

Chapter 4 PROCESSING, MARKETING AND TRADING OF FISH AND FISH PRODUCTS

Fish processing

According to data from the Fisheries Committee, 49 enterprises in 2005 were involved in fish processing, and rose to 57 in 2006. Currently, fish processing and storage is completely controlled by the private sector (irrespective of geographical location).

Fish processing enterprises can be divided into two groups: (i) older enterprises that have “inherited” equipment from Soviet times through privatization (e.g. Atyraubalyk, Balkhashbalyk and Zaisanbalyk); and (ii) new enterprises that have started their activities since the middle of the 1990s and that principally focus on the processing of zander fillets; enterprises include Ulkenbalyk Ltd Co., Rybprom Ltd Co. and Karatalbalyk Ltd Co. These latter companies are noted for introducing new technologies in their operations – principally, skinning machines for removing the head and the filleting of zander – although the fillet at present is cut and packed manually.

The majority of fish processing plants are not HACCP or ISO certified, but developments in this area are being made under pressure of the export markets.

The Fisheries Committee suggests total investment in the fish processing sector amounted to US\$195 000 in 2006. However, as many companies have increased their capacity in recent years, and the cost of an Individual Quick Frozen (IQF) freezer is around US\$95 000, the real level of investment in the subsector is likely to be much higher, especially as private investment data are not included in the official statistics. All the equipment is imported from either China or the Russian Federation.

Actual processing capacity can be determined by the level of fish exports – which suggests a processing level of over 30 000 tonnes annually across the whole country. The main constraint to expansion is the availability of financing for upgrading the technical efficiency of the plants. Processing plants can be stratified into three types as outlined in Table 11.

TABLE 11
Fish processing activities in Kazakhstan

Processing plants, categorized by size and techniques available	Species			
	Bream, Caspian roach	Zander	Common carp, perch, catfish, carp, pike and other freshwater fish	Sturgeon
	Products produced			
Large enterprises – five are European Union certified for exports (evisceration, smoking, drying, canning, filleting, production of fish liver oil, etc.)	Cured, smoked, mince, canned	Freshly frozen, filleted	Carcass, fillet	Caviar, sturgeon meat, smoked meat
Medium-sized enterprises (smoking, filleting and drying)	Cured, smoked, freshly frozen	Freshly frozen, filleted	Freshly frozen	
Small enterprises	Fresh	Fresh	Fresh	

In addition, many women from rural areas are engaged in fish processing for sustenance purposes, mainly in spring and autumn when supplies are more plentiful. They purchase fish from amateur fishermen (or obtain fish from members of their extended family or neighbours), and smoke or cure it at home, albeit in somewhat unsanitary conditions, before selling it in local markets, railways stations and along roads.

Fish storage

In large cities, there are storage centres for fish products that are used by small wholesalers who purchase small batches (generally not more than 5 tonnes) from individual suppliers.

These batches are then broken down into segments of 100–200 kg and distributed through the retail trade network. A wide assortment of fish products are offered in large cities. The biggest suppliers however are the processing plants that are European Union (EU) certified. They supply whole fish, mince, zander “cheeks”, fish belly, and cured and smoked fish products. For example, Rybprom Ltd. supplies the nation’s biggest market in Almaty with bream, common carp, catfish, crucian carp, fillets of all lake fish (except bream), and bream mince. The large processing companies have their own cold storage and freezing facilities and warehouses to store the (often frozen) fish and build up stocks for high season. The only domestic company that supplies fish snacks, such as pieces of cured or smoked bream in small packages, is Mordelikates Ltd in the city of Karaganda.

Distribution and marketing of fish and fish products

All fish markets and wholesale distribution companies are in private hands. Open markets in large cities and towns can be differentiated according to their appearance, range of products offered and prices.

In large cities, fish markets are generally well equipped, prices are higher and the offered range of products is richer, while in small towns and villages fish markets are poorer equipped, prices are lower and the assortment of products depends on the proximity of the settlement to the waterbodies.

Quality control requirements regarding the selling of fish products are stipulated in the “Veterinary-Sanitary Regulations for Production and Sale of Fishery Products” and are overseen by the Sanitary and Epidemiological Station. These regulations state (in Article 5.6.3) that areas where auctions and/or the wholesale distribution of fish products takes place shall: (i) be covered, and roofs and walls must be easily cleanable and easily disinfected; (ii) have a watertight, easily washed and disinfected floor, and be equipped with a water drainage system; (iii) be equipped with wash basins and WC (and wash basins should have washing and disinfecting agents for hands and disposable towels); (iv) be well lit; (v) be used only for the display and storage of fish products – with no transportation vehicles allowed inside the edifice; (vi) all containers must be regularly, at least after each sale, cleaned and rinsed on both sides with drinking water or clean sea water (and, if necessary, disinfected); (vii) special signs prohibiting smoking, spitting, the taking of meals and the presence of animals must be clearly displayed in prominent places; (viii) be closed – if relevant bodies deem it necessary; (ix) have all water supply fixtures compliant with the terms stipulated in Article 3.4 of the Veterinary-Sanitary Regulations; (x) have special watertight containers made from stainless steel for those fish products which are deemed unfit for consumption; and (xi) have a special room for inspecting fish products.

In addition, after unloading or the first sale, the fish products must be immediately delivered to the destination in accordance with the terms stipulated in Article 5.6 of the Veterinary-Sanitary Regulations (Article 5.6.4) or, if this is not possible, stored in designated sales areas with cold rooms in compliance with the Veterinary-Sanitary Regulations (Article 5.6.5).

Kazakhstan does not have any auctions for fresh fish at the moment. Processors and wholesalers conclude agreements with fishers – paying cash on the spot or bartering – and transport the purchased fish to their (processing) facilities. In the case of larger enterprises, these can simply be stations where primary processing is undertaken or, alternatively, the fish is transported directly to the processor’s main installations.

Margins are high, with the price paid to fishers generally very low, except in the instances of fish destined for the export market (zander, sturgeon). In the Sary-Arka market in Almaty, smoked bream was being retailed in 2007 at a price of tenge 450 (around US\$4), while fishers were receiving around US\$0.5 for the fresh product on the lake's shore.

Fish market in Sary-Arka, Almaty, 2007



Picture Courtesy of Mr. S. Timirkhanov

Fish is generally transported in cars without refrigeration equipment. But in the summer fish is sometimes transported in refrigerators layered with ice or in specially insulated container (thermo) boxes layered with ice. The ties between processor and fisher have evolved over time and it is very difficult for outside suppliers (fish) with no contacts in the trade network to get a good price for their fish without a preliminary agreement. Nevertheless, recreational fishers (including amateur fishermen or fishermen who hold a license for sport fishing) also supply fresh fish to local markets or sell it to wholesalers.

Three types of purchasers can be identified (Table 12), although the importance of each group in the domestic market (in terms of market share) is unknown:

- Small purchasers. These purchasers own one fish landing site. They do not have processing facilities nor, in most cases, refrigerators for primary storage of fish. They buy fresh fish from their fishers and sell it directly to bigger processors or buyers.
- Medium-sized purchasers. These purchasers own two or more fish landing sites, have some processing facilities for storing and freezing fish, and sometimes may have small shops for the retail of smoked or cured fish. They buy fresh fish from their contracted fishers, smaller users and/or intermediaries and sell it directly to larger wholesale buyers.
- Large purchasers. These purchasers have two or more fish landing sites and often work in more than one water basin. Fresh fish is bought from their contracted fishers and small fishers, while freshly

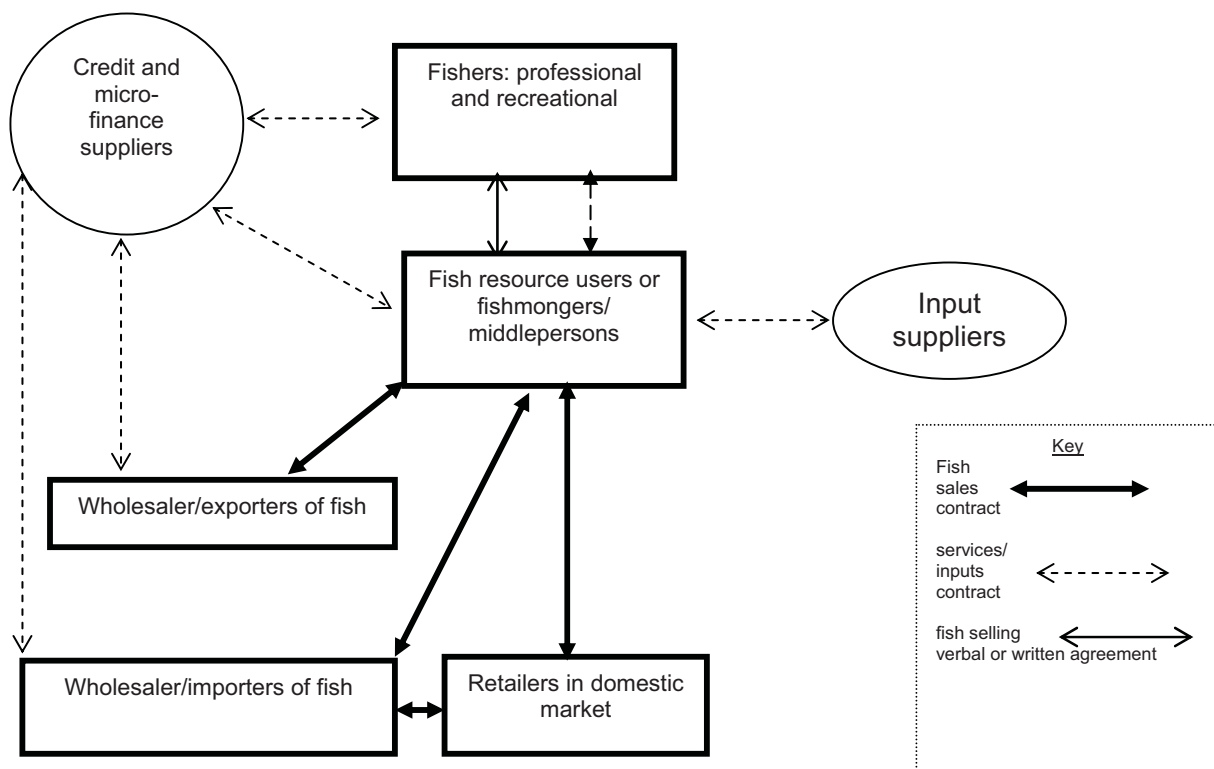
frozen fish is bought from medium-sized purchasers. The bigger companies, such as Atyraubalyk JSC (who supply caviar and sturgeon), Rybprom Ltd. (the largest Kazakh supplier of zander fillets to Europe), Ulkenbalyk Ltd. (pikeperch fillets) and Balkhashbalyk JSC (pikeperch fillets and bream) have export numbers allowing them to export the fish to the European Union.

TABLE 12
Fish purchasers in Kazakhstan

Purchaser	Product	Place of sale	Price obtained
Large	Processed fish	External market – Europe and CIS. Internal market – supermarkets and other large points of sale, budget organizations (tender supplies to educational and medical institutions, such as hospitals, kindergartens, military organizations, etc.).	High
Medium	Processed and freshly frozen fish	External market – the CIS. Internal market – as with large purchasers, some sales to local retailers.	High –medium
Small	Fresh fish	Internal market – local retailers.	Low

The fish retail chain (Figure 4) in Kazakhstan is extensive in both geographic and numeric terms, but to date no data have been collated to identify either the number of retail points or their distribution across the national territory.

FIGURE 4
Fish market supply chain



Two further points should be made about the domestic fish market in Kazakhstan. First, there is a marked regional variation in fish prices, as shown in Annex 7. Fish prices in the main cities of Astana and Almaty tend to be higher than those in the countryside. In particular, the prices for nearly all species of fish for sale are highest in Astana. The distance to fishing locations must play a major role in this price difference, as prices for the main species caught are significantly lower in markets near fish landing sites. For instance, in Balkash, situated next to the lake with the same name, fish is the least expensive of all major marketplaces in Kazakhstan. Also in Atyrau, Aral and Aralsk, the species caught and sold in nearby waters are considerably cheaper than those originating from the more distant locations. As an example, bream is about five times as expensive in Aktau as in Aralsk, the latter being a major landing site for these fish. In addition, some species (e.g. sturgeon, herring and whitefish) are not available in the smaller markets as there is less demand for species of this type in these markets.

Second, there is a limited seasonal variation in fish prices, although this is not visible in all markets and for all species. An indication of the seasonal variation is presented in Table 13 below. The table also shows that a retail price increase could be observed for years 2005 and 2006 for fresh fish, cured fish and canned fishery products. This trend has largely continued in recent years.

TABLE 13

Average seasonal market retail price (in US\$) per kg of fish or fishery product in Kazakhstan, 2005–2006

Fish or Fish product	16 January 2005	14 April 2005	14 July 2005	16 October 2005	16 January 2006	14 April 2006	14 July 2006	16 October 2006
Fresh	1.42	1.5	1.46	1.47	1.59	1.6	1.58	1.6
Cured	3.36	3.53	3.58	3.66	3.86	3.97	4.04	4.07
Herring	2.41	2.5	3.01	2.54	2.61	2.59	2.6	2.61
Canned (conventional can)	1	1.02	1.03	1.6	1.09	1.12	1.14	1.15

Source: Agency of the Republic of Kazakhstan on Statistics.

Fish trade

Export

The wholesale supply of fish to external (as indeed to internal) markets is undertaken by large- and medium-sized enterprises that hold export licenses. At the moment of writing this review, only five enterprises have export licenses. A strong demand for freshly frozen fish (exported at a temperature of -18 OC) comes from a number of large fish processing plants in the Russian Federation and the Ukraine, and a good part of fish products exported from Kazakhstan are directed there. There is direct export to Europe as well. Kazakh companies, working mostly with French and German partners, supply cured or freshly frozen bream to these partners. In general, the partners in the export market repackage, relabel and prepare the products for retail sale in line with the existing national level agreements made with supermarkets or other points of sale. Freshly frozen bream is the main exported fishery product of Kazakhstan.

Exports to the CIS countries are governed by the decree on “Veterinary-Sanitary Regulations for Production and Sale of Fishery Products”. A special form (No. 2 Veterinary Certificate) is required to be completed for exporting fish to CIS countries. Domestic import norms within the CIS were inherited from the USSR, and technological developments are not reflected in the majority of such norms (given that they have often not been updated).

Fish products to be exported to the countries of the European Union must satisfy all the requirements of Directive 91/493/EEC (and related European Union legislation in this field). While Kazakh enterprises have reached European standards in terms of receiving, freezing and storing of fish products, there is

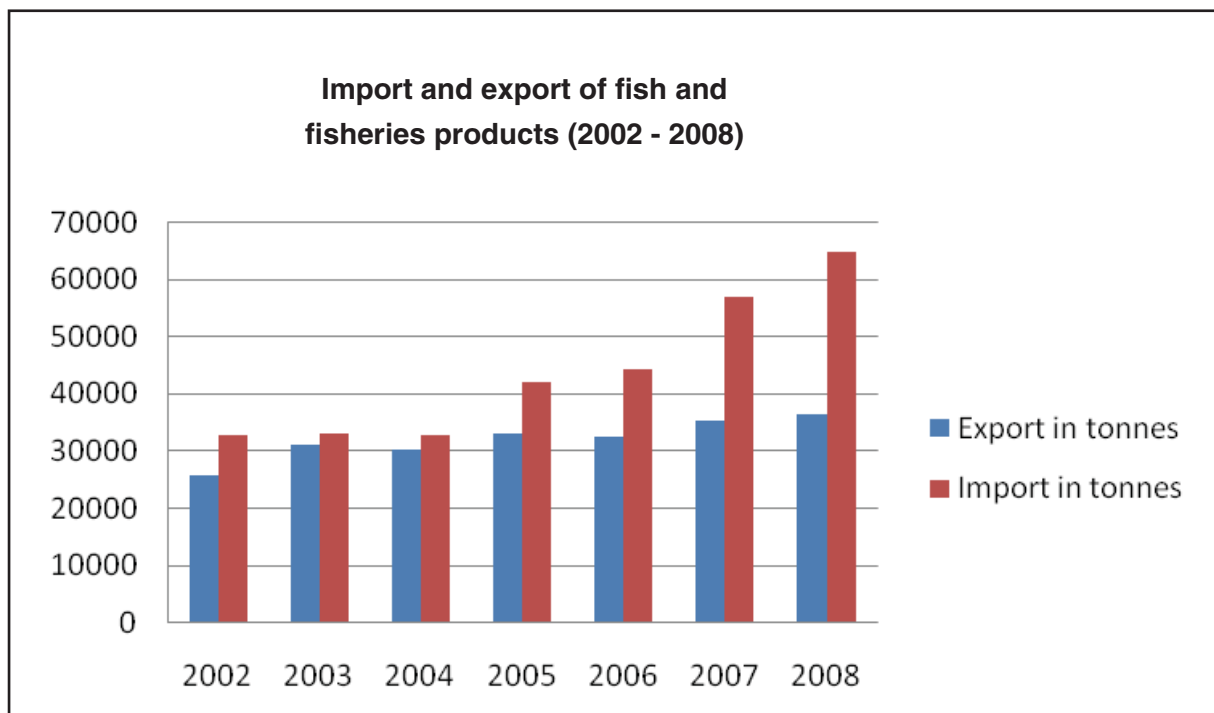
some slippage in terms of internal quality controls for raw produce and the packaging thereof. HACCP approaches are not in widespread use in Kazakhstan, and this is reflected in the export options available for fishery products from Kazakhstan.

Import

There are no data on the number of companies entitled to import fish products, although statistical data gathered by the Customs Control Agency and analyzed by the Fisheries Committee do give quantities and distinguish between the types of imported produce. Aggregated data are available (see figure 5).

In many instances importing companies do not specialize in the importing of fish products. For example, Pulsar Company in Almaty which retails imported canned fish also imports many other products; categorization for analysis by the Fisheries Committee is made difficult as there is no regulation that requires companies to report disaggregated data on fish and fishery products imports by species and form. Many supermarkets also retail imported fish products (mainly from Moscow and Kaliningrad in the Russian Federation or China) in small packages as snacks, to complement beer for example. In the bigger cities, imported fish products from European countries can be found.

FIGURE 5
Import of fish and fisheries products (2002–2008)



Source: Fisheries Committee.

The Ministry of Industry and Trade of the Republic of Kazakhstan is in the process of reconsidering present rates of import customs duties in order to harmonize and rationalize rates given its obligations within the regional organizational framework (specifically to comply with the unified customs tariffs of the EurAsian Economic Community)² and in relation to the country's ongoing process towards accessing the World Trade Organization (WTO). Kazakhstan applied for WTO membership in 1996. Current import and export regulations are given in Table 14.

TABLE 14
Current customs regulations and charges (import and export of fish products)

Activity	Regulation/charge
Importing/exporting goods to or from Kazakhstan	Import and export coding determined according to trade nomenclature of economic activities
Taxation of goods	In the case of imported fish products, the customs duty charge depends on the country of origin. Value added tax (VAT) is chargeable at a rate of 14 percent
Tax exemptions (imports)	The CIS countries are exempt of import tax on fishery products
Customs freight declaration (CFD)	Fees levied: Decree No. 765 of 14.08.2006 levies a fee of 50 euros for the first page of the CFD document, 20 euros for each subsequent page
Licences, quotas for import/ export of goods	Licences are only required to export caviar
Phytosanitary, veterinary, sanitary or ecological certificates	Veterinary and sanitary certificates from the Astana Veterinary Department are required for exports (permission is based on laboratory studies and confirmation that the product meets accepted standards)
Special ministerial permission needed	From the Ministry of Agriculture for exporting/importing fish: <ol style="list-style-type: none"> 1) Species and derivatives (of) that are under threat of extinction (Decree No. 31 of 27.01.04) 2) (Exporting) whole fish, its parts and derivatives (Decree No. 16 of 24.05.06)

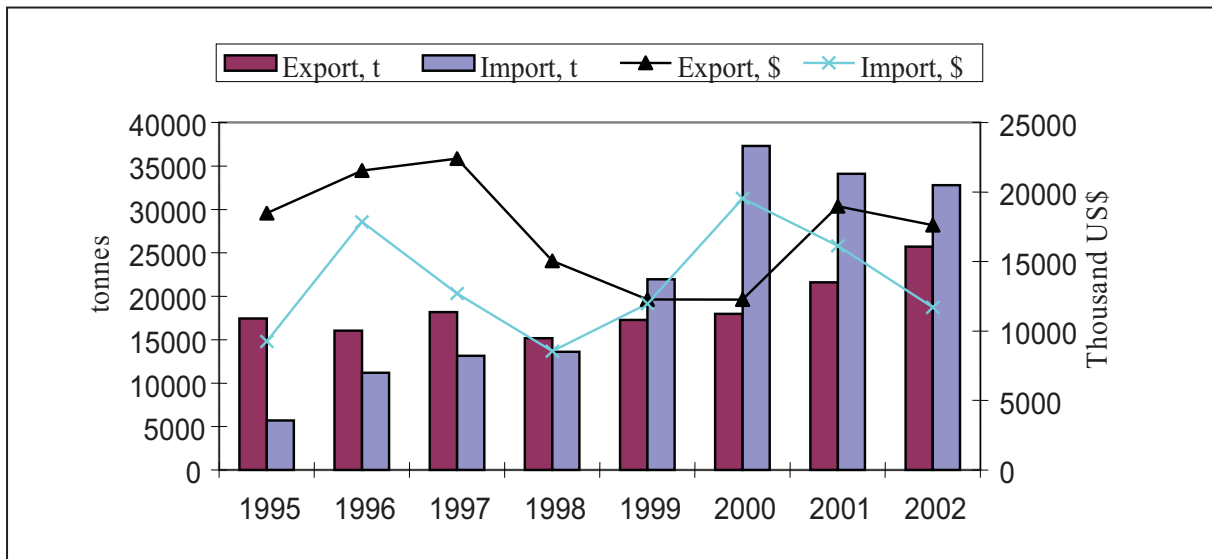
In 1994, an agreement was reached among the CIS countries and a protocol on the mutual recognition of veterinary documents was signed. As a consequence, if Kazakh export products have obtained the requisite national veterinary document, then additional transit permission is not required.

Fish Trade Data

Until the late 1990s, Kazakhstan ran a trade surplus (volume and value) in terms of fish and fishery products. Since then, while fish exports have generally exceeded fish imports in value terms, a greater volume of fish is imported than exported (Figure 6 and Table 15).

¹ On 1 January 2004, Kazakhstan changed over from a 9-digit trade nomenclature to a 10-digit one based on the Harmonized System of Describing and Coding of Goods (2002). The changeover was effected in accordance with an agreement "On Unified Trade Nomenclature for Foreign Economic Activities of the EurAsian Economic Community," adopted on 11 June 2003.

FIGURE 6
Fish and fisheries products imports and exports (1995–2002)



In 2006, fish imports peaked at 44 182 tonnes (Table 15), costing Kazakhstan US\$31.8 million (up from 34 700 tonnes and US\$16 million in 2001). Although the majority of imports in volume terms came from outside the CIS region (61 percent), the bulk of the imports was low quality fish, such as bream, perch and roach, compared with the relatively higher unit price paid for imports of sander and sturgeon from the CIS region. Imports from the CIS region accounted for 56 percent of the foreign exchange spent on the import of fish products in 2006. Frozen, convenience and canned produce accounted for almost 95 percent of imports.

The divergence in prices between the CIS region and the rest of the world was much more profound in the case of exports, CIS exports retailing at an aggregate unit price of US\$0.7 per kg compared with the (European) aggregate unit price of US\$5.6 per kg (Table 15). As a consequence, while import volumes exceeded export volumes by 36 percent, Kazakhstan recorded a trade surplus in fish and fishery products of US\$18.8 million in 2006.

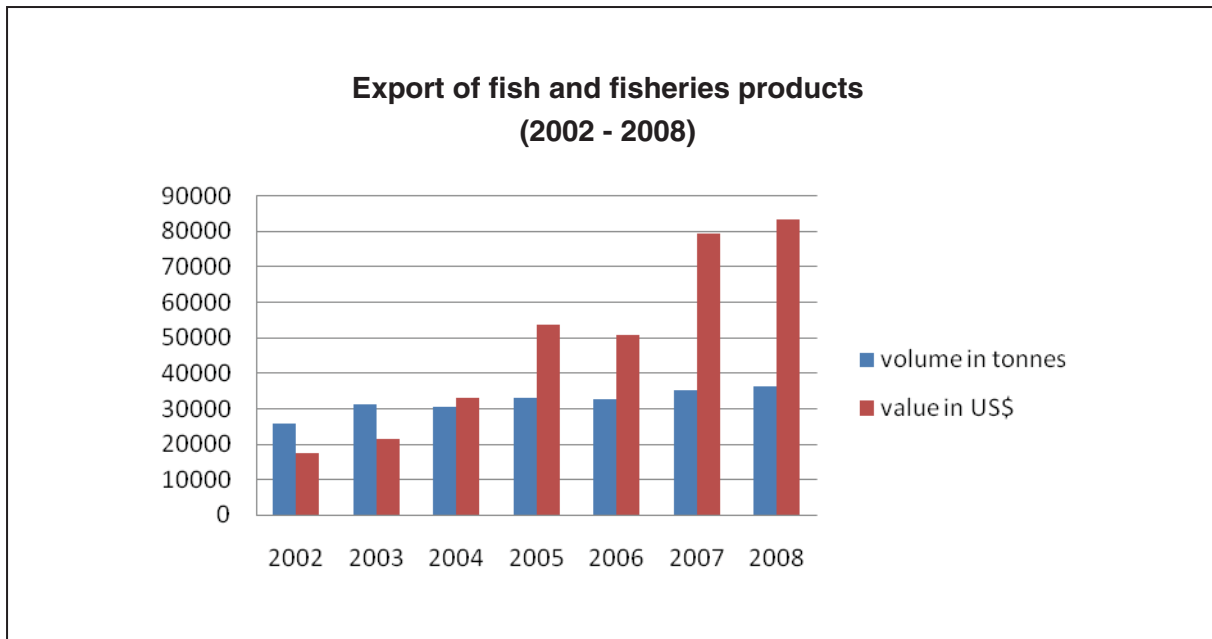
TABLE 15
Export and import of fish products, 2006

	Export			Import		
	Tonnes	Value US\$ (millions)	Average cost per kg (in US\$)	Tonnes	Value US\$ (millions)	Average cost per kg (in US\$)
CIS countries	26 622.0	17.9	0.7	17 302.7	17.8	1.0
Other countries in the world	5 882.9	32.7	5.6	26 879.3	14.0	0.5
Total	32 504.9	50.6	1.6	44 182.0	31.8	0.7

Source: Fisheries Committee.

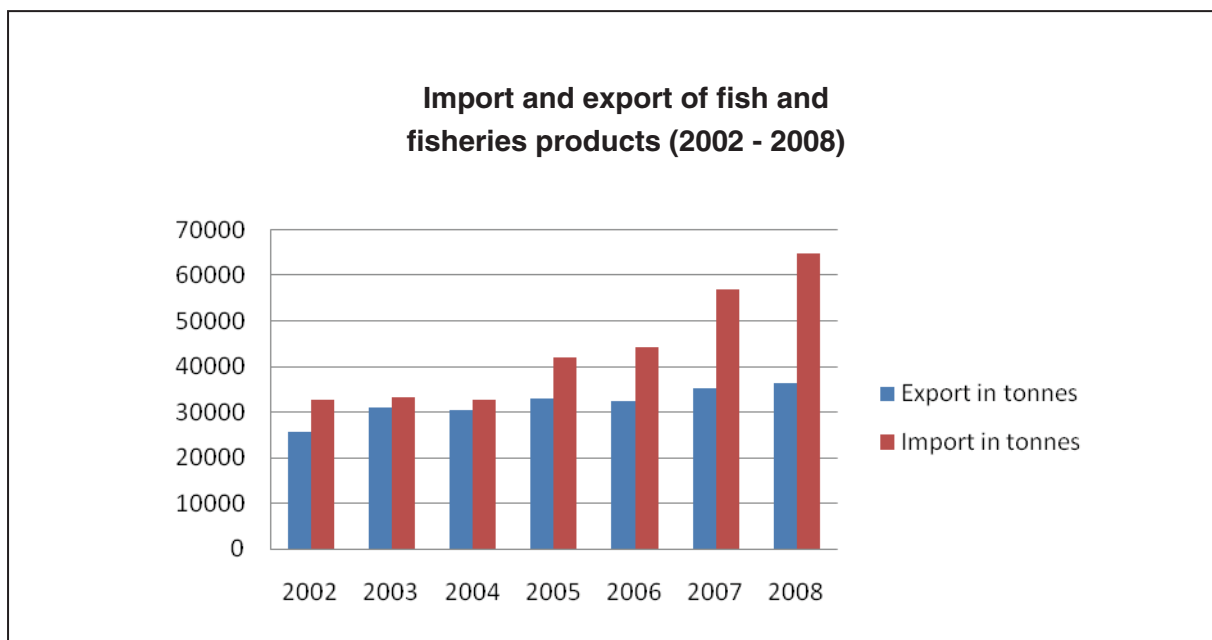
In 2008, the average price for 1 kg of exported fish increased by 67.91 percent in comparison with 2006 and became US\$2.29, which indicates an increase in proportion of the processed fish exports because the catch volumes of commercial fish species had not fluctuated much.

FIGURE 7
Export of fish and fisheries products (2002–2008)



Source: Fisheries Committee.

FIGURE 8
Import and export of fish and fisheries products (2002–2008)



Source: Fisheries Committee.

The import of fish products steadily rises compared with the exports. Kazakhstan does not re export fish products. Trade in live fish and other aquatic animals is minimal.

Fish demand and consumption

In 2004, the Fisheries Committee estimated that the average per capita consumption of fish and fish products totalled 7.9 kg in Kazakhstan. (However, the Statistical Digest estimated the per capita fish consumption at only 3.5 kg in 2005, see Table 16.) According to the evaluation of the Agency of the

Republic of Kazakhstan on Statistics, the per capita fish and fish products consumption in Kazakhstan reached 8.4 kg in 2006 and 9.6 kg in 2007.

In rural areas, the demand for fish and fishery products is generally limited to fresh fish that people cook in their homes, although there are some variations depending on the region. In big cities, a larger share of fish consumed originates from imports, with the major demand coming from restaurants.

In Soviet times, the so-called “fish day” was on Thursday, when people consumed fish as a main component of their meals. Now there are no such days and this special “fish eating” tradition has disappeared. Spring and autumn are the peak periods for domestic fish consumption, which are also the periods when most fish is harvested from the lakes and reservoirs of the country.

TABLE 16
Consumption of fish and fishery products by oblast, 2005

Oblast/city	Fish, shellfish and clams sales (million tenge)	Population (000's)	Per capita expenditure on fish products (tenge) per month	Per capita income (tenge) per month	Percentage of income spent on fish products	Per capita fish consumption in kg (presuming that 1 kg of fish costs 161 tenge)
Akmola	138.4	742.7	186	9 441	2	1.2
Aktyubinsk	1 467.8	678.6	2 163	13 750	16	13.4
Almaty	192.5	1 589.8	121	8 193	1	0.8
Atyrau	203.6	463.5	439	29 970	1	2.7
Eastern-Kazakhstan	1 101.7	1 442.1	764	11 883	6	4.7
Zhambyl	44	992.1	44	6 917	1	0.3
Western-Kazakhstan	300.4	606.5	495	15 313	3	3.1
Karaganda	1 307.6	1 331.7	982	14 051	7	6.1
Kostanai	231.2	907.4	255	10 474	2	1.6
Kyzylorda	104.8	612.1	171	9 553	2	1.1
Mangistau	87.4	361.7	242	29 417	1	1.5
Pavlodarsk	275.7	743.8	371	13 808	3	2.3
Northern-Kazakhstan	313.2	665.9	470	10 084	5	2.9
Southern-Kazakhstan	124.9	2 193.6	57	6 433	1	0.4
Astana city	497.8	529.3	940	26 196	4	5.8
Almaty city	2 116.6	1 209.5	1 750	24 235	7	10.9
Total	8 507.6	15 074	564	12 817	4	3.5

Source: Regions of Kazakhstan (2005), Statistical Digest, Agency of the Republic of Kazakhstan on Statistics.

Before 2001, the Agency of the Republic of Kazakhstan on Statistics used a simple calculation to determine the country's per capita consumption of fish products – dividing the total amount of fish products available (production plus imports less exports) by the national population. Since 2001, the Agency of Statistics of the Republic of Kazakhstan has collated information on the consumption of staple food products by oblast using a survey sample of 12 000 households (Table 16). The table shows

that fish is a popular dish in Aktyubinsk, Eastern- and Northern- Kazakhstan oblasts (16 percent, 6 percent and 5 percent of expenditure, respectively) – oblasts that border the Russian Federation and where imported fish products are plentiful. Karaganda oblast and Almaty city are also major centres of fish consumption. In contrast, while the populations of Atyrau, Kyzylorda and Southern-Kazakhstan mostly live along the rivers and lakes (totalling more than 3 million people), just 1 percent of expenditure is devoted to fish products. The reason for their relatively low expenditure on fish is that most people in these oblasts access fish through local and/or non-market (subsistence fishing) channels. Given that subsistence fishing is a widespread supplementary livelihood source across much of Kazakhstan, this helps explain the discrepancy between the per capita consumption figures cited by the Agency of the Republic of Kazakhstan on Statistics and the figure given by the Fisheries Committee.

Taking into account however that the population started to grow again in 2002, reaching 15.6 million at the start of 2008, just over 1 percent higher than a year earlier (EIU, 2008), and proceeding from the scientifically recommended norm for fish consumption (14.6 kg per person), then 228 000 tonnes of fish – commercially produced or imported (net) – must be landed annually in order to satisfy the population's demand for fish and fish products. Current recorded capture and culture production adds up to less than 15 percent of this estimated demand.

FAO's Food Balance Sheets (FAO, 2005), and using official statistics from the Government of Kazakhstan, show that per capita supply of fish in 2005 was only 2.9 kg and that fish proteins as percentage of the total protein intake of the population only accounted for 0.9 percent. In the last decade, the percentage of fish protein intake as part of the total animal protein intake of the population has never been higher than 3 percent, which indicates that other protein sources are much more important in the diet of the Kazakh people than proteins derived from fish and fishery products.

Chapter 5 GOVERNANCE AND INSTITUTIONAL FRAMEWORKS

Fisheries administration

The government is currently in the process of rationalizing fisheries management. A World Bank study (2004) noted that at least four departments³ within the Ministry of Agriculture – and a number of other government agencies⁴– all had remits that involved different aspects of fisheries management. This was partly ameliorated following the re-creation of the State Fisheries Committee in 2003 as a new entity (albeit subordinate to the Committees for Water Resources and Hunting and Fishing, and the Veterinary and Science Departments) within the Ministry of Agriculture. The Fisheries Committee, based in Astana, has a current staff of 23 people (Table 17), and is responsible for overseeing the country’s ameliorated 11 fish reproduction complexes.

TABLE 17
Staff responsibilities (and number) in the Fisheries Committee in Kazakhstan

Unit	Staff
Management	3
Department of protection, reproduction and regulation of fish resources and other water animals	2
Division of fish resources protection and fishery instruction	4
Division of fish reproduction and fishery development	4
Department of finance and administrative juridical work	2
Division of financial accounts and state procurement	2
Division of administrative and juridical work	4
Support staff	2
Total	23

At the national level, the Fisheries Committee is charged with the planning and management of the country’s fisheries (including aquaculture), and is responsible for representing Kazakhstan in regional bodies dealing with fisheries related issues. The 2003 reform also introduced eight regional Interregional Basin Departments, which are tasked with managing the distribution of fishing quotas, licensing fisher enterprises and data collection. At the oblast level, local leaders (Akimats) are charged with coordinating activities to protect local fish stocks and ensure their replenishment.

Fishery training, research and extension

Fisheries research does not fall directly under the domain of the Fisheries Committee, but rather under the Science Department of the Ministry of Agriculture. Four national higher education institutions offer courses in fisheries research and training:

³ The Water Resources Committee and the Forestry and Hunting Committee are involved in issues relating to water diversion and reservoir ownership; the Department of Science deals with research and the computation of quotas and TACs; and the Veterinary Department applies standards relating to fish quality and the transportation of fish.

⁴ These include the Ministries of Natural Resources and Environment Protection (deals with pollution levels and impact upon fish stocks); Interior Affairs (implements fisheries protection measures); Health care (coordinates control of sanitary work on reservoirs); Foreign Affairs (transboundary use of fish resources); Science and Education (training and development of curricula); Transport and Communications (maintains fleet registry); the Customs Control Agency (export and import of fish products); Frontier Service of the National Security Committee (organizes and conducts joint work on protection of transboundary species); and the Akimat oblast (which holds fishing quotas and organizes tenders thereto, and conducts fisheries protection activities).

- The S. Seyfulin Kazakh Agrotechnical University (Astana)
- The Al Farabi Kazakh National University (Almaty)
- The National Agrarian University (Almaty)
- West-Kazakhstan Agrarian University (Uralsk)

These institutions have little direct connection with the Fisheries Committee. In 2007–2008, 100 students (65 Kazakh, 35 Russian) were awarded grants to pursue university-level courses in fisheries related themes at the four institutions.

There are also a number of other institutions tasked with undertaking research in the aquaculture and fishing industry. The most important of these are:

- Kazakhstan Agency of Applied Ecology Ltd. More information can be found on the following Web site: www.kape.kz/en/Home.aspx.
- Kazakh Fisheries Scientific Research Institute, which has a head office in Almaty and six regional branches, provides technical and research support to the Fisheries Committee. The institute's main activities include: evaluation of reservoirs for use by the fishery sector, developing recommendations for restocking of reservoirs, ecological monitoring, aquaculture development and demonstration activities, and fisheries management advisory services (www.kazniirh.kz).
- KazAgroInnovation is a joint-stock company under the Ministry of Agriculture which (via the Fisheries Scientific Research Institute) undertakes scientific research within the fisheries field, specifically in subjects related to the ecological monitoring of reservoir fish stocks and on the development of commercial sturgeon farming technology (based at the Kapshagay complex in Almaty oblast).

Fishery statistics

Local fisheries inspectors (about 600) collect local catch data, which are collated on a monthly basis by the regional basin-level administrations. The data are passed on to the Fisheries Committee to produce aggregate totals. Data on exports and imports of fish and fish-related products are collected by the Customs Control Agency and sent to the national Fisheries Committee.

A vessel registry is maintained by the Ministry of Transport and Communications, while data on vessels deployed in the national fisheries is compiled by the Fisheries Committee on the basis of returns made by companies tendering for quota allocations. The Agency of the Republic of Kazakhstan on Statistics provides an annual report on capture and culture fisheries based on the figures provided by the institutions above. However, the World Bank (2004) cautions that: "Most (if not all) of the fisheries under-report their catch numbers both to the Statistics Agency and to the inspectors in order to avoid taxes and other fees. So actual catches are probably several times higher, and likely exceed quotas." Studies by FAO (Sarieva *et al.*, 2008 and Karimov *et al.*, 2009) in the markets in Kyrgyzstan and Uzbekistan report on large volumes of Kazakh reservoir fish illegally exported to markets in Biskek and Chinaz, in Kyrgyzstan and Uzbekistan, respectively.

Fisheries related organizations

Kazakhstan encourages the establishments and activities of professional unions which offer specialist support to their members (as well as undertake lobbying on items of special interest to the members). Currently, there is one national organization that can be considered as representing all Kazakh fishers – the Association of Fishery, Fishing-process, Fish-farming and Fish-trading Enterprises of Kazakhstan. As the association was established in 2008, it still needs to prove itself.

At the regional level, a number of associations of fish producers and natural resource users have emerged, many only in recent years. These include, among others:

- The Association of Fish producers in the Balkash area is dominated by the joint-stock company Balkhash Balyk⁵, and is lake centric.
- Aral Tenizi, formed as a public union by fishers on the Aral Sea, was established in 1998. It works towards the restoration on the North Aral Sea as a freshwater lake and supports local fishers and their families. Training programmes are offered and the union has recently opened its own fish processing company Kambala-Balyk LLP. Membership exceeds 300, and 14 local volunteer centres have been established to further disseminate information on the sea and the activities of Aral Tenizi (Thorpe and van Anrooy, 2009).
- Association of Commercial Fishery of Kazakhstan “Kazrybprom”. This association is grouped around 10 fishery enterprises and is based in Almaty.
- Association of Fishery Production and Trade Companies – based in Almaty.
- Virtual Club of Fishermen.
- “House of Fishermen” public association – based in Kostanai.

International cooperation in fisheries management and development

In December 2003, Government representatives from Azerbaijan, Iran (Islamic Republic of), Kazakhstan, the Russian Federation and Turkmenistan signed a framework convention on managing the Caspian Sea, but its ratification took almost three years. This resulted in the establishment of the 2007-2009 “Caspian Riparian Countries: The Regional Programme for Joint Management, Preservation and Sustainable Utilisation of Bioresources of the Caspian”. President Nursultan Nazarbaev ratified the Framework Convention for the Protection of the Marine Environment of the Caspian Sea at the end of 2008.

Kazakhstan is also participating in the Commission on Aquatic Bioresources (CAB) of the Caspian Sea. The CAB consists of officials of national fisheries agencies of the Caspian Sea range states. Initially the representatives of only four Caspian states were members of the CAB (Azerbaijan, Kazakhstan, the Russian Federation and Turkmenistan), but in 2002 Iran (Islamic Republic of) also became a member.

The CAB is a so-called interagency body. The chairmanship of CAB rotates every two years among the five countries. During the two-year period, the chairing country also acts as the CAB Secretariat. CAB has the following objectives:

- Coordination among range states on conservation and exploitation of Caspian aquatic bioresources;
- Scientific collaboration and data exchange, including conducting joint research (stock assessment);
- Regulation of fishing based on scientific data; and
- Determination of TAC and export quotas of shared stocks.

In the mid-1990s, the Danish Society for a Living Sea (DSLS) was instrumental in helping to resurrect the Aral Sea fishery, supplying a combination of nets, fibreglass vessels, freezing stations and technical expertise to help local fishers target flounder. DSLS was also highly supportive to the endeavours of the non-governmental organization Aral Tenizi in its early years.

The Ministry of Agriculture and Rural Affairs of Turkey (MARA) invited Kazakh fisheries and aquaculture experts on several occasions in 2006 and 2007 to the Republic of Turkey to participate in study tours, workshops, exhibitions and training sessions. For instance, the “Workshop on the Fisheries and Aquaculture Sector in Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan and Uzbekistan” was conducted under a joint project of MARA and the Turkish International Cooperation Agency (TICA) in Bodrum, Turkey, in April 2006. These partners brought over 20 experts from Central Asia to Future Fish Eurasia 2007, held in Istanbul, Turkey, in October 2007.

⁵ Under Law 142, “About Non-commercial Organizations”, Article 18, commercial organizations can participate as members in associations formed by non-commercial organizations in those instances where such coordination is deemed to enhance entrepreneurial activities.

Moreover, the Global Environment Facility (GEF) and United Nations Development Programme (UNDP) project – the “Integrated Conservation of Priority Globally Significant Migratory Bird Wetlands Habitat: A Demonstration on Three Sites” – teamed up with FAO, the Ministry of Agriculture of Kazakhstan and the World Bank in 2009 to organize a “Regional Training Workshop on Sturgeon Hatchery Practices and Management”, held in Atyrau, Kazakhstan, 15–18 April 2009.

A new regional GEF and UNDP project called “The Caspian Sea: Restoring Depleted Fisheries and Consolidation of a Permanent Regional Environmental Governance Programme” (CaspEco), was just launched in early 2009. The project aims to support the littoral states’ efforts to halt the decline in bioresources and restore depleted fisheries in the Caspian Sea through the implementation of agreed actions defined in the Caspian Strategic Action Plan, and to fully operationalize and make the Caspian Sea’s regional environmental governance mechanism sustainable according to its project document.

At the regional level, since 2007 FAO has organized a number of expert and training workshops in which Kazakh fisheries and aquaculture experts and policy-makers participated. These workshops included, among others:

- “The Regional Workshop on the 1995 FAO Code of Conduct for Responsible Fisheries in the Central Asian region: a Call to Action,” Tashkent, Uzbekistan, 8–10 April 2008.
- “The Regional Workshop on Recreational Fisheries in Central Asia”, Issyk Kul, Kyrgyzstan, 14–16 September 2009.

Various workshops also have been organized under the FAO Technical Cooperation Programme (TCP) projects, such as:

- “Capacity building for the recovery and management of the sturgeon fisheries of the Caspian Sea” (TCP/INT/3101); a joint project in which Azerbaijan, Iran (Islamic Republic of) and Turkmenistan also participated, in the period 2007–2009.
- “Advice to Central Asian Governments on the feasibility of commercial fish and livestock feed production” (TCP/RER/3205); a joint project with Kyrgyzstan, Tajikistan and Uzbekistan, in the period 2009–2010.

The World Bank has also provided inputs to Kazakhstan’s fishery sector. During the period 2003–2004, a World Bank team prepared a sector study entitled “Innovations in Fisheries Management for Kazakhstan”. This study was part of the Joint Economic Research Program between the World Bank and the Government of Kazakhstan. The draft report was disseminated but not officially published. The World Bank has supported various capacity-building activities in the field of fisheries management through its Trust Fund for Environmentally and Socially Sustainable Development, and through the “Aral Sea Fisheries Management and Sustainable Livelihoods Project”, which was approved in 2008 and begun in 2009.

Chapter 6

POLICY, REGULATORY AND MANAGEMENT FRAMEWORKS

Policy and planning

Fisheries policy is enshrined in a number of national and sectoral development plans, decrees and programmes. In chronological order, the relevant policy documents are:

The Innovative Industrial Development Strategy of the Republic of Kazakhstan for 2003–2015. This strategy seeks to develop a competitive export-oriented goods sector, with processed fish products mentioned as one potential avenue to consider.

State Rural Areas Development Programme for 2004–2010. The strategy to raise living standards and well-being in an effective, optimal – yet sustainable – manner in rural areas also impacts upon the fisheries sector.

The Agro-Business Sustainable Development Programme of the Republic of Kazakhstan (2006–2010). The programme seeks to develop the sustainable production of local merchandise (fish being one example) in a manner that contributes to national production and income growth.

Fishery Sector Development Concept of the Republic of Kazakhstan for 2007–2015 (Government Decree No. 963, 6 October 2006). This decree identifies a number of goals and objectives related to the formation, protection, and rational use of national fish and aquaculture resources – with an emphasis on increased deployment of modern technologies and techniques for accelerated fisheries development. The intention of the programme is to systematize state regulation and control over water resources, facilitate the maintenance and development of fisheries facilities, improve the sector's legislative base (particularly as regards aquaculture and regulation), and assist in developing information systems and analytic techniques to support fisheries management processes. Development is expected to occur in three stages: an introductory phase (2007–2009), an intermediate phase (2010–2012) and a final phase (2013–2015).

The concept shapes the main goals and objectives aimed at increasing the competitive ability of this industry through the conservation, reproduction and sustainable use of fish resources and the development of commercial fishery taking into account the latest methods and up-to-date technologies. Within this concept, the state programme of the development of commercial fishery from 2010 to 2020 is being developed in Kazakhstan at the time of writing this FAO Fisheries and Aquaculture Circular. The implementation of this programme will be funded from national and local budgets, and private investments, and will count on the support from international financial organizations and other institutions (Isbekov, 2009).

Republican Scheme of Acclimatising and Stocking Fish Reservoirs (2007: Government Decree No. 57, 25 January 2007). The scheme proposes the insertion of high value fish into various waterbodies and reservoirs of the nation.

Medium-Term Plan of Social and Economic Development for 2008–2010: Government Decree No. 753, 29 August 2007. This governmental decree devotes a special section to fisheries in which it pledges to: (i) increase fisheries competitiveness based on sustainable development of the sector through the protection, reproduction and rational use of natural reservoirs' water bioresources; (ii) enhance conditions for commodity fish culture – in terms of fish reproduction, the organization of fish farming (including sturgeon farming) and developing the sector; and (iii) [further] improve the fishery management system – specifically reforming legislation relating to the protection, reproduction and rational and efficient use of fish resources.

Legal and regulatory framework

For the majority of time following independence, the 1993 Law on the Protection, Culture and Utilization of Fauna was used as the juridical mechanism to frame policy within the sector – despite said law solely devoting a series of clauses to fisheries. This was superseded by Law No. 593-II of 9 July 2004 on Law on Protection, Reproduction and Use of Fauna and the subsequent publication of a series of legal documents relating to protection of fish stocks, fishery regulation, rational use of fish stocks, acclimatizing, fisheries-ameliorative works, research, normative documents on fish culture, ichthyologic service, and strengthening of sturgeon protection in the Ural-Caspian basin. This law provides for the protection of rare and threatened species and their habitats and is also aimed at implementation of international obligations. In particular, it restricts international trade in species listed in the Convention on International Trade and Endangered Species (CITES) Annexes 1 and 2.

The impetus towards opening up the sector in recent years, in particular following the World Bank sectoral visit in 2003, led the Government of Kazakhstan to publish a series of decrees, most notably:

- Rules for Managing Fish Industry (Government Decree No. 1456 of 31 December 2004). This allows the development of culture fisheries in the nation’s lakes and reservoirs, and permits the state to grant long-term (ten year) leases to fishing enterprises.
- Rules for Conducting Tenders for Assigning Waterbodies (Areas) and Qualifying Requirements to Participants in Tenders (Government Decree No. 102 of 4 February 2005) sets down the criteria for determining “qualifying” enterprises.
- Approving the Composition of Tender Commissions for Assigning Waterbodies (Areas) of International and National Importance (Government Decree No. 72 of 6 February 2006) deals with the mechanics of the tendering process.

Other important fishery sector legal framework documents that have been issued in recent years include:

- The order of the Ministry of Agriculture of the Republic of Kazakhstan No. 785 of 27 December 2006 on “About Approval of the Concept of Ecological Monitoring of Reservoirs and Water Currents of Fishery Values”. On the same day the Ministry of Agriculture issued Order No. 780 on “About Approval of Methodical Recommendations about Evaluation of Expenses for Carrying Out Fishery Researches”; an order which provides insight in the value attached to fishery research in Kazakhstan.
- The governmental decree of the Republic of Kazakhstan of 2 March 2007, No. 163 on “About the Programme Approving Maintenance of Sustainable Development of Balkhash-Alakolskogo Basin for 2007–2009.”

Other laws that are of high relevance for the fishery sector include the following:

- Ecological Code of the Republic of Kazakhstan (09.01.2007, N212-III)
- Water Code of the Republic of Kazakhstan (09.07.2003, N481-II)
- The Law of the Republic of Kazakhstan “Specially Protected Natural Areas” (07.07.2006, N175-III)

International and regional conventions and agreements

Kazakhstan is party to a number of international conventions and agreements that relate to fisheries resources, wetlands and the Caspian Sea environment. Implementation of these conventions and agreements is key to the sustainable development of the sector.

The Framework Convention for the Protection of the Marine Environment of the Caspian Sea (Tehran Convention) was signed by the five Caspian states in November 2003. The Convention aims at protecting the Caspian environment from all sources of pollution and to protect, preserve and restore the marine environment of the Caspian Sea.

Kazakhstan is a party to the Convention on Biological Diversity (approved by Government Decree No. 918 of 19 August 1994). During 1998–1999, the Ministry of Natural Resources and Environment Protection of Kazakhstan prepared the national strategy and action plan on conservation and sustainable use of biological diversity. Although attention is given to threatened stock of certain fish species, particularly sturgeon, the action plan lacks concrete actions and budgets dedicated to sturgeon biodiversity conservation. Kazakhstan accessed the Cartagena Protocol on Biosafety in 2008. While the government drew up a list of rare and endangered animal species in 2004 (Government Decree No. 469 of 2 September 2004), it has to date failed to expand this list to take note of the 13 critically endangered/ endangered or vulnerable fish species noted in the 2008 Red Book of the Republic of Kazakhstan.

Kazakhstan is not a signatory (at the time of writing of this FAO Fisheries and Aquaculture Circular) of the United Nations Convention on the Law of the Sea, the Agreement relating to the implementation of Part XI of the Convention, and of the Agreement for the implementation of the provisions of the Convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks.

In May 2007, Kazakhstan became one of the contracting parties to the Ramsar Convention on Wetlands.

In Kazakhstan, the FAO Code of Conduct for Responsible Fisheries is not being actively applied. However, Kazakhstan representatives attended the regional workshop “The 1995 FAO Code of Conduct for Responsible Fisheries in the Central Asian Region: A Call to Action”, held in Tashkent, Uzbekistan, on 8–10 April 2008, and there is an expectation that aspects of the code will be incorporated into future national legislation.

Since 2008, the Ministry of Agriculture of Kazakhstan has been involved in the establishment of a regional fisheries and aquaculture commission for Central Asia. After a number of technical and intergovernmental meetings, the countries of Central Asia and the Caucasus requested FAO in June 2009 (FAO, 2009b) to support the establishment of a Regional Fishery Body (RFB) under Article XIV of the FAO Constitution. Following this request, the FAO Council at its 137th Session, held in Rome in October 2009, approved the Agreement on the Central Asia and Caucasus Fisheries and Aquaculture Commission. As soon as three parties to the agreement have deposited their instrument of acceptance to FAO, this new RFB will take effect. The RFB shall carry out the functions and responsibilities in the inland waters and areas within the territorial boundaries of the Central Asian states, namely Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, and the Caucasus, namely the Republic of Armenia, the Republic of Azerbaijan, Georgia and Turkey and, with respect to inland fisheries, other waters within the transboundary water basins bordering the territories of the Central Asian states and the Caucasus.

The objectives of this RFB shall be to promote the development, conservation, rational management and best utilization of living aquatic resources, as well as the sustainable development of aquaculture in the area.

Fishery management

Fishery management plans for specific waterbodies, which many other countries commonly prepare and implement for their waterbodies, are not in place in Kazakhstan. Waterbodies are commonly leased to enterprises, and catch quotas are based on scientific research and annual review by the Fisheries Committee.

Licences and quotas

Quotas (and other fishing restrictions) are annually approved by the Government of Kazakhstan and distributed through a tender process. However, the allocation mechanism is not governed by cost price, as in the majority of tender/quota systems, but based upon the ranking of bids by the special state

body – Interregional Basin Department of Fisheries. The World Bank (2004:31) suggests such a system should be reviewed as it is opaque and tends to yield suboptimal results (including the under-reporting of catch).

To participate in the tender process, potential bidders are required to prepare documents as required by the tender commission. The fishing vessels to be deployed must be registered with the Committee on Transport and Communications (all registered vessels are certificated, with details on ownership, vessel type and registration number). All bidders are expected to show that they have access to refrigeration equipment and fishers/brigades and that they are financially solvent. Successful bidders are expected to manage the fishery in a sustainable manner.

Within a year of the tender procedure being established, a total of 1 933 waterbodies had been assigned to 960 users. By 12 July 2007, these users in turn had invested tenge 206.1 million (tenge 164.8 million went to technical and technological re-equipping, tenge 30.4 million to the reproduction of fish resources, and tenge 10.9 million to completing scientific studies).

Enforcement

The World Bank Report 2004 noted that the implementation of monitoring, control and surveillance (MCS) activities in Kazakhstan was an area of “particular weakness.” In particular, the data collection system was poor and unreliable (catches, infractions and transgressions are all recorded by hand), there is a lack of standards/norms *vis-à-vis* fisheries enforcement (and no enforcement unit within the Fisheries Committee),⁶ inspectors are “poorly trained, underequipped and have limited powers of arrest”, prosecution procedures are lengthy, and the penalties for high-level infractions are too low.

Thorpe and van Anrooy (2009) suggest that MCS techniques have improved since the publication of the World Bank Report. The number of poachers who were caught increased by around 20 percent between 2005 and 2006 (8 449 to 10 203), and there is also an exponential growth in the volume of fines levied (up 300 percent, from tenge 10.4 million to tenge 41.5 million). However, there are concerns that the size of the inspectorate is still too large (numbers cited range from 441 to just over 600) given the reported size (in landings terms) of the fishery, and thus a downsizing in personnel could conceivably free up more funds for enhanced training and improved salaries.

While the leasing out of waterbodies is likely to see part of the enforcement burden passing into private hands, co-management would be a more practical option in the case of managing larger waterbodies such as the Aral Sea. The introduction of chasseurs (stewards) on some fish reservoirs, as in Kyrgyzstan, is another possible option for enforcing minimum catch sizes, which will reduce the magnitude of illegal catches and prevent overfishing.

With respect to the above, it is noteworthy that the recent “Workshop on Illegal, Unreported and Unregulated fishing and Illegal Trade in Sturgeon Products”, held in Antalya, Turkey, in September 2009, which was co-organized by FAO, CITES and Interpol and included participants from Azerbaijan, Iran (Islamic Republic of), Kazakhstan and Turkmenistan, recommended that a Regional Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (RPOA) be developed for the Caspian region. This RPOA should however be preceded by the development of a National Plan of Action (NPOA-IIU) in each of the Caspian littoral states.

The workshop also discussed the four Kazakh agencies that are involved in the prevention and combating of IUU fishing and trade of sturgeon. These agencies are:

⁶ This is perhaps a symptom of the fact that there is confusion as to whom is actually responsible for enforcement – the Ministry of Agriculture or the Ministry of Natural Resources and Environment Protection.

- Fisheries Committee of the Ministry of Agriculture
- Ministry of Internal Affairs
- Customs Control Service of the Ministry of Finance
- Frontier Service of the Committee of National Safety

In addition, the Kazakh experts at the workshop specifically referred to Ministerial Decree No. 493 of 29 April 2004 of the Government of Kazakhstan entitled “Regulations on the Sales of Sturgeon Caviar Produced in Kazakhstan,” which aims to harmonize trade of sturgeon caviar and prevent its illegal marketing within the territory. This decree was followed by a number of related regulations to strengthen enforcement measures. It is noteworthy to mention that in September 2009 a draft bill was under consideration by Kazakhstan’s Senate, which would, if endorsed, result in a government monopoly on purchase, caviar production and wholesale trade in sturgeon within the territory of Kazakhstan.

Chapter 7

SOCIAL AND ECONOMIC ASPECTS OF FISHERIES AND AQUACULTURE

Employment

According to the Fisheries Committee of Kazakhstan, 17 300 people were employed within the fisheries sector in 2006, a figure that is sharply down from the 1980s when the sector employed around 60 000, but up from the official figure of 2002 when there were only 13 200 persons working in the sector.

But there is some dispute with the actual numbers. As mentioned earlier, the majority of catches are not registered, and a significant part of fishery activity is in the black economy and hence not reflected in the official reporting (statistics). While the 2004 FAO Fisheries Profile put the number employed at less than a third of the Fisheries Committee figure (5 200 persons), the World Bank (2005) suggests that as many as 110 000 rural residents may be (informally) active in the sector – where fishing is an alternative source for livelihood and an important supplementary source of animal protein in the diet of rural workers during the winter. The World Bank used the data provided by the Researcher Group Fishery Sector, which also concluded that actual catches are three to four times higher than those officially declared. Timirkhanov *et al.* (2007: 51) in fact postulate that as many as 300 000 people nationwide may be dependent upon fisheries for their livelihoods. The latest figures from the Agency of the Republic of Kazakhstan on Statistics (2008) estimate the number of employees in fisheries and aquaculture at only 2 349 with an average monthly nominal wage of tenge 50 223 (i.e. about US\$418).

Most people employed in the sector are hired under seasonal contracts and, in summertime, as the levels of catch decline, many factory floor employees in fish processing plants are made redundant for a period of two to three months. Fishers hired under such contracts are obliged to seek alternative livelihoods during this period. In addition, current laws and regulations are such that fishery sector employers are not eager to report on all employees (including seasonal workers) involved in their fishing business. There are no disaggregated data available to show numbers employed by oblast, by company or by sector (aquaculture or capture, private or public).

Social security of fishers, aquaculturists and other workers engaged in the sector

Kazakhstan does not have specific social security schemes for fishers. However, fishers, like all Kazakh citizens, are entitled to a variety of child benefits and income support schemes when income falls below a defined level. A fisher in Karateren, for example, was receiving around tenge 10 000 a month – a useful supplement to his fishing income, which was barely double that sum (Thorpe and van Anrooy, 2009).

Decree No. 30-3 of 7 February 2005 “About Obligatory Insurance of the Civil Liability of the Employer for Causing Any Harm to Life/Health of the Worker during the Execution of Their Labour Duties,” (Article 3 – civil liability of the employer), establishes that an employer has a duty of care to the employee in the workplace and can be held liable in the case of an accident occurring. However, few fishers had contracts which entitle them to such support – and most fishers are responsible for ensuring their safety on board their vessel (only a few fishers have safety equipment such as life jackets or life buoys due to their cost).

Economics of fisheries and aquaculture

While official catch estimates put the sectoral share at 0.2 percent of GDP, if the illicit catch is factored in the share could be as much as 0.75 percent of GDP. This moreover is likely to increase following substantive state and private sector investment in restocking. While aggregate data are not available for private sector investment, state financing of hatcheries and nurseries increased 65 percent between 2004 and 2007, from tenge 246.5 million to tenge 406.3 million (around US\$3.38 million).

Figures from the Agency of the Republic of Kazakhstan on Statistics (Table 19) show that the contribution of fisheries to the GDP increased significantly between 2003 and 2008, as it had increased 3.7 times. This increase can partly be attributed to the State Programme on Fish Industry Development (2004–2006). However, the share of the sector in the total rural sector's contribution to the GDP is still minimal. Agriculture and cattle breeding are not significant (in agriculture in 2008 it was about 0.2 percent, in cattle breeding 0.4 percent; see Table 19).

TABLE 18

Rural sector gross product values (various categories) at current prices in million US\$*

	2003	2004	2005	2006	2007	2008
Agriculture	4 112 876	5 140 745	5 751 833	6 754 634	9 168 562	10 946 475
Arable farming	2 377 472	2 878 101	3 013 689	3 423 507	5 155 666	5 651 701
Cattle breeding	1 735 404	2 262 644	2 738 144	3 331 127	4 012 897	5 294 774
Fish industry	5 730	9 681	15 643	14 425	20 816	21 167

*Annual average tenge exchange rate to 1 US\$	Year					
	2003	2004	2005	2006	2007	2008
	149,62	135,94	132,80	126,33	122,35	120,26

TABLE 19

Share of the fish industry GDP compared with the agriculture and cattle breeding sectors, in percentages

	2003	2004	2005	2006	2007	2008
GDP share of the fish industry compared to the GDP of the agriculture sector	0.139	0.188	0.272	0.214	0.227	0.193
GDP share of the fish industry compared to the GDP of the cattle breeding sector	0.330	0.428	0.571	0.433	0.519	0.400

To further facilitate the reactivation of the sector, the Government of Kazakhstan has signed 35 agreements with other states (a further 14 are under negotiation) on double taxation relief so as to encourage inward investment into the sector.

Currently, resource users are subject to the following taxes or levies:

- Payments for bioresources, approved by the Government of Kazakhstan. These are quota fees for corporations
- Social tax (depends on status of the resource user) for corporations
- Personal income tax for individuals (varies according to income of the person)
- Pension tax for individuals (10 percent of income)
- Corporate tax (20 percent of income), for corporations only
- Wealth tax (0.1 percent of income) for corporations
- Land and water taxes (fixed fee, depending on area/volume used) for corporations
- Environmental tax (if harmful substances employed) for corporations
- Transport tax (depends on mode of transport and age of vehicle) for corporations
- VAT (12 percent of sales) for corporations

Small businesses also benefit from a Special Tax Mode (STM) – introduced to prevent them from crossing the boundary from licit to illicit production, which simplifies reporting procedures and also entitles such enterprises to pay reduced levels of tax.

Significant tax privileges are also available under the STM for agricultural production, with a halving of all the taxes identified above. Peasant farmers also make a single land tax payment, dependent on the size of the landholding. Fishers and fish processors are currently not party to the STM and so are unable to benefit from reduced tax burdens. Yet given that most fisheries enterprises have less than 50 employees (qualifying them as a small business on the above staffing criteria – many in fact are simply owner-fishers), and that the majority are employed on a seasonal basis, the current tax burden is not simply inequitable, but is also a disguised incentive to under-report catches.

In accordance with the Law # 242 from 21.01.2010 “About modification and additions in some acts of the Republic Kazakhstan concerning the fish economy” many changes were added into the following legal documents:

- i. The law of Republic Kazakhstan from July, 9th, 2004 593-II About protection, reproduction and use of fauna.
- ii. The Criminal code of Republic Kazakhstan from July, 16th, 1997.
- iii. The code of administrative offences of Republic Kazakhstan Code from January, 30th, 2001
- iv. The Water code of Republic Kazakhstan from July, 9th, 2003
- v. The Ecological code of Republic Kazakhstan from January, 9th, 2007
- vi. The Law of Republic Kazakhstan from July, 8th, 2005 “About state regulation of development of agriculture and rural territories”
- vii. The law of Republic Kazakhstan from November, 16th, 2009 “About modification and additions in some acts of Republic Kazakhstan concerning the taxation”
- viii. In the Law of Republic Kazakhstan from July, 7th, 2006 “About especially protected natural territories”

All these changes concerned mainly the aquaculture sector. In particular, these changes involve the provision of subsidies for fish feed purchase (50%), for buying fingerlings (50%) and for genetics and breeding of fish (50%). The aim was to increase the efficiency and quality of production of aquaculture by providing budgetary support for leasing of equipment and gears for fishing, for artificial reproduction of fish and for processing and production. The amendments to the tax code will reduce the sum of corporate surtax by 70 percent, including changes to the value added tax, the social tax, the land tax, the property tax and the tax on vehicles.

Credit and investment in fisheries and aquaculture

Under the Innovative Industrial Development Strategy of the Republic of Kazakhstan for 2003–2015, the joint-stock company “National Holding KazAgro” is mandated to offer financial support programmes for various branches of agricultural activity through a series of joint-stock companies⁷ – however, it does not have a specialized programme to support the fisheries sector.

⁷ These include the Food Contract Corporation (Mission: to implement state policy on food safety maintenance and assist Kazakhstan to become a significant exporter of grain and processed products); Agrarian Credit Corporation (Mission: to provide an accessible credit system that aids the development of competitive rural business enterprises); KazAgroGarant (Mission: to offer financial guarantees to grain and cotton growers so as to minimize their exposure to production risk); KazAgroFinance (Mission: to provide credit to enable technical and technological updating of competitive and export-oriented agriculture); Mal Onimderi Corporation (Mission: to support the development of livestock production and export); KazAgroMarketing (Mission: to support the development of market infrastructure for the promotion of agricultural goods and services); and the Fund for Agriculture Financial Support (Mission: to develop microcredit and insurance systems to ensure the availability of financial and insurance services in rural areas)

While the country's commercial and state supported banks are willing to extend credit at interest rates of 11 percent p.a. (or above), small and medium-sized fishing enterprises are largely precluded from accessing credit due to their lack of collateral and the low levels of recorded catch. Small- and medium-scale enterprises in the fishery and aquaculture sector in Kazakhstan generally do not have access to microcredit nor to microfinance services. Insurance of the aquaculture production processes is not possible at the present time.

Currently, just the Investment Fund of Kazakhstan (IFK) is funding (two) fisheries projects:

- The Modernization and Extension of Fish Processing Industries Project in East-Kazakhstan oblast (Borrower: the joint-stock company *Zaisan Fish Products*).
- The Organization of Fish Processing project centred upon the factory in Almaty oblast (Borrower: the joint-stock company *White Fish of Kazakhstan*).

The sums that are loaned are not public knowledge.

The World Bank investment project "Syr Darya Control and Northern Aral Sea Project" (SINAS), which was executed in the period 2001–2008, resulted in a reduction of salinity in the North Aral Sea, and enabled fish catches to rise from 52 tonnes in 2004 to more than 2 000 tonnes in 2007. Two fish processing plants and three fish receiving centres were fully operational by the end of 2008 (World Bank, 2008). The second phase of the SINAS project is likely to include additional activities in support of the fishery sector rehabilitation and development in the North Aral Sea.

The role of fisheries and aquaculture in food security and poverty alleviation

There is a paucity of data on poverty in the Republic of Kazakhstan. Thorpe and van Anrooy (2009) note however that poverty has only increased marginally since the break up of the Soviet Union (up from 15.5 percent of the population in 1989 to 21 percent in 2003). Declining life expectancy accounts for the country slipping from 54th to 73rd on the Human Development Index in the period 1990–2005 (down 2.9 years to 65.9 years in this same period). Poverty is most acute in the 50–60 "sick" towns which saw their principal enterprise (and main employer) close during the independence period, and which prompted the approval of the 2002 law "On Targeted Social Assistance", a programme that provides assistance to an estimated 90.4 percent of the people who fall below the national poverty line.

While the country does not produce a poverty reduction strategy paper, the "2003–2005 State Program for Poverty Reduction in the Republic of Kazakhstan"⁸ noted extensive and acute levels of rural poverty, which was territorially concentrated in Atyrau and Mangistau oblasts bordering the Caspian Sea (poverty levels in the more remote areas of Mangistau reaching 95.5 percent). In response, the programme promised to reduce poverty by 48.8 percent between 2002 and 2005, with food security being one of its main objectives – although the role that the fisheries and aquaculture sector would play in this strategy was not defined.

At the household level, however, fish and fish products can provide an important livelihoods component – with an estimated 300 000 dependent upon income and/or protein derived from the sector. Among approximately 150 fishing communities across Kazakhstan, practically every household possesses some form of fishing tackle, and recreational/subsistence fishing is often undertaken to supplement the household diet. Fishing is a particularly important source of protein in the winter months when farming and many other activities are well-nigh impossible.

⁸ To the best of our knowledge, more recent data were not made available.

Chapter 8

SECTORAL DIAGNOSIS

In 2007, two meetings were held with representatives of the fisheries sector in the cities of Almaty (on 8 June 2007 at Hotel “Zhetysu”) and Aralsk (on 15 June 2007 at the NGO Aral Tenizi office) so as to understand the current situation in the fisheries and aquaculture sector, and how policy might be formulated to ensure it contributes fully to the economic and social development of Kazakhstan. Some 30 experts participated in the meetings, among them state representatives, representatives of civil society, scientific organizations, and fishers and fish processors.

Surveys taken at these meetings identified the principal development priorities for the sector as:

- Improving fisheries legislation and increasing administrative support to the sector (83 percent approval).
- Strengthening human resources – improving the technical and professional levels of the staff employed within the sector (77 percent approval).
- Strengthening the financial and material (equipment, etc.) support available to the sector (75 percent approval).
- Exploiting the natural resource potential of the sector (70 percent approval).

Various methods can be used to diagnose the current situation. One of the most commonly 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 analysis (SWOT) (Karimov *et al*, 2009). 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 strategic plans and programmes for fisheries sector development.

The meetings evaluated the strengths, weaknesses, opportunities offered to and threats faced by the sector, reasoning that such an analysis could provide useful entry points for the refinement of current – and the development of future – sectoral development strategies.

Strengths

I. Fisheries legislation and administrative support

- The long-term leasing (10 years) of fishery sites to private sector fishers (resource users)
- The decision to ban monofilament nets from the national fishery
- The approval of a long-term strategy (2007–2015) for the development of the country’s fisheries
- The Fisheries Committee, as an authorized body, has already developed a structure for the management of the national fisheries

II. Human resources

- Current personnel have wide experience regarding the functioning of state structures
- The existence of fishery education/training programmes within universities and colleges
- Fish-production and fish-capture specialists are employed at the enterprise level
- A large number of professional fishers
- The activities of the fisher organization Aral Tenizi in the Kyzylorda area

III. Financial and material support

- The willingness of the Investment Fund of Kazakhstan to lend to fisheries projects
- Comparatively low costs for fish production (in comparison with the world)
- The level of business interest in developing the national fisheries
- The presence of specialized fish-processing enterprises (with a strong material and technical basis,

and with access to bank credit)

- Favourable conditions for the production of all kinds of manufactured goods related to fisheries and aquaculture development (gear, boat construction, etc.)
- The availability of resources to permit the manufacture of domestic fish feed compounds

IV. Natural resource potential

- Presence of numerous small and large reservoirs which are ideal for the purposes of fish culture, especially in Semirechie
- Multiple fish species (rare, high value and trash)
- The natural and climatic conditions of Kazakhstan – which favour the development of various forms of aquaculture

Weaknesses

I. Fisheries legislation and administrative support

- Transfer of fishing rights from public to private sector via the quota process did not occur through a process of competitive (price-based) selection
- Transition from monofilament nets to nylon gillnets is costly, with the latter six times the price of the former
- Continued use of poor quality Chinese nets in the Kazakh fishery
- A failure to effectively control net size
- There is no coordinated fishery management at the ministerial level – with capture, processing and trade all the concern of different ministries
- There is no law on fishery management
- There are problems with the organization of the country's recreational fishery
- There are currently no measures to encourage fish culture by the private sector
- The level of unreported fish catches being illegally exported from Kazakhstan

II. Human resources

- There is a lack of qualified staff with particular specialisms, such as ichthyologists, hydrobiologists, fish breeders and ichthyoparasitologists, among others
- The limited appeal of fishing as an occupation of first choice among the youth
- The dearth of fishery and fish-processing technology specialists

III. Financial and material support

- There are no specific state privileges/benefits available to fishers (capture or culture)
- An absence of state support to fisheries enterprises (tax exemptions, credit access, subsidies and privileges)
- Insufficient state investment in the sector
- The high price of fish culture material and feedstuffs
- Infrastructure problems (inadequate number and type of vessels, too few receiving stations and insufficient transportation on large reservoirs, lack of spare parts for vessel/gear repair, few access roads to the sea, low standards of the temporary living facilities for fishers, absence of life jackets, among others)
- The lack of fish-processing equipment

IV. Natural resource potential

- Absence of economic research on the various technologies employed in capture fisheries and aquaculture
- Poor scientific and methodological assistance available to those who wish to start an aquaculture

business (local scientific research institutes still do not produce such materials)

- Absence of modern methods to study the fish stocks in reservoirs
- Lack of a good experimental base for development of sturgeon breeding
- Fish migration from the small Aral Sea to the big Aral Sea

Opportunities

I. Fisheries legislation and administrative support

- Development of a Fishery law that resolves most of the weaknesses identified in the current regulatory regime
- Introduction of current and long-term plans for the development of the fisheries sector
- Imposition of (an additional) tax on the export of raw fish so as to offer protection to local processors
- Unification of fisheries capture, processing and trade functions within one ministry
- Relocate fisheries management activities for the Aral-Syrdarya basin to Aralsk city (at the moment fishers must go 500 km to Kyzylorda city to get an official permit)

II. Human resources

- Increase salaries paid to fishery specialists (fisheries science, fisheries protection) – to avoid staff departures
- Organize fishers into one national professional fishers' association
- It is necessary to solve arising problems together (in participation and consultative manners) in so-called co-management approaches

III. Financial and material support

- There is a need to provide a package of state support to the fisheries sector (privileged access to inputs, subsidies, incentives to businessmen prepared to invest money in fish-processing plant construction, equipment and fleet renovation, funding of aquaculture development, access to improved fish-catching techniques, and transport to ensure the delivery of quality raw fish from distant sites)
- State financing for the development of aquaculture activities
- The state should assist in the creation of a non-governmental fishers' foundation to support the independent activity of fishers and fish processors

IV. Natural resource potential

- To develop regional programmes on fishery development
- To improve dialogue between participants in the fisheries sector via the establishment and publishing of an applied scientific magazine
- Development of Fisheries Science as a distinct discipline within the educational system
- Support the reproduction of fish stocks (for example, by introducing a seasonal ban on fishing – especially during the spawning period)
- Take into consideration the value of fish resources when authorizing dam/reservoir construction (and provide fish passes so as to not inhibit the spawning or migratory activities of certain species)

Threats

I. Fisheries legislation and administrative support

- The Government of Kazakhstan and/or the Fisheries Committee might refuse to develop a programme on state support for the sector (despite the fishery concept decree being approved – and the fact that current fishery programmes are already being developed)
- The Government of Kazakhstan chooses to ignore the problems faced by the fisheries sector

- Fishery specialists are unable to lobby effectively to generate support for their interests
- Government bureaucracy, insufficient extension services and inadequate consultations with fishers and fish processors before policies are introduced
- The State may not support the introduction of a system of privileges for fishers (despite doing so for producers of agricultural products)

II. Human resources

- Continued low salaries paid to fish protection specialists and scientific employees causes the outflow of well-qualified staff
- Low social guarantees for state employees in the fisheries sector
- Key posts within the sector are not filled (as they become available) by fishery sector experts
- There is a lack of specialists able to write funding proposals so as to attract funds into the sector

III. Financial and material support

- Domestic fish prices are too low to encourage financial investment in the sector
- The Fisheries Committee fails to persuade the Ministry of Finance to release funds which can be used to develop and support private sector investment in fishing and fish culture
- Delays in the provision of financing, fishing vessels and gear and other equipment purchases

IV. Natural resource potential

- Overfishing caused by current unreliable information on catches
- Pollution of lakes by industrial waste and effluents

REFERENCES

- EIU.** 2008. Country Profile 2008: Kazakhstan. Economist Intelligence Unit, London, United Kingdom. 28 pp.
- FAO.** 2004. *Kazakhstan: fishery country profile*. Rome. (Available at www.fao.org)
- FAO.** 2005. FAO Food Balance Sheets.(Available at:<http://faostat.fao.org/site/291/default.aspx>)
- FAO.** 2008. *Report of the Regional Workshop on the 1995 FAO Code of Conduct for Responsible Fisheries in the Central Asian region: a call to action, 8–10 April 2008, Tashkent, Uzbekistan. FAO Fisheries Report No. 866*. Rome. 92 pp.
- FAO.** 2008b. *Report of the Regional Workshop on Inland Fisheries and Aquaculture in Central Asia: Status and Development Prospects, Beymelek, Antalya, Turkey, 11–14 December 2007*. R. van Anrooy, G. Marmulla and R. Celebi (eds). FAO Fisheries Report No. 862. Rome. 58 pp. (Available at www.fao.org/docrep/011/i0240b/i0240b00.htm)
- FAO.** 2009. The State of World Fisheries and Aquaculture 2008. Rome. 176 pp.
- FAO.** 2009b. *Report of the Second Intergovernmental Meeting on the Establishment of Central Asian and Caucasus Regional Fisheries Organization, Trabzon, Turkey, 3–5 June 2009*. FAO Fisheries and Aquaculture Report No. 912. Rome.
- Isbekov, K.** 2009. Country review summary of the fisheries sector and production of fish feeds in Kazakhstan. In: *Report of the FAO Regional Workshop on Fish and Livestock Feed Assessment Methodologies, Tashkent, Uzbekistan, 24–27 June 2009*. Rome, FAO. 48 pp. (unpublished, distributed in Central Asian region in Russian and English language).
- Ismukhanov, K. & Mukhamedzhanov, V.** 2003. The Use of Irrigation Systems for Sustainable Production of Agricultural and Fish Products in the Republic of Kazakhstan. In T. Petr (ed.). *Fisheries in Irrigation Systems of Arid Asia*. FAO Fisheries Technical Paper No. 430. Rome, FAO.
- Karimov, B., Kamilov, B., Upare, M., van Anrooy, R. Bueno, P., & Shokhimardonov, D.** 2009. *Inland capture fisheries and aquaculture in the Republic of Uzbekistan: current status and planning*. FAO Fisheries and Aquaculture Circular No. 1030/1. Rome, FAO. 124 pp.
- Kim, Y.** 2009. Current status of sturgeon populations in the Ural-Caspian basin In: *Report of the FAO/World Bank/UNDP/GEF/Fishery Committee of the Republic of Kazakhstan “Regional Training Workshop on Sturgeon Hatchery Practices and Management”, Atyrau, Kazakhstan, 14–19 April 2009*. Rome, FAO. 40 pp. (unpublished; distributed in Central Asian region in Russian and English language).
- Petr, T. & V.P. Mitrofanov.** 1998. The impact on fish stocks of river regulation in Central Asia and Kazakhstan. *Lakes & Reservoirs: Research and Management* 3: 143-164.
- Petr, T., Ismikhonov, K., Kamilov, B., Pulatkhon, D. & Umarov, P.D.** 2004. Irrigation Systems and Their Fisheries in the Aral Sea Basin, Central Asia. In R.L. Welcomme and T. Petr, eds. *Proceedings of the Second International Symposium on the Management of Large Rivers for Fisheries Volume II: Sustaining Livelihoods and Biodiversity in the New Millennium*, Phnom Penh, 11–14 February 2003. RAP Publication, 2004/17. Penang, FAO.
- Sarieva, M., Alpiev, M., van Anrooy, R., Jorgensen, J., Thorpe, A. & Mena Millar, A.** 2008. *Capture fisheries and aquaculture in the Kyrgyz Republic: current status and planning*. FAO Fisheries Circular No. 1030. Rome, FAO.
- Thorpe, A. & van Anrooy, R.** 2009. *Inland fisheries livelihoods in Central Asia: policy interventions and opportunities*. FAO Fisheries and Aquaculture Technical Paper. No. 526. Rome, FAO. 2009. 61 pp.
- Timirkhanov, S., Chaikin, B. & Makhambetova, Z.** 2007. *Fisheries and Aquaculture in the Central Asian Region: Fish Industry and Aquaculture of the Republic of Kazakhstan*. Aralsk/Almaty, Kazakhstan. (unpublished)
- Van Anrooy, R., Hickley, P., Sipponen, M., & Mikkola, H.** (eds). 2010. *Report of the Regional Workshop on Recreational Fisheries in Central Asia, Suu Samyr Valley, Kyrgyzstan, 14–16*

September 2009. FAO Fisheries and Aquaculture Report No. 912. Rome, FAO.

- World Bank.** 2004. *Innovations in Fisheries Management for Kazakhstan*. Washington D.C., World Bank. (Available at: <http://siteresources.worldbank.org/INTKAZAKHSTAN/Data%20and%20Reference/20292610/KZ%20Fish--Draft%20Report--V4-eng.pdf>)
- World Bank.** 2005. *Innovations in Fisheries Management for Kazakhstan*. Washington D.C., World Bank. (Abstract in English, full text in Russian. Available at: http://www.worldbank.org/kz/external/default/main?pagePK=51187349&piPK=51189435&theSitePK=361869&menuPK=64187510&searchMenuPK=361897&theSitePK=361869&entityID=000112742_20060119163246&searchMenuPK=361897&theSitePK=361869)
- World Bank.** 2008. Status of Projects in Execution – FY08 – Europe and Central Asia Region. Country: Kazakhstan. Accessed via the Web in October 2009: (Available at: http://www1.worldbank.org/operations/disclosure/SOPE/FY08/Country/SOPE_ECA_Kazakhstan.pdf)

Annex 1

A list of fisheries bodies under the Ministry of Fishing Industry of the Kazakh SSR (Kazakh Soviet Socialist Republic)

Independent bodies under the Ministry of Fishing Industry of the Union of Soviet Socialist Republics included:

1. **Guryevrybprom.** A fishing and fish processing association working in the Ural-Caspian basin and situated in Balykshy village, Atyrau oblast.
2. **Ural-KaspNIIRKh.** Ural-Caspian Fisheries Scientific Institute situated in Atyrau city (former Guryev), which was later included into KazNIIRKh.

Basin Administrations for Protection, Reproduction and Regulation of Fishing subordinated to Glavrybvod of the Ministry of Fishing Industry of the USSR included the following:

1. **KAZAKHRYBVOD.** The Kazakh Republican Basin Administration for Protection, Reproduction and Regulation of Fishing. It included oblast fishery protection inspectorates, an acclimatization station, and was situated in Almaty.
2. **URALKASRYBVOD.** The Ural-Caspian Basin Administration for Protection, Reproduction and Regulation of Fishing controlled the northern part of the Caspian Sea within the borders of the Kazakh SSR, Ural River and other water basins in the Atyrau, Mangistau and Ural oblasts, as well as in the Orenburg oblast in Russia. It was located in Atyrau city (Guryev).

Fishing and fish processing associations in the Kazakh SSR were located in most fishery regions, fish landing sites and fishing communes.

Basic fishing associations include the following: Atyraurybprom (Atyrau city, Ural River bank, Balykshy village), Mangyshlakrybholodflot (Caspian Sea, Bautino port), Balkhashrybprom (Balkash city, Balkash lakeshore, Ozernoe village), Zaisanrybprom (Zaisan lakeshore, Priozernoe village), Aralrybprom (Aral lakeshore). The above-mentioned fishing associations captured up to 90 percent of the annual catch in Kazakhstan's reservoirs.

Most fishing enterprises were located directly on the reservoirs, where fisherfolk lived and where all operation services schools, hospitals and clubs were concentrated. Fish farms and fishing factories were located in or near cities, taking into account fish processing requiring numerous employees and delivery directly to the distribution networks.

TABLE A1.1
Fishing and fish processing associations of the fish industry

Oblast	Fishing associations	Fish farm/ Fish plant/ Fishing <i>kolkhoz</i> (collective farm)
Ural-Caspian Basin		
1. Atyrau 2. Mangystau 3. Western-Kazakhstan oblast	Atyraurybprom Mangystaurybholodflot fish and seal catching in the Caspian Sea	Fishing <i>kolkhoz</i> – 11
Balkash-Alakol Basin		
1. Almaty		Fish farms – 2: Shilik, Alakol. Fish plants – 1: Ily Fishing <i>kolkhoz</i> – 4: Dostizhenie, Kirova, Ulga, Krasnyi Rybak
2. Zhambyl		Fish plants – Zhambyu Fish Farm Mynaralsky Fish Farm
3. Karaganda	Balkhashrybprom (Balkash city), created in 1929	Fish farm – “50 Let Octyabrya”, 1 Fish Farm
Aral-Syr-Darya Basin		
1. Kyzylorda	Aralrybprom (Aralsk), created in 1925	Fish plants: Kyzyl-Ordinsky, Kazalinsky, Fish farms: – 3: Named after 1 May, Raim, Zhambul
2. Shymkent		Shymkent fish farm. Shardara and Kirov fish farms
Irtysh-Zaisan Basin		
1. Eastern-Kazakhstan	Zaisanrybprom, created in 1933	Fish plants: Kurchum, Bukhtarma Amanat, Semipalatinsk
Inner Reservoirs		
1. Akmola		Fish plants – 2: Kokchetav and Tselinograd
2. Aktyubinsk		Aktyubinsk fish farm
3. Kustanay		Fish plant – Kustanay
4. Pavlodar		Pavlodar fish farm
5. Northern-Kazakhstan		Petropavl fish farm

TABLE 1.2
Trade enterprises, fish and fishery product trade centers

Oblast/city	Enterprise and trade centre
Akmola	Tselinryba. Trade centre (<i>okean</i>)
Aktyubinsk	Aktyubryba. Trade centre (<i>okean</i>)
Almatinskaya, Almaty city	Almataryba. Trade centre (<i>okean</i>)
Kapshagay	Kapshagayryb complex
Atyrau	Guryevryba
Eastern-Kazakhstan	Vostokryba. Trade centre (<i>okean</i>)
Zhezkazgan	Zhezkazganryba
Zhambyl	Zhambylryba
Western-Kazakhstan	Zapkazryba
Karaganda	Karagandaryba. Trade centre (<i>okean</i>)
Kyzylorda	Kyzylordaryba
Kokshetau	Kokshetavryba
Kustanai	Kustanayryba. Trade centre (<i>okean</i>)
Mangistau	Mangystauryba
Pavlodar	Pavlodarryba. Trade centre (<i>okean</i>)
Semipalatinsk	Semipalatinskryba. Trade centre (<i>okean</i>)
Northern-Kazakhstan	Sevkazryba. Trade centre (<i>okean</i>)
Taldy-Kurgan	Taldykurganryba
Turgay	Turgayryba
Southern-Kazakhstan	Yuzhkazryba

Annex 2

Aquaculture

The very first aquaculture activity in Kazakhstan took place in 1937. One of the first aquaculture activities was the establishment of the Almaty pond fishery farm, which is now the private enterprise “Bent”.

Temperature ranges, being indicators of the environment, have direct influence on fishery- technological specifications in aquaculture. Therefore, the territory of the former USSR was divided into seven areas which are still used as such. The borders of these areas are defined as isolines presenting the number of days in a year with air temperature 15°C and above. The difference between each isoline was 15 days. In accordance with this principle, six fishing areas are allocated within the territory of Kazakhstan.

All aquaculture farms in Kazakhstan still use the above-mentioned area normative, confirmed by the order of the Chairman of the Fisheries Committee on 1 April 2005, No. 16-6/28p “About confirmation of temporary fishery-technological specifications on breeding juveniles of valuable fish species”.

TABLE A2.1
Kazakhstan aquaculture areas

Fishery areas	Number of days with air temperature 15 °C and above	Oblast
II	76–90	North end of Akmola oblast, Northern-Kazakhstan
III	91–105	Eastern-Kazakhstan, Pavlodar, south end of Akmola oblast, north end of Karaganda and Kostanay oblasts
IV	106–120	North end of Akyubinsk oblast and south end of Karaganda and Kostanai oblasts
V	121–135	Atyrau, Western-Kazakhstan, south end of Akyubinsk oblast
VI	136–150	Almaty, Zhambyl, Kyzylorda, Mangistau
VII	151–175	Southern-Kazakhstan

The production capacity of ponds located in the above-mentioned six areas are different. Normative standards for projection of pond aquaculture objectives are presented in Table A2.2.

TABLE A2.2
Pond capacity figures used for planning and fish farm management purposes in 1975–1980 upon two-year production cycle in metric centner/ha

Normative title	Norm	Area						
		I	II	III	IV	V	VI	VII
Average fish capacity on carp and herbivorous fishes:								
Grow-out ponds	8.0–26.0	8.0	14.0	16.0	19.0	22.0	24.0	26.0
Carp	8.0–15.0	8.0	11.0	12.0	13.0	13.0	14.0	15.0
Herbivorous	3.0–11.0	-	3.0	4.0	6.0	9.0	10.0	11.0
Nursery ponds	8.5–28.0	8.5	15.0	17.0	20.0	25.0	26.0	28.0
Carp	8.5–16.0	8.5	12.0	13.0	14.0	15.0	15.0	16.0
Herbivorous	3.0–12.0	-	3.0	4.0	6.0	10.0	11.0	12.0
Average fish capacity on peled in addition to carp:								
Yearling breeding together with two-year-old carp	1.0–1.5	1.0	1.5	-	-	-	-	-
Commercial yearling breeding	0.8–0.8	0.8	0.8	-	-	-	-	-
Two-year-old	1.0–1.5	1.0	1.5	-	-	-	-	-
Average fish production of pike in addition to carp	0.06–0.4	For all areas						

TABLE A2.3

Data on commercial fish production in Kazakhstan in 1970, 1990, 2004 and 2006 (tonnes)

Oblast	1970	1990	2004	2006
Akmola		529	0	0
Including:				
Pond fishery	30	57	0	0
Lake commercial farm	0	397	0	0
Adjusted reservoirs		75	0	0
Atyrau	0	0	0	0
Almaty	258	2 383	110	150
Including:				
Pond fishery	258	2 177	110	150
Lake commercial farm	0	82	0	0
Adjusted reservoirs	0	115	0	0
Herbivorous fishes	0	9		0
Aktubinsk				
Pond fishery	0	89	25	30-15
Eastern-Kazakhstan	102	529	0	0
Pond fishery	102	529	0	0
Zhambyl				
Including:				
Pond fishery	0	620	0	0
Adjusted reservoirs	0	20	0	0
Western-Kazakhstan	15	637	0	0
Including:				
Pond fishery	15	545	10–15	10
Adjusted reservoirs	0	92	0	0
Karaganda	0	330	0	0
Including:				
Pond fishery	0	213–60	0	0
Adjusted reservoirs	0	117	0	0
Kyzylorda	33	2553	0	0
Including:				
Pond fishery	33	987	0	0
Lake commercial farm	0	993	0	0
Adjusted reservoirs	0	5 730		0
Kostanai	0	201	0	0
Including:				
Lake commercial farm	0	154	0	0
Adjusted reservoirs	0	47	0	0

Oblast	1970	1990	2004	2006
Pavlodar	17	240	0	0
Including:				
Pond fishery	17	201	0	0
Hatcheries	0	39	0	0
Northern-Kazakhstan	0	174	0	0
Lake commercial farm	0	174	0	0
Southern-Kazakhstan	217	1 379	0	0
Including:				
Pond fishery	217	1 236	0	0
Adjusted reservoirs	0	87	0	0
Hatcheries	0	3	0	0
Herbivorous fish	0	53	0	0
Total	672	9 883	145	190
Including:				
Pond fishery	672	6 657	145	190
Adjusted reservoirs	0	1 323	0	0
Lake commercial farm	0		1 800	0
Hatchery farms	0		42	0
Herbivorous fish	0	61	0	0

Sturgeon fingerling production by Atyrau and Ural sturgeon hatcheries for the period 1998–2004 is presented in Table A2.4.

TABLE A2.4

Sturgeon fingerling production in Kazakhstan in the period 1998–2009 in thousand pieces

Sturgeon species	1998	1999	2000	2001	2002	2003
Beluga	0.00	515.60	1 920.40	1 684.50	2 016.30	2 918.34
Russian	300.00	1 492.60	1 266.30	2 295.10	1 394.00	816.76
Fringebarbel	0.00	822.30	277.80	1 720.70	572.20	828.70
Starry	1 487.00	2 518.00	3 771.00	2 529.00	2 185.50	1 896.20
Sterlet	0.00	0.00	0.00	0.00	20.00	0.00
Total	1 787.00	5 348.50	7 235.50	8 229.30	6 188.00	6 460.00

Sturgeon species	2004	2005	2006	2007	2008	2009	Total
Beluga	1 487.70	0.00	924.00	503.10	1 296.20	0.00	13 266.14
Russian	906.40	2 915.20	2 100.10	785.10	394.40	601.90	15 267.86
Fringebarbel	253.20	374.00	0.00	0.00	0.00	314.60	5 163.50
Starry	4 060.70	3 424.60	4 344.70	6 203.90	5 361.40	6 316.50	44 098.50
Sterlet	0.00	0.00	34.00	358.40	0.00	0.00	412.40
Total	6 708.00	6 713.80	7 402.80	7 850.50	7 052.00	7 233.00	78 208.40

Annex 3

List of legal documents that are of relevance to fishery sector development in Kazakhstan in the period 2004–2006

The law of the Republic of Kazakhstan of 9 July 2004 on “The protection, reproduction and use of animal world”.

Decisions of the government of the Republic of Kazakhstan:

- 1) About conducting of state purchasing works and services, having important strategic role (9.03.04, No. 292);
- 2) About measures on regulation caviar commerce of sturgeon species of fishes in the Republic of Kazakhstan (29.04.04, No. 493)
- 3) About some issues on Fisheries Committee of the Ministry of agriculture of the Republic of Kazakhstan (7.05.04, No. 517);
- 4) About reorganization and renaming of separate state institutions of the Fisheries Committee of the Ministry of agriculture of the Republic of Kazakhstan (07.09.04, No. 938);
- 5) List of fishery reservoirs (lots) of international and republican value (3.11.04, No. 1137»;
- 6) Regulation for Red Book of the Republic of Kazakhstan (15.12.04, No. 1330);
- 7) Rules of creation and government accounting of zoological collections (29.12.04, No. 1413);
- 8) List of officers of the authorized and territorial bodies, carrying out state control upon protection, reproduction and use of animal world, having right to wear uniform (without shoulder straps) (29.12.04, No. 1415);
- 9) Fisheries Maintenance rules (31.12.04, No. 1456);
- 10) Regulation for state protection of animal world of the Republic of Kazakhstan (31.12.04, No. 1457);
- 11) Authorization rules for animal world use (31.12.04, No. 1469);
- 12) State accounting procedures, cadaster and monitoring of animal world in the Republic of Kazakhstan (05.01.05, No. 1);
- 13) Limit regulation and animal world use ban (05.01.05, No. 2);
- 14) Fish catch limits and other water animals in fishery reservoirs for 2005 (7.01.05, No. 5);
- 15) Tender rule procedures on fishery reservoir allocations (lots) and qualified requirements to tender participants. (4.02.05, No. 102);
- 16) Fishery rules (18.03.05, No. 246);
- 17) Regulation for Fisheries Committee (6.04.05, No. 310);
- 18) Fish catch limits and other water animals for 2006 (26.01.06, No. 50);
- 19) Composition of commissions on fishery reservoirs (lots) allocation of the international and republican value (6.02.06, No. 72);
- 20) About state purchasing, having important strategic role (24.02.06, No. 122);
- 21) Fisheries development conception of the Republic of Kazakhstan for 2007-2015 (6.10.06, No. 963).

Orders of the Minister of Agriculture of the Republic of Kazakhstan

- 1) Procedure for issuance of authorizations by the Administrative body for import and export abroad endangered animal species and plants, its parts and derivatives (27.01.04No.31);
- 2) Sturgeon fish caviar labeling rules in the Republic of Kazakhstan for trading on the domestic and foreign market (31.08.04 No.462);
- 3) Reclamation work rules on the Kazakhstan reservoirs (2.09.04 No.469) ;
- 4) Regulations on the use of special features by the officers of authorized and territorial bodies of the state institutions on animal world protection (10.11.04 No. 639);
- 5) Regulations for animal use, except rare and endangered species, in scientific, cultural and educational, instructional and aesthetic purposes, including creation of the zoological collections (10.11.04No.652);

Orders of the Fisheries Committee

- 1) About restriction of some fishing gear (5.05.04, No.56-п);
- 2) Biological substantiation preparation for fish resource and other water animals' use. (8.11.04, No.106-п);
- 3) Standards for huntsman service of the fishery institutions (10.11.04, No. 107 «а»-п);
- 4) Regulations to determine rating estimation of the fish resource and other water animal use (12.09.05, No.16-6/64п);
- 5) Regulations to determine rating estimation of the fish resource and other water animal use (8.02.06, No.16-6/11п);
- 6) Standard form of the fisheries development Plan (06.03.06 No.16-6/28п);
- 7) Regulations for fish and other water animal catch upon scientific-research work (17.05.06, No.16-6/67п);
- 8) Authorization rules for export abroad out of Republic of Kazakhstan, its parts and derivatives (24.05.06, No. 16-6/69п).

Annex 4

Main reasons for the decline in fisheries production in Kazakhstan after independence from the Soviet Union in 1991

While there are many reasons that have contributed to the decline in capture fisheries and aquaculture production in Kazakhstan, there is general consensus among the stakeholders of the sector that the reasons below have harmed the sector most.

Lack of fish feed

After independence Kazakhstan did not have any specialized fish feed plants that could supply fish farms. Feed for carp species continued to be produced, but only in animal feed plants whose main aims were to produce feed for poultry and livestock. The main supplier – Semipalatinsk Feed Plant – produced feed for fish, and in big volumes, for Syr-Darya, Shymkent, Kyzylorda, Chilik, Ust-Kamenogorsk, Almaty and Tasutkel pond farms. The farms were obliged to order and receive large quantities, sometimes even two to three months before animal feeding season. Due to the extended storage time, the feed was generally of low quality, which had an adverse effect on the output.

Kazakhstan also did not have feed plants for the production of trout and sturgeon feed. Feed for trout was imported from Uzbekistan (Chinaz city). Because of the low quantity ordered, Kazakhstan farmers were forced to reject the feed and use the alternative source of import from Dnepropetrovsk city in the Russian Federation, which was economically not sound. Therefore, sturgeon and trout production did not develop in a proper way.

Excessive large areas of fishing and nursery ponds

In Soviet times, fish pond systems were large infrastructure projects. Pond sizes of several hectares were common. Some farms had pond areas of hundreds of hectares, which made management difficult after the collapse of the Soviet Union. It was difficult to feed the fish, manage water supply, empty the ponds after harvest, and conduct other management and maintenance measures. It would be necessary to reconstruct all farms and establish farms with pond sizes from 1 up to 3 hectares.

Nursery ponds of the past often were large: 10 or more hectares, which reflect on breeding process of high volumes of stocking materials for restocking of reservoirs, lakes and other waterbodies. At the present time, it would be necessary to reconstruct all farms and establish nursery ponds from 0.5 up to 1 hectares.

Payment for use of water resources

From all the aquaculture farms, only Almaty, Chilic and Shymkent had independent water supplies and all other farms had mechanical supplies. In connection with sharp increases in the fees for water and power supply in several areas, fish farming became unprofitable.

Land use fees

Establishment and increase of the land use fees increased the net costs of aquaculture production. The land use fees for aquaculture farms were not based on the same rules as those for agriculture.

Payment for electric power

The continuous increase of electric power supply costs threatened the activities of nearly all fish farms. Particular damage was done to the sector when power suppliers turned off the electricity supply to farms in the winter season, causing high mortalities among stocks in nursery farms.

High cost of fertilizers, chemicals and drugs

Mineral fertilizers, lime, chemicals for water quality improvement and drugs needed when fish health problems occur are virtually unavailable in Kazakhstan or inaccessible for the fish farmers due to high prices as most are not produced domestically and need to be imported.

Custom tariffs

The export and import rules and tariffs for aquaculture inputs (including for imports of live fish for breeding purposes and replacement of stocks, larvae and roe (fertilized) have hampered the sectoral development for a long time. It is considered necessary to make changes in custom normative and place no restrictions and charges on import of larvae and roe (fertilized), fish feed, drugs, laboratory equipment and chemical reagents, fish facilities and equipments.

Absence of a strategy and development program for aquaculture in the republic of Kazakhstan

In the transition of Kazakhstan the system of state support has not been modified yet sufficiently; while in agriculture more progress has been made, with the result that agriculture has been given several privileges. Absence of any development strategies and programmes that are carried by the sector as a whole have not allowed and do continue to constrain the development of aquaculture. Moreover, there is no Law “About aquaculture development”, there is no State “Program for commercial fishery development” and all of this restrains entrepreneurs to be engaged in breeding of commercial fish and to do investments needed.

Annex 5

Fish species and subspecies found in Kazakhstan

№ п/п	Scientific name	Russian name	English name
Petromyzontidae Миноговые Lampreys			
1	<i>Caspiomyzon wagneri</i> (Kessler, 1870)	минога каспийская [волжская]	Caspian [Volga] lamprey
2	<i>Lampetra camtschatica</i> (Tilesius, 1811)	минога тихоокеанская [японская]	Arctic lamprey
3	<i>Lethenteron kessleri</i> (Anikin, 1905)	минога сибирская	Siberian brook lamprey
Acipenseridae Осетровые Sturgeons			
4	<i>Acipenser gueldenstaedtii</i> Brandt, 1833	осетр русский	Russian sturgeon
5	<i>Acipenser nudiventris</i> Lovetsky, 1828	шип	Fringebarbel sturgeon
6	<i>Acipenser persicus</i> Borodin, 1897	осетр персидский	Persian sturgeon
7	<i>Acipenser ruthenus</i> Linnaeus, 1758	стерлядь	Sterlet
8	<i>Acipenser stellatus</i> Pallas, 1771	севрюга	Starry sturgeon
9	<i>Huso huso</i> (Linnaeus, 1758)	белуга	Great (white) sturgeon, beluga, hausen
10	<i>Pseudoscaphirhynchus fedtschenkoi</i> (Kessler, 1872)	лжелопатонос сырдарьинский	Syr Darya sturgeon
Clupeidae Сельдевые Shads			
11	<i>Alosa braschnikowii</i> (Borodin, 1904)	Каспийская морская сельдь, бражниковская сельдь	Caspian marin shad
12	<i>Alosa caspia caspia</i> (Eichwald, 1838)	Северокаспийский пузанок	Caspian shad
13	<i>Alosa kessleri volgensis</i> (Berg, 1887)	Волжская многотычинковая сельдь, волжская (астраханская) сельдь	Caspian anadromous shad
14	<i>Alosa saposchnikowii</i> (Grimm, 1887)	Большеглазый, или сапожниковский, пузанок	Saposhnikovi shad
15	<i>Alosa sphaerocephala</i> (Berg, 1913)	Аграханский пузанок пузанок	Agrakhan shad
16	<i>Clupea harengus</i> Linnaeus, 1758	салака, балтийская сельдь	Baltic herring
17	<i>Clupeonella cultriventris</i> (Nordmann, 1840)	черноморско-каспийская тюлька	Black Sea sprat
18	<i>Clupeonella engrauliformes</i> (Borodin, 1904)	анчоусовидная тюлька	Anchovy sprat
19	<i>Clupeonella grimmi</i> Kessler, 1877	большеглазая тюлька	big-eyed kilka, southern Caspian sprat
Salmonidae Лососевые			
20	<i>Brachymystax lenok</i> (Pallas, 1773)	ленок	lenok
21	<i>Brachymystax savinovi</i> Mitrofanov, 1959	Ленок Савинова	
22	<i>Coregonus albula</i> (Linnaeus, 1758)	ряпушка европейская	Vendace

№ п/п	Scientific name	Russian name	English name
23	<i>Coregonus lavaretus lavaretus</i> (Linnaeus, 1758)	сиг обыкновенный	Common whitefish
24	<i>Coregonus peled</i> (Gmelin, 1789)	пелядь	Peled
25	<i>Hucho taimen</i> (Pallas, 1773)	таймень	Taimen
26	<i>Oncorhynchus mykiss</i> (Walbaum, 1792)	микижа	Rainbow trout
27	<i>Salmo trutta aralensis</i> Berg, 1908	лосось аральский	Aral trout
28	<i>Salmo trutta trutta</i> Linnaeus, 1758	кумжа обыкновенная	Sea trout
29	<i>Stenodus leucichthys</i> (Guldenstadt, 1772)	нельма, белорыбица	Inconnu
30	<i>Thymallus arcticus arcticus</i> (Pallas, 1776)	хариус сибирский	Arctic grayling
	Esocidae	Щуковые	Pices
31	<i>Esox lucius</i> Linnaeus, 1758	Щука обыкновенная	Northern pike
	Anguillidae	Угревые	
32	<i>Anguilla anguilla</i> (Linnaeus, 1758)	угорь европейский	European eel
	Cyprinidae	Карповые	
33	<i>Abbottina rivularis</i> (Basilewsky, 1855)	абботина речная	Chinese false gudgeon
34	<i>Abramis brama</i> (Linnaeus, 1758)	Лещ	Common bream
35	<i>Alburnoides taeniatus</i> (Kessler, 1874)	быстрянка полосатая	striped bystranka
36	<i>Alburnoides oblongus</i> (Bulgakov, 1923)	верховодка ташкентская	Tashkent riffle bleak
37	<i>Alburnus alburnus</i> (Linnaeus, 1758)	уклейка	bleak
38	<i>Alburnus chalcoides</i> (Guldenstadt, 1772)	шемая	Danube bleak
39	<i>Anabarrilius polylepis</i> (Regan, 1904)	анабарилиус многочешуйный	
40	<i>Aristichthys nobilis</i> (Richardson, 1846)	толстолобик пестрый	bighead carp
41	<i>Aspiolucius esocinus</i> (Kessler, 1874)	жерех щуковидный, жерех-лысач	pike asp
42	<i>Aspius aspius</i> (Linnaeus, 1758)	жерех обыкновенный	Asp
43	<i>Ballerus ballerus</i> (Linnaeus, 1758)	Синец	Zope
44	<i>Ballerus sapa</i> (Pallas, 1814)	Белоглазка	White-eye bream
45	<i>Barbus brachycephalus brachycephalus</i> Kessler, 1872	усач аральский	Aral barbell
46	<i>Barbus brachycephalus caspius</i> Berg, 1914	усач каспийский	Caspian barbell
47	<i>Barbus capito capito</i> (Guldenstadt, 1772)	усач булат-маи	Bulatmai barbel
48	<i>Blicca bjoerkna</i> (Linnaeus, 1758)	Густера	White bream
49	<i>Capoetabrama kuschakewitschi kuschakewitschi</i> (Kessler, 1872)	остролучка	Sharpray

№ п/п	Scientific name	Russian name	English name
50	<i>Capoetabrama kuschakewitschi orientalis</i> (Nikolskii, 1934)	остролучка шуская	Chu sharpray
51	<i>Carassius auratus auratus</i> (Linnaeus, 1758)	карась китайский	Goldfish
52	<i>Carassius carassius</i> (Linnaeus, 1758)	Золотой, или обыкновенный карась	Crucian carp
53	<i>Carassius gibelio</i> (Bloch, 1782)	карась серебряный	Prussian carp
54	<i>Chondrostoma variabile</i> Jakowlew, 1870	подуст волжский	Volga undermouth
55	<i>Ctenopharyngodon idella</i> (Valenciennes, 1844)	амур белый	Grass carp
56	<i>Cyprinus carpio carpio</i> (Linnaeus, 1758)	сазан, карп	Common carp
57	<i>Diptychus maculatus</i> Steindachner, 1866	осман чешуйчатый	Scaly osman
58	<i>Gobio cynocephalus</i> Dybowski, 1869	пескарь сибирский	Siberian gudgeon
59	<i>Gobio gobio gobio</i> (Linnaeus, 1758)	пескарь обыкновенный	gudgeon
60	<i>Gymnodiptychus dybowskii</i> Kessler, 1874	осман голый	Naked osman
61	<i>Hemiculter leucisculus</i> (Basilewsky, 1855)	востробрюшка обыкновенная	Sharpbelly
62	<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)	толстолобик белый	Silver carp
63	<i>Leuciscus baicalensis</i> (Dybowski, 1874)	елец сибирский	Siberian dace
64	<i>Leuciscus idus idus</i> (Linnaeus, 1758)	Язь	Ide
65	<i>Leuciscus leuciscus leuciscus</i> (Linnaeus, 1758)	елец обыкновенный	Common dace
66	<i>Leuciscus lindbergi</i> Zanin et Eremeev, 1934	елец таласский	Lindberg's dace
67	<i>Megalobrama sp.</i>	черный амурский лещ	
68	<i>Opsariichthys uncirostris</i> (Temminck et Schlegel, 1846)	трегубка	Three-lips
69	<i>Pelecus cultratus</i> (Linnaeus, 1758)	Чехонь	Ziege
70	<i>Phoxinus brachyurus</i> Berg, 1912	гольян семиреchenский	Seven River's minnow
71	<i>Phoxinus phoxinus</i> (Pallas, 1814)	гольян озерный	Lake minnow
72	<i>Phoxinus phoxinus</i> (Linnaeus, 1758)	гольян обыкновенный	Eurasian minnow
73	<i>Pseudorasbora parva</i> (Temminck et Schlegel, 1846)	чебачок китайский	stone moroco
74	<i>Rhodeus ocellatus ocellatus</i> (Kner, 1866)	горчак глазчатый	Rosy bitterling
75	<i>Rhodeus sericeus</i> (Pallas, 1776)	горчак обыкновенный	Amur bitterling
76	<i>Rhodeus sinensis</i> Gunter, 1868	горчак китайский	
77	<i>Rhynchocypris poljakowi</i> (Kessler, 1879)	гольян балхашский	Balkhash minnow

№ п/п	Scientific name	Russian name	English name
78	<i>Rutilus frisii</i> (Nordmann, 1840)	вырезуб, кутум	Kutum
79	<i>Rutilus rutilus</i> (Linnaeus, 1758)	плотва обыкновенная	Roach
80	<i>Scardinius erythrophthalmus</i> (Linnaeus, 1758)	Красноперка	Rudd
81	<i>Schizothorax argentatus</i> Kessler, 1874	Маринка балхашская	
82	<i>Schizothorax intermedius</i> McClelland, 1842	Маринка обыкновенная	Common marinka
83	<i>Squalius cephalus</i> (Linnaeus, 1758)	Голавль	European Chub
84	<i>Tinca tinca</i> (Linnaeus, 1758)	Линь	Tench
85	<i>Vimba vimba</i> (Linnaeus, 1758)	рыбец	vimba
Balitoridae		Балиторовые	
86	<i>Barbatula barbatula</i> (Linnaeus, 1758)	голец усатый	Stone loach
87	<i>Barbatula toni</i> (Dybowsky, 1869)	Голец сибирский	
88	<i>Noemacheilus kuschakewitschi</i> (Herzenstein, 1890)	Голец Кушакевича	Kuschakewitsch loach
89	<i>Noemacheilus sewerzowi</i> G.Nikolsky, 1938	Голец Северцова	Sewerzow's stone loach
90	<i>Triplophysa coniptera</i> (Turdakov, 1954)	Голец терский	Ters stone loach
91	<i>Triplophysa dorsalis</i> (Kessler, 1872)	Голец серый	Gray loach
92	<i>Triplophysa labiata</i> (Kessler, 1874)	губач одноцветный	Plain thicklip loach
93	<i>Triplophysa stoliczkai</i> (Steindachner, 1866)	голец тибетский	Tibetan stone loach
94	<i>Triplophysa strauchi</i> (Kessler, 1874)	Губач пятнистый	Spotted thicklip loach
Cobitidae		Вьюновые	
95	<i>Cobitis melanoleuca</i> Nichols, 1925	Щиповка сибирская	
96	<i>Cobitis taenia</i> Linnaeus, 1758	Щиповка обыкновенная	Spined loach
97	<i>Misgurnus fossilis</i> Linnaeus, 1758	вьюн	Weatherfish
98	<i>Misgurnus mohoity</i> (Dybowsky, 1869)	вьюн китайский	
99	<i>Sabanejewia aurata aralensis</i> (Kessler, 1877)	щиповка аральская	Aral spined loach
100	<i>Sabanejewia aurata aurata</i> (Filippi, 1865)	щиповка переднеазиатская (золотистая)	Golden spined loach
101	<i>Sabanejewia caspia</i> (Eichwald, 1838)	Каспийская щиповка	Caspian spined loach
Siluridae		Сомовые	
102	<i>Silurus glanis</i> Linnaeus, 1758	Сом обыкновенный	Wels catfish
Adrianichthyidae		Адрианихтовые	
103	<i>Oryzias latipes</i> (Temminck et Schlegel, 1846)	медака	Japanese rice fish
Poeceliidae		Пецилиевые	

№ п/п	Scientific name	Russian name	English name
104	<i>Gambusia holbrooki</i> (Girard, 1859)	гамбузия миссисипская	Eastern mosquitofish
Atherinidae		Атериновые	
105	<i>Atherina boyeri caspia</i> (Eichwald, 1831)	атерина каспийская	Caspian sand smelt
Lotidae		Налимовые	
106	<i>Lota lota</i> (Linnaeus, 1758)	налим	Burbot
Gasterosteidae		Колюшковые	
107	<i>Pungitius platygaster platygaster</i> (Kessler, 1859)	колюшка малая южная	Southern ninespine stickleback
108	<i>Pungitius pungitius</i> (Linnaeus, 1758)	колюшка девятиглая	Ninespine stickleback
Syngnathidae		Игловые	
109	<i>Syngnathus abaster</i> Risso, 1827	игла-рыба черномосркая пухлящевая	Black-striped pipefish
Mugilidae		Кефалевые	
110	<i>Liza aurata</i> (Risso, 1810)	Сингиль	Golden grey mullet
111	<i>Liza saliens</i> (Risso, 1810)	Остронос	Leaping mullet
Percidae		Окуновые	
112	<i>Gymnocephalus cernuus</i> (Linnaeus, 1758)	ёрш обыкновенный	Ruffer
113	<i>Perca fluviatilis</i> (Linnaeus)	Окунь	European perch
114	<i>Perca schrenkii</i> Kessler, 1874	окунь балхашский	Balkhash perch
115	<i>Sander lucioperca</i> (Linnaeus, 1758)	Судак обыкновенный	Zander, pikeperch
116	<i>Sander marinus</i> (Cuvier, 1828)	судак морской	Estuarine perch
117	<i>Sander volgensis</i> (Gmelin, 1788)	Берш	Volga pikeperch
Eleotrididae		Головешковые	
118	<i>Micropercops cinctus</i> (Dabry, 1872)	элеотрис китайский	
Gobiidae		Бычковые	
119	<i>Benthophilus baeri</i> Kessler, 1877	пуголовка Бэра	Baer pugolovka
120	<i>Benthophilus casachicus</i> Rahimov, 1978	пуголовка казахская	
121	<i>Benthophilus ctenolepidus</i> Kessler, 1877	пуголовка шипоголовая	
122	<i>Benthophilus granulosus</i> Kessler, 1877	пуголовка зернистая	Granular pugolovka
123	<i>Benthophilus grimmi</i> Kessler, 1877	Пуголовка Гримма	-
124	<i>Benthophilus kessleri</i> Berg, 1927	Пуголовка Кесслера	-
125	<i>Benthophilus leptcephalus</i> Kessler, 1877	Пуголовка узкоголовая	-
126	<i>Benthophilus leptorhynchus</i> Kessler, 1877	пуголовка узкорылая	Short-snout pugolovka
127	<i>Benthophilus macrocephalus</i> (Pallas, 1787)	пуголовка каспийская	Caspian tadpole goby
128	<i>Benthophilus magistri</i> Iljin, 1927	пуголовка азовская	Azov tadpole goby

№ п/п	Scientific name	Russian name	English name
129	<i>Benthophilus mahmudbejovi</i> Rahimov, 1976	Пуголовка Махмудбеева	-
130	<i>Benthophilus spinosus</i> Kessler, 1877	Пуголовка шиповатая	Spiny pugolovka
131	<i>Benthophilus stellatus</i> (Sauvage, 1874)	звездчатая пуголовка	Stellate tadpole-goby
132	<i>Benthophilus svetovidovi</i> Pinchuk et Rahimov, 1979	пуголовкаСветовидова	
133	<i>Caspiosoma caspium</i> (Kessler, 1877)	Каспиосома	-
134	<i>Hyrnanogobius bergi</i> Iljin, 1928	Бычок Берга	-
135	<i>Knipowitschia caucasica</i> (Kawrajski et Berg, 1916)	Бычок-бубырь	-
136	<i>Knipowitschia iljini</i> Berg, 1931	Бычок Ильина	-
137	<i>Knipowitschia longecaudata</i> (Kessler, 1877)	бычок Книповича длиннохвостый	-
138	<i>Mesogobius nigronotatus</i> (Kessler, 1877)	бычок темнопятнистый	
139	<i>Mesogobius nonultimus</i> (Iljin, 1936)		
140	<i>Neogobius bathibius</i> (Kessler, 1877)	бычок глубоководный	
141	<i>Neogobius caspius</i> (Eichwald, 1831)	бычок хвалынский	Caspian goby
142	<i>Neogobius fluviatilis</i> (Pallas, 1814)	Каспийский бычок- песочник	Caspian sand goby
143	<i>Neogobius gymnotrachelus</i> (Kessler, 1857)	бычок-гонец	Racer goby
144	<i>Neogobius gorlap</i> Iljin, 1949	бычок-головач каспийский	Caspian big-headed goby
145	<i>Neogobius melanostomus</i> (Pallas, 1814)	Бычок-кругляк	round goby
146	<i>Neogobius ratan</i> (Nordmann, 1840)	бычок-ратан	Caspian ratan goby
147	<i>Neogobius syrman</i> (Nordmann, 1840)	Бычок-ширман	Caspian syrman goby
148	<i>Proterorhinus marmoratus</i> (Pallas, 1814)	Бычок-цуцик	Tubenose goby
149	<i>Rhinogobius sp.</i>	бычок китайский	
Channidae		Змееголовые	
150	<i>Channa argus</i> (Cantor, 1842)	змееголов	Snakehead
Cottidae		Керчаковые	
151	<i>Cottus gobio gobio</i> Linnaeus, 1758	подкаменщик обыкновенный	Bullhead
152	<i>Cottus gobio jaxartensis</i> Berg, 1916	подкаменщик чаткальский	Tschatkal sculpin
153	<i>Cottus sibiricus</i> Kessler, 1899	подкаменщик сибирский	Siberian sculpin
154	<i>Cottus spinulosus</i> Kessler	подкаменщик туркестанский	Turkestan sculpin
Pleuronectidae		Камбаловые	
155	<i>Platichthys flesus</i> (Linnaeus, 1758)	глосса	Glossa, Flounder

Annex 6**Species included in Red Book of the Republic of Kazakhstan****Ural-Caspian Basin**

Caspian lamprey
Sea trout
Caspian anadromous shad
Inconnu
Kutum

Aral-Syr-Darya basin

Fringebarbel sturgeon
Syr-Darya sturgeon
Aral trout
Pike asp
Aral barbel
Turkestan barbel
Chu sharpray

Irtysch basin (non-endemic)

Taimen
Inconnu

Balkash basin

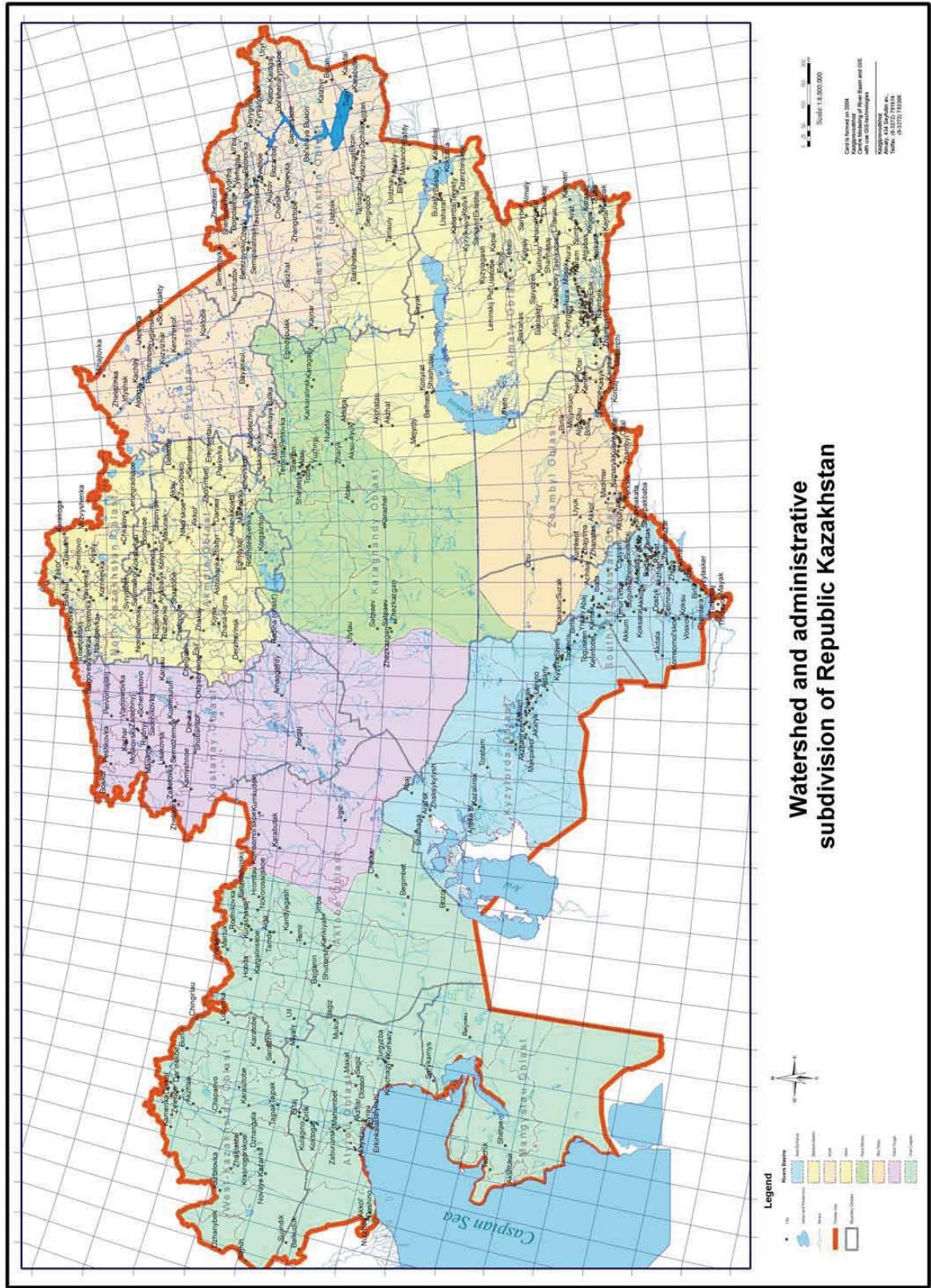
Balkhash marinka (endemic)
Balkhash perch
Fringebarbel sturgeon
Aral barbel

The last two species were acclimatized from the Aral basin.

Annex 7: Fish prices (whole fish/per kg) in September 2007 in major cities in Kazakhstan

City	Price 1 kg – 28 September 2007																				
	Sturgeon	Pike	Crusian carp	Carp (M)	Carp (L)	Pike perch	Perch	Bream	Roach	Asp	Dace (small fry)	Grass carp	Whitefish	Orfe	Silver carp	Tench	Sazan	Cat Fish	Herring	Flounder	
Atyrau	900	100	70			200		80	150	100							180	200			
Aktau	850	350				400		200	200	250							250	380	350		
Ust-Kamenogorsk		150	120	220	300	460	100	70			110			110	170	400					
Semipalatinsk		250	120			500	120	120			110					500					
Pavlodar		200	90	290	300	550	90	60			100			150	320	300					
Almaty						400		170		80		650			300	650	150				
Taldykorgan			60			400		50	50	120						250	150				
Balkhash			40					50	140	140						180	150				
Astana	2 200	300	150	350	400	500	100	60		350	350	450	60	100	400	400	450	350	260		400
Kokshetau		280	150	250	400	450	130	120			130			300	360						
Karaganda		260	160	280	320	355	120	110	370		110			130		320	400	260			
Zhezkazgan				300	350	360										350					
Petropavlovsk		250	90	300	450	400	80								250						
Kostanay		250	95	200	250		70	70			130				270	200					
Shymkent			70			100		70			70				70	100					100
Kyzyl-Orda		100	80					70			70	250			250	300	350				
Aralsk			150					40			40					200	300	30			
Taraz			70	140	330	200		80													
Aktyubinsk		250	170	300	450		80	120								350	550				
Aral			100			230	120	80		160					150	180	200				
<i>Average price in the Republic of Kazakhstan</i>	1317	228	105	263	355	367	101	90	182	171	122	450	60	158	255	267	301	298	320	177	

Annex 8: Watershed and administrative subdivision of Republic of the Kazakhstan



Watershed and administrative subdivision of Republic Kazakhstan

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