/05). However, since most activities on open waters fall under sport fisheries, more managing elements are contained in relevant legal instruments (Regulation on sport freshwater fisheries, 82/05). Whether commercial or sport fisheries, the Regulation on protection of freshwater species (82/05) applies. Croatia is a member state of GFCM and ICCAT, and transposes the recommendations of these bodies into national legislation.

LINKS

Institute for Coast and Sea in Dubrovnik — www.imp-du.com

Institute Ruđer Bošković — www.irb.hr

Croatian Agriculture Extension Institute (CAEI) — www.hzpss.hr

Ministry of Agriculture, Forestry and Water Management (MAFWM) — www.mps.hr

Croatian Chamber of Economy (CCE) — www.hgk.hr

Croatian Chamber of Crafts and Trade (CCT) — www.hok.hr

Institute of Oceanography and Fisheries, Split (IOF) — www.izor.hr