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NATIONAL FISHERY SECTOR OVERVIEW

THE REPUBLIC OF ICELAND

1. GENERAL GEOGRAPHIC AND ECONOMIC DATA

Area:	103 000 km ²
Water area:	758 000 km ²
Shelf area:	111 000 km ²
Length of continental coastline:	4 970 km
Population (2007):	308 000
GDP at purchaser's value (2008):	USD 16 634 000 000
GDP per head (2008):	USD 52 096
Agricultural GDP (2008):	USD 114 435 834
Fisheries GDP (2008):	USD 422 532 312

2. FISHERIES DATA

2007 (preliminary data)	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes live weight				kg/year
Fish for direct human consumption	734 812	75 985	782 880	27 917	90.6
Fish for animal feed and other purposes	669 254	-	621 000		

Estimated Employment (2008):	
(i) Primary sector (including aquaculture):	4 300
(ii) Secondary sector:	3 100
Gross value of fisheries output (2008):	n.a.
Trade (2008):	
Value of fisheries imports:	USD 109 714 310
Value of fisheries exports:	USD 1 994 727 550

3. FISHERY SECTOR STRUCTURE

3.1 Overall fishery sector

Icelandic marine fishery landings accounted for 1.7 percent of the world's catches in 2007, making Iceland the 15th largest fishing nation in the world that year. Annual catches have

fallen in recent years because of lower catches of capelin. Domestically, the industry is significant, employing approximately 6.5 percent of the workforce. Iceland's fishing grounds are productive, yielding large amounts of herring, blue whiting, mackerel, capelin, cod, haddock and redfish. Icelandic fishing vessels also operate outside the economic zone, in accordance with international agreements, and thus generate substantial additional value. The long distance fishing is in the North-Atlantic, in the Barents Sea, in international areas, and in the EEZ of Faroe Islands and Norway. There is no special long distance fleet. The domestic fleet also fishes outside its EEZ, mainly for Iceland's share of the Atlanto-Scandinavian herring. In 2008 130 000 tonnes of that herring was taken in Icelandic waters, around 66 000 tonnes in Norwegian waters and 19 000 in international areas. 8 000 tonnes of arctic cod were caught in the Barents Sea. The most important species caught in Icelandic waters in terms of value are: cod, haddock, redfish and herring. Atlantic salmon is an important species for recreational fishing. Aquaculture in Iceland is much less important, with farmed Arctic char as the main product. Iceland is the world's largest producer of farmed char.

Demersal fish are the backbone of the country's fishing industry, with cod yielding the most value, although cod catches have fallen in recent years. Demersal fish are used entirely for human consumption and caught using small, well-equipped boats, medium-sized vessels and trawlers. The fish is processed by companies that vary from small, family-owned businesses to public companies employing large, modern processing plants. Most demersal fish is exported. Pelagic species are caught by large vessels using mid-water trawls and/or purse-seines. In terms of volume, the majority of pelagic species are used for fishmeal, but a growing share is prepared for human consumption, thus increasing the value per kg landed.

3.2 Marine sub sector

3.2.1 Catch

Catch by year

Total Catches, all fish, tonnes	2004	2005	2006	2007	2008
Cod	227 258	212 456	199 375	174 436	151 452
Haddock	84 563	96 580	96 591	109 313	102 326
Saithe	62 966	67 736	75 460	64 245	70 106
Redfish	47 688	61 535	57 949	55 454	69 589
Ocean redfish	36 826	16 005	24 646	19 919	6 786
Catfish	13 186	15 192	16 408	16 192	14 550
Greenland turbot	15 479	13 021	11 796	9 582	11 697
Plaice	5 693	5 794	6 370	5 816	6 718
Other flatfishes	9 981	8 482	7 273	6 241	5 795
Other demersal species	19 761	21 812	26 058	26 314	35 005
All demersal species	523 401	518 613	521 926	487 512	474 024
Icelandic herring	121 577	102 967	131 629	144 026	170 814
Atlanto-Scandinavian herring	102 788	161 693	159 751	175 868	200 009
Capelin	525 086	605 060	184 431	307 447	148 581
Blue whiting	422 074	265 890	314 755	234 952	163 748
Other pelagic species	0	363	4 222	36 518	112 390
All pelagic species	1 171 525	1 135 973	794 788	898 811	795 542
Lobster	1 437	2 030	1 876	2 007	2 069
Shrimp	20 001	8 657	3 044	2 026	2 193
Other shellfish	11 240	3 348	1 161	5 308	8 124

Total catch	1 727 786	1 668 927	1 322 914	1 395 716	1 283 078
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Catches of the Icelandic fishing fleet increased steadily starting in the 1950s and reached one million tonnes for the first time in 1965, the vast majority of the catch being herring. Cod catches reached a historical peak in 1981 with 461 000 tonnes. The largest total catches, 2.2 million tonnes, were obtained in 1997, over half of the landings being capelin.

Since the turn of the century, the largest annual catch was obtained in 2002 (2.1 million tonnes). At the time capelin accounted for half the total landings. Overall, total catches have gradually decreased, mostly due to smaller catches of capelin. This species, so abundant in the 1980s and 1990s, has modified its migrating pattern possibly because of changes in the climate and thus became scarcer in Icelandic waters. However, catches of Atlantic herring have increased and blue whiting is more common in Icelandic waters now than in previous decades. Catches of mackerel have increased and reached 112 000 tonnes in 2008. The total marine catches, all species, of Icelandic fishing vessels in 2008 were 1 283 000 tonnes.

Cod catches have been diminishing due to relatively small spawning stocks and a decrease in their average weight, and because of a lesser abundance of capelin, their main prey. There were 238 324 tonnes of total nominal landings of Atlantic cod in 2000, which decreased to 199 000 tonnes in 2006, compared to 174 000 tonnes in 2007 and 151 000 tonnes in 2008. Based on Icelandic scientific advice, the national TAC (Total Allowable Catches) for cod in the quota year 2007/2008 was set at 130 000 tonnes, compared to ICES (The International Council for the Exploration of the Sea) advice of 152 000 tonnes. The quota was increased to 160 000 tonnes later that fishing year. This total was the lowest cod catch allowed since the 1940's. However, the value of the catch has remained steady due to high fish prices, especially for cod.

Catches of haddock have been increasing in recent years and have reached little over 100 000 tonnes. Other demersal species worth highlighting are saithe (also known as pollock or coley), ocean perch and flatfishes, all of which had steady or slightly decreased catches. Monkfish is now more widely distributed in Icelandic waters, with catches increasing steadily and reaching around 3 000 tonnes a year.

Pelagic catches have been decreasing because of fluctuations in the capelin stock. In 2000, the capelin catch totaled 892 000 tonnes; in 2007 it was 307 000 tonnes and in 2008, 149 000 tonnes. In the winter season 2008/2009, no catches were allowed. The spawning stock is low, but recruitment is improving according to the Icelandic Marine Research Institute (MRI). Herring fishing has been good in recent years, both from the domestic summer spawning stock and from the Atlanto-Scandian stock. In 2003 the total herring catch was 250 000 tonnes; in 2008 the catch had risen to 371 000 tonnes. Blue whiting catches have been on a downward trend due to tighter total allowable catches in accordance with international agreements and recommendations from ICES. In 2003, Iceland caught 501 000 tonnes of blue whiting but in 2008 the total was only 164 000 tonnes. As previously mentioned, mackerel has become a valuable addition to the pelagic catches.

Landings by foreign vessels have been decreasing. Most foreign landings consist of pelagic species used for human consumption, fishmeal and oil. The Faroe Islands account for the largest portion of these catches, i.e. about half. Greenland and Norway come next with around 15 percent each. In 2007, landings by foreign vessels plus imports totaled 105 202 tonnes; these catches were mostly composed of capelin and blue whiting. Preliminary figures for 2008 are 130 346 tonnes, worth USD 92 million. Almost all of that fish was processed and then exported. The import value has remained relatively constant in 2007 and 2008 at around USD 64 million.

Iceland has always been highly dependent on its marine resources, both in terms of employment and as a source of the foreign currency needed to pay for imports. In the last few years, however, its importance has decreased because of the growth of other sectors that generate foreign currency such as tourism, aluminum production, banking and other services. Despite the increasing value of fishery products, fish exports have decreased in relative

importance. In 2007, fishery exports totaled around 613 000 tonnes (product weight) with a value of USD 2.0 billion. That was 42.4 percent of Iceland's commodity exports. In 2008, the value was USD 2.0 billion, 37.2 percent of the country's total commodity exports. But, this ratio is likely to increase once more since the economic recession is not hitting fisheries as hard as it does other economic activities in Iceland.

Employment in the fisheries sector has also been decreasing because of increased automation in the processing sector and rationalization both on board vessels and in fish processing. In 2002, 11 700 people were employed in the fisheries industry, slightly more on the processing side than in fishing itself. In 2008, the total number was 7 400, split evenly between processing and fishing. The share of fishing in Iceland's GDP has fallen from 7.7 percent in 2001 to 4.8 percent in 2008. In 2009 its share is growing, but, once the economic crisis ends, the share of fisheries in the GDP is likely to decrease again.

3.2.2 Landing sites

Most of the catches of the Icelandic fishing fleet, both in terms of quantity and value, are landed outside Reykjavik. Pelagic species comprise the majority of the catch and they are mostly landed in the eastern part of the country, primarily in the community of Neskaupstaður. On the Vestmannaeyjar islands there is also a big fishing harbor. In terms of value, most of the catch in 2008 was landed in harbors in Suðurnes, USD 195.8 million, followed by the capital area, mainly Reykjavik and Hafnarfjörður with landings worth USD 190 million. The total value of the catch in 2008 was USD 1.1 billion. Fish worth USD 140 million was landed abroad.

Volume and value of national landings in domestic ports in 2008

Species	Tonnes	%	USD million	%
Demersal	449 817	35.1	785.5	70
Pelagic	795 542	62	241.6	21.6
Flatfish	24 211	1.9	75.9	6.8
Shellfish	12 368	0.9	12.6	1.4
Other	1 122	0.1	0.3	0.2
Total	1 283 078		1115.6	

3.2.3 Fishing fleet and gears

The fishing fleet consists of three main categories: trawlers, boats (larger than 15 gross tonnes) and small boats (smaller than 15 gross tonnes). At the end of 2008, 1 529 vessels of 159 627 gross tonnes were registered with the Icelandic Maritime Administration, a decrease of 113 vessels and about 9 700 gross tonnes from the previous year. There were 769 boats, with a combined gross tonnage of 86 400. The number of boats had decreased by 65 in 2008 and by 5 300 in gross tonnage. At the end of 2008 there were 60 trawlers with a total gross tonnage of 69 900. This represented a decrease of four trawlers and a loss of gross tonnage of 4 200 compared to the previous year. There were 700 registered small boats in 2008 with a gross tonnage of 3 300. The number of small boats had decreased by 44 compared to 2007 and their combined gross tonnage had fallen by 210 gross tonnes. Most Icelandic vessels are registered outside the capital.

In the fishing year 2007/2008 the majority of the catch (701 000 out of 1 253 300 tonnes) was taken by wet fish trawlers and freezer trawlers. Boats caught 480 000 tonnes and the small boats share was 72 000 tonnes. In terms of demersal fish, the breakdown was: trawlers 135 600 tonnes, boats with 246 300 tonnes and small boats with 72 000 tonnes.

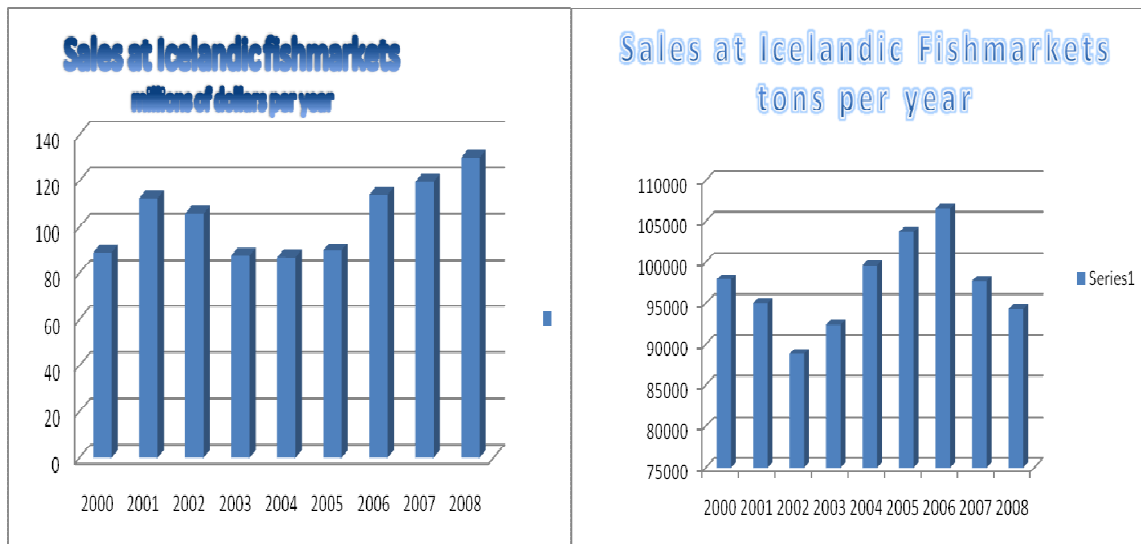
There are five main types of fishing gear used in Iceland: bottom trawls, purse seines, long-lines, gill-nets and Danish seines. In terms of value, the majority of fish are caught in bottom trawl. Other types of fishing gear used for demersal fish are longline, gill nets, Danish seine, and jigging lines. The pelagic species are taken in mid-water trawls or purse seines. Most of

the cod (45.6 percent) was caught in bottom trawl, 33.4 percent by longlines, 12.3 percent in gill nets and 4.8 percent in Danish seines.

3.2.4 Fish markets

Auction fish markets have been functioning in Iceland since 1987. These markets deal almost exclusively with demersal fish and, on the average, the sale per year is close to 100 000 tonnes. The total varies slightly in line with total allowable catch. There has been a steady, yearly increase in fish prices. The increase recorded for 2008 was the largest ever recorded for a single year: the average price increased by 12.7 percent and reached USD 1.40 per kilo. Total sales reached USD 130 million, up 8.7 percent from the previous year. However, the quantity went down to 94 300 tonnes from 97 700 tonnes in 2007 and 106 500 tonnes in 2006. The main reason for this contraction was lower TACs for most species.

The markets operate via a computer services company that connects 15 fish auctions companies in 30 locations into one auction network. In daily auctions 200 to 300 buyers remotely purchase fresh fish in real time. The Icelandic government is not involved in providing facilities for auction markets. They are privately operated under the Fish Auction Market law.



3.2.5 Main resources

The ocean around Iceland includes warm Atlantic waters in the south and colder waters in the north. Variability in oceanic conditions is therefore high, depending on the strength of the currents. The Irminger current keeps the waters south and west of Iceland relatively warm and stable both inter- and intra-annually. The major spawning grounds for most Icelandic fish stocks are in these waters. Most of them spawn in early spring, when the larvae are able to utilize the spring phyto- and zooplankton bloom, while they drift to nursery areas. The waters north of the country are colder and temperatures fluctuate more, both between seasons and years, depending on the strength of the Irminger current versus the colder currents. The waters north of Iceland are also important rearing grounds for juveniles of species such as capelin, herring, haddock and cod. Further north waters get colder, but temperatures fluctuate less. Few commercially important species live there, with the notable exception of northern shrimp, capelin and Greenland halibut.

The productivity of Icelandic waters is fairly high, caused both by the temperature-driven exchange of sunlit surface waters with nutrient-rich deep waters and the mixing of cold and warm ocean currents. Although many species live around Iceland, the ecosystem is dominated by a few but abundant species. About 25 species are of commercial importance, but only a handful dominate catches. The main species are cod, haddock, saithe, redfish, various flatfish, capelin, herring, blue whiting and mackerel. Of these, one species, cod, has nearly always

provided more than half of the export earnings for Icelandic marine products. In recent decades, the total catches have fluctuated from one to two million tonnes per year.

3.2.6 Management applied to main fisheries

The Ministry of Fisheries and Agriculture is responsible for the management of the Icelandic fisheries and the implementation of relevant laws and regulations. The Ministry regulates commercial fishing each fishing year, including allocating amongst holders of vessel quotas the TAC for each stock that is subject to a TAC. The allocation of vessel quotas is based on yearly catch rates recorded prior to the establishment of individual vessel quotas for the species concerned.

In 1990, a comprehensive and uniform Fisheries Management Act was passed by the Icelandic Parliament. This Act established the individual transferable quota (ITQ) system for the fisheries and vessels were subject to vessel catch quotas. The vessel catch quotas represent shares in the national total allowable catch (TAC). They are permanent, divisible and fairly freely transferable. The ITQ system breaks down into two parts: one "common quota system" for boats larger than 15 gross tonnes and a "small vessel quota system" for boats smaller than 15 gross tonnes.

A vessel can transfer some of its quota between fishing years but its quota is lost if it catches less than 50 percent of its total quota, measured in "cod equivalents", over two subsequent years. There is also a requirement that within the year, the net transfer of quota from any vessel must not exceed 50 percent of the vessel quota. In order to prevent undue consolidation of fishing rights by a few fishing companies, certain upper limits have been set for the holding of quota shares in major fishable stocks by a fishing company or a group of companies closely linked by ownership. The upper limit is 12 percent of the quota share for cod, 20 percent for haddock, saithe and Greenland halibut, 35 percent for redfish, 20 percent for herring and capelin and 20 percent for offshore shrimp. A further clause stipulates that each fishing company, or group of companies, is not permitted to hold more than 12 percent of the value of the combined quota shares for the stocks where fishing is subject to TAC limitations.

A separate small vessel quota system is available for boats of less than 15 gross tonnes. From these vessels fishing can only be carried out with hand lines or longlines. These boats are awarded quotas for all the major demersal species and owners can freely transfer the quota to other owners of boats of less than 15 gross tonnes. However, to prevent consolidation of fishing rights, these quotas cannot be transferred to the common quota system. Currently about 700 boats form part of the small boat system.

3.2.6.1 Fishing year

Fishing for demersal species during the summer months is unfavorable as the quality of fish deteriorates more rapidly than during other times of the year and the workforce in fish processing factories is low as many regular factory workers are on vacation. In an effort to move fishing to other parts of the year the official "fishing year" is no longer equal to the calendar year but runs from September 1st to August 31st.

There are a few exceptions to this rule. The fishing year for Icelandic herring is set to start on September 1st and ends on May 1st, and, for inshore shrimp it runs from October 1st to May 1st. In the capelin fishery, the TAC applies from the 20th of June to the 30th of April.

In addition, the fishing for the Atlanto-Scandian herring stock, of oceanic redfish in the Irminger Sea and of northern shrimp on the Flemish Cap, is also subject to special regulations established by international agreements.

3.2.6.2 Fishing fee

An amendment to the Fisheries Management Act was passed by the Icelandic Parliament in its 2002 spring session. The amendment establishes a levy on the allocation of fishing rights

payable by fishing companies. Since the 1st of September 2004 all vessels in the Icelandic fishing fleet have been charged a levy irrespective of whether they fish within or outside the Icelandic EEZ. The fishing fee is determined each year and is based on the income from catches landed in the twelve-month period from the 1st of May to the 30th of April less major running costs and fishermen's salaries. The Directorate of Fisheries is responsible for determining, levying and collecting the fishing fee.

3.2.6.3 Supporting measures

The Icelandic fisheries management system has many measures supporting specific fisheries. One of these is a measure that permanently closes extensive nursery areas to fishing. In addition, spawning areas of cod are closed for a few weeks in late winter during the spawning period and the Marine Research Institute has the right to order immediate, temporary closure of areas with excess juveniles. Another important measure is the measure that prohibits fishing by larger trawlers closer than 12-mile from the shore in most areas. Also fishing and fishing gears are subject to several selectivity measures, one of which is a minimum mesh size of 135 mm in bottom trawls or equivalent. A sorting grid is mandatory to avoid by-catch of juvenile fish in the shrimp fisheries and devices for excluding juveniles in other trawl-fisheries for demersal fin-fish are also mandatory in certain areas.

The imposition of the "catch rule" for cod is a very important landmark in the precautionary approach to cod stock management. This rule, based on scientific recommendations, was adopted by a government decision and became effective in 1995. It states that the annual TAC for cod must be set at 25 percent of the fishable biomass. This implies that the TAC is automatically set following the annual stock assessment of cod. However, following the recommendations of the Icelandic Marine Research Institute, the government decided in July 2007 that the TAC for cod in the fishing year 2007/08 should be set at 20 percent of the fishable biomass.

There are requirements that cod and saithe of less than 50 cm and redfish shorter than 33 cm, can be kept separate in the catch and landed outside the quota. But fish of this size must not exceed 10 percent of the cod, saithe, haddock and redfish catch; the equivalent numbers for haddock are 41 cm and 25 percent. In compensation as small fish has a rather low value, these small fish do not count fully in the calculation of each vessel's quota.

There are also strict requirements for the keeping of logbooks on-board all fishing vessels and they must be made available for fishery inspectors. The logbooks are also important for scientific assessment purposes.

3.2.6.4 Management by International Agreements

Icelandic fishing of the Atlanto-Scandian herring stock in the northeast Atlantic is controlled by an international agreement amongst Iceland, the Faroe Islands, Norway, the Russian Federation and the European Union. The annual TAC is decided by the Northeast Atlantic Fisheries Commission (NEAFC). The Icelandic share of the TAC is allocated to individual vessels. The same applies to the fishing for blue whiting.

Fishing of oceanic redfish stock in the international area of the Irminger Sea is also controlled by NEAFC. This stock is fished by Iceland, Russia, the Faroe Islands, Greenland and some EU countries. The Icelandic share of the TAC is allocated to individual vessels.

The capelin stock is also trans-boundary by nature but most of it is found within the Icelandic EEZ. It is fished mainly by Iceland, but a proportion of the TAC is fished by other nations in accordance with an agreement between Iceland, Norway and Greenland.

An agreement between Iceland, Norway and Russia has settled a dispute involving Icelandic fishing in the international area of the Barents Sea. According to the agreement fishing for this species within the respective EEZ is agreed, but subject to stock conditions.

The northern shrimp fisheries in the international area of the northwest Atlantic, usually called the Flemish Cap, is managed by the Northwest Atlantic Fisheries Organization (NAFO) and subject to effort restriction. Iceland has objected to this system of management and instead allocated individual vessel quotas which it sees as more effective. Icelandic observers are placed on-board a number of Icelandic fishing vessels to assess fishing activities and check on shrimp size, maturity and by-catch.

3.3 Recreational sub-sector

Atlantic salmon is the most important fish for the recreational sector, accounting about 75 percent of the recreational catch. Nonetheless, the number of fishermen targeting Arctic char and brown trout is increasing, possibly in response to the fact that the Arctic char and brown trout license is cheaper than that for Atlantic salmon. Catches of salmon are reported to be reducing in some rivers because of stock decline resulting from increased urbanization processes and possibly from negative effects of interaction with escapes from salmon aquaculture.

Recreational angling is also important in the tourist sector, attracting many foreign anglers. There has been an increase in "catch and release" salmon angling over the recent years.

It is estimated that the minimum direct and indirect annual revenue from salmon angling amounts to USD 30 million. Each angled salmon is worth USD 500 to the Icelandic economy. This figure includes river-related costs, such as fishing licences, food, lodging and payments for guiding on the rivers. Other costs may increase the value of each salmon up to USD 1 000. These include bait, tackle and angling gear, payments for air travel, and other costs associated with fishing trips. Seasonal variation in catches may also affect the value of salmon. In 2008 about 90 900 salmon were caught, 9 400 in nets. Compared to 2007 the salmon catch by anglers increased by 27 700 fishes in 2008, an increase of 52 percent. Recreational sea angling is growing in Iceland, partly as a part of tourism. ITQ are needed for such fishing.

3.4 Aquaculture sub-sector

3.4.1 Species and production

The national aquaculture production decreased to 4 800 tonnes in 2007 from the level of annual production over 8 300 tonnes in previous years. In 2008 it was just over 5 100 tonnes. The annual production of salmon has decreased sharply from 5 200 tonnes in 2006 to 1 200 tonnes in 2007 and 330 tonnes only in 2008. Production of Arctic char has on the other hand increased from 1 200 tonnes in 2006 to 2 000 tonnes in 2007 and further to 3 200 tonnes in 2008. The production of Atlantic cod has been maintained around 1 500 tonnes since 2006. In 2008, there were about 50 registered fish farms in Iceland. Of those, about 30 were producing juveniles, mostly for salmonid releases. Only five were producing juveniles of other marine species. There were 12 sea cage farms, most of which were producing Atlantic cod (*Gadus morhua*). There were 30 additional land-based farms, mostly involved in salmonid. Eight mussel farms and four research stations remain in operation.

3.4.2 Cod Farming

In Iceland, mainly two methods are used for cod farming. One is based on capturing wild cod for on-growing, the other focuses on the production of cod from hatching to market size. There are mainly two size classes of fish captured for on-growing: juveniles (3-5 g) and 1-2 kg cod. Wild cod (1-2 kg) reach market size (3-4 kg) in 6-12 months. Juveniles (3-5 g) are captured in autumn and after 7-9 months and approximately 100-150 g increase in weight they are transferred to sea cages.

Hatchery production has been carried out at the Mariculture Laboratory of the Marine Research Institute, which is located on the southwest coast of Iceland. During the period 2004-2007, the

hatchery produced 100 000-200 000 cod juveniles per year which were delivered to cod farms in Iceland and on the Shetland Islands. The company IceCod Ltd. has recently started production of cod juveniles and is expecting to increase production next year. Each autumn since 2003, about one million cod juveniles have been collected in an in-shore area in Northwest Iceland and reared in nurseries during the winter months; the following spring 300 000-700 000 juveniles are stocked in sea cages. However, with selective breeding and better culture technology, it is expected that the quality of hatchery produced juveniles will be superior to wild juveniles within a few years.

Today 11 enterprises farm hatchery-produced cod or fatten wild-caught cod. The slaughtered volume of farmed and wild-farmed cod has increased from 10 tonnes in 2 000 to 1 450 tonnes in 2007. Hraðfrystihúsið-Gunnvör and Brim, the two largest producers of farmed cod in Iceland, are vertically integrated seafood companies, controlling the juvenile production, on-growing, harvesting, packaging and marketing of the products.

Today it seems that fattening of wild cod is more economically efficient than using farmed juveniles. For the next few years, therefore, the production of cod will still be based mainly on the on-growing of wild cod. There is going to be slow growth in the production of farmed cod in Iceland and the expected volume is less than 4 000 tonnes in 2010. If cod farming in Iceland becomes profitable, a large increase in production is to be expected after 2010, especially if the breeding program will be able to deliver cod juveniles that grow faster than those captured in the wild.

Most of the farmed cod are filleted for the production of fresh loins. The remainder of the fillet is mainly frozen. The annual export of whole fresh-farmed cod has been 50-200 tonnes for the past four years. The export of farmed cod fillets is not registered in Icelandic export statistics. Thus, no information is available regarding volume and value. The main export market for fresh farmed cod from Iceland is the United Kingdom.

Production from aquaculture, round fish,tonnes

Year	2009*	2008	2007	2006	2005	2004	2003	2002	2001	2000
Salmon	500	283	1 158	6 895	6 094	6 020	3 700	1 471	2 645	3 370
Arctic char	3 200	3 006	2 145	1 426	977	1 336	1 670	1 540	1 320	1 364
Rainbow trout	100	0	10	10	50	142	180	248	105	95
Halibut	50	19	31	141	129	123	95	120	93	30
Turbot	80	41	70	47	115	62	32	9	3	0
Cod	1 200	1 502	1 467	1 412	1 050	595	445	205	70	11
Total	5 130	4 851	4 881	9 931	8 415	8 278	6 122	3 593	4 236	4 870

*Estimated

3.4.3 Aquaculture exports

In 2006 the export of all aquaculture products reached more than 5 000 tonnes (product weight) in volume and about USD 28.6 million in value. Export volume of all species decreased to about 2 000 tonnes (product weight) in 2007. The same year, about 1 200 tonnes of Arctic char products, 600 tonnes of Atlantic salmon and 270 tonnes of other species were exported. In 2008 export value of aquaculture production grew to USD 37.5 million, of which Arctic char exports were worth USD 22.7 million.

The largest markets for Icelandic aquaculture products by volume are the United States (25 percent), the United Kingdom (15 percent) and Denmark (15 percent). One Icelandic firm has been successful in producing halibut juveniles, most of which are exported to Norway. Another Icelandic firm has been specializing in the selective breeding of salmon and in the export of salmon eggs.

4. POST-HARVEST USE

4.1 Fish utilization

The majority of commercially caught fish is exported. Most of it is processed before export, but some is exported as a whole fish on ice in containers, mostly to EU member countries, such as Great Britain and Germany. Means of processing are mainly salting, freezing, drying, fishmeal and fish oil. The bulk is processed on land, but processing of pelagic species at sea is increasing.

4.1.1 Salted fish

Saltfish factories are situated around most of the Icelandic coast. They vary in size from small family enterprises to public companies operating large, specialized factories. There are currently 104 plants holding a saltfish processing licence. They are supplied by fishing vessels ranging from large wetfish trawlers to small boats fishing with hook and line, although large cod from gill netters are most often used for saltfish processing.

The main markets for saltfish products are located in southern Europe and South America. Portugal and Spain are the chief markets for split saltfish, followed by Italy, Greece and France. Spain and Italy are the chief markets for saltfish fillets. Cod and salted saithe are exported to South America and the West Indies where consumption of saltfish is common. Salted herring is exported to Northwestern Europe.

In recent years, salted fish products have constituted 15-20 percent of the value of seafood exports from Iceland. Most of this is salted demersal fish but salted roe from various species and salted herring are also exported. Salting fish for local and export markets has a long history in Iceland and salted fish is still a favorite component in many festive dishes around the world, in long-established markets from Scandinavia to South America. Cod is by far the most important species subjected to saltfish processing. About half of the cod catch in Iceland has traditionally been salted and, one variety, the *bacalao* is especially favored in many southern European countries. Saltfish is likely to remain in demand in the traditional product forms but it has also gained acceptance in innovative convenience products.

4.1.2 Dried fish

Stockfish is the principal form of dried fish. Most stockfish is unsalted cod, dried by sun and wind on wooden racks. Icelandic companies started to dry fish indoors, using special drying devices, late in the 1980s. However, indoor production of dried whole fish is complicated and substantial research has been done to improve the production. Dried fish products constitute about 2 percent of the value of seafood exports from Iceland. Markets are found mainly in Nigeria.

4.1.3 Frozen fish

Quick frozen seafood products have, for a number of years, constituted about 50 percent of the value of seafood exports from Iceland. Quick freezing is still unrivalled as a method for preserving the quality of raw fish and as there are continuous improvements in processing technology the Icelandic fish freezing industry is likely to maintain a strong position.

Land-based freezing plants are situated around most of the Icelandic coast, but part of the catch is also frozen on board the fishing vessels. Both sectors have their advantages for the market. Land-based factories are versatile and able to produce a wide variety of modern products ready for consumption, whereas the freezer trawlers can claim the ultimate in product freshness.

However, today's freezer trawlers are large, modern and well equipped for highly automated processing and their success is evident by the large share of the trawler catch that is processed on board. Modern-day freezing on board fishing vessels started in the early 1980s. In 1986 less than 5 000 tonnes of demersal fish were processed this way but by 2007 about

142 000 tonnes of demersal fish were processed and frozen on. This was about 30 percent of the total demersal catch. Similarly, in 2007, 46 percent of the flatfish catch (10 000 tonnes) was frozen at sea as were 129 000 tonnes of pelagic fish (14%), chiefly herring. There are currently 61 freezer vessels holding processing permits in the Icelandic fleet. They are either specialized for demersal fisheries or they are large, multipurpose vessels, geared for both the pelagic and the demersal fisheries.

Most land-based factories are also modern and technically well equipped. In recent years, there have been many mergers of companies operating land-based freezing plants and this has led to many older plants being closed. There are currently about 120 freezing plants holding a processing permit. The plants are supplied by fishing vessels ranging from large wetfish trawlers to small boats equipped with hand lines.

Markets for Icelandic frozen fish products are found worldwide: in North America, Europe and the Far East, especially Japan. Whole-frozen and headed and gutted products are especially popular in Japan and Taiwan, while the markets for fillets are found in Europe and North America. The United Kingdom absorbs the largest share of Icelandic shrimp, while nephrops products are sold mostly in southern Europe.

4.1.4 Fresh fish

Fresh seafood, in the form of fresh fillets and whole fish on ice, is occupying an increasing proportion of seafood exports from Iceland.

Modern transport and logistics make it possible to export Icelandic fresh whole fish by boat and fresh fillets by air to all the major fresh fish markets. The main importers are the retail sector and food service operators in Europe and North America who are provided a steady supply of good quality fresh fish. In recent years the export of fresh fillets by air has increased markedly both in volume and value terms, and is now more important than the export of whole, fresh fish. The main species exported fresh are cod, haddock, redfish, catfish, saithe and plaice.

Whole fish on ice are exported by sea and markets are almost exclusively found in Europe, mainly due to the relatively short sea voyage. Fresh cod fillets on ice are exported to the United Kingdom and France, fresh haddock to the United States (by air) and to the United Kingdom, and redfish to Germany and France.

4.1.5 Oil and meal production

Fishmeal and fish oil constituted 13 percent of the value of seafood exports from Iceland in 2008. Fishmeal is primarily used as a protein source in animal feeds and fish oil is mainly used as an energy source in fish feeds. There is a growing international market for fishmeal and oil mainly due to the expansion of aquaculture worldwide but new emerging markets, such as the pet food industry, also absorb growing quantities. Markets for Icelandic fishmeal are found primarily in the United Kingdom, Denmark, Norway and Ireland, but fishmeal is also exported to North America. Markets for fish oil are primarily in Norway and other European countries.

Capelin, herring and blue whiting are the most important species used for fishmeal and oil processing and they provide about 95 percent of the raw material for meal and oil products. However, trimmings from the food fish processing sector are increasingly supplied as raw material for fishmeal and oil production. This is beneficial as it reduces the risk that trimmings be dumped at a considerable cost to the environment. There are more than ten fishmeal and oil factories in Iceland, many of them modern and highly automated. All the factories are located on the coast. Catcher vessels use purse-seines and/or pelagic trawls, the mesh size of which is regulated. Vessels are increasingly equipped with refrigerated storage holds to keep fish as fresh as possible during transport to processing factories.

5. FISHERY SECTOR PERFORMANCE

5.1 Net profit of fishing and fish processing 2001-2007

Percent of revenue	2001	2002	2003	2004	2005	2006	2007
All fishing and processing (Total)	18.1	10.1	10.0	5.9	8.4	16.9	10.3
Fishing and processing of demersal species	19.6	11.5	10.3	7.5	9.7	18.5	12.8
-Demersal fishing	13.2	12.6	10.8	6.5	10.0	16.5	12.6
Boats	12.3	11.3	10.9	7.0	6.1	15.6	13.6
Trawlers	2.7	11.7	11.0	3.0	8.7	19.1	17.3
Freezing vessels	17.4	14.4	10.7	7.2	14.6	16.5	8.7
-Processing of demersal species	16.5	3.2	3.6	4.6	3.5	9.7	3.3
Freezing	17.9	6.6	5.1	11.0	4.8	7.1	3.1
Salting	14.9	-0.9	1.8	-3.9	0.7	14.3	3.6
Fishing and processing of shrimp	8.2	1.6	10.8	0.8	-	-	-
Fishing and processing of capelin	17.4	9.5	7.7	0.8	1.1	8.9	9.4

The statistical office of Iceland "Statistics Iceland" has analyzed the income statements of fishing and fish processing companies for 2007 as well as their balance sheets. Information from these statements along with data on exports and catches was used to measure the overall profitability in the industry. The results (see table above) show *inter alia* that the combined net profit of all fishing and fish processing in Iceland declined from 16.9 percent of revenue in 2006 to 10.3 percent in 2007. The aggregated balance sheet of fishing and fish processing have total assets of USD 3.3 billion, the total liabilities are USD 2.5 billion and total equity is USD 0.8 billion.

The Icelandic fishing industry has been profitable since the early 1990s. On average the profit of the industry has been between 5 percent and 6 percent of total revenues. Only in 1997 and 1999 did the industry lose money, 1.4 percent in 1997 and 1.3 percent in 1999. However, the profitability of the industry has been improving in recent years and every year since 2001 the profitability of the fishing industry as a whole has been above 5 percent of revenues (see figure above), which contrasts with the period 1993 and 2000 when the profitability of the industry was never above 5 percent. The two best years on record were 2001, when the profit of the industry was 18.1 percent of revenues, and 2006, when the profit was 16.9 percent. The increased profitability of the industry is mainly due to increased productivity and higher international prices.

The fluctuations of the exchange rate for the Icelandic currency (the króna, ISK) explain some of the variation in profitability. Since 2000 the value (measured in US dollars) of the ISK was the lowest in 2001, which was the best year ever for the Icelandic fishing industry. On the other hand, 2005, when the ISK was strongest, was the second worst year for the industry since 2001.

Prices of demersal fish, shrimp, fishmeal and oil increased from 1993 to 2007, but a downturn started in 2008. For the most important category, demersal fish, prices have been increasing almost continuously since 1993, being 40 percent higher in 2006 than 1993. Freezer trawlers have generally been the most profitable dimension of the fishing industry. On average, the profit earned by freezer trawlers was 8.9 percent of revenues between 1993 and 2006. The best year for the freezer trawlers was 2001 when their profit was 16.5 percent, and the worst year was 1997 when they lost 3.4 percent of revenues. Shrimp processing and fishing for shrimps, on the other hand, have as a rule been the least profitable sectors of the Icelandic fishing industry, with average profits amounting to only 3.3 percent of revenues. The main

reasons for the low profitability of this segment of the fishing industry are the sharply decreasing catch rates for shrimp together with falling prices. Consequently, the industry has all but disappeared.

The average profit of the pelagic sector has been 5.8 percent of revenues during the period observed. What is special about the profit of this segment of the Icelandic fishing industry is that its profit is by far more variable than that of other branches. For example, the standard deviation of the profit of the pelagic sector is almost double that observed for the freezer trawlers. The reason for this is that catches, especially of capelin, the most important species, are highly variable. Furthermore, the prices of fishmeal and oil fluctuate much more than prices of most other fish products. The best year for the Icelandic pelagic fish industry was 1996, with a profit of 21.4 percent of revenues; the worst year was 1999 when the industry lost the equivalent of 20.1 percent of revenues.

5.2 Economic role of fisheries in the national economy

Historically, agriculture and fisheries have been the mainstays of the Icelandic economy; sheep farming and cod fisheries as the fundamentals of these two sectors. The importance of fisheries increased considerably during the 20th century, which enabled the nation to develop from a poor agricultural country into a prosperous modern society. However, the contribution of fisheries to the economy was and is vulnerable. It fluctuates as international fish prices rise and fall and is also subject to the changing conditions of fish stocks exploited by the Icelandic fishing industry.

Around the turn of the 21st century, the importance of the fishing industry declined considerably, not because of a direct fall in the fisheries themselves, but rather as the result of a rapid growth in the service and production sectors, such as financial services, software design and aluminum manufacturing. Diversification in the Icelandic economy increased, as in other industrialized countries, with further development of the service sectors. Nevertheless, the export of fish products continues to have a considerable impact on the nation's foreign currency earnings. The following numbers reflect this importance. In 2007 export revenue from fish and fish products were equal to 42 percent of merchandise exports, roughly 28 percent of total exports and 7 percent of GDP.

5.3 Employment

In 2007, the total catch in Icelandic waters was close to 1.3 million tonnes of fish which, once processed, supplied exports worth ISK 128 billion or USD 2 billion. In the same year, the nation's population numbered 313 000 and its workforce 181 500. The fishing industry employs around 4.1 percent of the total workforce. Although perhaps not apparent from the aforementioned numbers, the fishing industry is fundamental for the whole economy and in particular for maintaining economic growth and well-being outside Reykjavik. Fisheries and fish processing companies provide the most important source of livelihood in coastal communities, where employment opportunities are limited.

Profitability and efficiency within the fishing sector have increased substantially, mostly because of improved technology, both in processing and harvesting. The use of fully automated processing, employing the latest computer technology, is widespread in the industry. Improvements and innovations in transportation and logistics, like the use of temperature-controlled containers, better storage boxes and readily available refrigerated warehouses, have also increased efficiency. The availability of air cargo capacity also has increased significantly, making possible the huge rise in exports of chilled fish products.

Several auxiliary companies have developed as an offspring of the fishing industry, providing support services and products. Some of those supportive businesses have successfully exported their innovations and expertise globally, e.g. in fishing technology, manufacturing of fish processing machinery and the marketing of seafood products.

5.4 Demand

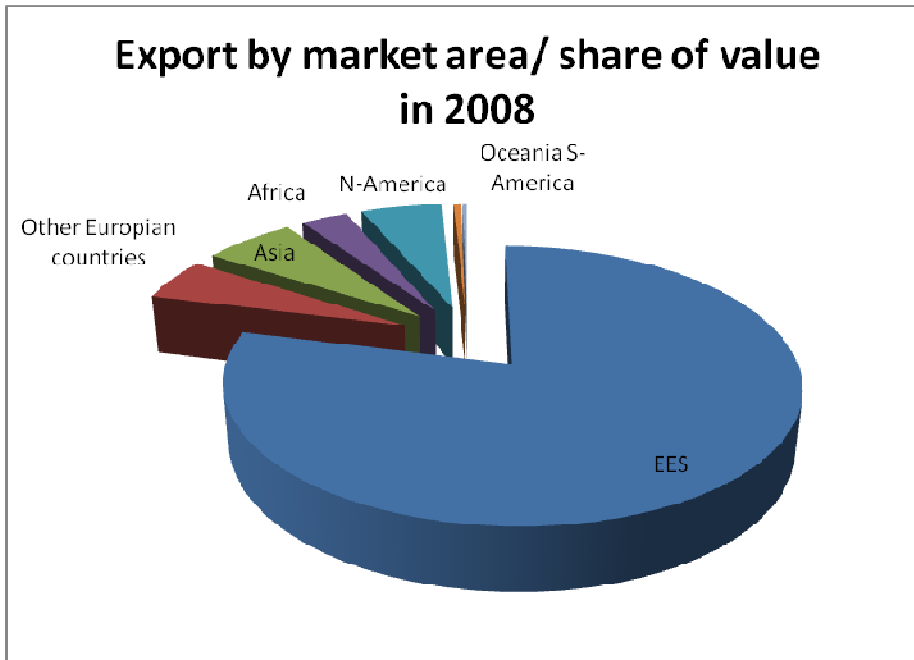
The majority of Iceland's fish production is exported. According to a recent survey by the Public Health Institute of Iceland, Icelanders consume 44 to 47 kilograms of fish per person a year (in product weight). The rate of consumption has been decreasing despite good availability, quality and an increased awareness of the health benefits of eating fish. More than half of fish consumption is from demersal species; salmon, trout, shells and shellfish come next.

5.5 Trade

Exports of fish and fishery products by product category, tonnes (product weight) per year

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Frozen	193 080	211 988	250 430	260 292	313 815	330 028	317 096	285 631	289 012
Salted	63 381	61 408	57 575	52 922	54 917	49 732	48 848	47 662	38 565
Fresh	110 648	117 432	95 533	105 285	96 220	89 993	87 275	77 959	109 477
Dried	11 150	11 767	13 862	13 239	15 399	15 935	14 748	13 312	12 752
Meal/fish oil	331 813	359 709	367 757	355 048	321 147	245 694	166 600	184 281	202 058
Other	18 338	19 327	21 681	22 173	26 040	24 133	26 631	10 690	10 000
Total	728 410	781 631	806 838	808 959	827 538	755 515	661 198	619 535	651 864

In 2008, exports of fish and fishery products amounted to 651 864 tonnes (product weight) and the total value amounted to USD 2.0 billion. Frozen products generated about half of the value of exports; the highest export revenues were from uncured salted cod. The European Economic Area is the most important market area for Icelandic marine products and in 2008 the export value to the EU amounted to ISK 135 billion or 79 percent of the total value of Icelandic fish exports. Of these exports, products from demersal fish amounted to 252 000 tonnes (product weight) of which cod products were one third. The export of fishmeal and oil totaled 202 058 tonnes, valued USD 257 million or 13 percent of total fish export value.



5.6 Whaling

Iceland traditionally uses whales, considered a marine resource subject to sustainable use. Accordingly, the Icelandic government decided to resume commercial whaling in 2008. A total quota for the year was calculated on the advice of the Icelandic Marine Research Institute. In 2008, the quota for minke whales was 40 animals. Thirty-seven were caught. The advice for 2009 was to establish a quota of 150 fin whales and 200 minke whales. A research plan on common minke whales was implemented during the period 2003 to 2007 involving the capture of a total of 200 animals in order to gain a better understanding of the role of common minke whales in the ecosystem. The material collected from these animals has since been studied by scientists in order to increase the general knowledge about minke whales, including the role of common minke whales in the marine food system and how they prey on other species in their habitat. Seven fin whales were caught in 2006, none in 2007 and 2008.

The abundance of both common minke whales and fin whales has been confirmed by the Scientific Committees of the International Whaling Commission (IWC) and the North-Atlantic Marine Mammal Commission (NAMMCO).

5.7 Food security

The Directorate of Fisheries provides supervision on board fishing vessels and in ports of landing, which involves inspection of the composition of catches, fishing equipment and handling methods. The Directorate issues licences to processing plants and supervises their production. Processors have to meet specific requirements concerning hygiene, equipment and quality control. Approved inspection bodies are responsible for inspection of hygiene, facilities and in-plant monitoring of production, both in processing establishments on land and on board vessels. Formal accreditation of inspection bodies is required.

6. FISHERY SECTOR DEVELOPMENT

6.1 Constraints and opportunities

The growth of the Icelandic fishing and fish processing industry is limited mainly by the sustainable yield of the natural resources. The management aims at building up stocks of the fish species already utilized and encourage fishing of underutilized species. There lie the opportunities of the future. Further more there are opportunities in increased production for human consumption of species such as capelin, blue whiting, herring and mackerel. Increased processing of value added products is also a possibility

6.2 Government and private sector policies and development strategies

The health of the ocean and the sustainable utilization of its living resources provides the main basis for Iceland's economic welfare and the government considers ocean issues to be central to its activities for the foreseeable future. Thus, the Icelandic policy on ocean issues is intended to promote the future health, biodiversity and sustainability of the ocean surrounding Iceland,, In practice this means that in Iceland fisheries management aims to achieve sustainable utilization of the marine ecosystem as a whole.

The Icelandic ocean policy is based on three pillars. Firstly, on the United Nations Convention on the Law of the Sea, which provides a legal framework for ocean issues and a basis for the management, conservation and utilization of the ocean area both within and beyond of Icelandic national jurisdiction. Secondly, on the principle of sustainable development, the basis of which was established at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. And thirdly, on the principle that responsibility for the conservation and utilization of marine ecosystems is best placed in the hands of those States directly affected by the decisions taken and have the greatest interests at stake.

All the bigger private companies engaged in fishing, fish processing and export of fish and fisheries products have their own policies built on sustainability and wholesomeness of their

products. Traceability and information on fisheries management is a very important part of their policies. Responsible fishing, and fish processing, also implies full utilization of the catch, including utilization of by-catch and by-products.

6.3 Research

The Marine Research Institute (MRI) is the centre of scientific research for marine resources. It has a staff of about 150, including 100 scientists and research assistants and it runs two research vessels.

The Marine Research Institute:

- Carries out research on the marine environment around Iceland and its living resources.
- Advises the government on catch levels and conservation measures, and,
- Informs the government, the fisheries sector and the public about the ocean and its living resources.

The research gives emphasis to:

- Marine climate and environmental monitoring
- Plankton production
- Reproduction and recruitment
- Fish stock assessment
- Multi species interactions
- Role of marine mammals in the ecosystem
- Fishing gear and fisheries impact on the ecosystem
- Mariculture
- Potential species to exploit
- Ecosystem-based fisheries management

Research and advice on exploited stocks.

The Marine Research Institute (MRI) assesses the size and conditions of exploited stocks to provide the basis needed to establish TAC (Total Allowable Catch) recommendations. Pelagic stocks are assessed using acoustic methods in surveys conducted during both summer and winter, while demersal species are assessed in surveys conducted each spring and autumn. The advice provided by MRI relies both on the results of these surveys and on extensive data obtained from fishing boat log-books and landings reports.

Environmental research.

The largest part of the environmental work is concentrated on standardized monitoring of long term changes of temperature, salinity, nutrients, phyto- and zooplankton, fish larvae and juveniles. Work is also conducted on benthic ecology including seafloor and marine habitat mapping. MRI technology is also used in work-related environmental impact assessments, conducted in connection with potential mariculture operations and for different kinds of coastal-based construction.

Matis is an official food research institute focusing on innovation in food and biotechnology and various services in the food industry in Iceland and abroad. Research on behalf of the fish processing industry is a very important part of its work. Matis' vision is to engage in applied research with the goal of increasing the value of food processing and food production as well as to ensure the safety and quality of food and feed products.

Matis employs many of Iceland's most competent scientists in the field of food technology, food research and biotechnology; food scientists, chemists, biologists, engineers and fisheries scientists. Furthermore many M.Sc. and Ph.D. students are doing their research at Matis and working on their theses.

Matis assignments are focused on:

- Food safety and Environment

- Value Chain and Processing
- Consumers and Products
- Biotechnology and Biomolecules
- Genetics and Aquaculture Analysis and Consulting

Matis assignments include:

- Product development
- Aquaculture
- Processing technology
- Traceability
- Supply management
- Biotechnology
- Genetics

Matis was established by a legislation enacted in 2006 and involved the merger of three public food research institutes.

Matis also operates Prokaria, a private biotechnology company and Iceprotein, a protein production company.

6.4 Education

The United Nations University Fisheries Training Program is operated under the supervision of Marine Research Institute. MRI also co-operates with many foreign institutions and international organizations and has through the years been involved in many international projects in the fields of marine sciences. The universities in Iceland provide various education for directors of fisheries companies, the private Icelandic School of Multi Technology takes care of education of fishing captains and machinists. Courses in net making are available in some schools.

6.5 Foreign aid

Foreign aid in fisheries and sustainable development is regarded by the Ministry of Fisheries and Agriculture as a pressing and important issue. Support for the principles of sustainable development needs to be gathered in development cooperation fora through active participation in the discussions on the means and ends of development co-operation. Financial assistance for programmes in fisheries and environmental protection, under the auspices of multilateral development institutions, needs to be secured. Iceland has an extensive and varied expertise in fisheries, resource management and marine biodiversity that can be utilized to the benefits of developing nations. The Icelandic International Development Agency – ICEIDA has worked extensively on fisheries related projects in several countries. Several students from developing countries have each year studied with The United Nations University Fisheries Training Program – UNUFTP which is based in Iceland and led by the Marine Research Institute in a formal cooperation with the Icelandic Fisheries Laboratories, University of Iceland and the University of Akureyri that has strengthened the links between the developing countries and Iceland.

7. FISHERY SECTOR INSTITUTIONS

The Icelandic Parliament, Althingi, establishes, by legislation, the fundamental rules upon which Icelandic administration is to base fisheries management. The Ministry of Fisheries and Agriculture is responsible for the overall management of the fisheries, including the issuing of regulations and long term planning for the sector. Eight specialized organizations report to the The Ministry of Fisheries and Agriculture. They are:

- The Directorate of Fisheries
- The Marine Research Institute
- The Agricultural Economics Institute
- The Icelandic Food and Veterinary Authority (MAST)
- The Icelandic Food Research (Matis)

- The Central Bureau of Applied Research
- The Institute of Freshwater Fisheries
- The Freshfish Price Directorate

The institutes that are primarily concerned with Icelandic fisheries and the marine environment are the four first on this list. In addition, the Coast Guard (under the Ministry of Justice and Ecclesiastical Affairs), the Icelandic Maritime Administration (under the Ministry of Communications), the Environmental Agency of Iceland (under the Ministry for the Environment) and Statistics Iceland (under the Prime Minister's Office) are of major relevance to Icelandic fisheries and for the sustainable use and conservation of the Icelandic marine ecosystem.

8. GENERAL LEGAL FRAMEWORK

The fisheries management act is general legal framework for fisheries in Icelandic waters. It includes the ITQ system and numerous other restrictions. The first article states that the exploitable marine stocks of the Icelandic fishing banks are the common property of the Icelandic nation. Commercial fishing permits may only be granted to fishing vessels holding certificates of seaworthiness and registered in the Registry of Vessels of the Icelandic Maritime Administration or the special registry of the Administration for boats less than six meters in length. Their owners and operators must fulfil the requirements to pursue fishing in Iceland's exclusive fishing zone, as provided for in the Act on Investment by Foreign Parties in Industrial Operations and the Act on Fishing and Processing by Foreign Vessels in Iceland's Exclusive Fishing Zone. Ownership of foreigners in fishing and fish processing companies must not exceed 25 percent. Discard of fish is prohibited.

REFERENCES

Statistics Iceland, homepage.

The Ministry of Fisheries and Agriculture, general information on the website fisheries.is, booklets at the same website, Close to the Sea, Icelandic Fisheries in Figures 2008, Iceland responsible Fisheries.

The Marine Research Institute, information from the website hafro.is.

The Directorate of Fisheries, information from the website fiskistofa.is, Aflahefti Fiskistofu 2008 and Starfsskýrsla Fiskistofu, booklets in Icelandic.

The Icelandic Food Research (MATIS), information from the website matis.is

The Institute of Freshwater Fisheries.

The Maritime Administration, Information from the website sigling.is

The Association of Icelandic Fishing Vessel Owners, various booklets and statistics available at the website liu.is

The Icelandic Aquaculture Association, statistic and information at the website lfh.is

The Association of Fish producers, homepage sf.is

The Union of Icelandic Fish markets, website rsf.is

sjavarutvegur.is a website on Fisheries in Iceland

A good deal of this information is available in English on the mentioned websites.