FAO Fisheries and Aquaculture Circular No. 1030/4 SEC/1030/4 (En)
ISSN 2070-6065

FISHERIES AND AQUACULTURE IN THE REPUBLIC OF AZERBAIJAN: A REVIEW

Copies of FAO publications can be requested from:
Sales and Marketing Group
Office of Knowledge Exchange, Research and Extension
Food and Agriculture Organization
of the United Nations
E-mail: publications-sales@fao.org
Fax: +39 06 57053360
Web site: www.fao.org/icatalog/inter-e.htm

Cover photograph: Zaur Salmonov

FAO Fisheries and Aquaculture Circular No. 1030/4 **SEC/1030/4 (En)**

FISHERIES AND AQUACULTURE IN THE REPUBLIC OF AZERBAIJAN: A REVIEW

by

Zaur Salmonov
Director
Khilly Sturgeon Hatchery
Ministry of Ecology and Natural Resources
Neftchala, Azerbaijan

Agasadiq Qasimov
Head of Artificial Reproduction section
Ministry of Ecology and Natural Resources
Neftchala, Azerbaijan

Haydar Fersoy
Fisheries Management Expert
FAO Subregional Office for Central Asia
Ankara, Turkey

and

Raymon van Anrooy
Fishery and Aquaculture Officer
FAO Subregional Office for the Caribbean
Ankara, Turkey

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Ankara, 2013

ISBN 978-92-5-107402-2

Preparation of this document

This circular contains a historical overview and a review of the status of fisheries and aquaculture in Azerbaijan. It is the fifth document in an FAO Fisheries and Aquaculture Circular series on the fisheries sector in Central Asia. Other publications in the series cover (in order of publication) Kyrgyzstan, Uzbekistan, Kazakhstan and Tajikistan.

The circular was prepared between 2011 and 2012 by FAO, with local consultancy services, to increase general understanding and awareness of the status of the fisheries and aquaculture sector in Azerbaijan. Although changes in the sector occur rapidly, it is intended to provide an accurate picture of the situation in 2010.

However, the preparation of the document was hampered by the limited availability of official statistical data and information. Over many years, little information on fisheries and aquaculture in Azerbaijan was collected. This means that there are large gaps in historical information on basic sector indicators, such as production volume and value of capture fisheries and aquaculture, employment, per capita fish consumption, fleet sizes, and imports and exports of fish. Aggregated information that is available is generally of limited use for policy-makers. Often, the quality of the aggregated data is bad and the information does not reflect the current situation. As in other Central Asian countries, major improvements in data and information collection and analysis are required if the data collected are to be used by fisheries policy-makers and managers.

With this document, FAO aims to increase awareness among small-scale fishers and aquaculturists in Azerbaijan, and in the Central Asian region in general, on the status, regulations, policies, plans, problems and opportunities of the sector. This information can help them to develop their businesses. Other aims of the circular are to inform decision-makers at national government levels, non-governmental organizations, fishers' organizations, as well as international agencies, about the role of fisheries and aquaculture in terms of their current contribution to employment, food security and poverty alleviation, and about the opportunities for increasing the contribution of the sector to sustainable growth and development in the country.

Salmanov, Z., Qasimov, A., Fersoy, H. & van Anrooy, R. 2013.
Fisheries and aquaculture in the Republic of Azerbaijan: a review.
FAO Fisheries and Aquaculture Circular No. 1030/4. Ankara, FAO. 42 pp.

Abstract

Following the general tendency of the successor States to the Union of the Soviet Socialist Republics, fishing and the production of fish and fish products in Azerbaijan declined considerably in the early 1990s, with annual fish production falling from more than 20 000 tonnes in the early twentieth century to just 1 570 tonnes by the end of the century. Fish imports into Azerbaijan are relatively stable, while sturgeon and black caviar make up the majority of fish exports. Sudden increases in export volumes can be explained by the different catch quotas for sturgeon in years concerned. Compared with the global average consumption of fish and fish products, consumption of fish-derived products in Azerbaijan is low as a result of both high product prices determined by insufficient domestic production and the immaturity of the distribution network.

Some structural transformations in the sector occurred in 2001, and Azerbaijan has signed a number of international conventions, three of which are related to water resources. Moreover, Azerbaijan is a member of the Commission on Aquatic Bioresources of the Caspian Sea.

CONTENTS

Tables

Figures

Plates

Acknowledgements

The authors would like to thank Mr Huseyn Baghirov, Minister for Ecology and Natural Resources, for his support in implementing this research. They would like to express their special gratitude to Dr Rauf Hajiyev, Deputy Minister for Ecology and Natural Resources, who provided invaluable assistance in consolidating the forces of his department throughout the work on the paper.

The authors would like to make a special mention of the assistance provided by all the staff at the Department for Reproduction and Protection of Aquatic Bioresources, especially Mr Gahraman Zahidli and Mr Masud Maharramov.

Thanks are also extended to Ms Maria Giannini and Mr Michiel Fransen for their comments, suggestions and contributions that helped to improve the report.

The success in the realization of this project depended in many respects on the coordinated work of various staff at the FAO Subregional Office for Central Asia.

Abbreviations and acronyms

AzerFRI Azerbaijan Fisheries Research Institute

CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora

Code FAO Code of Conduct for Responsible Fisheries

DRPAB Department for Reproduction and Protection of Aquatic Bioresources

GEF Global Environment Facility

IUU Illegal, unreported and unregulated (fishing)

MENR Ministry of Ecology and Natural Resources

SSPF State Social Protection Fund of Azerbaijan Republic

SWOT Strengths, weaknesses, opportunities and threats (analysis)

1 Introduction

The Republic of Azerbaijan, which greatly exceeds the other republics of the Southern Caucasus in terms of size and population, has the lowest reserves of freshwater compared with the other countries in the region. One of the undoubted advantages of Azerbaijan is the length of its sea coastline – about 840 km.

The rich culture in fisheries and fish consumption in Azerbaijan is reflected in its large fishing fleet (which is geared towards sprat fishing), its being the first country to develop biological technology for the artificial culture of sturgeon, and the presence of the Kura River (which is the largest river in the Southern Caucasus and bisects the country, resulting in considerable resources of anadromous and semi-anadromous fish in the regional waters). After the collapse of the Union of the Soviet Socialist Republics, and in the early years of independence, the fishing industry lost efficiency and there was a major decline in commercially valuable fish species both in the Caspian Sea and in inland waters. The total volume of the fisheries shrank to less than one-tenth of their size between 1990 and 2005, and a similar reduction was recorded in the same period for aquaculture production. The poor economic situation throughout the region and the impossibility of meeting the traditionally large demand for fish caused prices to rise and, as a result, reduced fish consumption to the critically low figure of 3.4 kg per capita.

A growth in investor interest in aquaculture has been observed in recent years. This has been due in part to the increased attention the State has given to this sector as a food-producing sector, especially because it is also part of the State Programme to Ensure Food Security. In addition, the high consumer prices for fish and the growth in the population's purchasing power against a backdrop of high growth in the economy have encouraged greater interest in fisheries. However, the development of aquaculture is rather chaotic because it lacks a legal basis for its purposeful development.

The expected extension of the credentials of the state regulating authorities in fish breeding and fishery, the imposition of a moratorium on the catching of all sturgeon species in the Caspian Sea, and the incipient development of a draft "Law on Aquaculture" will provide great impetus to the development of the sector. According to experts, the expected measures, together with efficient collaboration with international experience in the framework of various programmes and FAO projects and other international organizations operating in this sphere, will make it possible to expand the output of aquaculture production in the coming few years. It is expected that such an expansion will not only stem from an increase in production volume caused by adopting more piscicultural practices, but also reflect the achieving of higher productivity from existing units and greater use of technology.

2 Historical background

GENERAL BACKGROUND

Azerbaijan is situated between 40º30'N and 47º30'E and has a total surface area of 86 600 km^2, of which 1.6 percent is water. The country spans 500 km from north to south and 400 km from east to west. About 40 percent of Azerbaijan is covered with mountain ranges, from the Greater and Lesser Caucasus ranges to the Talysh Mountains. Its highest point is the summit of Mount Bazarduzu (4 466 m) and its lowest is the bed of the Caspian Sea (–28 m). Although Azerbaijan has thousands of rivers (8 359), only 24 of them are longer than 100 km, with the Kura River being the longest (1 515 km). All these rivers discharge into the Caspian Sea. The largest lake in Azerbaijan is Lake Sarysu, which has a surface area of 67 km^2. The lake is mainly used for recreational use, but it is also used for fishing. In addition to the rivers and natural lakes, Azerbaijan has many reservoirs, of which the Mingachevir and Shamkir reservoirs on the Kura River are the largest. The Araz Dam on the Araz River forms the third-largest reservoir.

Azerbaijan is bordered to the east by the Caspian Sea, which has a shoreline of 713 km, to the west by Armenia, and to the north by Georgia and the Russian Federation. The entire southern border is shared with the Islamic Republic of Iran (see map in Figure 1). Azerbaijan is divided into 59 rayons, 11 city districts, and has one autonomous republic (the Nakhchivan Autonomous Republic).

FIGURE 1
Map of Azerbaijan

FISHERIES AND AQUACULTURE – UP TO INDEPENDENCE

Before Azerbaijan's independence in 1991, the fisheries sector consisted of capture fisheries and aquaculture hatcheries, the latter serving as a restocking resource. Despite the presence of hatcheries, commercial aquaculture practices were only developed from the 1980s onwards.

The majority of fishing activities took place in the Caspian Sea, with the main product being sturgeon (Acipenseridae) caviar. Initially, capture fisheries seemed to have little impact on sturgeon stocks, but research from trawl surveys has shown otherwise. Between 1935 and 1940, sturgeon catches started to decline rapidly, and they have been in decline ever since. There are several reasons for this decline: (i) overfishing, and illegal, unreported and unregulated (IUU) fishing; (ii) lack of fishery management; (iii) deteriorating environmental conditions; and (iv) the construction of several dams, which have prevented fish from migrating upstream to their natural spawning grounds. Annual sturgeon catches declined from 5 000 tonnes at the beginning of the twentieth century to less than 108 tonnes in 1991. Alongside sturgeon, several cyprinid (Cyprinidae) and salmon (Salmonidae) species were considered as major target species for Azerbaijani fisheries in the Caspian Sea. These stocks also declined following the pattern of sturgeon decline and for the same reasons. As a result, the total haul of the three species combined declined over 90 years from a peak of 33 000 tonnes to a marginal catch of 1 570 tonnes, of which cyprinid species represent the largest share (Table 1).

Fisheries in inland waters were mainly concentrated in the larger rivers (the Araz and Kura Rivers) and reservoirs (the Mingachevir and Shamkir reservoirs, which were designed for electricity generation). The valuable fish species for these inland fisheries were European carp (*Cyprinus carpio*), shemaya (*Chalcalburnus chalcoides*), eastern bream (*Abramis brama*) and pike-perch (*Sander lucioperca*).

To increase catches, several restocking programmes for the Caspian Sea and inland waters were developed, but despite the release of millions of juvenile sturgeon, salmon and cyprinids from the 12 hatcheries (Table 2), catches still declined. From the late 1980s, aquaculture has been practised in Azerbaijan to increase fish production. Before independence, three commercial land-based fish farms were operational in the country, as were two lake-based commercial farms. The main fish species bred on these farms were carp (Cyprinidae), European catfish (*Silurus glanis*) and bream (*Abramis brama*).

TABLE 1
Trend in different fish species caught in Azerbaijan, 1901–1990

Year	Acipenseridae	Salmonidae	Cyprinidae	Total
	(tonnes)			
1901–1905	5 680	0.15	14 220	20 050
1906–1910	3 330	0.19	15 280	18 800
1911–1915	5 430	0.18	17 740	23 350
1916–1920	1 860	0.50	7 100	9 460
1921–1925	3 300	0.26	11 020	14 580
1926–1930	4 070	0.27	13 320	17 660
1931–1935	4 220	0.26	28 500	32 980
1936–1940	4 070	0.20	14 740	19 010
1941–1945	1 640	0.10	7 700	9 440
1946–1950	2 600	0.15	7 530	10 280
1951–1955	2 300	0.13	7 700	10 130
1956–1960	1 700	0.01	6 130	7 840
1961–1965	0.70	0.01	4 570	5 280
1966–1970	0.27	0.001	2 740	3 010
1971–1975	0.26	0.001	1 640	1 910
1976–1980	0.41	0.01	0.64	1 060
1981–1985	0.25	0.09	1 460	1 800
1986–1990	0.17	0.05	1 350	1 570

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

TABLE 2
Number of hatchery-produced fingerlings in Azerbaijan, 1960–1990

	1960	1965	1970	1975	1980	1985	1990
	(millions)						
Acipenseridae	4.1	11.1	13.4	12.9	14.8	12.9	17.5
Salmonidae	0.3	0.2	0.2	0.4	0.5	0.7	0.1
Cyprinidae	304.4	262.4	688.8	738.8	712.3	679.3	416.1
Total	308.8	273.7	702.4	752.1	727.6	692.9	433.7

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

As mentioned above, aquaculture was not practised widely in Azerbaijan until the end of the twentieth century. This was because of the extensive reserves of the Caspian Sea. Aquaculture production became more and more important when the depletion of the natural reserves of bioresources in both the Caspian Sea and inland waters occurred. Existing farms suffered from a lack of modernization and mainly produced fish in extensive systems. The Oryad Fish Farm, according to its production capacity and occupied land area, was the largest among them, with a pond surface area of 680 ha and a maximum production capacity of 1 380 tonnes. However, even in its best years of production, this enterprise was unable to produce more than 700 tonnes of fish per year. The second-largest enterprise by production capacity, which used the same production method, was the Neftchala Fish Farm, which had a pond surface area of 600 ha and a maximum production capacity of 900 tonnes/year. During its operation, this enterprise produced no more than 500 tonnes/year and an average of 400 tonnes/year. In the first years after independence, an attempt was made to organize fish farms in the Nakhchivan Autonomous Republic. In 1992, the Sharur Fish Farm, which also used extensive pond production methods, was designed and built. Its production capacity and pond surface area were 300 tonnes/year and 15 ha, respectively. This farm remained in operation for several years, but its maximum registered production was just 100 tonnes/year.

Before Azerbaijan's independence, pond culture was the preferred production method used in the Republic. Ponds with a surface area of 150 ha and capacity of 100 tonnes/year were built at Lake Hajikabul. This area was used as a hatchery to produce larvae and fingerlings to restock the lake.

INSTITUTIONAL SETTINGS

Before the independence of Azerbaijan in 1991, the management and development of the fisheries sector was guided by the Ministry of Fisheries of then Soviet Union. This ministry consisted of four departments:

- The Department of Territorial Fishery (Kaspryba), which consisted of fishing enterprises with fishing fleets and a subsidiary that dealt with the processing and production and trading of fish and fishery products.

- The Department of Southern Caspian Fisheries (Yuzhkasprybvod), which directed the reproduction and conservation of fish stocks and regulated the fishing industry.

- The Department of Fisheries under the Council of Ministers of the Republic of Azerbaijan (Azuprrybhoz), which engaged in the production of marketable fish in pond-based fish farms and fishing in inland waters.

- The Azerbaijani branch of the Scientific Research Institute, which dealt with the development of a scientific basis for rational fisheries management in the sea, river and inland waters.

After independence, the above departments were united and newly divided under Azerbalyg State Concern. However, the main structure remained the same until the Azerbalyg State Concern was dissolved in 2001.

3 Status of fisheries and aquaculture

NATURAL RESOURCES AND POTENTIAL OF THE FISHERIES SECTOR

Caspian Sea

The Caspian Sea, with its political and economic importance and known for its natural wealth, has been a focal point for Azerbaijan since the eighteenth century. Technically speaking, the Caspian Sea is not an actual "sea" and, therefore, its littoral States have no maritime rights as they only border the sea. For this reason, Azerbaijan is a landlocked country with no maritime rights.

The length of the modern Caspian Sea from north to south is 1 200 km, with an average width of 320 km. Of the total shoreline of 6 500 km, 713 km fall under Azerbaijani jurisdiction. The water level of the Caspian Sea is about 28 m below sea level. There are about 50 islands in the sea, and about 130 rivers of varying sizes flow into it. The average depth of the Caspian Sea is 190 m, but it has become shallower by 3.2 m in the past 100 years. The salinity level of the Caspian Sea is about 1.2 percent, which translates to one-third of the salinity of an ocean. The Caspian Sea is known for the large diversity of fish found there, which is the result of geographical, climatological and hydrological factors. Because of the large number of shallow areas in the sea, nutrient mixing occurs, resulting in high primary production and, therefore, also greater fish production.

Its five littoral States benefit from the Caspian Sea in three ways: (i) the Caspian Sea has large natural oil and gas resources that are extracted, used and/or exported; (ii) it forms an important fishing area for sturgeon and kilka; and (iii) the sea is the only possible way for its landlocked littoral States to access international waters, through the Volga River and several canals in the Russian Federation. These resources and accessibility are the cause of many disputes.

Rivers

Azerbaijan has 8 359 rivers, of which 3 218 flow directly into the Caspian Sea. The two largest rivers (the Araz and Kura) have a length of more than 500 km within the boundaries of the country. Inland capture fisheries in rivers mainly focus on the Araz and Kura Rivers, with most fishing taking place on the Kura River.

TABLE 3
Hydrological characteristics of 12 transboundary rivers of Azerbaijan

River	General flow	Transit flow	Local flow
	(km^3/year)		
Akhinjachay	0.15–0.20	0.12–0.16	0.028–0.038
Aqstafachay	0.39–0.42	0.34–0.36	0.05–0.06
Araz[1]	9.0–9.5	7.2–7.8	1.6–1.8
Arpachay	0.44–0.54	0.36–0.45	0.08–0.09
Bazarchay	0.59–0.69	0.53–0.63	0.05–0.06
Injasu	0.028–0.03	0.022–0.024	0.004–0.006
Khrami	1.8–1.9	1.8–1.9	–
Kura[2]	17.0–19.0	12.0–13.0	5.0–6.0
Okhchuchay	0.30–0.32	0.27–0.29	0.02–0.025
Qabirli	0.4–0.6	0.49–0.58	0.01–0.015
Qanikh	3.8–4.4	2.4–2.8	1.4–1.6
Samur	2.36–2.40	2.36–2.40	–

[1] Measured until it joins the Kura River.

[2] Measured until it joins the Araz River.

Source: AQUASTAT (FAO, 2008).

The Kura River flows from Turkey, through Georgia, into Azerbaijan. The total length of the river is 1 515 km (with a total surface area of 118 000 km^2), of which 906 km is within the boundaries of the country. The Araz River, which stretches for more than 1 072 km, also originates in Turkey and flows through Armenia and Iran (Islamic Republic of) before entering Azerbaijan. The rivers meet on the Shirvan Plateau in Azerbaijan and continue as the Kura River, finally flowing into the Caspian Sea.

In addition to these two large rivers, Azerbaijan has 22 rivers of 100–500 km long, 40 of 51–100 km, and 107 of 26–50 km. The remaining rivers are shorter than 26 km and are usually tributaries of larger rivers. In total, 5 141 rivers flow into the Kura River and 1 177 rivers contribute to the Araz River.

Azerbaijan has 21 transboundary rivers. A brief description of the hydrological characteristics of 12 of the 21 rivers is given in Table 3.

Lakes and reservoirs

Azerbaijan has more than 450 natural lakes, ranging vastly in size. The total surface area of all lakes in Azerbaijan combined is estimated at 394 km^2. The only lake used for commercial fishing is Lake Sarysu.

Azerbaijan has more than 50 reservoirs that range in volume from 16 km^3 to less than 0.020 km^3 (see Table 4 for the ten largest reservoirs). Most reservoirs are used for irrigation and hydroelectric purposes. Currently, there are only two reservoirs – Mingachevir and Shamkir – that are used for commercial fisheries. The Sarsang reservoir, located on the Terter River, had been used for fishing activities of local importance in the past but is currently in the occupied territories of Nagorno-Karabakh. The Jeyranbatan reservoir, located on the Absheron Peninsula, is used as a drinking-water reservoir for Baku and Sumgait and, for this reason, it is not used for fishing purposes.

The total and usable storage capacities of all functioning reservoirs in Azerbaijan are, respectively, 23 km^3 and 12.4 km^3, and they have a combined surface area of over 1 000 km^2.

TABLE 4
The ten largest reservoirs of Azerbaijan, by volume

Reservoir	Area	Storage Capacity
	(km^2)	(km^3)
Mingachevir	605	16.07
Shamkir	116	2.68
Yenikend	23.2	1.58
Araz	145	1.35
Sarsang	14.2	0.565
Jeyranbatan	13.9	0.186
Aqstafachay	6.3	0.12
Varvara	22.5	0.06
Khanbulanchay	24.6	0.052
Khachinchay	1.76	0.02

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Potential water resources for fisheries

The largest rivers (the Araz and Kura) and reservoirs (the Mingachevir and Shamkir) of Azerbaijan are already in use for commercial fishing. Lake Sarysu, the largest lake in the country, is also being used for commercial fishing. Smaller waters are not used for commercial fishing because they are not capable of sustaining a fish population on which commercial fisheries can thrive. However, recreational fisheries can, and do, use these waters.

The current commercial output from rivers, lakes and reservoirs is far below its optimum. To increase this output, proper management and well-designed stocking programmes must be applied. By optimizing fish production in these waters, much greater production from fishery activities can be achieved. In addition to increasing the productivity of existing fishing areas, new areas could be identified for culture-based fisheries.

In order to intensify aquaculture activities in the country, almost all larger irrigation canals (used for cotton production) will need to be used for the caged culture of fish. Azerbaijan has an estimated 65 900 km of irrigation canals (FAO, 2008), which offer excellent possibilities for the expansion of aquaculture practices. In addition to the exploitation of the existing irrigation canals, new techniques could be developed to start aquaculture in mountainous areas (raceway systems) and in lakes (caged culture).

Fish fauna

The ichthyofauna of Azerbaijan includes 97 fish species, of which 11 have been either introduced or have unknown origins (www.fishbase.org). As a result of major changes in the water system, which have been attributed to cotton production, some species have become endangered. Species that depend on migratory routes to reach their spawning grounds are especially vulnerable, and they have declined since the introduction of dams and other water regulation mechanisms. The following species are currently endangered: *Acipenser gueldenstaedtii* (Russian sturgeon), A. nudiventris (barbel sturgeon), A. persicus (Persian sturgeon), A. stellatus (stellate sturgeon), Barbus capito capito (Bulatmai barbel), Clupeonella abrau abrau (Abrau sprat) and Huso huso (beluga sturgeon). In the case of all sturgeon species and the Abrau sprat, overfishing is also a major reason for their serious decline.

Between 1960 and 1990, a number of fish species from outside Azerbaijan were introduced into inland waters to increase fish production. These species included: bream (*Abramis brama*), European carp (*Cyprinus carpio*), silver carp (*Hypophthalmichthys molitrix*), grass carp (*Ctenopharyngodon idella*), golden grey mullet (*Liza auratus*), leaping grey mullet (*Liza saliens*) and pike-perch (*Sander lucioperca*).

Commercial fish species

Azerbaijan has 21 fish species that are of commercial value (Table 5). Most belong to the Acipenseridae, Clupeidae and Cyprinidae families, although in terms of volume the vast majority of the catch is composed of Clupeidae (Table 6).

In the last few years, cyprinids have been fished in increasing quantities from inland waters despite the fact that this fish family has a relative low meat quality and its intermuscular bones make them hard to prepare. The increase in the production of Persidae and Mugilidae is mainly the result of using them as alternatives for the decreasing catches of other families. Aside from carp species, only pike, perch, snakehead (*Channa* spp.; Channidae) and trout (*Oncorhynchus*; Salmonidae) are considered attractive species for aquaculture production. Snakehead is an aggressive species, and the ramifications of culturing this species should be carefully considered before it is brought into production. Escapes of this species into the wild have led to serious problems with native fish species in North America. Trout is a species that requires cool, oxygen-rich water, which makes it an excellent species to be farmed in the mountainous areas of Azerbaijan.

Although Azerbaijan has a relatively large number of fish species that are not of use for fisheries and aquaculture, the existing commercial species should provide enough food security if they are managed in an optimal way.

Despite several measures to prevent the decline of sturgeon stocks, catches are still decreasing and stocks are on the edge of extinction. The only solution that will enable Azerbaijan to maintain its position in the international sturgeon market (producing caviar) is sturgeon aquaculture. Although these species are not easily kept in captivity and caviar production is a time-consuming process, a number of countries (China, France, Iran [Islamic Republic of], Israel, Italy, Spain and Uruguay) are already keeping stocks of

several sturgeon species for aquaculture. In this way, pressure on wild stocks is reduced and a sustainable production method of caviar is used.

The relatively limited freshwater resources are insufficient to meet the increasing demands of the local population for aquaculture products. The other main reason for the existing situation is the lack of a relevant legal basis upon which to develop aquaculture using different water sources, such as marine areas, underground reservoirs or lakes. More technological improvements are needed for freshwater or marine cage culturing, and the effective use of underground water in closed systems also requires special water treatment technology as well.

Lake Hajikabul had significant aquaculture value in the past. However, because of a dramatic reduction in the water level, the lake is no longer used for the purpose of conducting aquaculture activities. Similar problems with using inland waters in Daghlig Garabagh and its seven bordering regions have also been reported.

TABLE 5
List of fish species used for commercial purposes

Family	Scientific name	Common name
Acipenseridae	*Acipenser gueldenstaedtii*	Russian sturgeon
Acipenseridae	*Acipenser persicus*	Persian sturgeon
Acipenseridae	*Acipenser stellatus*	Stellate sturgeon
Acipenseridae	*Acipenser nudiventris*	Fringebarbel sturgeon
Acipenseridae	*Huso huso*	Beluga sturgeon
Clupeidae	*Clupeonella cultriventris*	Kilka
Cyprinidae	*Abramis brama*	Bream
Cyprinidae	*Cyrpinus carpio*	European carp /common carp
Cyprinidae	*Hypophthalmichthys molitrix*	Silver carp
Cyprinidae	*Ctenopharyngodon idella*	Grass carp
Cyprinidae	*Rutilus rutilus*	Roach
Cyprinidae	*Rutilus frisii*	Kutum
Cyprinidae	*Aspius aspius*	Asp
Cyprinidae	*Vimba vimba*	Vimba
Cyprinidae	*Chalcalburnus chalcoides*	Shemaya
Esocidae	*Esox lucius*	Pike
Mugilidae	*Liza auratus*	Golden grey mullet
Mugilidae	*Liza saliens*	Leaping grey mullet
Persidae	*Sander lucioperca*	Pike-perch
Persidae	*Perca fluviatilis*	Perch
Salmonidae	*Salmo trutto caspiensis*	Caspian salmon
Siluridae	*Silurus glanis*	Wels catfish

Source: www.fishbase.org.

TABLE 6
Catch composition, 2000–2007

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	(%)										
Clupeidae	98.37	95.36	97.97	94.40	96.33	96.07	92.50	84.95	79.9	66.2	66.8
Cyprinidae	1.01	2.92	1.02	2.90	1.84	2.05	5.27	9.54	12.1	22.3	24.7
Acipenseridae	0.37	0.69	0.68	1.62	0.96	0.94	0.22	2.24	2.2	0.4	0.6
Mugilidae	0.02	0.50	0.03	0.15	0.24	0.22	0.59	2.07	4.12	7.4	6.2
Persidae	0.03	0.22	0.21	0.66	0.44	0.59	1.14	0.97	0.75	1.2	0.5
Siluridae	0.05	0.07	0.04	0.12	0.09	0.04	0.07	0.13	0.56	1.7	0.6
Esocidae	0.15	0.23	0.05	0.14	0.11	0.09	0.20	0.10	0.37	0.8	0.6
Total	100	100	100	100	100	100	100	100	100	100	100

Source: FishStat Plus v2.32 (FAO, 2009).

Conservation and restocking of Caspian sturgeon

Sturgeon stocks are currently very low. Catches have been declining since the 1950s and, as a result of habitat destruction and limited access to breeding grounds, natural reproduction has been reduced to almost nothing. After receiving recommendations from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ministry of Ecology and Natural Resources (MENR) of Azerbaijan developed the Programme for the Management of the Aquatic Bioresources of the Caspian Sea. Within this programme, two tactics are being applied to improve the condition of sturgeon stocks in the Caspian Sea:

- Natural spawning grounds are being cleaned and made suitable for natural reproduction. Natural spawning sites are being inventoried and protected. In addition to protection of natural spawning grounds, the delta of the Kura River is also being deepened to make the river accessible for fish migration. However, because there are many dams on the Kura River, full restoration of natural spawning grounds will be hard to accomplish.

- In addition to improving the natural spawning conditions for sturgeon, older sturgeon hatcheries are being upgraded and repaired. The Khilly Sturgeon Hatchery, a brand new complex, was built in 2003. More information on this hatchery and on restocking in Azerbaijan is given below.

General fish production

Under the Azerbalyg State Concern, about 100 fishing vessels of various types and sizes operated in Azerbaijan; this situation did not change between the date of independence and the date of liquidation of the Azerbalyg State Concern in 2001.

After liquidation, the entire fisheries sector was privatized. Since then, about 100 fishing vessels have been operating in the Caspian Sea, of which about 60 are assigned to kilka fishing. The remaining vessels focus on freshwater fish species such as carp, perch and shad. Caspian fisheries use two main types of fishing techniques: kilka is caught with seine nets; and other species are mainly caught with trawl nets.

The early 1990s marked the beginning of a difficult period in Azerbaijan, as it experienced the first years of independence. These years were characterized by economic decline as well as a decline in aquaculture production (Tables 7 and 8).

TABLE 7

Total freshwater and marine fish production, 1991–2010

	1991	1995	2000	2005	2007	2008	2009	2010
	(tonnes)							
Freshwater fish production	2 893	1 189	342	385	385	444	334	222
Marine fish production	36 770	9 872	18 595	2 723	8 770	1 267	1 043	972

Source: State Statistical Committee of the Republic of Azerbaijan (2011).

TABLE 8

Aquaculture production (processed fish volume included), 1998–2010

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
(thousand tonnes)												
3.1	5.1	3.8	3.2	2.2	1.8	3.1	3.5	1.2	1.7	1.3	1.3	0.9

Source: State Statistical Committee of the Republic of Azerbaijan (2011).

As confirmed by the figures shown in Tables 7–9, catches from both captive fisheries and aquaculture are declining in volume and in value, and the import of fish from captive fisheries and aquaculture is increasing in terms of both volume and value.

TABLE 9

Caspian Sea and inland waters catch, 2000–2010

Fish species	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	(tonnes)										
Bream	55	127	48	50	43	63	66	75	76	72	56
Carp	93	51	10	13	16	17	20	17	16	9	9
Crucian carp	4	17	6	8	7	3	13	10	20	19	12
Roach	8	64	19	26	36	33	32	48	58	39	34
Kutum	–	–	16	31	16	18	20	46	50	41	54
Asp	1	5	1	4	3	2	2	4	4	1	3
Pike	28	25	6	9	10	8	5	3	4	1	–
Mullet	3	55	3	10	14	15	21	62	35	40	62
Catfish	9	8	4	8	8	4	3	4	7	8	4
Sander	5	19	17	35	33	41	39	25	27	27	20
Goby	–	–	–	–	1	2	1	1	–	–	1
Sturgeon	70	76	76	105	89	85	–	67	65	–	2
Trout	–	5	–	–	–	–	–	–	–	–	–
Herring	1	52	24	48	64	60	68	96	108	79	90
Sprat	18 520	10 389	10 950	6 073	8 897	8 637	3 667	2 450	1 020	839	708
Vimba	–	–	–	–	1	2	4	7	9	5	6
Shemaya	–	–	6	7	8	5	5	10	16	18	14
Other fishes species	–	–	2	8	13	8	10	18	2	4	7
									Other sources		
All fish caught by fishers without quota	185	7 712	10 634	16 743	15 357	17 283	17 344	17 534	17 709	15 912	16 000
All fish caught by fishing companies	140	95	78	122	184	114	110	122	144	137	123
Aquaculture production	–	–	–	–	–	–	–	–	39	183	227
Total volume of caught fish	19 122	18 700	21 900	23 300	24 800	26 400	21 430	20 599	19 409	17 434	17 432

Source: State Statistical Committee of the Republic of Azerbaijan (2011).

TABLE 10

Exports of fish and fish products, 2003–2009

	2003	2004	2005	2006	2007	2008	2009
Fish (tonnes)	329.0	2 277.1	3 033.0	538.0	851.1	514.4	489.8
Export volume (US$)	1 110.9	300.0	561.5	292.0	816.3	361.6	294.8
Sturgeon caviar (tonnes)	6.7	8.8	10.9	0.3	3.9	2.0	2.9
Export volume (US$)	2 971.8	4 254.5	6 656.2	365.8	5 027.1	5 238.6	5 658.8

Source: State Statistical Committee of the Republic of Azerbaijan (2011).

Between 2003 and 2009, the export of fish fell to half of its previous levels in terms of quantity and by 3.5 times in monetary terms (Table 10). There was a volume increase in the import of canned products of 50 percent in this period – a monetary increase of more than double – and this is significant (Table 11).

TABLE 11
Imports of fish and fish products, 2003–2009

	2003	2004	2005	2006	2007	2008	2009
Fish (tonnes)	3 421.7	4 364.8	4 842.6	4 124.4	4 167.1	6 075.4	6 912.2
Import volume (US$)	1 275.5	1 386.7	1 788.1	1 430.0	1 965.3	3 831.6	4 322.1
Canned fish products (tonnes)	4 607.2	1 463.5	3 394.4	4 796.4	5 904.9	7 400.8	6 937.8
Import volume (US$)	5 163.8	1 524.7	4 233.1	2 829.7	6 101.2	10 189.5	10 208.6

Source: State Statistical Committee of the Republic of Azerbaijan (2011).

In the same period, the figures given indicate an increase in demand against a backdrop of increasing consumer prices, and this is not insignificant. Considering the changes in fish exports and fish products in the same context, it is possible to say that most of the financial value is derived from the export of sturgeon-produced black caviar. Using the information from Table 10, it is possible to conclude that although there was a 67 percent increase in export volume from 2003 to 2009, exports were characterized by more than a fourfold increase in this period. Therefore, fish exports were largely at the expense of species of little value. This is linked to the sudden decline in valuable commercial fish species in the Caspian Sea and in the inland basins as well.

MARINE CAPTURE FISHERIES

Many of the physical – and chemical and biological – parameters of the Caspian Sea are part of its uniqueness. One of these parameters is the high productivity of the sea for valuable fish species such as sturgeon and herring. In the 1980s, more than 90 percent of the production of black sturgeon caviar and sturgeon meat came from the Caspian Sea. At the same time, various scientists declared the Caspian Sea as a protected area for sprats, which ensured that Caspian sprat resources remained strong and valuable.

Table 12 shows the fish production of capture fisheries both in the Caspian Sea and in inland waters. Two species of sprat account for 80 percent of the volume of caught species. In comparison with 1991, catches in the Caspian Sea had decreased by thirty-sevenfold in 2010. As one might expect, for such rich resources, an appropriately large fishing fleet and infrastructure was required. However, the decline in fish stocks since 1991 has made the maintaining of a large fishing fleet inefficient. After independence, there was a considerable reduction in the size of the fishing fleet and fishing infrastructure.

TABLE 12
Fish production data

	1991	1995	2000	2005	2007	2008	2009	2010
	(tonnes)							
Total freshwater fish production	2 893	1 189	342	385	385	444	334	222
Total marine fish production	36 770	9 872	18 595	2 723	8 770	1 267	1 043	972

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

As mentioned above, almost 80 percent of fish caught come from two sprat species. The fishing fleet only continues to exist for sprat fishing. At present, information about the qualitative and quantitative composition of the fishing fleet is collected on the basis of information submitted by fishing companies or individuals when they receive their fishing quota.

Table 13 reflects the fishing fleet's composition over three years. The vast majority of fishing boats are small boats of less than 6 m in length. They are used to catch Cyprinidae, which are caught 1.6–3.2 km off the coast. Boats of 24–30 m rank second in terms of the number of vessels. These vessels mainly catch sprat. It is important to note that all the fishing vessels belong to the private sector. Table 14 presents some detailed technical information on these vessels.

TABLE 13
Fishery fleet composition

Fishery fleet composition												
Length	**< 6 m**			**24–30 m**			**45–60 m**			**> 60 m**		
Year	2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
Number	563	624	633	34	28	22	4	4	2	1	–	–
Total waterway tonnage (tonnes)	–	–	–	3 112	2 596	2 082	2 890	2 890	1 545	1 115	–	–
Power kW)	–	–	–	4 945	4 109	3 515	3 408	3 408	1 704	852	–	–

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

TABLE 14
Technical parameters of fishing vessels

Vessel type	**Length**	**Width**	**Ballast draught**	**Motor power**	**Endurance**	**Boat load**	**Speed**	**Staff**
	(m)	(m)	(m)	(hp)	(km)	(tonnes)		
RS-150 (fishing)	27	5.5	1.75	1 × 150	161 from the coast	38	9 knots	9
PTS-225 (fishing fleet transportation)	27	5.5	1.75	1 × 225	161 from the coast	2 × 46	10 knots	9
Proqres-2	4.64	1.7	–	30	1.6–3.2	0.5	50 km/h	1
Proqres-4	4.69	1.72	50	2–3	0.8 km	–	50 km/h	1

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

TABLE 15
Fish catch composition

	2002	2003	2004	2005	2006	2007	2008	2009	2010
									(tonnes)
Huso huso	–	1.7	1.7	0.76	0.45	1.82	0.47	0.356	0.36
Acipenser Persicus	–	3.4	2.66	5.3	1.1	7.3	1	0.888	1.14
Acipenser stellatus	–	5.09	3.75	1.2	0.42	5.8	0.52	0.455	0.47
Herring	24	48.2	63.58	96.44	68.4	59.8	107.7	79.224	90.4
Sprat	10 950.1	6 072.26	8 896.48	2 450.44	3 667	8 636.6	1 020	839.32	708
Kutum	15.78	31.6	16.6	46.27	20.4	17.98	50.5	41.1	53.8
Carp	1	0.45	7	9.3	7.5	6.46	6	4.7	5
Roach	3.44	5.24	10.8	25.9	13	11.27	28.88	18.22	21.6
Bream	6	–	1.1	–	3.7	–	–	10.3	10.54
Asp	–	–	0.6	0.1	–	–	0.66	–	–
Sander	–	–	–	–	–	–	–	–	–
Mullet	3.37	9.77	14	61.7	21.3	15.66	35.4	39.47	62.2
Shemaya	–	–	2.1	3.5	0.8	–	5.27	3.28	5.4
Catfish	0.07	–	2.4	0.09	1.2	0.6	–	1.05	–
Goby	1.3	0.13	0.47	0.57	0.7	1.67	–	–	0.04
Golden carp	0.2	–	1.2	–	1.7	–	–	–	–
Qarasol	1.6	0.18	1.26	7.32	3.8	1.52	9.25	5.28	6
Bighead	–	–	–	–	–	–	–	–	–
Other species	0.85	5.0	2.1	13.96	2.3	3.2	1.2	–	6.4
Total	11 007.71	6 183.02	9 027.8	2 722.85	3 812.07	8 769.68	1 266.85	1 043.64	971.35

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Table 15 offers some detailed information on the composition of catches. The data show the drastic decrease in the number of marine fish caught.

Depleted sprat resources have made traditional fish-catching techniques unprofitable. As Table 13 shows, the number of vessels with a length of 24–30 m has declined in recent years. The older vessels, the RS and PTS type, are those mainly involved in sprat fishing.

INLAND CAPTURE FISHERIES

Fleet

After Azerbaijan's independence, the composition of the inland waters fleet changed only slightly. The current size of the fleet in inland waters is estimated at about 140 motorized vessels. Most of these vessels are relatively small, with limited engine power. However, about 46 fishing vessels on inland waters have an engine capacity of 80 bhp or more (Table 16).

In addition to motorized fishing vessels, an estimated 20 rowing boats are used for fishing purposes. Together, all inland fishing vessels in Azerbaijan catch an estimated 330 tonnes per year, primarily using keep nets and fyke nets.

TABLE 16
Size distribution of motorized fishing vessels in inland waters in Azerbaijan

Horsepower	Number of vessels
(bhp)	
< 20	10
20–40	35
40–60	25
60–80	30
80–100	36
> 100	10

Note: BHP = brake horsepower.

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

The Department for Reproduction and Protection of Aquatic Bioresources (DRPAB), part of the MENR, has seven vessels located in inland waters. Two of these are located on the Mingachevir and Shamkir reservoirs and are assigned to detect and stop illegal fishing activities and violations of the fishing regulations (Table 17). In addition to these, five fishing vessels are based on the lower part of the Kura River. These vessels have two functions: transporting spawners (mature fish ready to spawn) of several sturgeon species to hatcheries and transporting young sturgeon from these hatcheries to release sites close to the mouth of river in the Caspian Sea; and carrying out fish conservation activities.

TABLE 17
Distribution of inland waters vessels

Name	Production site	Type	Motor power	Length	Width	Height	Waterline	Speed	Location
			(kW)	(m)	(m)	(m)	(m)	(knots)	
Qradushiy	1965, p/q A-7333	Single-blade, tugboat	170.0	17.30	3.70	3.54	1.00	10	Mingachevir reservoir
Qamma-015	1973, Shipyard named after M.İ. Kalinin	Single-blade, seiner	25.0	13.62	3.12	1.20	1.00	7	Shamkir reservoir

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Rivers

Commercial fisheries on the rivers of Azerbaijan occur primarily in the Kura River. An essential proportion of the catches in the Kura River is of migrating sturgeon. In addition to sturgeon, roach (*Rutiles rutiles*), bream (*Abramis brama*) and pike-perch (*Sander lucioperca*) make up the majority of the catches (Table 18). Non-commercial fishing occurs in almost all other rivers, but these rivers are too small to sustain commercial fisheries. Fishing in these rivers serves a recreational purpose, and the fish caught are often used as food in local villages.

TABLE 18
Composition of catches on the Kura River, 2003–2010

	2003	2004	2005	2006	2007	2008	2009	2010
	(tonnes)							
Sturgeon	94.3	80.7	69.9	68	67	70	2.48	2.0
Carp	15.6	24.2	14.1	23.8	17.5	9.5	4.52	3.75
Roach	20.9	24.9	21.77	19.6	22	29	21.26	12.33
Bream	50	41.7	62.7	62.7	75.1	76	65.22	45.9
Asp	3.9	2.1	2	2	3.5	3.3	1.1	3.0
Pike-perch	25	32.4	41	39.5	24.6	26.5	26.6	19.84
Shemaya	8	10.8	7.35	6.5	6.1	11.5	14.55	9.2

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Reservoirs and lakes

The large reservoirs – Mingachevir and Shamkir – have favourable hydrobiological conditions for commercial fisheries. Fish catches from these reservoirs include bream (*Abramis brama*), pike-perch (*Sander lucioperca*), roach (*Rutiles rutiles*) and common carp (*Cyrpinus carpio*) (Table 19).

Although the smaller reservoirs also sustain fish populations, they are too small for commercial fisheries. Fishing activities in these reservoirs serve a recreational purpose and the fish caught are often used as food in local villages. The only lake that supports commercial fishing is Lake Sarysu. Annual catches from this lake are low (Table 20), making it of little significance to national fisheries production. The main species caught in this lake are pike (*Esox lucius*), roach (*Rutiles rutiles*) and common carp (*Cyrpinus carpio*).

TABLE 19
Composition of catches in the Mingachevir and Shamkir reservoirs, 2003–2010

Reservoir	Species	2003	2004	2005	2006	2007	2008	2009	2010
		(tonnes)							
Mingachevir	Bream	21.0	24.3	37.6	37.1	37.8	45.0	40	36.3
	Pike-perch	23.0	24.5	35.0	33.6	20.3	22.0	23	18
	Roach	10.5	10.2	7.5	7.7	7.2	11.5	9	9.8
	Common carp	16.3	16.2	8.2	11.2	10.9	14.4	2.2	3.2
	Shemaya	6.0	8.3	4.0	4.7	4.3	9.5	11.5	8.2
	Asp	2.2	2.1	2.0	1.0	1.8	3.3	1.1	3.0
Shamkir	Bream	29.0	19.1	25.0	29.3	32.5	30.9	29.1	9.6
	Pike-perch	11.5	7.6	6.0	5.8	4.3	4.5	3.6	1.8
	Roach	9.5	7.6	8.0	7.3	9.3	10.5	7.2	2.2
	Common carp	12.9	6.2	5.5	7.4	7.1	9.9	1.8	0.4
	Shemaya	3.0	2.8	3.0	2.6	1.8	2.0	3.0	1.0

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

All the waters of Azerbaijan are state property. While the appropriate legal basis and mechanisms for renting this form of property are being established, state control through ownership can be effective in managing the water resources.

TABLE 20
Composition of catches on Lake Sarysu, 2003–2010

	2003	2004	2005	2006	2007	2008	2009	2010
	(tonnes)							
Common carp	0.3	2.4	4.8	5.7	3.6	5.3	0.69	0.15
Roach	0.4	2.6	4.4	2.7	5.5	7.8	2.52	0.35
Pike	0.5	0.9	1.9	2	3	3.1	1.34	0.23

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Current production of inland capture fisheries

Inland commercial fishery activities in Azerbaijan are concentrated on four waterbodies: the Kura River, Lake Sarysu, and the Mingachevir and Shamkir reservoirs. Although there are many more rivers, lakes and reservoirs in Azerbaijan, commercial fisheries focus on just these four bodies of water. Catch statistics from these inland capture fisheries are presented in Table 21.

TABLE 21
Production from inland capture fisheries in Azerbaijan, 2003–2010

	2003	2004	2005	2006	2007	2008	2009	2010
	(tonnes)							
Rivers	252.7	230.3	231.1	168.7	227.2	257	167	112
Reservoirs	152	140	145	153	141	186	163	110
Lakes	1.2	5.9	11.1	10.4	12.1	0.8	4.3	–
Total	404.7	370.3	376.1	321.7	368.2	443.8	334.3	222

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

RECREATIONAL FISHERIES

According to the Regulations of Amateur and Sport Fishing, effective in Azerbaijan since 1999, recreational fishing is permitted to all citizens (free of charge) in all waters except in the national reserves, fish hatcheries and fish farms, in compliance with the established rules for fishing and water management. At present, Azerbaijan has about 20 000 recreational fishers.

All fishing activities (including commercial and recreational fisheries) and the capture of other marine animals and other seafood are regulated by the Conservation of Fish Stocks and Fishing Rules Act approved by Resolution No. 152, dated 24 September 1999, by the Cabinet of Ministers of the Republic of Azerbaijan. This resolution is an integral part of the Law of the Republic of Azerbaijan on Fisheries, adopted in 1998. This law defines the legal framework for the organization of fisheries management and the reproduction, use and conservation of fish stocks.

Recreational fishing in Azerbaijan occurs in the Caspian Sea and in the inland waters. Popular target species include pike-perch (*Sander lucioperca*), common carp (*Cyrpinus carpio*), bream (*Abramis brama*), roach (*Rutiles rutiles*), vimba (*Vimba vimba*), asp (*Aspius aspius*), kutum (*Rutilus frisii*), mullet (*Liza auratus*), shemaya (*Chalcalburnus chalcoides*), pike (*Esox lucius*), catfish (*Silurus glanis*), shrimp and crayfish.

According to the Regulations of Amateur and Sport Fishing, recreational fishers are allowed to use several handlines, but with the rule that no more than seven hooks can be used at the same time. In addition, the daily catch for non-predatory species is limited to 5 kg. When fishing for predatory fish (pike, sander, perch and Wels catfish), there is no daily catch limit.

Although there is no monitoring or statistical analysis of the amount of fish caught by recreational fishers, the Society of Hunters and Fishers estimates that at least 100 tonnes of fish is caught annually for recreation.

Most of the 20 000 recreational fishers are registered at one, or several, of the regional and national branches of the Society of Hunters and Fishers. In addition to the broad privileges provided by these societies, there are also some prohibitions for recreational fishers set out in legislation. Some examples of these prohibitions include the prohibition of fishing for any sturgeon species or species noted in the "Red Book of Azerbaijan", the use of fishing gear and methods not described or not allowed by the Regulations of Amateur and Sport Fishing, and fishing at spawning sites during the migration and spawning seasons.

To increase fish stocks in reservoirs and lakes, which are hunting grounds for recreational fishers, a number of fish species are being restocked.

There is no official information on recreational fisheries; therefore, it is difficult to estimate the scale of amateur fishing for personal consumption and recreation. However, it can be said that, owing to the insufficient availability of fish products and the relatively low purchasing power of regional populations compared with urban populations, the volume of amateur fishing for personal consumption is significant in regions that have long traditions of consumption of fish products. These places are mainly in the coastal regions of the Caspian Sea, as well as in locations where there are lakes that have value for recreational fishing.

To support recreational fishing, the reserves of the fish species popular with recreational fishers are supported by restocking and the conservation of water bioresources. The following section describes the hatcheries in detail.

Sport fishing in Azerbaijan is not being managed in accordance with the operational guidelines of the FAO Code of Conduct for Responsible Fisheries (the Code; FAO, 1995). The laws of Azerbaijan are not aligned with the Code, meaning that the Code cannot be enforced. The authors of this circular propose that aspects of sport fishing should be taken into account in the draft being prepared regarding the "Law on Aquaculture". This will enable the experience of FAO to be taken into consideration.

AQUACULTURE AND RESTOCKING

After the liquidation of the Azerbalyg State Concern in 2001 (described above), the aquaculture sector was divided into two parts: aquaculture activities for commercial fish farming; and aquaculture activities for the purposes of restocking commercial fishing areas. Aquaculture activities for stocking waters that sustain commercial fisheries remained state controlled, while aquaculture activities in commercial fish farms became part of the private sector.

With the transition of the farms to the private sector, many of them have lost their value and some are functioning far below their capacity. The reasons include outdated equipment, fixed assets and a lack of investment in the sector. However, at the same time, small-scale farms and one-household farms have started to develop. These farms are mainly concentrated in lowland areas along the Kura River, covering the middle and downstream part of the river. The species mainly cultured on these farms are European carp, silver carp and grass carp. Silver carp and grass carp were first introduced to Azerbaijan in 1960. The farming of grass carp serves two purposes: as a food source, and as a natural control on aquatic vegetation in the inland waters of Azerbaijan. Some of these farms have been converted into hatcheries while others operate as standard fish farms. Despite this diversification into several farm types, the commercial aquaculture sector in Azerbaijan still has low productivity. Since 2002, production has increased, but total production in 2008 was still a marginal 1 000 tonnes (see Table 22).

TABLE 22
Aquaculture production in Azerbaijan, 2002–2008

Aquaculture products	2002	2003	2004	2005	2006	2007	2008
	(tonnes)						
Common carp	60	100	150	300	400	700	700
Silver carp	20	30	180	150	160	130	250
Grass carp	–	–	20	50	40	70	50
Total	80	130	350	500	600	900	1 000

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

In addition to commercial aquaculture, aquaculture for the purpose of restocking exists in Azerbaijan. With the restocking of juvenile fish, natural stocks are strengthened and capture fisheries sustained. At the moment, 13 hatcheries produce juvenile sturgeon, Kura salmon and cyprinids, which are released in reservoirs, the Kura River and the Caspian Sea (Table 23). The majority of these hatcheries were constructed under the then Soviet regime. The modern Khilly Sturgeon Hatchery was constructed in 2003 (Plate 1). This hatchery was constructed with a concession loan of US$6 million (including three years of operating costs) from the World Bank as part of the Urgent Environmental Investment Project. This hatchery is equipped with modern equipment, and the production capacity of the hatchery is estimated at 15 million young sturgeon per year. The modern equipment at the Khilly Sturgeon Hatchery can also be used to extract eggs from live fish. In this way, female fish can be kept for longer periods and be reused for egg extraction (Plate 2).

TABLE 23
Characteristics of restocking hatcheries in Azerbaijan

Hatchery	Produced species	Area	Construction date	Annual capacity
		(ha)		
Ali-Bayramli Hatchery	Sturgeon	62	1957	3.5 million
Azerbaijan Exp. Marine Fish Hatchery	Kura salmon	0.2	1976	200 000
Chaykend Hatchery	Kura salmon	7.39	1955	100 000
Chukhur-Qabalingky Hatchery	Kura salmon	30.5	1956	100 000
Devechi Fisheries Amelioration Station	Cyprinids	3 600	1954	50 million
Khilly Sturgeon Hatchery	Sturgeon	15	2003	15 million
Kura Hatchery	Sturgeon	40	1954	1.5 million
Lesser Qizilagac Hatchery	Cyprinids	38.1	1954	150–200 million
Tovuz Hatchery	Cyprinids	115.1	1989	12 million
Ust-Kura Fish Plant	Sturgeon	82	1956	6 million
Ust-Kura Fish Plant	Cyprinids	550	1954	60 million
Varvar Hatchery	Cyprinids	334	1960	10 million
Yenikend Hatchery	Cyprinids	100	–	100 million

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Plate 1

Khilly sturgeon fry and fingerling rearing building.

Photo credit:Z. Salmanov.

Plate 2

Left to right: sturgeon ovulation checking; sturgeon egg extraction; and sturgeon egg incubation.

Photo credit:Z. Salmanov.

Although these farms have large production capacities, production rates are not continuous and it is rare for all farms to be producing at their maximum. There are several reasons for this: (i) management restrictions on the amount of fingerlings released; (ii) technical problems, which reduce production; and (iii) financial restrictions, which also result in lower productivity. Existing hatcheries produce the fingerlings of three families: Acipenseridae, Cyprinidae and Salmonidae. A total of 11 species from these 3 families are reproduced for restocking (Table 24).

TABLE 24
Number of fingerlings per species restocked, 2000– 2010

Species	Unit	Year										
		2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Acipenseridae	Specimens (millions)	17.850	12.875	15.05	12.02	19.890	16.96	16.032	9.68	12.458	7.68	1.523
Huso huso		0.357	0.274	0.163	0.466	0.467	–	–	–	–	–	–
Acipenser nudiventris		0.870	0.251	–	–	0.614	–	–	0.270	–	0.57	–
Acipenser persicus		9.758	5.823	10.0	8.282	12.870	13.879	12.676	7.670	8.976	5.44	0.887
Acipenser stellatus		6.870	6.527	4.887	3.268	5.938	3.079	3.356	1.74	3.482	1.66	0.636
Salmo trutta	Thousands	50.0	63.0	52.0	73.0	77.750	113.27	94.85	118.47	174.475	182.1	173.61
Cyprinidae	Specimens (millions)	512.0	482.83	449.31	440.65	436.38	427.51	432.13	435.91	409.68	402.8	429.186
Carp		74.85	74.95	55.31	40.75	49.12	51.21	51.02	56.97	41.56	62.26	58.904
Bream		27.3	20.2	14.96	11.5	18.500	16.34	15.56	6.43	6.32	10.7	10.232
Kutum		114.09	100.4	75.4	50.6	56.6	52.56	50.6	85.54	58.15	54.11	43.48
Roach		191.7	227.0	227.34	227.9	256.2	258.0	253.25	203.12	221.7	233.02	249.5
Asp		5.33	5.64	4.4	8.4	13.2	10.65	11.5	38.2	17.5	–	2.3
Phytophagous	Specimens (millions)	99.0	54.64	72.0	101.5	42.7	44.58	50.2	45.64	56.6	5.65	5.7

Source: Department for Reproduction and Protection of Aquatic Bioresources of the Ministry of Ecology and Natural Resources (unpublished data).

Recently, the effectiveness of restocking has become an important issue. Despite the release of millions of juvenile fish, overall fisheries production keeps declining. This has raised questions of whether restocking is a good tool for sustaining capture fisheries. Very limited research has been done in the past on the survival rate of juvenile fish and on the ideal release age and weight. In the past few years, some research has been devoted to these topics, but results are difficult to obtain and analyse.

The list of species cultivated in aquaculture is relatively poor in Azerbaijan. It includes the common carp (*Cyrpinus carpio*), silver carp (*Hypophthalmichthys molitrix*), bighead carp (*Arystichthys nobilis*), grass carp (*Ctenoparyngodon idella*) and rainbow trout (*Oncorhynchus mykiss*). Only the common carp is considered an endemic species. The effectiveness of using silver carp and grass carp in polyculture with common carp became an issue for discussion in the 1950s. They were imported from the Amur River complex at the beginning of the 1960s.

These five fish species have drawn the attention of biologists as attractive objects for acclimatization.

The main reasons for acclimatization of these species are:

- The fish consuming aquatic plants will be part of the second trophic level and will shorten the food chain by one link.
- Despite their consumption of low-calorie food, they are quite large species, they maintain a high growth rate and they are highly flavoured.
- Although they have a long life cycle (6–8 years), their coefficient of utility remains high compared with other fish.
- The fish of Amur River basin that feed on vegetable matter are tolerant to long-lasting winters and high salinity, which is the basis for proposing their potential for acclimatization.
- Fish that feed on vegetable matter are good ameliorators.

The other non-endemic fish used in aquaculture is rainbow trout. Initially, the dispersion of the present type was limited. In North America, this type of fish has a much greater dispersion. Because of its rapid growth, the simplicity of its cultivation and its tolerance to low and high temperatures, rainbow trout is one of the mostly frequently used types of fish in aquaculture.

In Azerbaijan, Ciprinidae produced in aquaculture are largely released in the south of the country near the Kura River estuary. As a species requiring low water temperatures, rainbow trout is used in the west and north of the country. Trout farms use mountain river water in the open raceway rearing system.

Interest in sturgeon aquaculture has been developing. The elaboration of new legislation will stimulate the development of industrial aquaculture using new technologies and new fish species such as sturgeon and salmon.

Currently, the market for ornamental fish is limited to the country's capital, Baku. At present, there are several enterprises working in this field in Azerbaijan. Artificial reproduction of ornamental fish is not conducted on an industrial scale. These companies mainly import the species required. In recent years, an insignificant volume of imports of ornamental fish has been registered from countries in Oceania.

In recent years, Azerbaijan has actively joined varying types of event organized by FAO, including workshops. Despite this, knowledge of the Code is poor and, as a consequence, its application in the private sector remains insufficient.

FACILITATING INDUSTRIES

A large sprat fishing fleet, such as the Caspian Oil Fleet, required servicing. For this purpose, the Caspian Ship Repair Company merged four shipyards in Azerbaijan. Hull restoration work as well as engine and mechanical repair work was undertaken. The well-equipped dock facilities enabled the repair of electronic and radio navigation equipment. Shipyard manufacturers also had well-developed coastal technical repair facilities. The Caspian Ship Repair Company operated under the structure of the Caspian State Shipping Company. In addition, as part of the structure of the State Oil Company, there was another complete ship repair system. A new private company, SAGA Shiprepair Company, has been included in the list of companies offering the relevant services to shipping companies in recent years.

The State, having the available financial resources, is the main provider of port services for the fishing fleet. The provision of such services requires sizeable investment. The State Caspian Shipping Company and the State Oil Company have the necessary facilities (inherited from the Soviet period), and, thus, there is no need for large investments to provide shipyard services. If these companies are required to provide services for large ships, the smaller-sized fishing fleet ships require a large and developed chain of smaller, more accessible ports.

There were three fishing ports in Azerbaijan: Narimanabad, Neftchala and Ovsan. However, because of the decline of natural resources in the Caspian Sea and little use for large fishing vessels, the infrastructure of these ports has been neglected and they do not meet modern maritime requirements.

Equipment and other materials that are used for the production and processing of the products of aquaculture (for example, equipment for processing and packing, hormonal preparations, veterinary prophylaxis preparations, oxygenators, aerators, materials, other fishing tackle and special clothes) are imported to Azerbaijan mainly from China, the Russian Federation and Turkey.

4 Processing, marketing and trading of fish and fisheries products

FISH PROCESSING AND STORAGE

In Azerbaijan, a number of companies are engaged in fish processing. They include:

- Shamkir Fish Processing Plant,
- Shahmar Ltd,
- Qovsani Baliq Kombinat Ltd,
- Caspian Fish Company Azerbaijan Ltd,
- Orienta Azerbaijan Baliq Sanaye Ltd,
- M.S.,
- Xezerbaliq Ltd.

These companies mainly focus on processing marine species. In addition to these marine companies, there are some smaller companies farther inland that focus on processing and storing freshwater species. However, limited information is available about these smaller companies as a result of the privatized market.

The larger companies have new and modern equipment for fish storage and processing. The latest fish processing plant that was constructed belongs to the Caspian Fish Company located in Baku. This plant has the capacity to process 300 tonnes of fresh material per day into a wide variety of products; for example, canned caviar, fresh fish, frozen fish, smoked fish and crayfish. However, as a result of poor catches, the low quantity of raw material supplied to processing plants means production is below maximum output. The sphere has great potential for development. Production takes place on a simple processing line, which continues with further packing, smoking, filleting, etc. The majority of processing companies do not produce canned fish to the standards required by European markets. The only company engaged in the correct kind of processing is the Caspian Fish Company.

The main species of interest to the processing industry are diadromous fish or semi-anadromous fish, such as sturgeon, kutum, bream, shemaya, roach, asp, sander and sprat. However, the fish species being used in aquaculture are not of interest to the processing industry. Details of the fish products processed by the private company Caspian Fish Company are given in Table 25.

TABLE 25

Range, price and volume of fish products processed by Caspian Fish Co., 2009

Products	Price	Annual production
	(US$/kg)	
Beluga, fresh frozen (FF), carton packed of 15 kg	27.50	15 tonnes
Sturgeon, FF, cut and packed	17.50	18 tonnes
Sturgeon, FF, packed for shashlik	19.00	12 tonnes
Salmon, FF, cut and packed	12.00	21 tonnes
Hake, headless, FF packed	5.00	55 tonnes
Shemaya, FF, gilled, packed	3.75	5 tonnes
Kutum, FF, gilled, packed	5.625	700 kg
Rainbow trout, FF, gilled, packed	15.00	14 tonnes
Hake, FF, skinless, packed	5.625	11 tonnes
Sprat, FF, packed	1.375	6 tonnes
Catfish, FF, filleted, packed	4.375	35 tonnes
Beluga, cold smoking (CS) packed	43.75	250 kg
Sturgeon, hot smoking (HS)	50.00	390 kg
Sturgeon, filleted, FF, packed	50.00	150 kg
Kutum, CS, gilled, packed	7.875	1 600 kg
Kutum, CS, gilled, packed, 15 kg	7.875	38 tonnes
Asp, CS, gilled, packed, 15 kg	8.00	80 tonnes
Bream, CS, in carton packaging of 15 kg	5.25	195 tonnes
Sprat, CS, in carton packaging	2.50	8 tonnes
Sprat, CS	1.375	8 tonnes
Rainbow trout, FF, packed	12.50	70 kg
Rainbow trout, cut, packed	15.625	570 kg
Shamai, CS in vacuum packaging	3.875	350 kg
Shamai, CS in carton packaging	3.25	30 tonnes
Shamai, CS, gutted	3.875	15 tonnes
Shamai, CS, headless in vacuum packaging	5.625	250 kg
Shamai, dried	3.875	250 kg
Salmon, CS in plastic packaging	31.25	1120 kg
Mackerel, CS, headless in carton packaging	5.75	80 tonnes
Mackerel, CS, headless in vacuum packaging	6.25	50 tonnes
Zander, fillet FF in carton packaging of 5 kg	5.75	70 tonnes
Zander, FF headless in carton packaging of 5 kg	4.625	20 tonnes
Atlantic herring, CS in carton packaging of 5 kg	3.75	40 tonnes
Atlantic herring, C/S in vacuum packaging of 5 kg	4.125	75 tonnes
Caspian herring, CS in carton packaging of 5 kg	4.375	25 tonnes
Hake, FF in carton packaging of 5 kg	5.00	60 tonnes
Beluga, large-piece assortment, 1/280 g jar	8.125	1 300 items
Beluga, small-piece assortment, 1/280 g jar	5.00	700 items
Salmon, large-piece assortment, 1/280 g jar	8.125	1 670 items
Salmon, small-piece assortment, 1/280 g jar	5.00	195 items
Caspian herring, assortment, 1/280 g jar	2.25	2 270 items
Herring, assortment, 1/280 g jar	2.25	2 865 items
Salmon, salted, in oil, 1/250 g jar	5.75	590 items
Sprat, salted, in oil, 1/350 g jar	1.625	895 items
Sprat, in oil, 1/280 g jar	1.50	1 200 items
Sprat, with spices, in oil, 1/500 g jar	5.625	550 items
Rainbow trout, salted, in oil, 1/280 g jar	8.125	370 items
Rainbow trout, salted, finely chopped, 1/280 g jar	5.00	70 items
Mackerel salted, 1/300 g in plastic packaging	2.75	333 items
Herring salted, 1/300 g in plastic packaging	2.625	185 items
Shamai in tomato sauce, 1/280 g	1.50	250 items
Beluga, in tomato sauce, 1/280 g	6.125	300 items
Mackerel in tomato sauce, 1/280 g	1.625	260 items
Rainbow trout in oil, 1/300 g	7.50	342 items
Rainbow trout, salted, in oil, 1/250 g	6.875	176 items

Note: FF = fresh frozen; CS = cold smoking; HS = hot smoking.

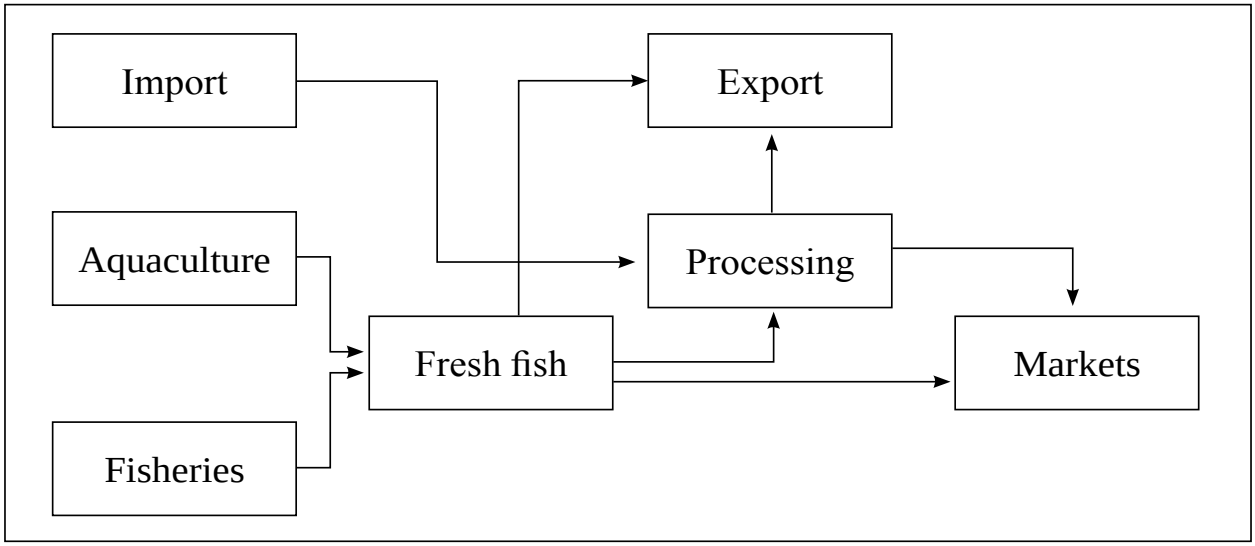
Source: Caspian Fish Co., Azerbaijan (unpublished data).

DISTRIBUTION AND MARKETING OF FISH AND FISH PRODUCTS

The distribution of fish and fish products is done in two main ways: (i) fish and fish products are sold by the fishers themselves in the local markets; and (ii) fish are bought by processing companies direct from fishers. The sales chain is illustrated in Figure 2.

FIGURE 2

Distribution of fish and fish products



After the fish has been processed into a wide range of products (fresh or frozen fillets, canned caviar, smoked or dried meat, etc.), the products are sold to wholesale markets. In turn, local supermarkets, restaurants and markets buy the products from the wholesale markets. Because fish production is currently at a very low level in Azerbaijan, the supply of fish to markets and processing companies is seasonal. The processing and wholesale companies are privately owned and, therefore, it is difficult to obtain production data.

There are no specific markets for the sale of fish or fish products in Azerbaijan. However, in public markets and supermarkets, sections are reserved for the sale of fish.

The demand for fish and fish products in Azerbaijan is primarily met by national production. However, to provide a greater diversity of products, an estimated 15 percent of the total supply of fish and fish products is imported from other countries (the Baltic States, Kazakhstan and the Russian Federation). These imports are usually in the form of processed fish and fish products and rarely in the form of live or fresh fish.

A distribution network of fish and fish products had been developed in the Soviet period, but with the dissolution of the Soviet Union, the storage chain and all distribution chains were completely reorganized. Stores oriented to the sale of fish and fish products began to sell other products. Since independence, the only company to have formed a distribution chain covering more than the capital is the Caspian Fish Company. Other companies, such as Okean, M.C. and Volna, also maintain some stores outside the capital.

The equipment used in the distribution of meat, meat products, milk and dairy products is also used in fish and fish product distribution. Good-quality refrigeration and stainless steel equipment are needed to meet hygiene standards. The shipment of caught fish is done by refrigerated road transport. The products of aquaculture, often cyprinids, are also transported by road with an oxygen supply.

As there are no official data, it is very difficult to calculate the number of people working in the sales of fish and fish products.

FISH TRADE

Azerbaijan exports several kinds of processed fish and fish products, including sturgeon caviar, fish meal and various forms of processed sprat (*Clupeonella cultriventris*), in canned, frozen and smoked form. Sturgeon products are mainly exported to Canada, Germany and the United States of America, while kilka products are mainly exported to Georgia and the Russian Federation. Imported fish and fish products come mainly from the Baltic States, Kazakhstan and the Russian Federation. Table 26 provides an overview of import and export data (value and volume) from 2003 to 2009.

On average, 100 tonnes of live fish is traded annually within Azerbaijan. The most common species in the live fish trade are common carp, silver carp, big head carp and grass carp. Live fish is usually traded on public markets in both rural and urban areas for a price that averages around US$7/kg (Table 27).

The whole production chain from either capture fishery or aquaculture farm to processed product is monitored by veterinary surgeons, public health agencies and other services in such a way that quality guarantees can be given on all fish and fish products.

TABLE 26
Import and export of fish and fish products, 2004–2009

	2004		2005		2006		2007		2008		2009	
	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export
Fish												
Tonnes	4 364.8	2 277.1	4 842.6	3 033.0	4 124.4	538.0	4 167.1	851.1	6 075.4	514.4	6 912.2	489.8
US$1 000	1 386.7	300.0	1 788.1	561.5	1 430.0	292.0	1 965.3	816.3	3 831.6	361.6	4 322.1	294.8
Canned fish products												
Tonnes	1 463.5	8.8	3 394.4	10.9	4 796.4	0.3	5 904.9	3.9	7 400.8	2.0	6 937.8	2.9
US$1 000	1 524.7	4 254.5	4 233.1	6 656.2	2 829.7	365.8	6 101.2	5 027.1	10 189.5	5 238.6	10 208.6	5 658.8

Source: State Statistical Committee of the Republic of Azerbaijan (2011).

TABLE 27
Estimated average market prices of fish products

Fish product	Estimated average price
	(US$/kg)
Fresh sturgeon meat	30
Smoked sturgeon meat	50
Live fish	7
Fresh and fresh-frozen fish	4
Large fresh fish	7
Small fresh fish	3.5
Smoked fish	7
Canned fish	1.2–3.0
Fish flour	3.5–4.1
Salted fish	4.8–6.0
Sturgeon caviar	1 000–1 200

FISH DEMAND AND CONSUMPTION

In recent years, average annual fish consumption in Azerbaijan has been less than 1 kg per capita. This is far below the global average for per capita fish consumption, which was about 17 kg in 2010 (FAO, 2010).

In Azerbaijan, most fish is consumed in the cooler months of the year in restaurants during holidays and celebrations. During the summer season, fish consumption is at its lowest point. Fish is mainly eaten fried, boiled, salted or smoked. During Novruz Bayram (the lunar New Year celebration), a traditional meal of kutum (*Rutilus frisii*), stuffed with nuts, raisins and spices and served with rice, is prepared.

In the coastal regions of the Caspian and in the regions adjacent to the main inland waters, fish and fish products represent a large part of the population's diet. The situation is not the same for the rest of the country. However, unofficial observations in the past three years have shown a change in the dietary priorities of the inland population, as these regions have begun to consume more fish and fish products.

The preference for species is mostly based on market supply and availability during the year. About 15 percent of the supply of fish or fish products in Azerbaijan is imported and includes species such as Russian Far East pink salmon (*Oncorhynchus gorbuscha*) and sockeye salmon (*O. nerka*), mackerel (*Scomber scombrus*), cod (*Gadus morhua*) and sea bass (*Dicentrarchus labrax*). Although the diversity of fish species in major urban centres and inland markets is dependent on availability at wholesale markets, the cities and villages located on the Caspian coast and in close proximity to large inland waters have a wider range of fish to choose from.

Fish consumption is very low in Azerbaijan and, although the demand for fish is much higher than current consumption, limited supply and high prices prevent an increase in consumption. The species (silver carp and grass carp) produced from the few commercial aquaculture farms are in such demand that there is too little production to supply markets and supermarkets; only restaurants receive farmed fish. More species, such as trout, snakehead and pike-perch, are highly valued in Azerbaijan, and aquaculture production of these species would result in good market prospects. However, without laws and development strategies, the aquaculture sector in Azerbaijan is struggling to develop.

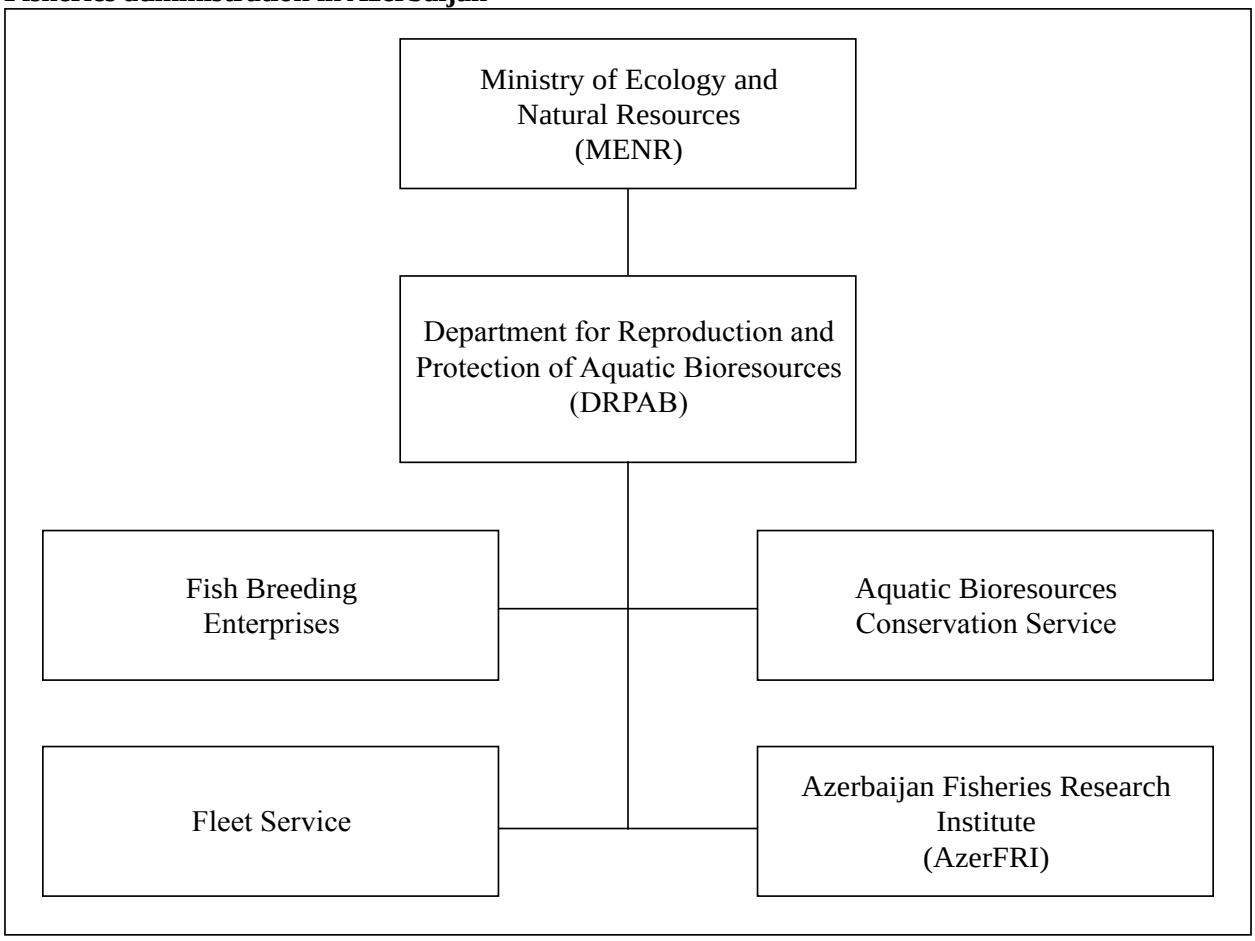
5 Governance and institutional frameworks

FISHERIES ADMINISTRATION

In Azerbaijan, the MENR is in charge of fisheries administration (Figure 3). As part of this ministry, the subordinate department – the DRPAB – carries out the administration tasks. Under this department is the Azerbaijan Fisheries Research Institute (AzerFRI). Together, these two entities advise the MENR and are responsible for estimating stocks, determining catch limits for inland waters, and awarding fishing licences that identify the section of the water where fishing is allowed, the season when fishing is allowed, and the catch limit for the licensed body of water.

The DRPAB houses four subdepartments: (i) Aquatic Bioresources Conservation Service; (ii) Fish Breeding Enterprises; (iii) Fleet Services; and (iv) AzerFRI (Figure 3). The financing of the DRPAB and all its subdepartments is provided by the MENR, which in turn is financed by the State Government. The annual budget of the DRPAB in 2007 was estimated at US$2.4 million and in 2008 at almost US$6 million. Activities, development and management decisions are made by the central organ. There are no decentralized local agencies.

FIGURE 3
Fisheries administration in Azerbaijan



Under the Aquatic Bioresources Conservation Service subdepartment, 11 state-managed hatcheries have been constructed to produce: sturgeon species (4 hatcheries), salmonid species (3 hatcheries) and cyprinid species (4 hatcheries). Fingerlings produced in these hatcheries are released into the Caspian Sea, the Araz and Kura Rivers and the larger inland waters where commercial fisheries take place.

The structure of the DRPAB was established from the remnants of the disbanded Azerbalyg State Concern (Chapter 2). This structural transformation occurred in 2001 within the framework of economic reforms in the country. By the Decree of the President of the Republic of Azerbaijan No. 811, dated 18 September 2001, the Azerbalyg State Concern was liquidated. One of the departments of the Azerbalyg State Concern that dealt with the reproduction and protection of fish resources and the adjustment of fishery, as well as the AzerFRI, was included in the newly created MENR. Table 28 provides detailed information about the staff of the DRPAB.

TABLE 28
Central staff composition of fisheries administration in Azerbaijan

	Position	**Department for Reproduction and Protection of Aquatic Bioresources**										**Quantity**
		Director	Deputy Director	Head of Section Station Head	Head Adviser Chief Adviser Adviser	Head Specialist/ Specialist	Head Inspector Chief Inspector Inspector	Captain Captain's Mate	Sailor	Mechanics Electric Turner welder	Fishery Worker, Shift Worker Cleaner	**Total**
Central Management	Governing body	**1**	1		1							**3**
	Aquatic Bioresources Reproduction Section			**1**	**4**							**5**
	Aquatic Bioresources Caught Regulation Section			**1**	**2**							**3**
	Financial Section			**1**	**2**							**3**
	Human Resources Section			**2**	**3**	**2**						**7**
Aquatic Bioresources Protection Service Staff	Governing body	**1**	**1**				**1**					**3**
	Absheron – Baku Region Section			**1**			**9**					**10**
	Salyan – Astara Region Section			**1**			**10**					**11**
	Sumqayit – Xachmaz Region Section			**1**			**5**					**6**
	Inland Waterbody Section			**1**			**7**					**8**
	Reproduction Section, Devechi Station					**1**					**2**	**3**
Marine Transport Service		**1**	**1**			**2**						**4**
Neftchala Base		**1**									**4**	**5**
	Repair Team									**4**		**4**
	"AMUR" Ship Team (20–59 km from potable water source 10 percent)							**2**	**2**	**3**		**7**
	NAUCHNIY" Ship Team (20–59 km from potable water source 10 percent)							**2**	**2**	**3**		**7**
	"YUQ" Ship Team (20–59 km from potable water source 10 percent)							**2**	**2**	**3**		**7**
	"TORNADO" Boat							**1**	**1**	**1**		**3**
	Mingachevir – Operational Station			**1**						**1**		**2**
	"QRADUSHIY" Boat (20–59 km from potable water source 10 percent)							**1**	**2**	**2**		**5**
	"QAMMA-015" (20–59 km from potable water source 10 percent)							**1**	**1**	**2**		**4**

FISHERIES TRAINING, RESEARCH AND EXTENSION

Scientific education in the field of fisheries and aquaculture in Azerbaijan is undertaken in the faculties of biology at two universities: Baku State University and Azerbaijan Pedagogical University. Students are educated on varying topics including hydrobiology and ichthyology. Professional education (non-scientific, focusing more on practical knowledge) is carried out by the Technical School of the Fish Industry. The main specialisms taught in the framework of the fishery faculty programme are ichthyology, fishing techniques and fish processing.

Under the umbrella of the DRPAB, AzerFRI, with the Institute of Zoology and Physiology, conducts research on fish stocks and catch limits. AzerFRI, which was established in 1912, conducts research in three fundamental areas: (i) stock estimation and distribution and the projections for major commercially valuable fish species; (ii) artificial reproduction and commercial aquaculture techniques; and (iii) natural food supplies and fish nutrition. AzerFRI performs annual trawling research in the Caspian Sea to collect material and information on ichthyofauna, food supply, the dietary composition of caught fish species, hydrochemistry (nitrogen and phosphorus levels, pH, organic load, etc.) and hydrology (information at several depth intervals on water temperature, salinity, oxygen levels and water transparency). These trawl studies also serve to collect information on the abundance and distribution of jellyfish (*Mnemiopsis leidyi*), which is an invasive species. The aim of these trawling expeditions is to obtain insight into the population size and distribution of the sturgeon species and other commercially valuable species in the Azerbaijani part of the Caspian Sea.

The state programme of Azerbaijan on the use of aquatic bioresources in the Caspian Sea and inland waters is based on restoration, conservation and the rational use of the available bioresources. To keep research up to date, the methodologies and equipment used are as modern as possible. In 2007, the MENR opened a graduate school in Baku. This new education centre aims to introduce the newest techniques and offer education at the highest level. Investment in, and maintenance of, the graduate school is state-funded.

In addition to national research, Azerbaijan is also involved in international research. In collaboration with the other four littoral states of the Caspian Sea, scientific research is carried out by the Commission on Aquatic Bioresources of the Caspian Sea. Although this commission also promotes research into other commercially valuable fish species, its main focus is on sturgeon fisheries and their conservation.

FISHERIES STATISTICS

Statistical data on fisheries and aquaculture performance are provided to the DRPAB by the relevant subdepartments. Based on an analysis of these data, the DRPAB and MENR make management decisions for the entire fisheries and aquaculture sector. These decisions include quota allocations, restocking activities and licence approvals.

Despite the setting up of a uniform organization across the whole sector, a dramatic improvement could be made by standardizing data collection and analysis. It is still very difficult to collect information from the private sector because of the non-transparency in sharing data on production, employment, working conditions and import/export rates, etc. As a result of a lack of uniform data collection methods, data on capture fisheries and aquaculture production are often biased and their release delayed.

UNIONS, COOPERATIVES, ASSOCIATIONS AND OTHER FISHERIES-LINKED INSTITUTIONS

As fisheries are currently operating at low levels and there is very little aquaculture in Azerbaijan, there are no unions, cooperatives or associations that employees in the sector can join. As a result of the lack of unions, employees cannot lobby for better development, priorities or social security.

At present, there are no bilateral financial donors or non-governmental organizations operating in the fisheries and aquaculture sector in Azerbaijan.

INTERNATIONAL COOPERATION IN FISHERIES DEVELOPMENT AND MANAGEMENT

Under the Caspian Environment Programme, Azerbaijan is cooperating with regional and international organizations, such as FAO. Since the implementation of the Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention), Azerbaijan has started, together with the other littoral Caspian Sea States, to develop, under the Caspian Sea Programme, cooperation in the field of fisheries in the context of conservation of aquatic resources. This programme is supported by the Global Environment Facility (GEF).

Azerbaijan is a signatory of 12 international conventions. Two of these relate to aquatic bioresources: CITES and the Convention on Biological Diversity.

FISHERIES AND AQUACULTURE POLICIES AND PLANNING

Since 1992, Azerbaijan has been a member of the Commission on Aquatic Bioresources of the Caspian Sea. This commission aims to identify fish stocks and create consistency between the littoral States of the Caspian Sea with regard to total catch limits. Within the framework of this commission, an action plan has been implemented to fulfil successfully the targets for joint management, conservation and the sustainable use of marine biological resources.

The main aims for the sustainable development of the fisheries sector in Azerbaijan in the long term are:

- improvement of the system of management of aquatic biological resources;
- regulation of fisheries activities and the creation of conditions for the supply of fish products to the population of Azerbaijan;
- organization and development of rational coastal fisheries, and freshwater and marine aquaculture;
- improvement of the system of conservation and preservation of aquatic biological resources;
- improvement of the scientific field of research and the educational system.

LEGAL REGULATORY FRAMEWORKS FOR FISHERIES

The current Law on Fisheries of the Republic of Azerbaijan only includes provisions for fisheries and does not have legal descriptions of, or legislative regulations for, aquaculture.

The Law on Fisheries (1998) defines the legal basis, organization and management of fisheries and the reproduction and conservation of fish stocks and regulates the use of biological resources. The law includes chapters on:

- the duties of the State in the fisheries industry;
- the use of fish stocks;
- reproduction, restoration and conservation of fish stocks;
- protecting the habitat of fish stocks;
- the regulation of the economy of fisheries;
- international cooperation.

Under the different chapters, the law also includes descriptions of:

- permissible limits of the negative impact on fish-farming reservoirs;
- protection of fisheries facilities from radioactive contamination;
- maximum permissible concentrations of harmful substances in waters of fish-breeding ponds;
- types and extent of payment for the use of water bioresources and rules for applying them, as well as fines for illegal fishing;
- rules of payment for the use of biological resources for legal and natural persons;
- rules of fishing and conservation of fish stocks – the place and timing of fishing, fishing gear and practices, and measurement of fish.

Penalties and punishments for violations of these topics are based on the Criminal Code of the Republic of Azerbaijan and the Code of the Republic of Azerbaijan for Administrative Violations. Within these Codes, the MENR has made several specific additions to make the codes further applicable to fisheries. In the fight against violations in the fisheries sector, the Legislation Department works in close cooperation with law enforcement and the Customs Department.

There are many laws and regulatory acts in Azerbaijan in which the issues of fisheries have been mentioned. The following is a list of laws and rules adopted by the Government in recent years:

- The Water Code of Azerbaijan Republic, No. 418-IQ, Baku, 26 December 1997.
- Law of Azerbaijan Republic on Subsurface, Baku, 13 February 1998, No. 439-Iг.
- Law of Azerbaijan Republic on Fishing, Baku, 27 March 1998, No. 457-Iq.
- Law of Azerbaijan Republic on Hydro-Meteorology, Baku, 17 April 1998, No. 485-Iг.
- Decree of the President of Azerbaijan Republic on the Application of the Law of Azerbaijan Republic on Hydro-Meteorological Activity, No. 701, Baku, 27 April 1998.
- Law of Azerbaijan Republic on Industrial and Utility Wastes, Baku, 30 June 1998, No. 514-Iг.
- Resolution of the Cabinet of Ministers of Azerbaijan Republic on the Approval of Procedures for Implementation of State Control over the Use and Protection of Water Facilities, No. 195, Baku, 25 September 1998.
- Resolution of the Cabinet of Ministers on the Procedure for Granting Woodland Fund Lands on Lease, No. 214, Baku, 17 October 1998.
- Law of Azerbaijan Republic on the State Land Cadastre, Monitoring of Lands and Land Structuring, Baku, 22 December 1998, No. 593-Iг.
- Decree of the President of Azerbaijan Republic Ensuring the Execution of the Law of Azerbaijan Republic on Hydro-Meteorological Activity, No. 103, Baku, 13 February 1999.
- Decree of the President of Azerbaijan Republic on Application of the Law of Azerbaijan Law of Azerbaijan Republic on Fauna, Baku, 4 June 1999, No. 675-IQ.
- Law of Azerbaijan Republic on Ecological Safety, Baku, 8 June 1999, No. 677-Iг.
- Law of Azerbaijan Republic on the Protection of the Environment, Baku, 8 June 1999, No. 678-IQ.

- Republic on Fauna, No. 186, Baku, 30 August 1999.
- Law of Azerbaijan Republic on Water Supply and Wastewater, No. 723-IQ. Baku, 28 October 1999.
- Law of Azerbaijan Republic on the Fertility of Land, Baku, 30 December 1999, No. 788-IQ.
- The Cabinet of Ministers of Azerbaijan Republic on Certain Normative-Legal Acts Related to the Land Code of Azerbaijan Republic, Resolution No. 42, Baku, 15 March 2000.
- The Cabinet of Ministers of Azerbaijan Republic. Resolution No. 56, on the Determination of Water Protection Zones, Sizes of Shore Protection Lines, Boundaries and Use of Water Protection Zones, Baku, 24 March 2000.
- Law of Azerbaijan Republic on Specially Protected Natural Territories and Objects, No. 840-IQ, Baku, 24 March 2000.
- The Cabinet of Ministers of Azerbaijan Republic. Resolution No. 77, on the Approval of the Rules of Referral of Specially Protected Water Objects to Individual Categories, Baku, 1 May 2000.
- The Cabinet of Ministers of Azerbaijan Republic on some Normative-Legal Acts Related to the Forest Economy, Resolution No. 45, Baku, 15 March 2001.
- Law of Azerbaijan Republic on the Protection of Atmospheric Air, No. 109-IIQ, Baku, 27 March 2001.
- General Regulations on State Environmental and Biosphere Preserves in Azerbaijan Republic, Approved by Decree of the President of Azerbaijan Republic No. 531, 4 July 2001.

A draft of a "Law on Aquaculture" is currently being prepared by the Government and is likely to be adopted in 2013. Without a law that focuses on aquaculture, very little investment and development can be carried out by existing aquaculture farms and non-governmental organizations. This limits the development of the small aquaculture sector despite its large growth prospects.

FISHERIES MANAGEMENT

Because of the poor legal basis for fisheries and aquaculture in Azerbaijan, a state programme with regard to fisheries development and/or aquaculture has not yet been adopted. Some important features of development of these issues have been outlined in different state programmes approved in the country in recent years. The State Programme to Ensure Food Security 2008–2015 includes objectives for aquaculture (Table 29). The programme was approved by a Decree by the President of Azerbaijan on 25 August 2008.

TABLE 29
Fisheries- and aquaculture-related objectives in State Programme to Ensure Food Security 2008–2015

Item	Main objectives	Responsible state-governing body	Year
5.3.14	Lake aquaculture development	Ministry of Ecology and Natural Resources, Ministry of Agriculture	2008–2015
5.3.15	Cyprinidae soil pond aquaculture development	Ministry of Ecology and Natural Resources	2009–2015
5.3.16	Rainbow trout cage culture development	Ministry of Ecology and Natural Resources	2009–2015

In addition, some features of the development of fishery and aquaculture were determined in the State Programme on Poverty Reduction and Sustainable Development 2008–2015 of the MENR (Table 30).

TABLE 30
Action Plan of the Ministry of Ecology and Natural Resources

Item	Main objectives	Responsible state-governing body	Year
3.3.4.1	Assure sustainable increase of aquatic resources	Ministry of Ecology and Natural Resources	2008–2010
3.3.4.1.1	Create and realize a workplan to ensure integrated research, monitoring and sustainable development of aquatic biological resources, Caspian Sea included	Ministry of Ecology and Natural Resources; Academy of Sciences	2008–2010
3.3.4.1.2	Increase production capacity of enterprises involved in support of aquatic bioresources reproduction	Ministry of Ecology and Natural Resources	2008–2010

By Order of the President of the Republic of Azerbaijan No. 3043, dated 15 September 2008, the State Programme on Poverty Reduction and Sustainable Development 2008–2015 was adopted.

The third document where the problems of the development of fisheries and aquaculture and their solutions are considered is the National Program on Environmentally Sustainable Socio-economic Development, adopted in 2003. Section 4.5 of the document sets out the goals for fishery and aquaculture development (Azerbaijan Republic, 2003):

"Section 4.5. Fish resources:

Azerbaijan Republic has significant potential for development of fisheries. This includes both increasing and use of valuable fish resources and artificial fish breeding in the Caspian Sea (mariculture). There are favourable natural conditions and human resources to develop both areas. The main issue is protection and recovery of fish resources in the Caspian and internal water resources and increasing industrial biological resources.

Protection and increasing sturgeon population is of primary importance for resolution of the problem. This valuable fish species is mainly concentrated in the Caspian Sea. Therefore, international cooperation is important in this area. This cooperation would help protect fish resources and improve fish ecosystems. Another objective is to develop mariculture, which is new for the country.

To achieve these objectives it is important to ensure management of sturgeon resources on the basis of sustainable development principles.

This requires:

- *to assess sturgeon resources in the Caspian;*
- *management of fish breeding;*
- *international cooperation for improving fish resources and use of these resources;*
- *increasing and breeding of fish resources in internal water resources;*
- *expansion of the artificial fish breeding in the Caspian Sea."*

The Commission on Aquatic Bioresources of the Caspian Sea sets the catch quotas for the different fish species. On the basis of the evaluation of the resources of different basins made by AzerFRI, the DRPAB issues fishing quotas. Under the DRPAB, the Protection of Water Resources Service ensures that quotas are not exceeded and controls illegal or unregistered fishing. Such controls are provided by the Water Police of the Republic.

Monitoring of buoys used for fishing and other purposes is carried out by the relevant service of the Ministry of Emergency Situations.

6 Social and economic aspects of fisheries and aquaculture

FISHERIES AND AQUACULTURE EMPLOYMENT

As a result of decreasing catches in the past 15–20 years, employment in the sector has shrunk to between one-third and one-quarter of its former size. In 2008, the employment figures were somewhere between 2 200 and 2 400 (Table 31). These numbers do not include employees in the processing industry. Because the processing sector is privately owned, employment numbers are difficult to collect. The decline in the number of employees in the fisheries sector in rural areas, especially in those areas located along the sea and in inland waters, poses serious problems for their income and food security as these areas often rely on fishing.

TABLE 31
Estimated employment figures in fisheries and aquaculture in Azerbaijan

	1990	1995	2000	2005	2008
Marine fisheries	1 100	850	1 000	1 200	1 400
Inland fisheries	170	184	207	222	250
Aquaculture	412	412	413	442	467
Processing and marketing	–	–	–	–	–
Research	37	37	37	37	37
Government/management	20	20	20	56	56

SOCIAL SECURITY OF FISHERS, FISH FARMERS AND OTHER WORKERS IN THE SECTOR

The social security and welfare of employees working in state hatcheries is dependent on the overall condition of the national economy. Because state hatcheries are not considered a high-priority business, restrictions on social security of the employees of state hatcheries are quickly made when the economy experiences a downturn. However, these employees come within the protection of the general pension system or system of social insurance.

In private companies (commercial aquaculture and processing companies), the social security of workers is closely related to the financial well-being of the company. However, no separate insurance programme for workers in the fishery sector exists.

The formation date of the State Social Protection Fund (SSPF) of Azerbaijan is directly connected to the economic relations in the country, as well as to the dynamics of the fundamental changes in the social insurance and provision of pension.

In the period of the Soviet Union, the social insurance and pension issues in Azerbaijan developed not in the framework of the legislation of an independent republic but in the framework of the all-union legislation.

By the Law of Azerbaijan Republic “On Supplements and Amendments to Some Articles of the Law of Azerbaijan Republic”, dated 31 December 1991, and “On the Normative Allocations for the Social Insurance and Employment Fund”, dated 1 June 1992, the social insurance allocations were defined as constituting 40 percent of the gross payroll. Of this amount, 85 percent was directed to the Pension Fund of the Republic and 15 percent to the Social Insurance Fund.

With the aim of improving administration in the area of financing the provision of pensions and social insurance, by the Decree of the President of Azerbaijan Republic dated 30 September 1992 “On the Establishment of the State Social Protection Fund of Azerbaijan Republic” on the basis of the Pension Fund of Azerbaijan Republic and the Social Insurance Fund of Azerbaijan Republic, the SSPF was established. Having an independent finance–bank system, the SSPF was commissioned with the financing of pensions, benefit and payment expenses as its fundamental duty.

In 1997, in connection with effectiveness of the Law of Azerbaijan Republic "On Social Insurance", the activities of the SSPF were further expanded as those of the body carrying out state administration in the area of mandatory state social insurance.

The measures taken in the period 2001–05, with the aim of fulfilling "The Concept of Pension Reform in Azerbaijan Republic", approved by the Order of the President of Azerbaijan Republic dated 17 July 2001, intended for the complete formation of the social insurance and provision of pension issues in the country according to European standards, conditioned the qualitative reconstruction of the activities of the SSPF.

Since 27 November 2001, in connection with the effectiveness of the Law of Azerbaijan Republic "On Individual Accounts in the System of the State Social Insurance", the SSPF has been operating as the central executive body carrying out individual accounting in the state social insurance system.

For the purpose of fulfilling the provisions of the concept, by the Decree of the President of Azerbaijan Republic No. 908, dated 4 August 2003, "On Measures for Improving the State Pension System in Azerbaijan Republic", the functions of the Ministry of Labour and Social Protection of the Population of Azerbaijan Republic on granting, financing and control over payments of pensions and supplemental benefits were passed to the SSPF, which carried out administration in the area of individual accounting and mandatory state social insurance. In this way, the functioning of the new insurance–pension body provided for under the reform concept was organized.

In connection with establishment of a single insurance pension system in the country, on the basis of Decrees No. 498 and No. 499, dated 22 December 2006, and signed by the President of Azerbaijan Republic, military personnel and persons with special ranks became covered by the mandatory social insurance and provided with labour pensions through the SSPF. Based on this, a number of changes were made in the statute of the SSPF. The preparation of proposals on the directions of the state policy in the area of labour pensions and the realization of this policy were included into the main duties of the SSPF: "Administration of the pension system in the country will be assembled in the newly created executive body. This body will be conducting operations on the collection of the pension contributions, development and introduction of the individual accounts system, control over the granting and payment of pensions, collection of the detailed statistical information about changes in the levels of income and pension expenditure".

ECONOMICS OF FISHERIES AND AQUACULTURE

As commercial fisheries and aquaculture companies in Azerbaijan are part of the private sector, figures regarding their economic health are very difficult to obtain. Therefore, no direct figures on this topic can be given here. However, to provide some insight into investment, incomes, profits and trends in the sector, Table 32 has been constructed. As the table shows, fisheries and the associated processing sector have low income and profits, and it thus confirms that fisheries is a declining industry.

TABLE 32
Investment, incomes, profits and trends in the fisheries and aquaculture sector

Activity	Sturgeon culture	Carp culture	Inland capture fisheries	Marine capture fisheries	Fish processing and marketing
Initial investment	Medium	Medium	Low	Low	Low
Operational costs (per year)	Medium	Medium	Low	Low	Low
Gross income (per year)	*	*	Low	Low	Low
Net profits (per year)	*	*	Low	Low	Low
Trend in net profits compared with 2000	*	*	Reducing	Reducing	Reducing

* Because sturgeon and carp hatcheries are state-owned, income and production are state-regulated. There is no commercial aim for these hatcheries. Therefore, no information on income, profits and trends can be given for these categories.

CREDIT AND INVESTMENT IN FISHERIES AND AQUACULTURE

In Azerbaijan, numerous financial institutions are active in carrying out state policies in the area of lending, subsidizing and investing in various economic sectors, including fisheries (Table 33).

Financial institutions, among others provide loans aimed at the implementation of business projects. They offer the following services as part of their operations and lending: (i) financing for small- and medium-sized businesses (with an annual turnover of at least AZN1 million); (ii) overdrafts; (iii) bank guarantees; (iv) letters of credit; and (v) factoring.

Loan terms (duration, amount and interest rates) are determined in accordance with the presentation of a business plan and financing intentions.

TABLE 33
Financial institutions undertaking financing activities in Azerbaijan

Financial institution	Bank interest rate	Currency	Amount	Credit duration
	(%)			(months)
Rabitabank	4	AZN	1 000 000–5 000 000	12–84
Bank Silk Way (large credit)	22	AZN	500 000–1 000 000	3–48
Parabank (large credit)	18	US$, AZN	100 000	6–36
Zaminbank (large credit)	26	AZN	100 000–1 000 000	6–60
Nikioil Bank	23	EUR, US$, AZN	50 000–100 000	12–60
United Credit Bank (macrocredit, investment)	18	AZN	50 000	1–48
Amrahbank (business credit)	22	US$, AZN	25 000–1 000 000	264–336
Parabank (business credit)	18	US$, AZN	20 000–100 000	6–36
Kapital Bank (business credit)	20	US$, AZN	20 000–1 000 000	12–24
NBC Bank (large credit)	22	AZN	10 000–100 000	12–36
Nikoil Bank (European Bank for Reconstruction and Development support programme)	22	US$	10 000–100 000	12–24
MuganBank (small credit)	22	US$	10 000–100 000	2–36
Nikoil Bank	6	AZN	10 000–500 000	12–84

THE ROLE OF FISHERIES AND AQUACULTURE IN FOOD SECURITY AND POVERTY ALLEVIATION

At the beginning of 2011, poverty in Azerbaijan affected 9.1 percent of the population. The agriculture sector provides jobs for 39.3 percent of the population, while it accounts for just 10 percent of the country's gross domestic product. There are local areas where fisheries are important for the rural economy and the livelihoods of rural communities. Fisher families can be found along the Caspian Sea coast, in the area surrounding the Kura River Delta where the Araz and Kura Rivers meet, and on the shores of the two largest reservoirs (Mingachevir and Shamkir). In addition to commercial fishers, there are also an estimated 20 000 recreational fishers. It is difficult to distinguish between the recreational fishers who fish for pure recreation and those who also keep their catches to support their households. Recreational fishing mainly takes place in the same places as commercial fishing, but also on smaller bodies of water that are not suited for commercial fishing. Although official numbers for employees in the processing industry do not exist, it is estimated that this part of the fisheries sector also supplies work to several thousand people. Jobs in this part of the sector are mainly located in Baku, Neftchala and Lenkoran.

On the national level, the importance of fisheries as a sector that contributes to national food security and poverty reduction is low. One reason for this is the diminishing fish stocks (especially sturgeon) in the Caspian Sea caused by overfishing, habitat destruction and pollution, among other factors. On the other hand, commercial aquaculture practices have only started to develop in the last two to three years. In addition to providing food, they also provide direct work at the farms and processing plants and indirect work for salespeople. There is a direct need for farm and processing employees in rural areas. The Government should give full support (financial and practical) to setting up aquaculture companies and thereby helping to create a healthy aquaculture sector.

The role of the fisheries sector in the further reduction of rural poverty will, to a large extent, depend on the country's ability to attract investment from domestic and foreign sources. This will mainly depend on whether a stable political and economic environment can be provided.

7 Sectoral diagnosis

Chapter 3 describes the status of fisheries and aquaculture in Azerbaijan without giving a detailed analysis of the situation. There are a number of constraints to overcome and issues to address if the fisheries sector is to develop in an environmentally and socio-economically responsible and sustainable manner.

Various methods can be used to diagnose the current situation. One of the most widely used methods to analyse a situation, create understanding and assist future decision-making processes in a simple manner is the strengths, weaknesses, opportunities and threats (SWOT) analysis. This method has the advantage that it addresses both internal and external factors that support or constrain development. The analysis of the internal and external sectoral environment provides useful information for the preparation of a strategic plan for the development of the fisheries and aquaculture sector in Azerbaijan. The following SWOT analysis assesses the current situation in terms of its natural, human, financial and educational resources.

STRENGTHS

- The part of the Caspian Sea coastal zone under the authority of Azerbaijan is a productive area of the sea.
- Devechi Port and Qizilagac Gulf are of great importance for many commercial fish species.
- The Kura River, which has maintained its value in terms of being a freshwater source, provides a habitat for many fish species, as well as a preserved natural spawning area for sturgeon.
- The availability of inland fish producing ponds, fish hatcheries for artificial breeding (of sturgeon, salmonids and cyprinids) and the scientific capacity available in fisheries.
- Capture fisheries is the basis for the development of many coastal areas of the country and includes a wide range of activities, ranging from assessing the resources to trading of fish and fisheries products in the domestic and export markets.
- The fisheries sector encompasses more than 60 enterprises of different forms of ownership.
- In the national economy, the fisheries sector plays an important role as a supplier of food, fodder (fish flour and oil, fish fodder for livestock, agar-agar, various biological active substances, etc.) and technical products.
- Fisheries companies are important in terms of generating employment for the population, particularly in many coastal areas where fishing is the main source of livelihood for people.

WEAKNESSES

- The destruction and disintegration of the previously functioning fisheries management system, consisting of a single authority, and at the same time, the relatively slow emergence of a new management and organizational structure in the fisheries sector.
- The distribution of responsibilities with regard to fisheries sector management and development functions causes the sector to be largely ignored by the institutions involved.
- The lack of a legal and policy framework for aquaculture development and management in the country.
- The general lack of an integrated approach in fisheries management.
- The sharp decline in stocks of aquatic bioresources, particularly valuable species (primarily sturgeon) in the Caspian Sea but also inland waterbodies of Azerbaijan, which has outstripped efforts by the Government to conserve and rehabilitate the aquatic bioresources.

- A significant discrepancy between the stocks of individual species of aquatic biological resources and fishing fleet capacity – the latter being too large for many fish species – which causes a structural imbalance in the sectoral struggle for sustainability.

- The lack of an effective system of market regulations for fish and fisheries products, which enables economically non-viable enterprises to be established and to survive.

- The weakening role of the Azerbaijan fisheries industry at the international level, as it is not able to cope with the increasing competition in the world market for fisheries products.

- The generally old, outdated and badly maintained fisheries infrastructure (a consequence of the lack of funds after independence) shows slow progress in terms of financing of modernization and renovation activities.

- Export orientation on raw, unprocessed or limited processed fish and fishery products. The value addition takes place abroad.

- The efforts to develop freshwater aquaculture and marine aquaculture do not match the available potential of the country.

- The weakening control over the quality of fish in all stages of the supply chain causes health risks. Fish safety and quality concerns are valid.

OPPORTUNITIES

- Continuation of restoring the Kura River Delta to improve the migratory routes of spawning fish towards the upstream parts of the river.

- Restoring the natural spawning areas of sturgeon, including rehabilitation and reclamation of spawning areas in the Araz and Kura Rivers, to improve conditions for natural reproduction of sturgeon.

- Increasing participation in international, regional research programmes and activities to improve the ecological conditions of sensitive species of fish in the Caspian Sea with the participation of the United Nations Environment Programme, United Nations Development Programme, FAO, Technical Assistance to the Commonwealth of Independent States, GEF, World Bank and the Caspian Environmental Programme. Participation is important particularly in research projects that include fish habitat, monitoring of marine pollution, ecotoxicological status of fish, behaviour of invasive species, as well as the development and implementation of the principles of sustainable fisheries management.

- Coordinating activities for the conservation of stocks of fish species and to support the biodiversity of the Caspian basin within the Commission on Aquatic Bioresources of the Caspian Sea, as well as with other international organizations and conventions.

- Harmonization of stock assessment methodologies used and identification of fish stocks and the total allowable catch of aquatic bioresources (including sturgeon).

- Development of a uniform methodology for assessing stocks of sturgeon, kilka and other commercial fish species.

- Implementation of the action plan of the regional programme of the Caspian littoral States on joint management, conservation and sustainable use of marine biological resources (developed by the Commission on Aquatic Bioresources of the Caspian Sea).

- Reconstruction and rehabilitation of outdated and technically obsolete fishing enterprises for artificial breeding (hatcheries) and improvement of the biotechnical knowledge for artificial reproduction of sturgeon and Caspian salmon in support of the restocking programmes.

- Creating specially protected natural areas at spawning sites of the Araz and Kura Rivers and the Yalama-Nabran coast area to increase natural feed supply for young sturgeon.

- Improving schemes and methods used for spawner harvesting and applying reuse methodologies of spawners to reduce pressure on marine stocks.

- Increasing public awareness on the state of sturgeon stocks and the fisheries sector activities in general through making use of specialized non-governmental organizations, the local media, and creating brochure and information materials on “the life of sturgeon” for secondary schools.

- Strengthening the educational and training capacity in the fisheries sector by establishing a training institute for the sector.

THREATS

- Pollution by industrial (oil, chemicals and household waste) and agricultural waste (fertilizer runoff) of water resources (sea, rivers, reservoirs) used by the fisheries sector.

- Spread of invasive species. Currently, it is the jellyfish (ctenophore) species Mnemiopsis.

- Increasing IUU fishing practices. The unreported catch of sturgeon, salmon and other valuable commercial fish species is devastating fish stocks, undermining fisheries management, and seriously endangering future prospects for fishing activities and other uses of aquatic bioresources.

- An increasing human influence on sensitive water areas that provide habitats for aquatic bioresources (including marine, river and inland water areas).

- The possible negative impact of climate change and hydrological factors (fluctuation in sea level, temperature, clarity, eutrophication, etc.) on aquatic life.

References

Azerbaijan Republic. 2003. *National Program on Environmentally Sustainable Socio-economic Development* [online]. Baku. [Cited 6 December 2012]. www.unece.org/fileadmin/DAM/env/epr/experts/Azerbaijan/Other/National%20Programme%20On%20Environmentally%20Sustainable%20Socio-Economic%20Development.doc

FAO. 1995. *Code of Conduct for Responsible Fisheries*. Rome. 41 pp. (also available at ftp://ftp.fao.org/docrep/fao/005/v9878e/v9878e00.pdf).

FAO. 2008. AQUASTAT – FAO's information system on water and agriculture. In: *FAO Fisheries and Aquaculture Department* [online]. Rome. [Cited 6 December 2012]. www.fao.org/nr/aquastat

FAO. 2009. FishStat Plus – Universal software for fishery statistical time series. In: *FAO Fisheries and Aquaculture Department* [online]. Rome. [Cited 6 December 2012]. www.fao.org/fishery/statistics/software/fishstat/en

FAO. 2010. *The State of World Aquaculture and Fisheries 2010*. Rome. 197 pp. (also available at www.fao.org/docrep/013/i1820e/i1820e.pdf).

State Statistical Committee of the Republic of Azerbaijan. 2011. Fishery and aquaculture statistical information. In: *The State Statistical Committee of the Republic of Azerbaijan* [online]. [Cited 6 December 2012]. www.azstat.org/statinfo/agriculture/az/meshe/003_1.shtml

ISBN 978-92-5-107402-2 ISSN 2070-6065

9 789251 074022

I3113E/1/11.12