**FAO Fisheries and Aquaculture Circular No. 1030/2** **SEC/C1030/2 (En)**

ISSN 2070-6065

# FISHERIES AND AQUACULTURE IN THE REPUBLIC OF KAZAKHSTAN: A REVIEW

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

# FISHERIES AND AQUACULTURE IN THE REPUBLIC OF KAZAKHSTAN: A REVIEW

by
**Serik Timirkhanov**
Deputy Director
LLP Kazakh Fisheries Scientific Research Institute
Almaty, Kazakhstan

**Boris Chaikin**
Senior Fisheries Adviser, Kazakhstan Agency of Applied Ecology
Director, the Environment Consulting Centre

**Zhannat Makhambetova**
Microeconomist
NGO "Aral Tenizi" (the Aral Sea)
Aralsk, Kazakhstan

**Andy Thorpe**
University of Portsmouth
Portsmouth, United Kingdom of Great Britain and Northern Ireland

**Raymon van Anrooy**
Fishery and Aquaculture Officer
FAO Subregional Office for Central Asia
Ankara, Turkey

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Ankara, 2010

ISBN 978-92-5-106569-3

## PREPARATION OF THIS DOCUMENT

This circular contains a historical overview and a review of the current status of fisheries and aquaculture in Kazakhstan. The document was prepared by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Fisheries Committee of the Ministry of Agriculture of the Republic of Kazakhstan and many stakeholders of the sector in Kazakhstan.

The authors of this circular are Mr Serik Timirkhanov (LLP Kazakh Fisheries Scientific Research Institute), Mr Boris Chaikin (LLP Kazakhstan Agency of Applied Ecology), Ms Zhannat Makhambetova (non-governmental organization "Aral Tenizi"), Mr Andy Thorpe (University of Portsmouth), and Mr Raymon van Anrooy (FAO). Former Chairman of the Fisheries Committee, Mr Suleimenov Kanat Bostanovich supervised the preparation of the review study. Mr Mirgaliy Baimukanov (Institute of Hydrobiology and Ecology) assisted with ensuring the consistency of data and information presented in this review study. Many other experts have provided their views and opinions on the various draft versions of this document.

This circular is the third document in a FAO Fisheries and Aquaculture Circular series concerning the fisheries sector in Central Asia. Other publications in the same series are the following: "Capture fisheries and aquaculture in the Kyrgyz Republic: Current status and planning" (Sarieva *et al*., 2008); and "Inland capture fisheries and aquaculture in the Republic of Uzbekistan: Current status and planning" (Karimov *et al.*, 2009). In 2010, a sectoral review of the Republic of Tajikistan also will be published in this series.

This circular was prepared over the period 2007–2009 by FAO to increase general understanding and awareness of the current status of the fisheries and aquaculture sectors in Kazakhstan. Although changes in the sector occur rapidly, it is intended to provide an accurate picture of the situation in 2008/2009. The preparation of the document was hampered however by the limited availability of official statistical data and information. Over many years fishery information was hardly collected in Kazakhstan, which means that there are large gaps in historical information on basic sector indicators such as production volume and value of capture fisheries and aquaculture, employment, per capita fish consumption, fleet sizes, and imports and exports of fish. Aggregated information that is available is generally of limited use for policy-makers. Often the quality of the aggregated data is bad and the information does not reflect the current situation. In Kazakhstan, as in other Central Asian countries, major improvements in data and information collection and analysis are required, if the data collected are to be used by fisheries policy-makers and managers.

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

Timirkhanov, S., Chaikin, B., Makhambetova, Z., Thorpe, A. and van Anrooy, R.
Fisheries and aquaculture in the Republic of Kazakhstan: a review.
*FAO Fisheries and Aquaculture Circular:* No. 1030/2. Rome, FAO. 2010. 76 pp.

**ABSTRACT**

The inland capture fisheries and aquaculture sectors in the Republic of Kazakhstan have gone through a dramatic decline in production, which lasted until 2001 for capture fisheries and continues until today for aquaculture production. While in 1989 some 89 000 tonnes of fish were produced within the Kazakh Soviet Socialist Republic (SSR), the production in 2007 was around 43 000 tonnes. The upward trend in capture fisheries production is remarkable, as in 2001 production amounted to just 21 000 tonnes. Aquaculture production is almost insignificant, with production accounting for less than 400 tonnes of marketable fish in 2007. In recent years, the contribution of the fisheries sector (including capture and culture) to the gross domestic product (GDP) was less than 0.8 percent. Imports of fishery products in 2006 were some 44 000 tonnes, while exports added up to 32 000 tonnes. Per capita consumption of fish is estimated at just over 3 kg, which makes fishery products a small contributor to the diet of the Kazakh people. The employment provided by the sector may be over 17 000 jobs. In recent years, the Ministry of Agriculture of Kazakhstan, with support from its Fisheries Committee, has made many improvements to the legal framework for the fisheries sector. It is however recognized that there are still many gaps in the policy and legal framework for the sector and that enforcement of rules and regulations needs more attention. International collaboration with the Kazakh fisheries sector has increased in recent years, particularly on sturgeon issues and at regional level. This FAO Fisheries and Aquaculture Circular aims to increase general understanding and awareness of the current status of the fisheries and aquaculture sectors in Kazakhstan. The document presented in this Fisheries and Aquaculture Circular was cleared for publication by the Fisheries Committee of Kazakhstan in February 2009.

# CONTENTS

**Page**

## TABLES



## FIGURES

**Photos and captions**

**Cover page picture 1: Aral net ice fishing**

Caption: ice fishing on the Northern Aral Sea in the winter season (picture courtesy of Mr S. Timirkhanov)

**Page 17 under Seas: DSCF 0609.JPG (picture needs some cropping)**

Caption: Remainder of the Soviet era Aral Sea fishing fleet (picture courtesy of Mr A. Thorpe)

**Page 17 under seas: Aral net fishing**

Caption: Ice fishing on the Northern Aral Sea in the winter season (picture courtesy of Mr S. Timirkhanov)

**Page 23 under inland capture fisheries: Aral catch 1.jpg**

Caption: Examples of fishing vessels used in the Northern Aral Sea (picture courtesy of Mr S. Timirkhanov)

**Page 25 under recreational fisheries: DSCN1700. Jpg**

Caption: Recreational fishing at trout farm near Almaty (picture courtesy of Mr R. Van Anrooy)

**Page 29 under aquaculture: DSCN 1687. Jpg**

Caption: Fingerling production tanks at a trout farm near Almaty (picture courtesy of Mr R. Van Anrooy)

**Page 29 under aquaculture: DSCN 2667. Jpg**

Caption: Sturgeon broodstock tanks at Erkin Kala hatchery near Atyrau (picture courtesy of Mr R. Van Anrooy)

**Page 31 under aquaculture supplies: DSCN 2674. Jpg**

Caption: Sturgeon feed production at Erkin Kala hatchery near Atyrau (picture courtesy of Mr R. Van Anrooy)

**Page 34:** Fish market in Sary-Arka, Almaty, 2007(picture courtesy of Mr S. Timirkhanov)

## ACKNOWLEDGEMENTS

First of all, the authors would like to thank the representatives of the Ministry of Agriculture and the Fisheries Committee, in particular, Mr D. Aytzhanov, acting Minister of Agriculture, as well as Mr Kanat Suleymenov, the former Chairman of the Fisheries Committee, for their cooperation. The authors also express their gratitude to Ms Akmaral Rakhymzhanova who ensured contacts with the Fisheries Committee. Special thanks go also to Ms Anara E. Menshimbayeva, the Chairman of the Agency of the Republic of Kazakhstan on Statistics for the information the agency provided in support of the study.

In addition, the authors thank the representatives of fisheries, entrepreneurs, NGOs, other ministries and international organizations for their assistance and readiness to share their vast knowledge and valuable information on fisheries and aquaculture in Kazakhstan. Particular thanks are also due to the experts who participated in the two stakeholder workshops, to carry out a sectoral diagnosis, held in Almaty and Aralsk in 2008.

The authors hereby also express their gratitude to Mr Mirgaliy Baimukanov (Institute of Hydrobiology and Ecology) for his assistance in ensuring the consistency of data and information presented in this review study; the Turkish experts at the Regional Workshop on Inland Fisheries and Aquaculture in Central Asia: Status and Development Prospects, Beymelek, Turkey, 11–14 December 2007 (FAO, 2008b), for their comments on the first draft of the review; Ms Deniz Ozkan, Ms Elif Erkal, Ms Anara Forrester, Ms Cana Salur and Mr Mustapha Sinaceur (FAO Subregional Office for Central Asia); and Mr Jean-François Pulvenis de Séligny (FAO Fisheries and Aquaculture Policy and Economics Division) for their technical, administrative, operational and supervisory support of this review study. The editorial assistance on this document by Ms Maria Giannini (FAO consultant) and publication support from Ms Françoise Schatto and Ms Tina Farmer (FAO Fisheries and Aquaculture Department) are also much appreciated.

## LIST OF ACRONYMS

| | |
|---|---|
| CAB | Commission on Aquatic Bioresources |
| CaspEco | The Caspian Sea: Restoring Depleted Fisheries and Consolidation of a Permanent Regional Environmental Governance Programme |
| CIS | Commonwealth of Independent States |
| CITES | Convention on International Trade and Endangered Species |
| DSLS | Danish Society for a Living Sea |
| EC | European Commission |
| EIU | Economist Intelligence Unit |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FC | Fisheries Committee under the Ministry of Agriculture of Kazakhstan |
| GDP | Gross Domestic Product |
| GEF | Global Environment Fund |
| HACCP | Hazard Analysis and Critical Control Points |
| ISO | International Organization for Standardization |
| IUCN | International Union for Conservation of Nature |
| IUU | Illegal, Unreported and Unregulated |
| JSC | Joint Stock Company |
| MARA | Ministry of Agriculture and Rural Affairs of Turkey |
| MCS | Monitoring, Control and Surveillance |
| NAS | North Aral Sea |
| NGO | Non-Governmental Organization |
| NPOA | National Plan of Action |
| POL | Petroleum, Oil and Lubricants |
| RFB | Regional Fishery Body |
| RK | Republic of Kazakhstan |
| RPOA | Regional Plan of Action |
| SEC | Subregional Office for Central Asia (FAO) |
| SINAS | Syr Darya Control and Northern Aral Sea Project |
| SSR | Soviet Socialist Republic |
| STM | Special Tax Mode |
| SWOT | Strengths, Weaknesses, Opportunities, Threats |
| TAC | Total Allowable Catch |
| TCP | Technical Cooperation Programme (FAO) |
| TICA | Turkish International Cooperation Agency |
| UNDP | United Nations Development Programme |
| USSR | Union of Socialist Soviet Republics |
| VAT | Value Added Tax |
| WTO | World Trade Organization |

Exchange rate:
The average exchange rate applied throughout this document is: US$1 = tenge148.

## EXECUTIVE SUMMARY

The inland capture fisheries and aquaculture sectors in the Republic of Kazakhstan have gone through a dramatic decline in production, which lasted until 2001 for capture fisheries and continues up till today for aquaculture production. While in 1989 some 89 000 tonnes of fish were produced within the Kazakh Soviet Socialist Republic (SSR), the production in 2007 was around 43 000 tonnes. The upward trend in capture fisheries production is remarkable, as in 2001 production amounted to just 21 000 tonnes. Aquaculture production is almost insignificant, with production accounting for less than 400 tonnes of marketable fish in 2007. By comparison, at global level, aquaculture accounts for nearly 50 percent of food fish production.

The Caspian Sea is a major source of fishery productions to the Kazakh people. Other main sources are a number of lakes (e.g. Balkash, Alakol, Tengiz) and reservoirs (e.g. Bukhtarma, Shardara, Bogen). The North Aral Sea has restarted to be a source of fisheries products in recent years. The main fisheries areas can be divided into basins: Ural-Caspian basin, Aral-Syr-Darya basin, Balkash-Alakol basin and Irtysh-Zaisan basin. Fish fauna is diverse, but was more diverse in the past. There are a number of species endangered, for example, various sturgeon species in the Ural-Caspian basin. Apart from commercial capture fisheries in reservoirs and lakes, recreational fisheries (particularly in the Lake Balkash region) is also important. The registered catches from recreational fisheries were higher than the official aquaculture production figures in 2006 and 2007.

The aquaculture sector was hit hardest by the collapse of the Soviet Union; virtually all its support infrastructure and facilitating services have disappeared in the last 15 years. While aquaculture production reached nearly 10 000 tonnes in 1994 (thus after independence), in recent years production has dropped to less than 1 000 tonnes. High-quality fish feeds, fingerlings, hatchery, culture equipment, and chemicals and drugs required in fish culture activities are not, or are barely produced, in Kazakhstan, and most of them have to be imported.

Illegal, unreported and unregistered (IUU) fishing continues to be a major problem in the fisheries sector in Kazakhstan; as a result, maybe only less than one-third of fish production is reported.

In recent years, the contribution of the fisheries sector (including capture and culture) to GDP has been less than 0.8 percent. Imports of fishery products in 2006 were some 44 000 tonnes, while exports added up to 32 000 tonnes. There are five large processing enterprises that are European Union (EU) certified for exporting fish to Europe. The large majority of fish processing facilities in the country are however not certified by Hazard Analysis and Critical Control Points (HACCP) or the International Organization for Standardization (ISO) at present.

The apparent per capita fish supply was 16.7 kg (live weight equivalent) at global level in 2006. In comparison, the current per capita consumption of fish of some 3 kg in Kazakhstan shows that fish and fishery products are only small contributors to the diet of the Kazakh people. The tradition of eating fish at least once a week, as was the practice under Soviet rule, does not exist anymore in Kazakhstan. In rural areas fish is generally consumed as a fresh product, as frozen and canned products are less available there. In urban areas many kinds of fish are available at the market; however, prices in urban areas are slightly higher than those in most rural areas, mostly because many urban centres (including the capital Astana) are located rather far away from the main reservoirs and lakes.

The employment provided by the sector may be over 17 000 jobs, but various state agencies and sector experts use different employment figures. In any case, the contribution of fisheries to employment is limited in Kazakhstan.

In recent years, the Ministry of Agriculture of Kazakhstan, with support from its Fisheries Committee, has made many improvements to the legal framework for the fisheries sector. It is however recognized that there are still many gaps in the policy and legal framework for the sector and that enforcement of rules and regulations needs more attention. The country still lacks a proper long-term fishery and aquaculture sector policy and a strategy which is carried out by all key stakeholders in the sector.

State programmes have been developed, but because of limited funding and limited involvement by the private sector these programmes have not reversed the downward trend in aquaculture production. Kazakhstan is however 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, something which is well-recognized by Kazakhstan's Ministry of Agriculture.

Fishery management plans, like those commonly used by other nations, do not exist as such in Kazakhstan. Although the country is lagging behind in terms of design and application of modern fishery management approaches, some fishery management tools such as total allowable catch (TAC) and quotas are applied in fishery management.

On paper, the human resources available at the Fisheries Committee, Kazakh Fisheries Scientific Research Institute, universities, fisheries organizations and fishery-sector related institutions cover all aspects that are needed for proper capture fisheries management and sustainable aquaculture development. But there is a limited inflow of young and competent experts in the sector at present; and as most experts were educated under the Soviet regime they have hardly received updates of their knowledge since.

International collaboration (e.g. through the United Nations Development Programme [UNDP], FAO and the World Bank) with the Kazakh fisheries sector has increased in recent years, particularly on sturgeon issues and at regional level. The staff of the Fisheries Committee and the Kazakh Fisheries Scientific Research Institute have participated in many international and regional events and workshops. International collaboration has increased awareness and built capacity on a range of issues, although it should be noted that only a few staff of both institutions have benefited from the participation in international events.

Small- and medium-scale enterprises in the fisheries and aquaculture sectors in Kazakhstan generally do not have access to credit or microfinance services. Insurance of aquaculture production processes is not possible at present.

The sectoral diagnosis that was prepared by key fisheries and aquaculture sector stakeholders in 2008 shows that with a sector-wide approach, which is carried out by all key stakeholders, the sector would be able to grow considerably, making better use of the available conditions and reaping the opportunities offered.

This FAO Fisheries and Aquaculture Circular aims to increase general understanding and awareness of the current status of the fisheries and aquaculture sectors in Kazakhstan. It provides, where data were available, a historical overview of the sector. The diagnosis may give entry points for public and private support to the sector, as well as provoke some guidance to international agencies in their assistance to the sector. The document presented in this Fisheries and Aquaculture Circular was cleared for publication by the Fisheries Committee of Kazakhstan in February 2009.

# Chapter 1
# INTRODUCTION

The capture fisheries and aquaculture sectors produced some 110 million tonnes of fish for human consumption in 2006. The accompanying apparent per capita supply of 16.7 kg (live weight equivalent) was the highest on record. Aquaculture accounted for 47 percent of the total fish supply worldwide in 2006 (FAO, 2009).

In contrast, per capita availability of fish in Kazakhstan was just around 3 kg in 2006 and the aquaculture share of total production was less than 1 percent. Inland capture fisheries and aquaculture sectors in Kazakhstan have been going through a dramatic decline in production, which started after independence in 1991 and lasted until 2001 for capture fisheries and continues until today for aquaculture production. Reasons for the decline are numerous and include, among others, poor water management, reduced state funding, fragmentation of authority over the sector, limited access to fish feeds, unsuitable pond systems, limited policy guidance, and incomplete and obsolete legal frameworks for the sector (Thorpe and van Anrooy, 2009).

Recognizing the availability of water resources for capture fisheries, capture-based fisheries and aquaculture, the Ministry of Agriculture of Kazakhstan has been trying to mediate the above situation by lifting constraints to sectoral development and providing guidance on management and development aspects. The limited contact between Kazakhstan and the western world in terms of fisheries in the first decade after independence however is still being felt. For many years, few experts were trained in fisheries or aquaculture subjects, and developments in other parts of the world (particularly in the field of aquaculture) were not followed suit in Kazakhstan. As employment opportunities decreased, experts who worked in the sector left. Reduced production by the sector meant less state attention, and financial support to the sector nearly dried up towards the end of the 1990s. In addition, the reduced attention to collection of data and information (statistics) on the sector made it difficult for policy-makers to identify the problems and opportunities and design and implement proper management systems for the sector. The increased contact between Kazakh fisheries experts and those of other countries around the Caspian Sea and the rest of the world has started a process of catching up on production and management aspects. There is however still a long way to go before the Kazakh fisheries sector can be regarded as sustainable and can apply modern standards and practices that are common in other parts of the world.

It should be noted that Kazakhstan is not an exception in terms of fisheries sector decline in Central Asia. All Central Asian republics have seen similar (or even worse) declines in the last 15 years, and all are only slowly recovering from the crisis the sector was in for years (Thorpe and van Anrooy, 2009).

The Food and Agriculture Organization of the United Nations started to develop strategic partnerships in the Central Asian region towards joint to sustainable development and management of the capture fisheries and aquaculture sectors in 2007. This report on the fisheries sector in Kazakhstan was a first step in the ongoing process towards increasing the understanding of policy-makers on fisheries and aquaculture issues. The information presented can be regarded as a kind of baseline information on the current situation of fisheries and aquaculture in the country. The historical information provided will allow stakeholders in Kazakhstan and abroad to identify and support actions needed to rehabilitate the fisheries sector (in particular, the aquaculture sector) and bring it up to international standards.

## STRUCTURE OF THIS REPORT

This report contains eight chapters. Chapter I briefly introduces the fisheries sector in Kazakhstan. Chapter II provides historical background on the situation of the fisheries sector up to the first years of this millennium. Chapter III offers an overview of the current status and the potential of the current natural resources for fisheries sector development in Kazakhstan, describing the status of inland capture fisheries and aquaculture. Chapter IV focuses on the situation regarding fish-storage facilities, processing, distribution, marketing and fish consumption. Chapter V describes the fishery administration in the country, with particular attention to training, research and extension, fishery statistics, associations of fishery enterprises and international relations of the fisheries sector. Chapter VI provides an overview of fisheries policy, legal and regulatory frameworks, and management issues. Chapter VII discusses the social and economic aspects of the fisheries sector and credit and investment issues. Chapter VIII concludes with a diagnosis of the current situation using a strengths, weaknesses, opportunities and threats (SWOT) analysis.

## Chapter 2
## HISTORICAL BACKGROUND

### Fisheries and aquaculture up to independence

The larger part of the Caspian and Aral seas was in the territory of the former Kazakh Soviet Socialist Republic (SSR), as were 48 000 lakes (3 041 of which had a surface area greater than one square kilometre) and more than 8 500 permanently or seasonally flowing rivers, among the more important the Syr-Darya, Ural, Irtysh (or Ertis) and Ili. Also located within the national territory were 475 reservoirs, the most prominent being the Bukhtarma, Kapchagay and Shardara reservoirs.

### Capture fisheries

Although the water basins within the national boundaries were first developed for fishery purposes at the end of the nineteenth and the beginning of the twentieth century, there is little literature or data on catch for the period. The 1920s saw a sharp intensification of fishing, most notably on the Aral Sea – later, during the Second World War, Aral fishers delivered 50 000 tonnes of fish to the Red Army. Aral landings remained prominent during the 1950s, with the state fishing enterprise Aralrybprom alone processing more than 20 000 tonnes of sturgeon, pikeperch, carp, bream and roach annually.

Agriculture however increasingly took precedence in the Kazakh SSR and almost three-quarters of its national water resources were directed to irrigate over 3.3 million hectares (ha) of land, including 1.1 million in the deltaic region of the Aral Sea. Such excessive water abstraction saw the desiccation and salinization of the Aral Sea, reaching its apogee in 1987 when, having lost 70 percent of its surface area and its water level dropping by 23 metres, the sea split into two. With the main sea port of Aralsk now stranded more than 100 kilometres (km) away from an increasingly saline and toxic sea (due to runoff of lindane, DDT and other agricultural pesticides), fishing effectively ceased in 1983. Though Lake Balkash was less affected, reducing in size by 2 610 km2 and water levels dropping two metres between 1970 and 1989, its fish landings also declined markedly (Petr and Mitrofanov, 1998; Thorpe and van Anrooy, 2009). Sturgeon, the country's highest value fish, equally suffered as landings from the Caspian Sea dropped from 26 600 tonnes in 1980 (Kazakhstan's share being 8 100 tonnes) to just 182 tonnes (including scientific quota) in 2006.

Consequently, the dynamics of catch between 1965 and 1990 was, on the whole, characterized by a decrease in the total catch volumes not only in the Aral Syr-Darya and Balkash-Alakol basins, but also in the Ural-Caspian basin and the national reservoirs of the Kazakh SSR as well (see Table 1).

TABLE 1
**Total catch in water basins of the Kazakh SSR (1965 and 1990)**

| Year | Total | | Of which | | | |
|---|---|---|---|---|---|---|
| | | | Ural-Caspian basin | | Inland reservoirs | |
| | Catch (000 tonnes) | % | Catch (000 tonnes) | % | Catch (000 tonnes) | % |
| 1965 | 111.9 | 100 | 62.7 | 56.0 | 49.2 | 44.0 |
| 1990 | 80.9 | 100 | 43.8 | 54.1 | 37.1 | 45.9 |

*Source:* Fisheries Committee, Ministry of Agriculture.

The decline in catch was reflected in a rundown in fisheries related industries. The shipbuilding yards in both the cities of Aralsk and Uralsk were closed down, and by the mid-1980s there were 910 registered vessels. These registered vessels were supported by 28 PTS (fish accepting and transporting vessels) of 150 hp and 80 smaller PTS; 5 PTR (fish accepting and transporting vessels equipped with refrigeration capacity); 24 land-based refrigeration facilities with 16 500 tonnes freezing capacity and 7 200 tonnes storing capacity; 19 fish and fishery products smoking establishments; and canneries with a production

capacity of 16 million cans annually. Most of these items were underused, if at all, within the sector.

**Fisheries management**

The Ministry of Fishing Industry under the former Union of the Soviet Socialist Republics (USSR) approved the "Rules for Fishing in the Water Basins of the Republic of Kazakhstan" (Document No. 225, of 24 June 1969). The rules set down the rights and responsibilities of the fishing industry bodies and the regulations on assigning water basins, as well as the rules for amateur and sport fishing. All citizens were granted the right to fish without a license in any of the water basins – with the exception of commercial fishing areas (fish cages, and areas with gillnets and traps), natural reserves, fish farms and other fish rearing stations. Regions where fishing rules applied, and places, time, terms, devices and means of fishing were determined. Fishing limits were stipulated for each species in each water basin, as well as the permitted mesh sizes for fishing gear. These regulations were enhanced by the Ruling of the Council of Ministers of the Kazakh SSR (Document No. 240 of 7 April 1970) with "Measures for Strengthening Protection of Fish Resources in Water Basins of the Kazakh SSR". This provided improved protection of water basins, promised to combat poaching and the violation of fishing rules, and set tasks and delineated responsibilities for regional councils, ministries and other administrative bodies. Penalties were introduced for illegal fishing and the capture of endangered species of fish in the Kazakh SSR (Collection of Normative Documents on Protection of Fish Resources in the Kazakh SSR, Almaty, 1971).

The Ministry of Fishing Industry was set up in 1966. It included the following under its jurisdiction:

- Fishing and fish processing facilities
  - Fishing ports and landing sites
  - Fish processing plants
- Aquaculture facilities, including ponds, lakes, nurseries, basins, fish farms, hatcheries and fish rearing stations
- Kazakhrybakkolkhozsoyuz – the Union of Fishing Collective Farms
- The Kazakh Scientific Institute for Fishing
- Kazgidrorybproekt – The Institute for Designing Fisheries Facilities
- The Republican Laboratory of Ichtiopathological Control
- The Republican Laboratory of Hydrochemical and Hydrobiological Control
- Planning Bureau

Annex 1 provides a list of fisheries bodies under the Ministry of Fishing Industry of the Kazakh SSR.

In 1988, by Decree of the Presidium of the Supreme Council of the Kazakh SSR, the Ministry of Fishing Industry and all its attendant functions became part of Gosagroprom
(State Committee for Agricultural Industry ) of the Kazakh SSR.

**Aquaculture**

Although there were a few aquaculture pilot activities carried out before, aquaculture production started increasing only in the 1970s. Aquaculture production grew swiftly and by 1990 there were 47 enterprises working across 50 reservoirs and 12 pond farms (a total territory of 5 041 ha – out of which 3 313 ha were feeding ponds and 728 ha for growing young fish); the sector employed 1 200 people. Of these 47 enterprises, 17 were either operational or ponds under construction, 16 were commercial lake fisheries and 14 were nursery pond enterprises. Output increased correspondingly, from 692 tonnes to 9 883 tonnes (i.e. 14.2 times) over the period 1970–1990, with yields reaching 1 500–1 800 kilograms per hectare. The main species cultivated were carp (white, silver and grass), rainbow trout, so called cisco species (*Coregonus sp.*, including whitefish, vendance and peled). Annex 2 provides historical trends and background information on pond aquaculture production.

**Independent fish processing and trade organizations**

Kazakhrybpromsbyt, the Kazakh production, marketing and trading enterprise, was created under

Decree No. 547 of 15 December 1976 (information from Kazakhrybpromsbyt No. 3–205, 26.07.07), and established fish processing and trade centers in all (the then) 19 oblasts of the country, with main branches located in the towns of Balkash, Rudniy, Ekibastuz and Tekeli. At its peak Kazakhrybpromsbyt's total refrigeration capacity reached 713 751 tonnes. The domestic supply and sale of fish and fish products was undertaken by the Ministry of Food Manufacturing Industry of the Kazakh SSR, in conjunction with Kazpotrebsoyuz (Kazakh Union of Consumer Associations) and the trading branch of the Ministry of Defense. Trading centres (*okean*) in nine cities and towns sold freshly frozen, frozen, smoked, cured, canned fish and fish products, including *presservs* (preserved fish with short-term storage). As some fish were sold live, the bigger shops were equipped with specially built pools to maintain them.

The annual flow of fish and fish products into the trading network (average for the period 1980–1990) was estimated to include 108 000 tonnes of assorted fish, 12 000 tonnes of herring and 94 million tins of fish.

## FISHERIES AND AQUACULTURE 1991–2009

### Institutional setting for fisheries

Two years after independence, Gosagroprom was abolished, and on 26 February 1992 Decree No. 159 created the Fisheries Committee as a distinct entity within the Ministry of Agriculture. After three years, the Fisheries Committee merged with the forestry and hunting sectors under the Ministry of Natural Resources and Environment Protection. In the period 2002–2003, responsibility for fisheries was transferred back to the Ministry of Agriculture. The current Fisheries Committee, with its mandates and responsibilities, exists since June 2003. Table 2 presents background information on the Fisheries Committee.

TABLE 2
**Fisheries Committee of the Ministry of Agriculture**

| Date | Name of organization | Juridical background |
|---|---|---|
| 26 February 1992 | Fisheries Committee was created as an entity of the Ministry of Agriculture | The resolution of the Cabinet of Ministers of the Republic of Kazakhstan, No. 159 of 26 February 1992 |
| 2 May 1994 | "Balyk" State Joint-Stock Company was established on the basis of all enterprises and companies related to the Fisheries Committee | The resolution of the Cabinet of Ministers of the Republic of Kazakhstan , No. 472 of 2 May 1994 |
| 14 February 1995 | Fisheries Committee under the Ministry of Agriculture of the Republic of Kazakhstan became part of the Committee on Forestry, Fishery and Hunting | The resolution of the Cabinet of Ministers of the Republic of Kazakhstan, No. 157 of 14 February 1995. The Ministry of Natural Resources and Environment Protection |
| 15 November 2002 | The fishing industry was removed from the Committee on Forestry, Fishery and Hunting and placed under the jurisdiction of the Ministry of Agriculture | Decree of the Government of Kazakhstan No. 1216 of 15 November 2002 |
| 4 March 2003 | The Fishery Department was established | Order of the Ministry of Agriculture of 4 March 2003 |
| 18 June 2003 | Fisheries Committee was re-established under the Ministry of Agriculture of the Republic of Kazakhstan | Decree of the Government of Kazakhstan No. 714 of 18 June 2003 |
| 6 April 2005 | The Fisheries Committee created the interregional basin and district territorial departments | The Decree of the Government of Republic of Kazakhstan No. 310 titled "Pending issues concerning the Ministry of Agriculture of the Republic of Kazakhstan" of 6 April 2005 |

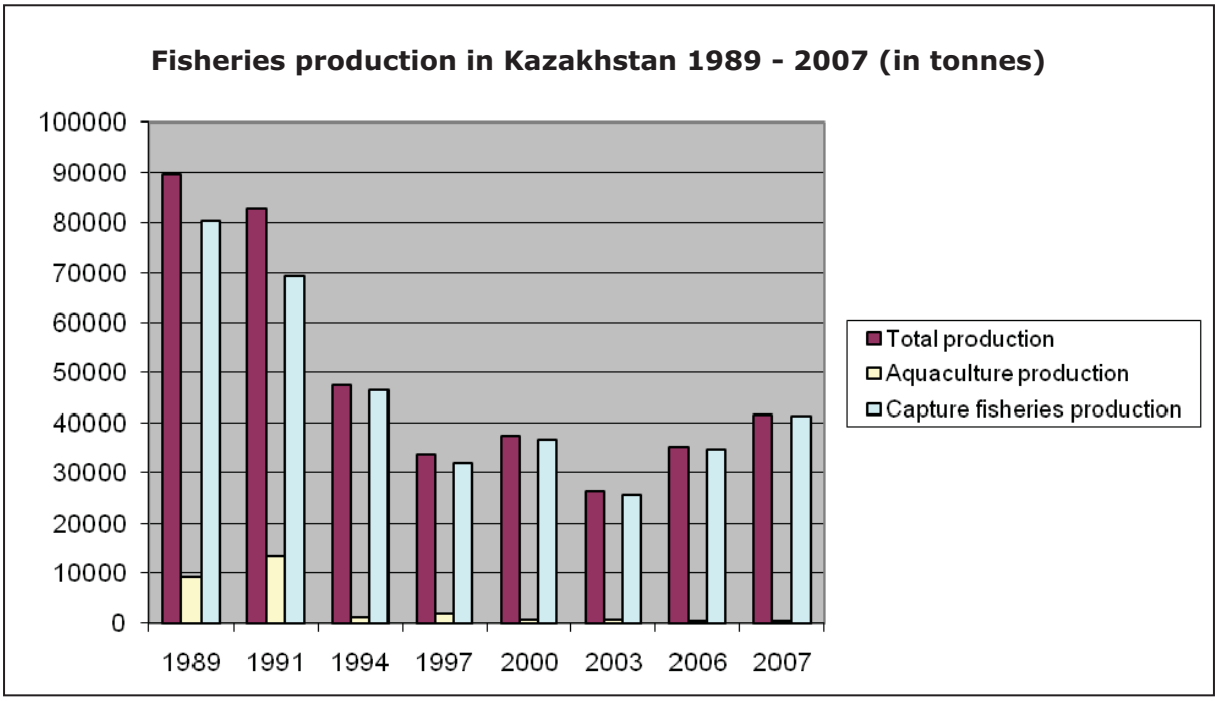
## Aquaculture and fisheries production

### Capture fisheries

The World Bank (2004) noted that the immediate post-independence harvest of 82 690 tonnes was worth over 280.5 million rubles (around US$14.4 million) and generated profits of around 79.3 million rubles (US$3.8 million), making the sector one of the most profitable and developed in the country. However, a combination of reduced funding (subsidy removal and the termination of fisheries extension services), an uncoordinated approach to water management in the newly independent republics (which saw the Syr-Darya's water – and fish – released into depressions without an outflow; increased water pollution; large-scale environmental and hydrologic changes from the construction of dams and reservoirs; and a lack of replacement equipment, particularly in aquaculture) – allied to a surge in under or no reporting of catches – saw a steady decline in the level of catches.

Capture fisheries production in Kazakhstan is however on the rise again, as shown in Figure 1 below, which uses information from the FAO FishStat Plus 2009 dataset.

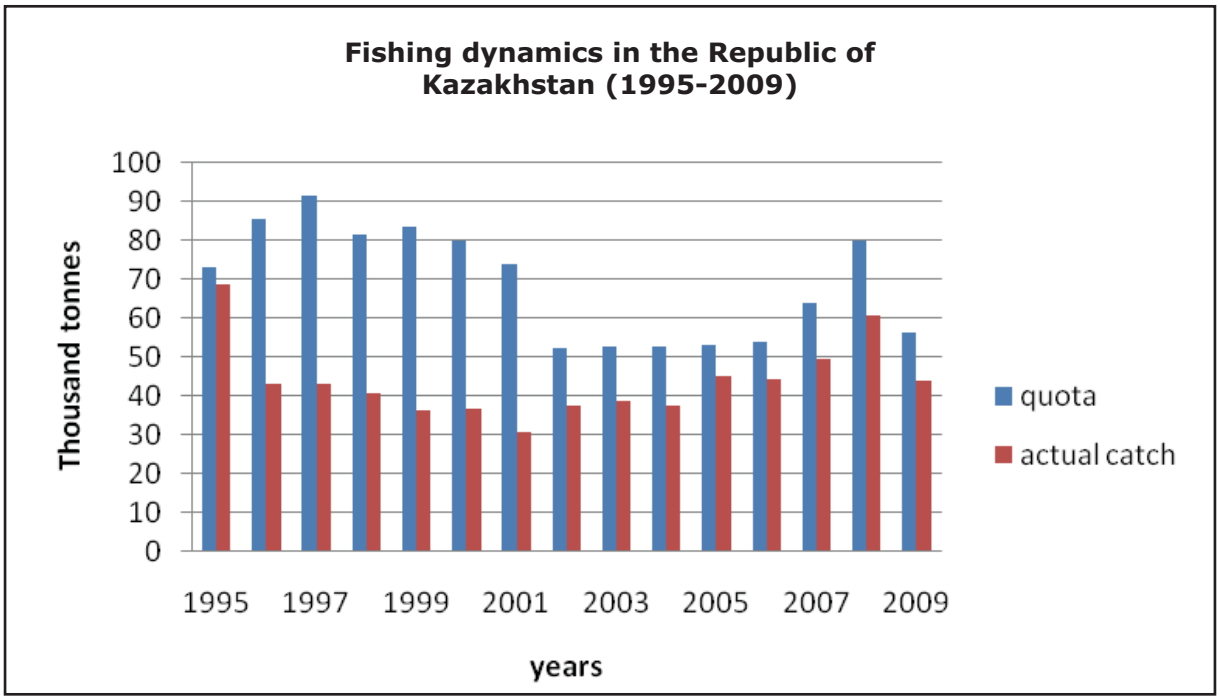
FIGURE 1
**Fisheries production in Kazakhstan 1989–2007 (in tonnes)**




While fish production declined until 2001, the increase in the capture of freshwater bream, pikeperch and crucian carp could indicate an upward trend. In 2001, capture fisheries production was at just 23 000 tonnes, climbed to 36 000 tonnes in 2005, and then decreased slightly in 2006 to 34 000 tonnes. Figure 1 shows that capture fisheries production in 2007 was estimated at just over 41 000 tonnes. The flounder catch rate in the North Aral Sea, which will become visible in the statistics of 2008, will add to this increase. Unfortunately, aquaculture production continued to decline over the 1989–2007 period. Common carp production decreased from 800 tonnes in 2005 to 80 tonnes in 2006, and a reduction also was noted in silver carp production in both 2006 and 2007. Silver carp production accounted for 262 tonnes in 2007, down from 424 tonnes in 2006. Overall, aquaculture production in Kazakhstan was estimated at 386 tonnes in 2007, which is less than 1 percent of the total fisheries production by the country in the same year.

Figure 2 below presents the dynamics in total quota availability and actual catch in the period from 1990 to 2009. It shows that officially recorded catches were significantly lower than the quota given to the fishers.

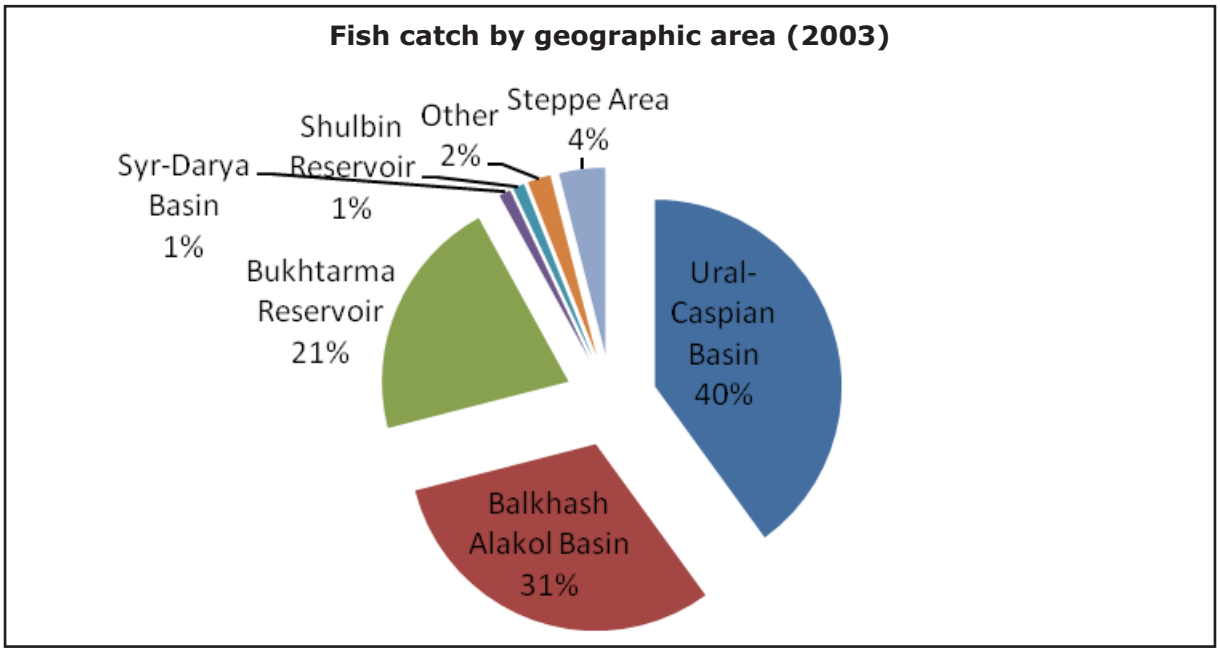
FIGURE 2
**Fishing dynamics in the Republic of Kazakhstan**




*Source:* Fisheries Committee of Kazakhstan.

To arrest this trend, the Government of Kazakhstan recently made the decision to reorganize – and hence privatize – the capture, processing and distribution of fish and fish products within the country. Access to fish resources, defined by access to quotas based upon calculated TAC, were "auctioned" off to interested bidders. Geographically, the bulk of the catch was now coming from three basins: Ural-Caspian, Balkash-Alakol and Zaysan-Irtysh (which includes the Bukhtarma reservoir) (Figure 3).

FIGURE 3
**Fish catch by geographic area (2003)**




*Source:* World Bank, 2004.

The main provider – the Ural-Caspian Interregional Basin Department (comprising Atyrau, Mangistau and Western-Kazakhstan oblasts) – has always been the major supplier of fish and fish products in Kazakhstan, with a total production share ranging from 45.1 to 61.3 percent. The main stocks of sturgeon are also concentrated in this basin.

The Balkash-Alakol Interregional Basin Department (oblasts of Almaty, and parts of Zhambyl, Karaganda and Eastern-Kazakhstan) has historically provided an output of 12 000–17 000 tonnes per year, although this has declined over time, while the Zaysan-Irtysh Interregional Basin Department (Eastern-Kazakhstan and Pavlodar oblasts) has recorded catches in the region of 11 000–12 000 tonnes per year.

While the Aral-Syr-Darya Interregional Basin Department (Kyzylorda and Southern-Kazakhstan oblasts) was posting landings of 15 000–20 000 tonnes from 1940 to 1965, the abstraction of water from the Aral Sea and its increasing salinization saw catches dwindle to near zero by the 1990s. Recent efforts to restore water levels in the North (Small) Aral Sea are beginning to pay off, however, though it is unlikely that historic catch levels will ever be replicated. Catch levels elsewhere are low.

**Aquaculture**

Aquaculture activities were most profoundly affected by the dissolution of the Soviet Union. While during the Soviet era governmental support had seen output grow from 672 to 9 883 tonnes, the withdrawal of subsidies and extension services and the inability to source feed, and other essential inputs, saw most hatcheries and fish farms halt production within three to four years after independence. The Aktyubselmash plant (100 tonnes capacity) in Aktyubinsk city, for example, produced fry and fingerlings for the growing of commercially valuable fish; however, production ceased after 1990. Even attempts to cultivate sturgeon via the construction of two hatcheries (capacity of 6 million fingerlings) in 1998 met with limited success in the first decade of independence.

Annex 4 presents the main reasons for the decline in fisheries production in Kazakhstan after independence from the Soviet Union in 1991.

Aquaculture activities still remain depressed – in 2006 only 190 tonnes of fish were produced. The major impediments to a resurrection of the sector appear to be: (i) funding – no more than 8–10 percent of the funding designated for the sector is directed to financing fish farming and the development of new technologies; and (ii) the absence of an appropriate regulatory framework which incentivizes such activities.

# Chapter 3
# THE CURRENT STATUS OF CAPTURE FISHERIES AND AQUACULTURE

## Natural resources and potential of the fisheries sector

### Geography and climate

Kazakhstan, the ninth largest country and the largest landlocked country in the world, is located in Central Asia. Bordered to the north and west by Russia (6 846 km), the south by the Kyrgyz Republic (1 051 km), with Uzbekistan (2 203 km) and Turkmenistan (379 km) lying to the west, and the Xinjiang Uygur Autonomous Region in the People's Republic of China (1 533 km) to the east, Kazakhstan's 2 717 300 km$^2$ makes it more than double the total size of the other four Central Asian republics. Part of its international borders traverse major regional waterbodies: the Caspian Sea (1 894 km – fishing rights are shared with the Republic of Azerbaijan, the Islamic Republic of Iran, the Russian Federation and Turkmenistan) and the Aral Sea (1 070 km – shared with the Republic of Uzbekistan).

The sheer size of the country ensures considerable topographical variation. The highest peaks in the country lie in the Tien Shan mountains along the Kyrgyzstan border (including the highest point – Mount Khan-Tengri at 7 010 metres above sea level) and the Altay mountains further north, which stretch across Kazakhstan, the Russian Federation and China. Glacial runoff from these ranges provides the major water source for most of Kazakhstan's rivers. In sharp contrast, the Karagiye Depression lying east of the Caspian Sea, in Mangistau, the country's poorest oblast, is 132 metres below sea level. Most of the country's elevation varies between 200 and 300 metres above sea level.

The climate is generally characterized as continental, but exhibits sharp seasonal variations –summer temperatures can reach as much as 53 °C, while in the winter period temperatures as low as -58 °C have been recorded in parts of the Tien Shan mountain range. While these high summer temperatures contribute to high rates of glacial melt – and are causing concern about the likelihood of growing water scarcity across the country as global mean temperatures continue to rise – they also contribute to high rates of evaporation, with many smaller lakes and glacial streams drying up in the high summer. As a consequence, much of the national territory is either classified as desert (44 percent) or semi-desert (33.2 percent), with the Kyzylkum (298 000 km$^2$ – the eleventh largest desert in the world, and stretching into the Republic of Uzbekistan and Turkmenistan) and Moyunqum deserts in the west and central-southern regions being key topographic features.

Desertification was exacerbated by Khrushchev's Virgin Lands Program in the 1950s and 1960s, which introduced large-scale wheat farming into the north and central steppes of Kazakhstan. With limited water availability (despite the implementation of an extensive irrigation programme), ploughing simply triggered wind erosion and much topsoil was simply blown away. In the Semey region in the north-east, Soviet testing of nuclear weapons (456 tests, 116 above ground) until 1990 at Kurchatov on the Irtysh River has resulted in high levels of radioactive contamination locally, and instances of radiation poisoning, birth defects, severe anaemia and leukaemia are common in the vicinity.

The latest census, of March 2009, placed the population of the country at 16.4 million people, with the urban population (54 percent) outnumbering the rural. Ethnic Kazakhs dominate (67 percent) with Russians (21 percent) a sizeable minority, and a number of smaller ethnic groupings. Three of the fourteen oblasts (Almaty, Karanganda and Southern-Kazakhstan) have populations that surpass a million people, while the poorer oblasts of Mangistau and Atyrau which border the Aral Sea have populations of less than 400 000.

**Rivers**

The arid and semi-arid nature of much of the country accounts for its relatively low number of rivers, despite its immense size. The country has an estimated 8 500 rivers of note (neighbouring Kyrgyzstan, with a surface area barely one-thirteenth of Kazakhstan, has almost 30 000). Seven of these, the Ural, Emba, Syr Darya, Irtysh (or Ertis), Ischim (or Esil), Tobyl (or Tobol) and Ili, are over 1 000 km in length, a further 155 rivers are over 100 km long, and around 6 000 extend for over 10 km. With the exception of the Irtysh, Ischim, Tobyl rivers, the remainder of the country's rivers form part of landlocked river systems. River flow changes considerably during the year, with flows being greater in the early summer period. The rivers are currently of limited importance for commercial fisheries, although a number are important for recreational fishing (including the Ural, Irtysh, Shelek, Tekes, Syr-Darya, Ili and Kigach). Table 3 lists the major rivers in Kazakhstan.

TABLE 3
**Water resources of Kazakhstan**

| Major rivers | Average annual discharge ($km^3$) | | Available water resources under different levels of supply (%) | | Current use of water |
|---|---|---|---|---|---|
| | Total | From neighboring countries | 75 | 95 | ($km^3$) |
| Total in Kazakhstan, of which | 110.9 | 43.9 | 32.6 | 26 | 36.6 |
| Syr-Darya | 17.9 | 14.2 | 9.8 | 9.3 | 12 |
| Ili | 17.8 | 11.1 | 4.3 | 3.4 | 5.2 |
| Karatal, Lepsy, Ayaguz, etc. | 10 | 0.3 | 2.7 | 2 | 3.6 |
| Irtysh | 33.8 | 7.8 | 10.8 | 8.4 | 5.4 |
| Ischim (Ishym) | 2.3 | - | 0.4 | 0.1 | 1 |
| Nura | 0.8 | - | 0.2 | - | 1.1 |
| Sarysu | 0.4 | - | 0.1 | - | 0.4 |
| Tobol | 0.6 | - | 0.1 | - | 0.5 |
| Torga | 1.4 | - | 0.2 | - | 0.5 |
| Shu | 282.4 | - | 2 | 1.6 | 2.7 |
| Talas-Assa | 1.4 | 0.7 | 1 | 0.7 | 1.4 |
| Ural | 9.5 | 6.5 | 0.6 | 0.3 | 2 |
| Emba, Sagiz | 0.8 | - | 0.2 | - | 0.2 |

*Source:* Ismukhanov and Mukhamedzhanov, (2003).

**Lakes**

There are an estimated 48 000 lakes in Kazakhstan, although a number of them dry up in the hot summer period. The most important lakes are Lake Balkhash, Lake Alakol and Lake Tengiz.

Lake Balkash, a 605 km long, 9–19 km wide lake, with a drainage basin of 501 000 $km^2$, lies to the east of Almaty, the former capital of Kazakhstan. It holds 112 $km^3$ of water and covers a surface area of 17 000 $km^2$, though this is shrinking due to the diversion of water flow in its river tributaries; its depth varies between 5.8 and 25.6 metres. The lake is fed by seven rivers, the main source being the Ili, and has variable salinity levels – the shallower west is more fresh, the slightly deeper east is more saline, with levels ranging from 3 to 6 ppt (parts per thousand).

Alakol, or (more properly) the Alakol lake system, consists of four large lakes (Sasykkol, Koshkarol, Alakol and Zhalanashkol) and a number of smaller basinal lakes located on the Balkhash-Alakol plain on the border of Almaty and Southern-Kazakhstan oblasts. Lake Alakol encompasses 2 696 $km^2$ (including islands), has a drainage basin of 65 200 $km^2$, and holds 58.6 $km^3$ of water. It is somewhat rectangular in shape – 104 km long and 52 km wide (covering 2 650 $km^2$) with an average depth of 22 metres (maximum depth is 54 metres), and is fed by 15 to 20 rivers. Lake Sasykkol is rather smaller, 50 km long and 15 km (on average) wide, varies in size from 600 to 736 $km^2$ (when in full flood), and is very shallow – with an average depth of 3.3 metres and a maximum depth of 4.7 metres. It is fed by the Ili, which provides around 80 percent of its water flow, and a number of smaller rivers. Smaller still is the brackish Lake Koshkarkol. Covering 120 $km^2$ and with a depth of up to 5.8 metres, it becomes one with lakes Sasykkol and Alakol during the flood season. Lake Zhalanashkol is the most isolated of the Alakol lakes. Located on the Kazakh-Chinese border, it was the source of a brief Russo-Chinese ownership conflict in 1969.

Lake Tengiz, best known for the unplanned landing of the Soyuz 23 spacecraft in 1976, covers an area of 1 382 $km^2$ in the north-central part of the country. With an average depth of 2.5 metres and a deepest point of 6.7 metres, the lake is on the Ramsar List of Wetlands of International Importance – providing a habitat for 295 bird species, 22 of which are on the "endangered" list of the International Union for Conservation of Nature (IUCN) Red Book.

**Remainder of the Soviet era Aral Sea fishing fleet (left). Ice fishing on the Northern Aral Sea in the winter season (right)**

Pictures courtesy of Mr. A Thorpe and Mr. S. Timirkhanov

**Seas**

Kazakhstan also has (shared) territorial rights of the region's two seas, although these have suffered contrasting fortunes. The Aral Sea, which housed a vibrant freshwater fishery in the first half of the twentieth century, was the principal victim of the Soviet decision to assign the Steppes of Central Asia the task of ensuring cotton self-sufficiency for the Soviet bloc. As cotton fields proliferated, the demand for water grew and the diversion of water had a profound effect upon the Aral Sea. By 1982, the sea's two sole tributaries, the Amu-Darya and the Syr-Darya (which had emptied 55 $km^2$ of water into the sea in the 1960s), failed to reach the sea at all. Water levels dropped 23 metres, the sea shrank 70 percent in area and split into two, and Aralsk, the sea's main fishing port, now found itself stranded 100 km from the increasingly saline North (Small) Aral Sea. Local endeavours to raise water levels in the North Aral Sea – by blocking runoff into the larger (but dead) South Aral Sea by blocking water outflow through the Bering Strait – were subsequently supplemented by the construction of the World Bank-funded 13 km Kok-Aral dyke in 2001. Water levels have since risen 3 metres, causing the North Aral Sea to expand in area by around 500 $km^2$, and bringing the waters back to within 25 km of Aralsk (Thorpe and van Anrooy, 2009).

In contrast, the water level of the Caspian Sea – currently around 28 metres below sea level – has been rising steadily since 1978 and, in Atyrau oblast on the northern tip of the sea, more than 10 000 $km^2$ of land have been inundated. If Caspian waters continue to rise at the current rate, then there is a high probability that 89 population centres, including Atyrau, Kazakhstan's main Caspian port and home to over 150 000 people and much of Kazakhstan's Caspian oil fields, could be under water within a decade. Currently the sea, which is the largest inland body of water in the world, has a surface area of around 371 000 $km^2$ and holds 78 200 $km^3$ of water, with a maximum depth of 1 205 metres. It has variable levels of salinity, ranging from 0.05 ppt near the estuary of the Volga River to 11–13 grammes per litre (= ppt) in the south-east. An endorheic basinal sea, accounting for 40–44 percent of global lacustrine waters, it is fed by 130 rivers. However, just four rivers (the Volga and Terek from the Russian Federation, and the Ural and the Emba from Kazakhstan) supply between 88–90 percent of the annual discharge into the sea.

The northern part of the sea is very shallow, with an average depth of 5–6 metres (less than 1 percent of the total water volume), and much of the coast is too shallow to permit any meaningful fishing. The Middle Caspian has a depth of around 190 metres (33 percent of water volume), while depths reach 1 000+ metres in the south (66 percent of water volume) – although is relatively underfished owing to the lack of appropriate vessels in the Caspian fleet. This depth also explains why the south of the sea only infrequently freezes during winter, while the north is generally caked with ice in winter.

**Reservoirs**

Kazakhstan has 475 reservoirs and more than 96 000 km of irrigation canals. The major reservoirs are in the south, where there are 75 reservoirs in total, with a combined capacity of 95.5 $km^3$ and a surface area of over 10 000 $km^2$ (see Table 4). The great majority of large reservoirs are multipurpose, providing hydropower and irrigation facilities, but they are also important sources of fish catch.

The Bukhtarma reservoir on the river of the same name (a tributary of the Irtysh) is, at 5 490 $km^2$, the fifth largest reservoir by area in the world. Constructed in 1960, it flooded and enlarged Lake Zaysan, and contains around 53 $km^3$ of water and extends over 500 km in length (maximum width 35 km), with an average depth of 9.6 metres. The reservoir not only provides hydropower for Eastern-Kazakhstan oblast, but has also helped improve navigation along the Irtysh (to Omsk) by stabilizing water flow. As seasonal drawdown is negligible, its relatively stable level has contributed to the successful spawning of fish.

Shardara reservoir, the second largest in the country, was constructed for irrigation and hydropower production in 1965 on the Syr-Darya River. Like most irrigation reservoirs in southern Kazakhstan, Shardara is filled in the autumn–winter period (October to March) and drawdown takes place in spring

and summer (April–September), with water levels fluctuating by up to 11 metres as a consequence. Full, the reservoir covers 90 km$^2$, but spring and summer drawdown can reduce the surface area to 28.7 km$^2$, with a similar reduction in volume.

TABLE 4
**Major reservoirs in Kazakhstan**

| Reservoir | Volume in million m$^3$ | | Surface area (ha) | |
|---|---|---|---|---|
| | At full supply | At minimum supply | At full supply | At minimum supply |
| Bukhtarma | 49 620 | 30 810 | 549 000 | 306 000 |
| Shardara | 5 200 | 4 200 | 90 000 | 28 700 |
| Kapshagay | 28 140 | 6 640 | 84 700 | 51 000 |
| Bogun | 370 | 368 | 68 500 | 4 900 |
| Ters-Aschibulak | 58 | 58 | 24 000 | 2 000 |
| Badam | 61.5 | 59 | 4 800 | 470 |
| Samar | 260 | 215 | 7 500 | 2 200 |
| Topar | 274 | 233 | 4 100 | 3 600 |
| Kengir | 319 | 309 | 3 740 | 1 000 |
| Zhezdin | 76 | 73.6 | 1 760 | 240 |
| Vyacheslav | 410.9 | 377.6 | 6 090 | 980 |
| Sergeev (on the Ishim River) | 693 | 635 | 11 680 | 1 920 |
| Seletin | 230 | 200.1 | 3 630 | 210 |
| Upper Tobol | 816 | 782 | 8 740 | 600 |
| Karatomar | 586 | 562 | 9 400 | 675 |
| Kirov (on the Kushum River) | 63 | 60 | 3 910 | 290 |
| Dungulyuk | 57.4 | 48 | 3 150 | 600 |
| Bitik | 106.7 | 100 | 5 300 | 1 430 |
| Karagalinsk | 280 | 262 | 2 750 | 500 |
| Charsk | 80 | 75 | 1 150 | 1 100 |
| Taschitkul | 620 | 551 | 7 760 | 1 670 |
| Storage lakes of the Irtysh-Karaganda canal | 273 | 210 | 15 600 | 11 500 |
| Shulbin | 263 | 162 | 27 500 | 12 500 |

*Source:* Ismukhanov and Mukhamedzhanov (2003).

Bogun reservoir, constructed on the river of the same name in Southern-Kazakhstan oblast, is the second largest reservoir in southern Kazakhstan. The dam is 5 km long and 17 metres high and, while the maximum depth ascends to 15 metres, average depth (when full) is 5.8 metres (1.4 metres when waters are fully drawn down). When full, the reservoir is 13.5 km long and 5.7 km wide, but during the three summer months the reservoir loses 75–80 percent of its accumulated winter water, with its surface area shrinking to be 15–20 of that when full. According to Ismukhanov and Mukhamedzhanov (2003), the

reservoir is a classical example of the contradiction that exists between the needs of irrigated agriculture and fisheries – "irrigation requires drawing water in spring when an increase in water level is in the interest of fishery as fish start to spawn."

Decree 1137 (3 November 2004) divides these waterbodies into two types based on importance of fisheries sector production (see Table 5 below).

TABLE 5
**Fishery waterbodies of importance in Kazakhstan**

| **Fishery waterbodies of national and international importance** | **Fishery waters (sections) of local importance** |
|---|---|
| 1. Aral Sea<br>2. Lake Zaysan, Bukhtarma and Shulba reservoirs and Irtysh River<br>3. Caspian Sea<br>4. Kigach River<br>5. Syr-Darya River<br>6. Ural River<br>7. Ili River and Kapshagay reservoir<br>8. Ishym River<br>9. Shardara reservoir<br>10. Alakol system of lakes<br>11. Lake Balkash<br>12. K. Satpayev Canal | All other waterbodies (sections) included in the lists approved by local district administrations |

Catch data are generally reported on a basin basis, with four principal basins (see Table 6) and complemented by the Steppes region of north and central Kazakhstan (around 7 000 lakes are found in this region, the largest about 15 km long).

TABLE 6
**Main fishing areas in Kazakhstan**

| **Basin** | **Waterbody** | **Administrative district (region)** | **Species** |
|---|---|---|---|
| Ural-Caspian basin | Caspian Sea | Atyrau | Sturgeons, roach, pikeperch, caspian shad, kilka, carp species, bream, etc. |
| | | Mangistau | |
| | Ural River | Atyrau | |
| | Kigach River | Atyrau | |
| | Local water ponds | West Kazakhstan district | Carp species, perch |
| Aral-Syrdarya basin | North (Small) Aral Sea | Kyzylorda | Flounder, bream, asp, pikeperch, aral roach, rudd |
| | Shardara reservoir | South Kazakhstan | Crucian carp, asp, common carp, pikeperch, roach, catfish |
| | Syr-Darya River (lake systems of the delta) | Kyzylorda | Dace, rudd, white eye bream, roach, river perch, pike, ide, ziege |
| | Local water ponds | South Kazakhstan | Dace, rudd, white eye bream, roach, river perch, pike, ide, ziege |
| Balkash-Alakol basin | Kapshagay reservoir | Almaty | Bream, pikeperch, asp, catfish, roach, common carp, silver carp, crucian carp |

| Basin | Waterbody | Administrative district (region) | Species |
|---|---|---|---|
| | Lake Balkash | Karaganda, Almaty, Zhambyl | Bream, pikeperch, asp, roach, catfish, common carp, crucian carp, Volga pikeperch, grass carp |
| | Ili River delta | Almaty | Bream, pikeperch, asp, roach, catfish, common carp, crucian carp, Volga pikeperch, grass carp |
| | Lake Sasykkol | Almaty, West Kazakhstan | Bream, pikeperch, Balkhash pikeperch, crucian carp |
| | Lake Koshkarkol | Almaty | |
| | Lake Alakol | Almaty, West Kazakhstan | |
| | Local water ponds | Almaty | |
| Irtysh-Zaysan basin | Bukhtarma reservoir | West Kazakhstan | Bream, pikeperch, roach, river perch, pike, ide, vendace, common carp, crucian carp |
| | Shulba reservoir | West Kazakhstan | Roach, river perch, bream, crucian carp, pike, pikeperch |
| | Irtysh River | West Kazakhstan, Pavlodar | Bream, roach, river perch, pikeperch, pike, ide, crucian carp, burbot |
| | Local water ponds | West Kazakhstan, Pavlodar | Bream, roach, river perch, pike, crucian carp, pikeperch, tench, dace |

**Fish fauna**

The Caspian Sea was, historically, a major source of the global sturgeon catch, but overfishing in recent years has threatened sturgeon stocks to such an extent that severe controls over landings have been introduced so as to support stock recovery. Six sturgeon species inhabit the Caspian Sea basin: Beluga (*Huso huso*), Starry sturgeon (*Acipenser stellatus*), Russian sturgeon (*A. gueldenstaedtii*), Sterlet (*A. ruthenus*), Persian sturgeon (*A. persicus*) and Fringebarbel sturgeon (*A. nudiventris*). Practically all the Caspian sturgeons ascend the Ural River for spawning, with three of them, the Beluga, Russian and Starry sturgeon having high commercial value. A ban on commercial fishing of Fringebarbel sturgeon in the Ural River was imposed in 2002 because there was a very low abundance of these Caspian sturgeon species. There is an exception for catch for restocking and research purposes (Kim, 2009).

While Caspian Sea sprats dominate the catch, there are several other species and subspecies endemic to the waters of the Caspian, including the Caspian inconnu, Caspian roach, Caspian bream, and a Caspian "salmon" (a subspecies of trout, *Salmo trutta caspiuss,* which is critically endangered). The sea is also home to the Caspian seal, *Phoca caspica,* one of the few inland freshwater seal species.

The Aral Sea was much less fortunate. A combination of increasing salinity (Petr *et al*., 2004, suggest levels reached as much as 34–37 g/litre in 1992) and toxicity of its waters – due to pesticide runoff from the cotton fields – had wiped out all the sea's endemic species by the 1980s. A Soviet saltwater fish restocking scheme paid limited dividends, with only flounder acclimatizing to its new saline climate. While flounder catches currently underpin local fishing activity, the recent rise in water levels (as local irrigation systems are scaled back/made more efficient and releasing more of the Syr-Darya's waters into the sea) has started to reverse salinity levels and brought pikeperch, snakehead and carp back into the sea, albeit, it seems, at the likely expense of flounder (Thorpe and van Anrooy, 2009).

After construction of the Bukhtarma dam, initial reservoir fauna mainly consisted of low value fish such as roach, rudd, perch and related species (70 percent plus of total catch). These were supplemented

by the introduction of higher value fish in the 1960s and 1970s, including zander (*Sander lucioperca*), bream (*Abramis brama*), vendace (*Coregonus albula*), which thereafter became an integral component of commercial catches. Fish food organisms from the Caspian Sea and the Onega and Baikal lakes were also introduced and now form an important element in the reservoir's food chain.

In the case of the Shardara reservoir, its construction was accompanied by the introduction of 33 fish species. While 21 species failed to thrive, 12 – including common carp, crucian carp, bream and zander (pikeperch) – are commercially important. The most important factor influencing the presence and abundance of ichthyofauna in the reservoir is the hydrological regime, which is determined by alternative water uses, and the hydrochemical regime. Water drawdown reduces the surface area and leads to shallower water thereby reducing the number of spawning areas and causing high spawn mortality during the spring breeding period, which takes place from 1 April to 20 May. Drawdown also sharply reduces the habitat available for benthic organisms (and changes their species representation), while the proliferation of blue-green algal blooms in the summer months raises fish mortality rates because of the low concentrations of dissolved oxygen present. In autumn, the drop in water temperature causes plankton die-off, further exacerbating the food situation, and the sector is not helped by the loss of zander, roach and bream fry – which is carried out into the Kyzylkum Canal (Ismukhanov and Mukhamedzhanov, 2003, suggest fry losses in May alone could ascend to a million a day).

In total, 155 species and subspecies have been recorded in Kazakh waters (Annex 5). The Government of Kazakhstan acknowledges and seeks to protect the 18 species and subspecies which appear in the Red Book of the Republic of Kazakhstan (Annex 6). Commercial species – defined as those being developed by the local industry for commercial purposes – are distinguished from non-commercial species (small aboriginal and introduced species which are either low value or exist in insufficient quantities to support the commercial harvesting thereof). However, despite stocks of Caspian salmon declining sharply, and the Balkhash perch (in Lake Alakol) being included in the Red Book of the Republic of Kazakhstan, both remain on the government listing of commercial fisheries.

**Inland capture fisheries**

**Fleet**

The size and type of vessels have not changed since independence, and fishers and fishing enterprises mostly continue to use vessels constructed in the pre-independence period. The Aral Sea fishery has benefited from the provision of second-hand Danish boats (and around 1 000 nets) during the last 20 years through a project funded by the Danish Society for a Living Sea (DSLS).

The most common fishing vessels are:

- Fibreglass boats (most of which date from the 1970s), approximately 8 metres long, powered by outboard motors of 8–30 hp, with a capacity of 1 tonne maximum.
- Small wooden boats, mostly powered manually with oars, with a capacity of 1.5 tonnes or less.

The Register of Shipping suggests 710 vessels were registered in 2007 (140 state owned, 570 private), with a further 130 vessels registered for passenger and freight use. However, it is likely that the total fleet is rather larger as many small boats are unlikely to have been registered. Of the 710 vessels registered, 483 have been granted permission to tender for fishing quotas. There is no information as to the geographic distribution of the fleet, but evidence suggests that there are around 100 fibreglass vessels operating on the North Aral Sea.

**Current production of capture fisheries**

Recent production data are available by basin. The sharp increases evident in recent years are attributable to a combination of an improved reporting system, greater clarity regarding fishing rights and reservoir access, reduced salinity and an enlarged fishing area (as with the North Aral Sea, which recorded a

fivefold increase in catches between 2005 and 2006). The Ural-Caspian and Balkash-Alakol basin fisheries (accounting for 30–40 percent of total catch apiece) dominate, with lesser contributions from other regions (see Table 7).

TABLE 7
**Fisheries production – by water basin in tonnes, 2005–2006**

| Name | 2005 | 2006 |
|---|---|---|
| Aral-Syr-Darya basin | 585.1 | 2 811.1 |
| Balkash-Alakol basin | 14 152.6 | 16 530.7 |
| Zaysan-Irtysh basin | 9 326.6 | 7 327.4 |
| Ural-Caspian basin | 16 151.4 | 13 630.9 |
| Other | 2 048.5 | 2 446.6 |
| Total | 42 264.2 | 42 746.7 |

## Illegal, unreported and unregulated fishing

Despite the government's efforts, illegal, unreported and unregulated (IUU) fishing is widespread in Kazakhstan. The World Bank (2004) reports that "most landings go unrecorded; the majority of activity in the fisheries sector takes place in the underground economy and does not register in official data." The same document estimates that actual production levels could therefore be three to four times higher than those officially recorded, with a potential resource rent loss of between tenge 220 million and 335 million (US$1.5 million–US$2.3 million). The extent of such fishing can be gleaned from data on the number of fishers. While FAO (2004) reports that there are around 5 200 active fishers in the sector, official 2006 Ministry of Agriculture statistics cite a number of 17 300 (Timirkhanov *et al*., 2007) – with the World Bank estimating that the real number could ascend to as many as 110 000 fishers.

**Examples of fishing vessels used in the Northern Aral Sea**

Picture courtesy of Mr S. Timirkhanov

**Recreational fisheries**

The main areas for recreational fishing are near the big settlements or industrial cities. Recreational fisheries includes both amateur fishing and sport fishing in Kazakhstan. Although some foreign visitors come to Kazakhstan for sport fishing, there are no collated data on the numbers of fishers or on target species. The registered catch by recreational fishers in 2008 is estimated by the Union of Societies of Hunters and Fishermen of Kazakhstan (Kazokhotrybolovsoyuz) at 916 tonnes (van Anrooy *et al.*, 2010), of which 40 percent originated from Lake Balkash.

While some 1 000 recreational fishers are officially registered as sport fishers, there are no data available about the total number of recreational fishers in the country. It is also not possible to estimate how many people fish in support of household food security. It is widely known however that such "subsistence" recreational fishing is conducted in all waterbodies of Kazakhstan where fish exist. In this respect it should be noted that the extent of subsistence fishing is much smaller in Kazakhstan than in other Central Asian republics, such as Kyrgzystan, Tajikistan and Uzbekistan (van Anrooy *et al.*, 2010).

Sport fishing can be undertaken using fishing rods of any style or type with up to five rods per fisher; spinning rods and spoon baits are allowed. Harpoon guns can also be used outside recreational areas. Other methods such as fishing with gill and trawl nets, electrofishing, fishing with dynamite or poison are not allowed.

The main areas where recreational, sport and subsistence fishing takes place are:

- Ural River (downstream)
- Syr-Darya River (downstream and estuary lakes)
- Ili River (near the Kapshagay reservoir down to Balkash lake)
- South-west part of Lake Balkash
- South-west part of Lake Akakol
- Irtysh River
- Shelek River (upstream)
- Tekes River (and its inlets)
- The western side of Djungar Alatau
- Various rivers that flow through the Kazakh part of the Altai mountain range

The main fish species targeted are catfish, pikeperch, pike, asp, members of the salmon family (rainbow trout, grayling, lenok), sturgeons and carp (crucian, silver and grass), and scaleless and scaly osman in mountain areas.

The Law of the Republic of Kazakhstan on Protection, Reproduction and Use of the Wildlife (9 July 2004) provides for sport-fishing activities (Chapter 6, page 34). Sport fishing is defined as catching fish and other water animals to meet sport and/or aesthetic needs for personal ends. Article 25 stipulates that all enjoy the right to sport fishing. Decree 246 of 18 March 2005 approved "Fishing Rules" (includes sport fishing), which can be undertaken in all national waterbodies, excluding areas where fishing is prohibited and in the waters of specialized fish farms.

According to the order of the Chairman of the Fisheries Committee (under the Ministry of Agriculture of Kazakhstan, Edict No.16-5/10п of 3 February 2005, titled "The approval of application, permit and fishing log forms", and Edict No.116-01-07/81п of 18 June 2007), any person wishing to fish has to obtain a commercial and/or sport fishing permit from the authorized territorial body. After the requisite fee is paid, the person receives a fishing permit that allows to fish at designated waterbodies. The standards which regulate recreational fisheries are set by the Ecological Code of the Republic of Kazakhstan, the Law of the Republic of Kazakhstan "About the separately guarded natural territories", and by the rules of amateur fishing, in support of the needs of the local population living in the protected areas within state natural reserves, as affirmed by Decree No. 79 of the Chairman of the Forestry and Hunting Committee of the Republic of Kazakhstan, dated 27 February 2007.

There are three national level overarching associations or unions that protect the interests of recreational fishers in Kazakhstan. They are:

- The "Union of the Societies of Hunters and Fishermen of Kazakhstan" (Kazakhotrybolovsoyuz). This union was created with a decision of the Council of Ministers of the Kazakh SSR in 1958.

- The "Federation of Sport Fishing of the Republic Kazakhstan" was registered by the Ministry of Justice of Kazakhstan on 28 June 2002. It has the right to enter international organizations and federations on sport fishing and to represent Kazakhstan in international competitions. The Federation is member of the World Sports Fishing Federation (www.wsff.org) and has participated successfully in many international sport fishing competitions.

- The "Association of Fishery, Fishing-process, Fish-farming and Fish-trading Enterprises of Kazakhstan" was recently established, in 2008. Although this association is not directly involved in recreational fishing, it is an important player in the sector as it possesses – through its members – reservoirs fisheries. It is involved in determining the catch quota for commercial and recreational fishers in these reservoirs.

**Recreational fishing at trout farm near Almaty**

Picture courtesy of Mr R. Van Anrooy

**Aquaculture**

Aquaculture in Kazakhstan comprises a variety of activities:

- Pond pisciculture
- Lake pisciculture
- Basin pisciculture
- The growing of fish in specialized ponds (one-, two- and three-year cycles)

Table 8 contains information on the status of fish farming in Kazakhstan to 2004. Many of the 18 fish farms listed in the table ended their operations by 2004.

During Soviet times, with government support, the output of fishing farms grew from 672 tonnes in 1974 to 9 883 tonnes in 1994. In the years after independence, however, production dropped sharply as most farms were unable to operate profitably in free market conditions, and by 2006 production totalled 190 tonnes. Even though farms have closed, infrastructure – in many cases – remains and could be reactivated with either state or private investment.

TABLE 8
**Large aquaculture production establishments in Kazakhstan**

| **Aquaculture establishment** | **Oblast** | **Fish species cultured** |
|---|---|---|
| Maybalyk Fish Nursery | Akmola | Carp, cisco or white fish |
| Zerendy Centre | Akmola | Whitefish, carp |
| Ardak Farm (formerly Karagaly Pond Fish Farm) | Aktyubinsk | Carp, sturgeon, herbivorous fish |
| Turgen Trout Farm (private) | Almaty | Trout |
| Bent Almaty Pond Farm (private) | Almaty | Carps, herbivorous fish |
| Chilik Pond Farm | Almaty | Carps, herbivorous fish; spadefish has been invasive |
| KazPASS State Enterprise | Almaty | Carps, herbivorous fish |
| Kapshagay Spawning and Breeding Farm | Almaty | Carps, herbivorous fish |
| Atyrau Sturgeon Hatchery Erkin Kala | Atyrau | Reproduction of sturgeon |
| Bukhtarma Spawning and Breeding Farm | Eastern-Kazakhstan | Carp, common carp |
| Karaganda Fish Nursery | Karaganda | Carp, common carp |
| Verkhne-Tobol Fish Nursery | Kostanai | Carp, common carp |
| Kamyshly-Bash Fish Nursery | Kyzylorda | Carp, common carp, herbivorous fish |
| Petropavlovsky Fish Nursery | Northern-Kazakhstan | Carp, common carp, cisco |
| Kachirsky Fish Nursery | Pavlodar | Carp, common carp |
| Shardary Fish Nursery | Southern-Kazakhstan | Carp, common carp, herbivorous fish |
| Zhivoye Serebro LLC (formerly Uralskoye Pond Fish Farm) | Western-Kazakhstan | Carp, sturgeon, herbivorous fish |
| Kolos Hatchery | Zhambyl | Carp, phytophagous fish |

Akmola oblast has two fish hatcheries. The *Zerendy Centre,* located in the Kokshetau National Park, was created as a pond farm complex covering 224.4 ha in 1967, and subsequently it developed a whitefish and carp hatchery capable of producing 50 million whitefish fries, 30 million carp fries and 1.3 million fingerlings. The *Maybalyk Fish Nursery* on the lake of the same name is capable of producing 50 million carp fries, 20 million whitefish fries, and 800 000 carp fingerlings.

Aktyubinsk oblast used to have one aquaculture operation. Set up in the period 1978–1981 on the banks of the Zhaksy-Kargaly River, the 12-pond complex encompassed 227 hectares. After independence, its pond fish production activities were transferred to the *Ardak Farm,* and production peaked shortly thereafter at 380 tonnes. However, rising costs saw commercial production cease in 2003.

Almaty oblast was home to five aquaculture operations. Three specialized commercial pond operations: *Almaty Pond Farm* (Bent), *Chilik Pond Farm* (Aidyn) and *Turgen Trout Farm* (LLP Technoimport) were complemented by three hatcheries. *Kapshagay Spawning and Breeding Farm* covers around 720 ha of ponds, but because of recurrent water shortages the farm only produces on one-fifth of its area – average production in the 1980s was around 700 000 phytophagous and 1.2 million carp fingerlings.

*KazPASS State Enterprise* is much smaller, with just 32 ponds covering an area of 25.9 hectares and an annual production of 500 000 phytophagous fingerlings. The *Besagash Complex* is the newest. It opened in 2002, and though it is able to produce up to 20 million carp or phytophagous fries on around 150 ha of ponds, it is still not operating.

Sturgeon is the targeted activity of the *Ural-Atyrau* and *Atyrau* sturgeon hatcheries in Atyrau oblast. The former, located on the Ural River, has 51.4 hectares of ponds and an annual production of 3 million sturgeon juveniles. The latter, also on the Ural River, has a smaller pond area (33 hectares), but an identical output level. In February 2007, by government decree (RK No.144), the two firms merged and became the Atyrau Sturgeon Hatchery Erkin Kala. The main enterprise is located at the lower reaches of the Ural River, 7 km from the coastal line of the Caspian Sea. The hatchery's primary activity is the reproduction of sturgeon. The target capacity is 7 million sturgeon fingerlings (average weight 3–5 g) per year using both hatchery locations. The hatchery does not have any domestic sturgeon broodstock at its disposal and implements traditional technology on the basis of the wild breeders captures in the lower reaches of the Ural River during their spawning run.

Russian sturgeon, Starry sturgeon, Beluga, Fringebarbel sturgeon and Sterlet are all reproduced by the Atyrau hatchery, but the prime species is starry sturgeon (65 percent of the released fingerlings). The rearing of fingerlings is performed by a combined method (first in tanks and then in earth ponds). Apart from the common hatchery units, the hatchery contains a facility for long-term holding of breeders at low temperature; is equipped with freezing systems (five tanks with a total volume of 160 $m^3$); has two laboratories for hydrochemical and hatchery control; and has a water treatment unit (three sedimentation tanks of 6.7 ha, equipped with systems of mechanical treatment and filtration). The volume of annual release of sturgeon fingerlings corresponds to target capacity of the hatchery. Over the 2004–2008 period, 35 775 000 fingerlings of different species were released into various sections of the Ural River, including in the Ural-Atyrau area, the Zolotoy Rukav and the Yaitsky Rukav.

In Eastern-Kazakhstan oblast, the major hatchery is at Bukhtarma reservoir, which has released over 175 million carp fingerlings to date (production capacity is 30 million fingerlings annually – of which 2 million can be sold to private fish farmers). The *Semipalatinsk* and *Ust-Kamenogorsk* trout farms were sold to private investors following independence but have since ceased operations.

Zhambyl oblast is home to the *Kolos Hatchery* on the peasant farm of the same name and *LLP "DSU-85" (formerly Shuiskoe Pond Farm).* DSU-85 started operations under its former guise in 1985 with an incubation plant that has a 50-million fry capacity. Covering 1 021 hectares, 830 hectares of which were ponds, the plant is capable of producing 50 million pieces of restocking material (carp and phytophagous fish). Kolos Hatchery began operations in 2002. Covering 71 hectares, it has a capacity of 5–10 million carp fries and up to 1 million carp fingerlings; unfortunately, production data of this hatchery are not available.

*Zhivoye Serebro LLC* (formerly Uralskoye Pond Fish Farm) in Western-Kazakhstan oblast has 287 ha of ponds and a 300-tonne capacity (carp and phytophagous fish). The two hatcheries in Karaganda oblast, *Karaganda Fish Nursery* and *Zhezkazgan Hatchery,* merged into the Karaganda complex in 2003. The latter brought 106.4 ha and a production capacity of 2 million carp fingerlings to the partnership, while the much larger Karaganda pond farm (established in 1975) provided 1 516 ha and an incubation plant with 80–100 million pieces capacity (4.5 million carp fingerlings). Kustanai and Northern-Kazakhstan oblasts each have one hatchery. The *Petropavlovsky Fish Nursery* in Kustanai is amost half a century old, since 1964. Extending over 52.7 ha, the hatchery in 2005 produced 108.7 million and 20.8 million whitefish and carp fries, respectively, and 1.3 million carp fingerlings. The *Verkhne-Tobol Fish Nursery* has a pond area of about 300 ha, and a production volume of 2.2 million carp fingerlings.

TABLE 9
**Stocking activities of (functioning) aquaculture hatcheries and nurseries in Kazakhstan, 2003–2006 (thousand pieces)**

| **Hatchery or nursery** | **2003** | **2004** | **2005** | **2006** |
|---|---|---|---|---|
| Maybalyk Fish Nursery | 33 900 | 44 400 | 45 800 | 50 800 |
| Kapshagay Spawning and Breeding Farm | 1 900 | 2 800 | 4 000 | 6 000 |
| KazPASS State Enterprise | 500 | 800 | 800 | 800 |
| Atyrau Sturgeon Hatchery | 3 000 | 3 250 | 3 350 | 3 500 |
| Ural-Atyrau Sturgeon Hatchery | 3 000 | 3 250 | 3 350 | 3 500 |
| Bukhtarma Spawning and Breeding Farm | 6 000 | 10 000 | 1 000 | 1 500 |
| Karaganda Fish Nursery | 2 000 | 3 400 | 4 600 | 5 800 |
| Verkhne-Tobol Fish Nursery | 1 200 | 2 000 | 2 200 | 2 200 |
| Kamyshly-Bash Fish Nursery | 12 000 | 13 400 | 14 160 | 15 220 |
| Kachirsky Fish Nursery | 1 000 | 1 900 | 2 200 | 2 200 |
| Petropavlovsky Fish Nursery | 10 800 | 16 000 | 61 300 | 101 600 |
| Shardary Fish Nursery | 700 | 800 | 850 | 900 |
| **Total: Thousand pieces** | **76 000** | **102 000** | **143 610** | **194 020** |

At present, Kyzylorda oblast possesses just one fish farm at *Kamyshly-Bash Fish Nursery,* which opened in 1966. It has 213.4 ha of ponds and produces around 8 million carp and 7 million phytophagous fingerlings. Until 1967, a 53-ha sturgeon farm operated at *Tastak* on the Aral Sea, then the farm converted into a breeding complex for carp species for insertion into the local reservoir-lake systems. Pavlodar oblast is home to *Kachirsky Fish Nursery,* where production levels reached 2 million pieces of carp by the late 1960s. Total stocked area extends to around 5 200 ha, with production levels presently approaching 2.2 million pieces. *Shidertinsky Spawning and Breeding Farm* commenced activities in 1977, producing 1.1 million pieces of carp annually.

Three aquaculture operations existed in Southern-Kazakhstan oblast. The *Syr-Darya Pond Farm* opened its doors in 1975-1976 where the waters of the Syr-Darya flowed into Lake Sarykol. The farm with its 824 ha of ponds produced up to 1 000 tonnes of fish in the late 1980s, raising 6.06 million carp and phytophagous fingerlings – it is currently inactive. *Shymkent Pond Farm* was established in 1963. At the end of the 1990s, the farm was split into *LLP Komesh-Balyk* (158 ha – producing 8 million assorted carp roe in the early years of this century) and *Kamysh-Balyk Meirhan* (119 ha – producing 40 tonnes of commercial fish and 500 000 carp fry in the years of the last century). *Shardary Fish Nursery,* just below the dam of the same name on the Syr-Darya, has 34 ponds and 210 ha, and is the only aquaculture enterprise still operating in the oblast.

**Fingerling production tanks at a trout farm near Almaty (left). Sturgeon broodstock tanks at Erkin Kala hatchery near Atyrau** (right)

Pictures courtesy of Mr R. Van Anrooy

## Facilitating industries

Fishing and aquaculture equipment and accessories (boats, nets, piscine, incubatory units, circulation system equipment, automatic feeders, reed mowers, different type of aerators, live-fish transport trucks, laboratory equipment and reagents) are not manufactured in Kazakhstan. All fishing nets are imported from the Russian Federation, where there is a net weaving factory in Astrakhan city, or from China. While it is prohibited to use monofilament nylon nets made in China, they are however still imported. Safety items are also totally imported, mainly from the Russian Federation. When goods are imported, the amount of dutiable import is based upon the customs value of the imported good, as determined in accordance with Article 220 of the Tax Code of Kazakhstan. The code also specifies the amount of other tax, custom fees and mandatory payments to be made when importing goods to Kazakhstan (in addition to the value added tax levied at a rate of 14 percent). Access to freezing and refrigeration equipment is available only in large cities. Petroleum, oil and lubricants (POL) are supplied by private companies as well. Sometimes natural resources users[1] have their own gas stations to make sure that their fishers do not face fuel shortages, and they even deliver POL to the fishing ground.

Historically, most vessels were imported into Kazakhstan. While a state-owned fibreglass boat factory –Aral Plastic – was established in Aralsk at the former Soviet ship repair yard in 2004, it was unable to thrive and now stands idle. The main reasons for its failure relates to the unpopularity of its boats among the fishers due to their high price (a boat with a LCC-8 engine cost tenge 1.2 million in November 2006), the lack of comfort and poor seaworthiness (Aral fishers made a number of observations *vis-à-vis* the design of the boat to increase its safety), and the lack of a leasing option.

---

[1] Natural Resources Users are defined by the law in Kazakhstan. According to the Law of the Republic of Kazakhstan of 9 July 2004 No. 593-II "About protection, reproduction and use of fauna". Chapter 1, Article 1/25 users of fauna – physical and legal entities, who is given the right of fauna use according to the present Law. According to the Order of the State Fisheries Committee Chairman of the Ministry of Agriculture of the Republic of Kazakhstan of 29 January 2004, N 14-p "About the statement of forms of the typical contract on using fish resources and other water animals in fishery reservoirs (sites) and assigning fishery reservoir (site); passports on fishery reservoir (site); sanctions on fish catches and extraction of other water animals; a logbook on fish catches; and extractions of other water animals (with the changes according to the Order of the Fisheries Committee Chairman of Ministry of Agriculture of the Republic of Kazakhstan of 2 September 2004, N 22-p). A Natural Resources User is a legal or physical entity who has concluded the typical contract on using fish resources and other water animals in fishery reservoirs (sites) of the Republic Kazakhstan and has been assigned a fishery reservoir (site).

All repairs to the current fleet are undertaken by the fishers themselves. This includes importing repair materials from China, and/or using the services of local specialists, especially those who have been involved in the repair services since Soviet times.

**Landing facilities**

There are few fish landing sides on the Caspian Sea shores in Kazakhstan. In Atyrau in the Ural-Caspian basin, a port there is owned by "Atyrau Balyk", a company which also has two barges for collecting fish from the boats of fishers. The ownership of Bautino port in Mangistau oblast is split into three entities at present (Agip, Commune of Aktau and Kazmonaygaz). But the majority of fishers however access the sea from the beach, as the fishers from the country's other three river basins (the Balkash-Alakol, Irtysh-Zaysan and the Aral-Syr-Darya). The port and moorings in Balkash city and Alakol in the Balkash-Alakol basin are owned by the company Balkhash Balyk. Moorings are available to fishers along the Zaysan River in the Irtysh-Zaysan basin, but none are available on the Aral Sea in the Aral-Syr-Darya basin owing to the marshy nature of the shore. An overview of the location of berths and their sizes is presented in Table 10.

TABLE 10
**Number of berths at fishing ports and quays in 2006**

| Oblast | Total units | Including mechanized | Total length of berths, running metres | Including mechanized, running metres |
|---|---|---|---|---|
| Almaty | 3 | 2 | 410 | 160 |
| Atyrau | 1 | 1 | 210 | 210 |
| Eastern-Kazakhstan | 7 | 7 | 1 051 | 1 051 |
| Karaganda | 1 | 1 | 100 | 100 |
| Northern-Kazakhstan | 1 | 1 | 100 | 100 |
| Pavlodar | 2 | 2 | 720 | 720 |
| Western-Kazakhstan | 2 | | 200 | |
| Total | 17 | 14 | 2 791 | 2 341 |

*Source:* Agency of the Republic of Kazakhstan on Statistics.

**Ice supply**

In general, those who hold fishing quotas (the so-called Natural Resources Users) provide their subcontracted fishers with ice (if they have an ice-making unit). If not, fishers either buy ice from suppliers or make it by freezing water in plastic bags and bottles.

**Aquaculture supplies**

Feed production for aquaculture is an established sector in Kazakhstan. About twenty different plants and firms produce fish feeds, which are located in cities and towns such as Almaty, Atyrau, Astana, Balkash, Jambul, Usharal, Stepnogorsk, as well as a few others.

The feed manufacturing industry in Kazakhstan currently produces about 100 formulas of mixed feeds, which necessitates the production of diverse types of raw materials. The number of ingredients or components used in this industry reaches 150. As the production of mixed feeds grows and the range expands, new types of raw materials are used in production, which are subject to preliminary comprehensive studies. Kazakhstan, however, is faced with difficulties in the production of specialized commercial feeds for sturgeons and trout, and hence imports them from abroad. The main suppliers of specialized feeds for the aquaculture sector come from the Russian Federation.

**Sturgeon feed production at Erkin Kala hatchery near Atyrau**


Pictures courtesy of Mr R. Van Anrooy

Fish feeds are a significant part of total aquaculture production costs, particularly in intensive cultivation. The trade-off between the quality of the feeds and their costs make the manufacturers constantly search for new diets and better feed management approaches. The availability of ingredients in a specific region is of significant importance to the diets used (Isbekov, 2009).

Medical drugs to treat fish diseases are not produced in the country. A specialized agency ("Kazglavvettorg") imports them from the Russian Federation and other Commonwealth of Independent States (CIS) countries. These drugs can be ordered by the aquaculture sector through the "Zoovetsnab" agency. Any equipment, medicine or other materials required for aquaculture production may be imported into Kazakhstan in strict compliance with customs rules and regulations.

## 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 processer'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

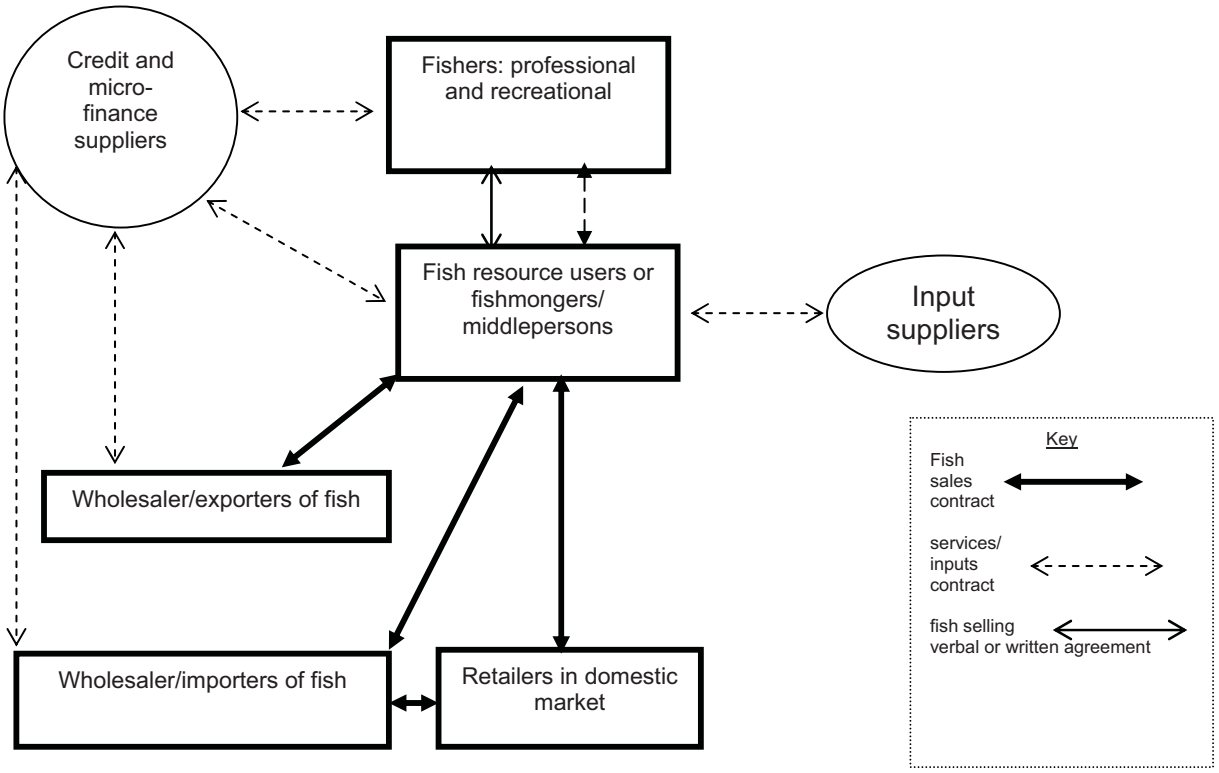
frozen fish is bought from medium-sized purchasers. The bigger companies, such as Atyraubalyk JSC (who supply caviar and sturgeon), Rybprom Ltd. (the largest Kazakh supplier of zander fillets to Europe), Ulkenbalyk Ltd. (pikeperch fillets) and Balkhashbalyk JSC (pikeperch fillets and bream) have export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

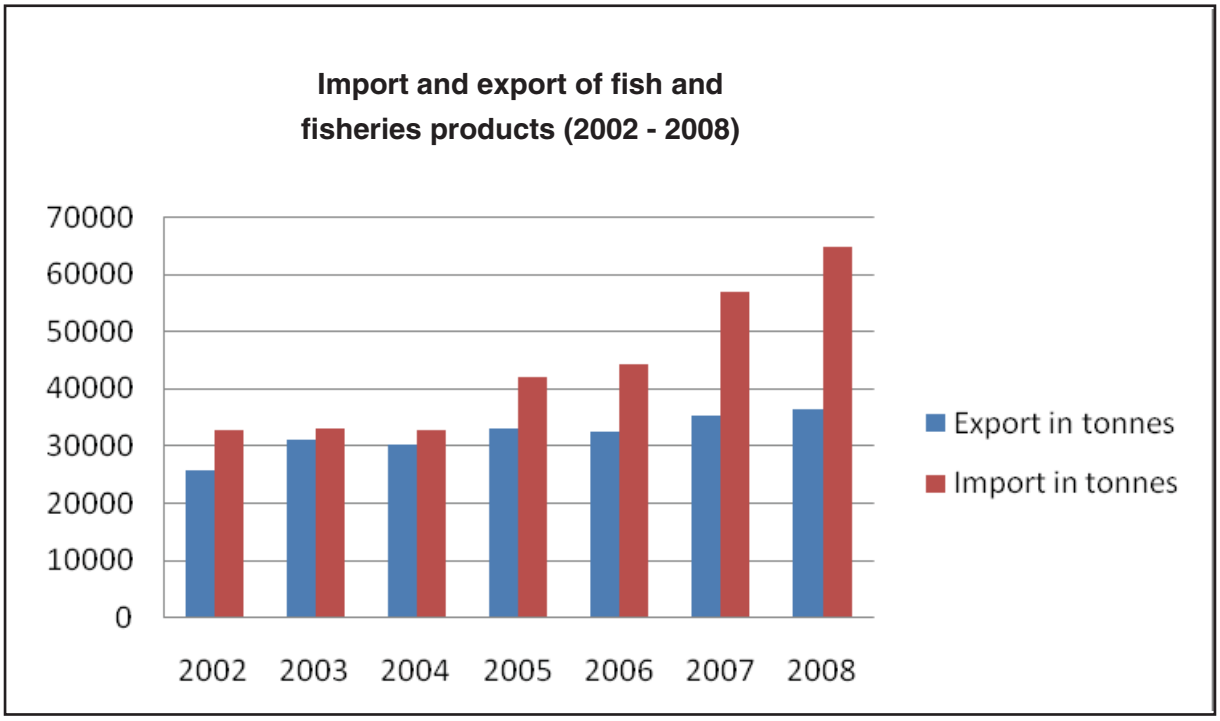
some slippage in terms of internal quality controls for raw produce and the packaging thereof. HACCP approaches are not in widespread use in Kazakhstan, and this is reflected in the export options available for fishery products from Kazakhstan.

**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:<br>1) Species and derivatives (of) that are under threat of extinction (Decree No. 31 of 27.01.04)<br>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.

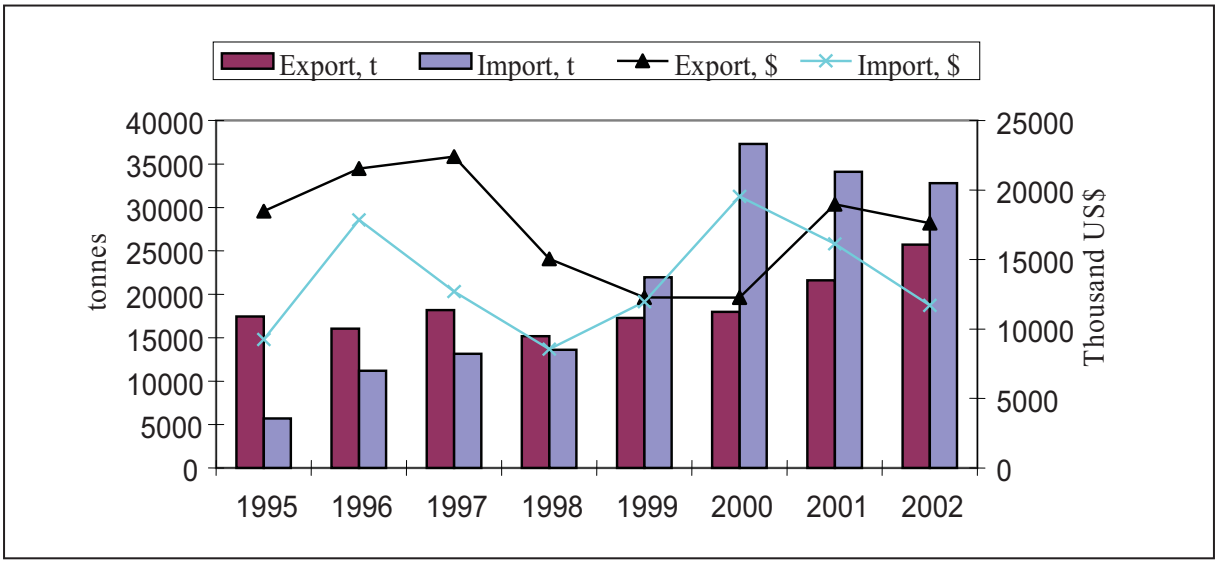
**Fish Trade Data**

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.

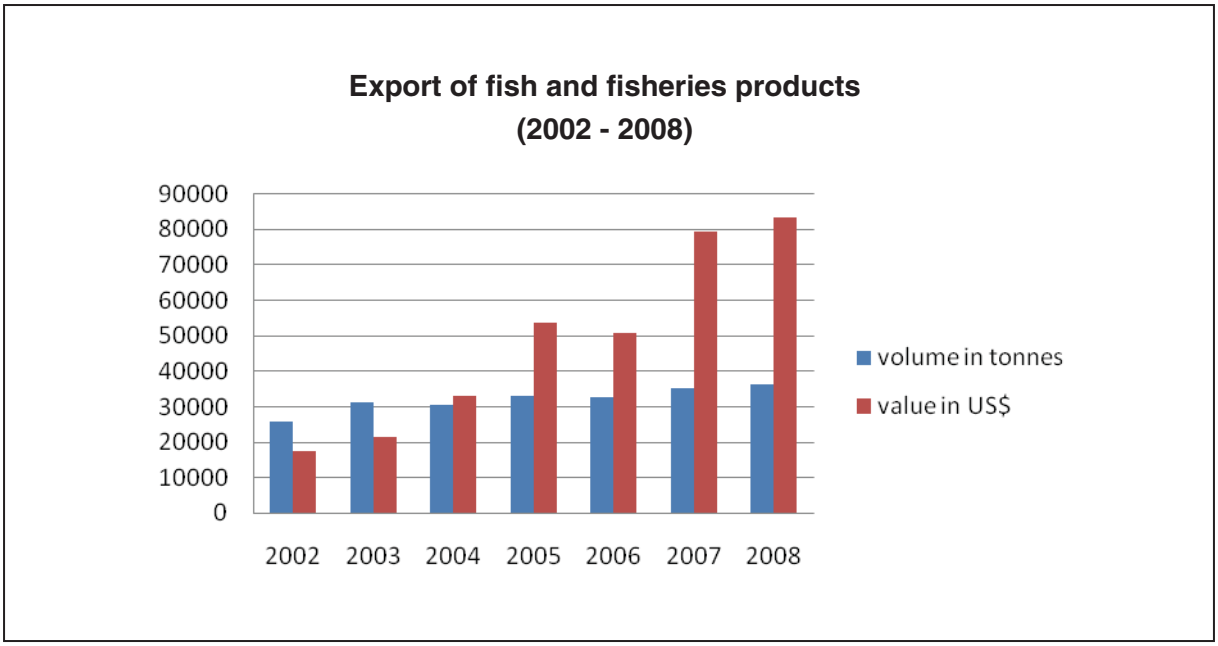
TABLE 15
**Export and import of fish products, 2006**

| | **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.

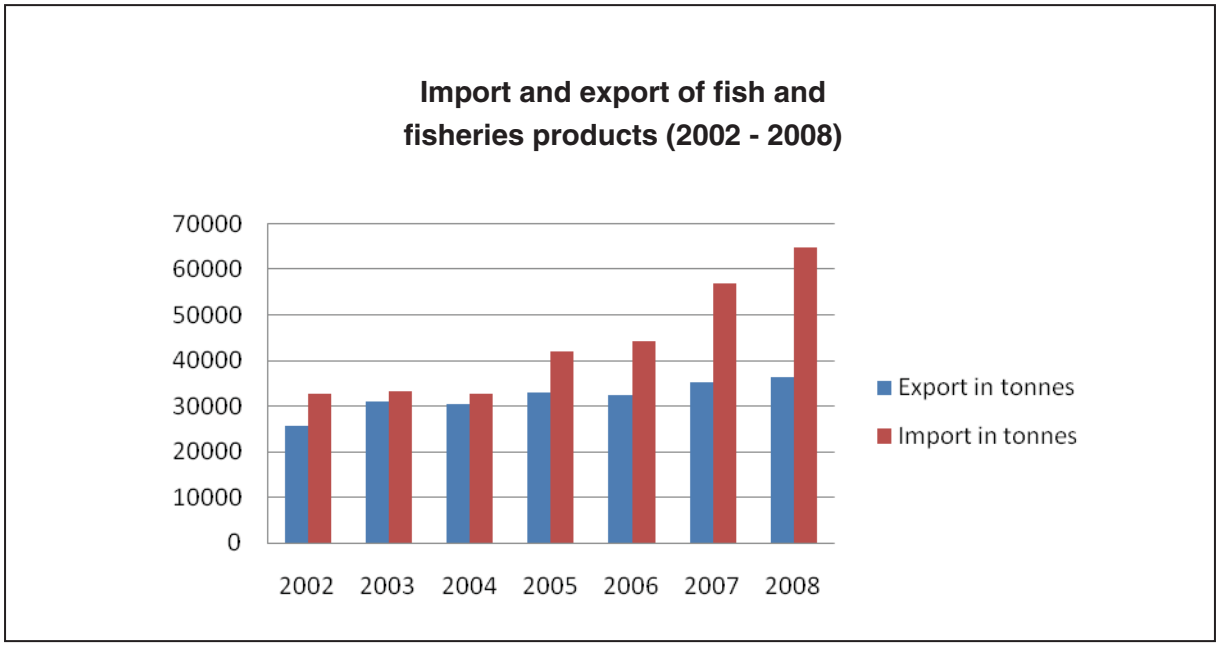
In 2008, the average price for 1 kg of exported fish increased by 67.91 percent in comparison with 2006 and became US$2.29, which indicates an increase in proportion of the processed fish exports because the catch volumes of commercial fish species had not fluctuated much.

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 | Percentageof 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 departments[3] within the Ministry of Agriculture – and a number of other government agencies[4]– 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 Balyk[5], 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, Tajikistran 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 Caucuses, 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 Caucuses.

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 companies[7] – 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 54$^{th}$ to 73$^{rd}$ 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.(Availableat: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., Ismikhanov, 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 andT. 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 Socialistic 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/<br>Fish plant/<br>Fishing *kolkhoz* (collective farm)** |
|---|---|---|
| **Ural-Caspian Basin** | | |
| 1. Atyrau<br>2. Mangystau<br>3. Western-Kazakhstan oblast | Atyraurybprom<br>Mangystaurybholodflot fish and seal catching in the Caspian Sea | Fishing *kolkhoz* – 11 |
| **Balkash-Alakol Basin** | | |
| 1. Almaty | | Fish farms – 2: Shilik, Alakol.<br>Fish plants – 1: Ily<br>Fishing *kolkhoz* – 4: Dostizhenie, Kirova, Ulga, Krasnyi Rybak |
| 2. Zhambyl | | Fish plants – Zhambyu Fish Farm<br>Mynaralsky Fish Farm |
| 3. Karaganda | Balkhashrybprom ( Balkash city), created in 1929 | Fish farm – “50 Let Octyabrya”,<br>1 Fish Farm |
| **Aral-Syr-Darya Basin** | | |
| 1. Kyzylorda<br><br><br><br>2.Shymkent | Aralrybprom (Aralsk), created in 1925 | Fish plants:<br>Kyzyl-Ordinsky, Kazalinsky,<br>Fish farms: – 3: Named after 1 May, Raim, Zhambul<br><br>Shymkent fish farm. Shardara and Kirov fish farms |
| **Irtysh-Zaisan Basin** | | |
| 1.Eastern-Kazakhstan | Zaisanrybprom, created in 1933 | Fish plants:<br>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 (*okean*) |
| Aktyubinsk | Aktyubryba. Trade centre (*okean*) |
| Almatinskaya, Almaty city | Almataryba. Trade centre (*okean*) |
| Kapshagay | Kapshagayryb complex |
| Atyrau | Guryevryba |
| Eastern-Kazakhstan | Vostokryba. Trade centre (*okean*) |
| Zhezkazgan | Zhezkazganryba |
| Zhambyl | Zhambylryba |
| Western-Kazakhstan | Zapkazryba |
| Karaganda | Karagandaryba. Trade centre (*okean*) |
| Kyzylorda | Kyzylordaryba |
| Kokshetau | Kokshetavryba |
| Kustanai | Kustanayryba. Trade centre (*okean*) |
| Mangistau | Mangystauryba |
| Pavlodar | Pavlodarryba. Trade centre (*okean*) |
| Semipalatinsk | Semipalatinskryba. Trade centre (*okean*) |
| Northern-Kazakhstan | Sevkazryba. Trade centre (*okean*) |
| 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 | *Caspiomyzon wagneri* (Kessler, 1870) | минога каспийская [волжская] | Caspian [Volga] lamprey |
| 2 | *Lampetra camtschatica* (Tilesius, 1811) | минога тихоокеанская [японская] | Arctic lamprey |
| 3 | *Lethenteron kessleri* (Anikin, 1905) | минога сибирская | Siberian brook lamprey |
| | **Acipenseridae** | **Осетровые** | **Sturgeons** |
| 4 | *Acipenser gueldenstaedtii* Brandt, 1833 | осетр русский | Russian sturgeon |
| 5 | *Acipenser nudiventris* Lovetsky, 1828 | шип | Fringebarbel sturgeon |
| 6 | *Acipenser persicus* Borodin, 1897 | осетр персидский | Persian sturgeon |
| 7 | *Acipenser ruthenus* Linnaeus, 1758 | стерлядь | Sterlet |
| 8 | *Acipenser stellatus* Pallas, 1771 | севрюга | Starry sturgeon |
| 9 | *Huso huso* (Linnaeus, 1758) | белуга | Great (white) sturgeon, beluga, hausen |
| 10 | *Pseudoscaphirhynchus fedtschenkoi* (Kessler, 1872) | лжелопатонос сырдарьинский | Syr Darya sturgeon |
| | **Clupeidae** | **Сельдевые** | **Shads** |
| 11 | *Alosa braschnikowii* (Borodin, 1904) | Каспийская морская сельдь, бражниковская сельдь | Caspian marin shad |
| 12 | *Alosa caspia caspia* (Eichwald, 1838) | Северокаспийский пузанок | Caspian shad |
| 13 | *Alosa kessleri volgensis* (Berg, 1887) | Волжская многотычинковая сельдь, волжская (астраханская) сельдь | Caspian anadromous shad |
| 14 | *Alosa saposchnikowii* (Grimm, 1887) | Большеглазый, или сапожниковский, пузанок | Saposhnikovi shad |
| 15 | *Alosa sphaerocephala* (Berg, 1913) | Аграханский пузанок пузанок | Agrakhan shad |
| 16 | *Clupea harengus* Linnaeus, 1758 | салака, балтийская сельдь | Baltic herring |
| 17 | *Clupeonella cultriventris* (Nordmann, 1840) | черноморско-каспийская тюлька | Black Sea sprat |
| 18 | *Clupeonella engrauliformes* (Borodin, 1904) | анчоусовидная тюлька | Anchovy sprat |
| 19 | *Clupeonella grimmi* Kessler, 1877 | большеглазая тюлька | big-eyed kilka, southern Caspian sprat |
| | **Salmonidae** | **Лососевые** | |
| 20 | *Brachymystax lenok* (Pallas, 1773) | ленок | lenok |
| 21 | *Brachymystax savinovi* Mitrofanov, 1959 | Ленок Савинова | |
| 22 | *Coregonus albula* (Linnaeus, 1758) | ряпушка европейская | Vendace |

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

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

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

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

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

**Irtysh basin (non-endemic)**

Taimen
Inconnu

**Balkash basin**

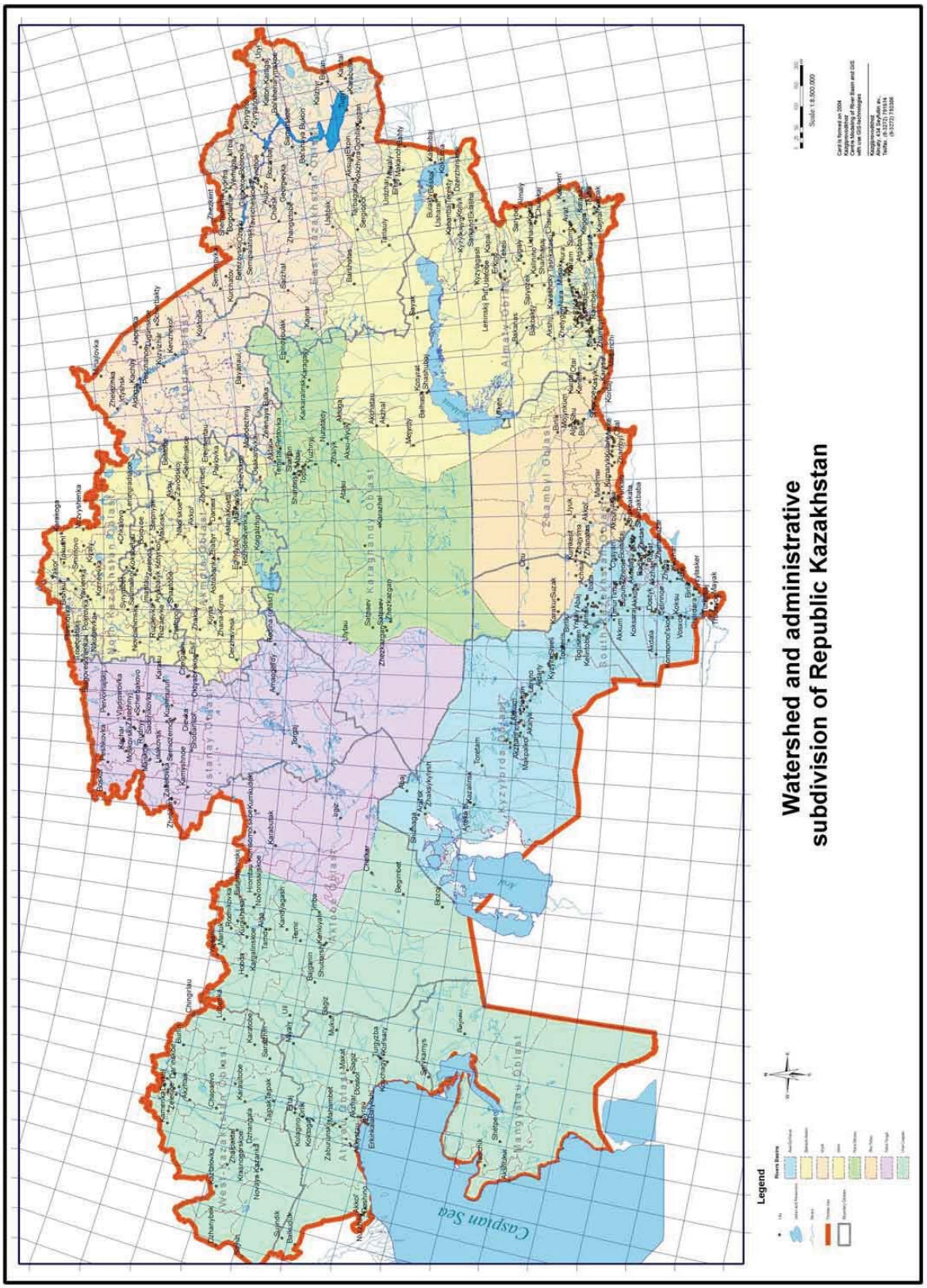
Balkhash marinka (endemic)
Balkhash perch
Fringebarbel sturgeon
Aral barbel

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 | 350 | 400 | 450 | 350 | 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 | | |
| ***Average price in the Republic of Kazakhstan*** | **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**



ISBN 978-92-5-106569-3 ISSN 2070-6065

9 789251 065693

I1596E/1/05.10/200