

<b>FISHERY AND AQUACULTURE COUNTRY PROFILE</b>	<b>Food and Agriculture Organization of the United Nations</b>	<b>FID/CP/UZB</b>
<b>PROFIL DE LA PÊCHE ET DE L'AQUACULTURE PAR PAYS</b>	<b>Organisation des Nations Unies pour l'alimentation et l'agriculture</b>	 <b>June 2008</b>
<b>RESUMEN INFORMATIVO SOBRE LA PESCA Y ACUICULTURA POR PAISES</b>	<b>Organización de las Naciones Unidas para la Agricultura y la Alimentación</b>	

## THE REPUBLIC OF UZBEKISTAN

### I. GENERAL GEOGRAPHIC AND ECONOMIC DATA

Area	447 400 km <sup>2</sup>
Water area	8 800 km <sup>2</sup> (excluding Aral Sea) 22 000 km <sup>2</sup> (including former Aral Sea)
Population (2007)	26.7 million
GDP at purchaser's value (2006)*	UZS 20 759.3 billion (≈USD 17.2 billion) (World Bank data)
GDP per capita (2006)*	USD 2 250 (World Bank PPP data) USD 610 (US Atlas methodology)
Agricultural GDP (2006)	UZS 7 314 billion (≈USD 5.5 billion)
Fisheries GDP (2006)	USD 7.2 million

\*Source: World development indicators database, April 2007  
(<http://devdata.worldbank.org/external/CPProfile.asp?PTYPE=CP&CCODE=UZB>)

### II. FISHERIES DATA

2006	Production	Imports	Exports	Total supply	Per capita supply
	tonnes live weight				kg/year
Fish for direct human consumption	7 200	990	820	7 370	0.3
Fish for animal feed and other purposes	None				

<b>Estimated Employment (2006):</b>	9 700
(i) Primary sector (including aquaculture):	5 700
(ii) Secondary sector:	4 000
<b>Gross value of fisheries output(2006):</b>	NA

<b>Trade (2006):</b>	
Value of fisheries imports:	USD 2 057 200
Value of fisheries exports:	USD 796 200

### III. FISHERY SECTOR STRUCTURE

#### 3.1 Overall fishery sector

Before the 1960s, fisheries in Uzbekistan consisted only of fish catches in the Aral Sea, and produced about 25 000 t/year. The major fish species captured were common carp (*Cyprinus carpio*), bream (*Abramis brama*), barbel (*Barbus brachycephalus*), roach (*Rutilus rutilus*) and shemaya (*Chalcalburnus chalcoides*). Less common were catfish (*Silurus glanis*), pike (*Esox lucius*), asp (*Aspius aspius*), sturgeon (*Acipenser nudiiventris*) and pikeperch (*Sander lucioperca*). After the well-known loss of the Aral Sea ecosystem and the cessation of fishery activities in 1983, fish capture was gradually transferred to inland water bodies. In the 1970 to 1980s period, up to 6 000 t/yr were harvested. The main water bodies for fishery were the residual Arnasay lake system in the middle reach of the Syrdarya river, and lakes and reservoirs in the Amudarya river delta region.

Starting in the early 1960s, the former Soviet Government initiated a large-scale aquaculture development programme in the Aral Sea basin in order to compensate losses in the Aral Sea fishery. Countrywide in Uzbekistan, some 20 fish farms were created in the 1960s and 1970s, with a total of 20 000 ha of ponds. Aquaculture is primarily polyculture of cyprinids in earth ponds in semi-intensive conditions. During the 1970s and 1980s, fish farms produced 20–25 000 t/yr, mainly silver carp, common carp (*Cyprinus carpio*) and grass carp (*Ctenopharyngodon idella*).

After independence, the fishery sector was incrementally privatized through the establishment of the corporation "Uzriba" by Decree of the Cabinet of Ministers, No.427 of 18.08.1994; transformation of "Uzriba" into the joint-stock company "Uzbalyk" by Decree of the Cabinet of Ministers, No.289 of 06.07.2001; liquidation of "Uzbalyk" and the complete privatization of fish breeding and fish capture farms by Decree of the Cabinet of Ministers, No.350 of 13.08.2003 "On measures for the intensification of demonopolization and privatization in the fishery sector".

However, these measures did not result in improvement of the sector: fish yields fell sharply, being only 4 300 t in 2004, and recovering to 7 200 t in 2006 (see Figure 1).

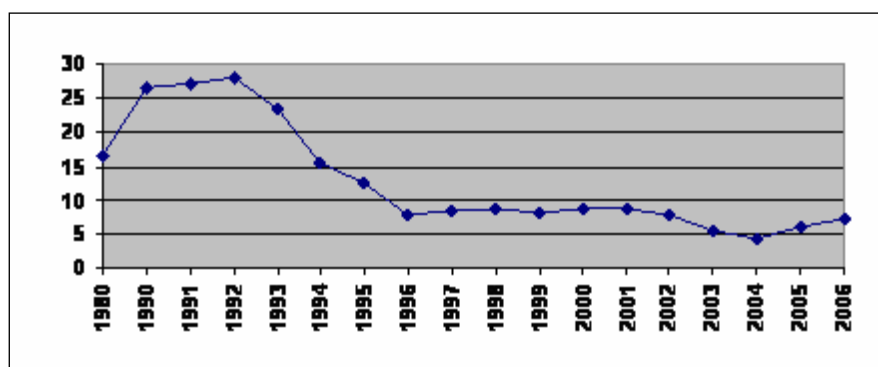


Figure 1. Total fish production in Uzbekistan in 1980-2006 ('000 tonnes).

## 3.2 Inland subsector

### 3.2.1 Catch profile

According to data available from Karakalpakstan, about 34 percent of the total catch of 3 400 t from natural water bodies in 2006 comprised common carp. Other main species caught were silver carp (*Hypophthalmichthys molitrix*), grass carp, crucian carp (*Carassius carassius*), pike-perch (zander), eastern bream, catfish and snakehead (*Channa argus warpachowskii*).

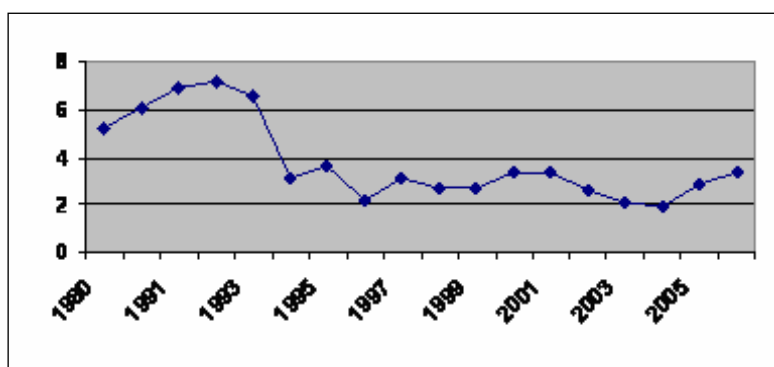


Figure 2. Total capture fishery production in 1980-2006, ('000 tonnes)

Table 1. Overview of the major species in fish catches across Karakalpakstan in 2004–2006

Species	2004		2005		2006 (first half-year)	
	tonnes	percent	tonnes	percent	tonnes	percent
Common carp	103.4	33.6	203.8	45.9	86.6	26.3
Silver carp	70.9	23.0	115.0	25.9	100.2	30.4
Pike perch	53.9	17.5	34.2	7.7	8.1	2.5
Snakehead	34.6	11.2	53.1	12.0	105.0	31.9
Grass carp	2.1	0.7	12.2	2.7	16.9	5.1
Crucian	20.5	6.6	8.3	1.9	6.7	2.0
Vobla (roach)	18.5	6.0	14.6	3.3	2.3	0.7
Catfish	0.4	0.1	0.4	0.1	1.4	0.4
Bream	3.6	1.2	2.4	0.5	1.9	0.6
Total	307.9	100.0	444.0	100.0	329.1	100.0

**Table 2.** Overview of the major species in fish catches in the Aydar-Arnasay Lake System in 2003–2004.

Species	2003		2004	
	tonnes	percent	tonnes	percent
Common carp	158.0	18.1	94.2	12.8
Pike-perch	11.0	1.3	30.1	4.1
Bream	1.0	0.1	40.7	5.5
Roach	342.0	39.1	218.2	29.6
Crucian	9.0	1.0	106.7	14.5
Wels catfish	0	0	0	0
Asp	5.0	0.5	15.7	2.1
Silver and grass carps	0.0	0	0	0
Pike	7.0	0.8	11.3	1.5
Snake-head	0	0	0	0
Others	341.0	39.1	220.7	29.9
Total	874.0	100.0	737.6	100.0

### 3.2.2 Fishery areas

Capture fisheries operate in freshwater reservoirs and in lakes for residual water storage. There are more than 800 000 ha of water bodies (lakes and reservoirs), of which 660 000 ha are suitable for capture fishery. Two lake systems are of major importance for capture fisheries. Lakes in the Amu Darya delta provided about 800 t in 2007 from the complex of 20 lakes with areas varying from 4 000 to 15 000 ha (a total of over 100 000 ha) (Table 3).

The second group is the Aydar-Arnasay Lake System, situated in the middle stream of the Syrdarya River. The catch was 760 t in 1994, 1 600 t in 2000 and 1 500 t in 2007. A major problem is that the water regime can change considerably between years according to irrigation needs. This restricts fisheries development, especially by affecting fish reproduction conditions.

Other regionally important fishery sources are fishing in lakes and reservoirs on the plains of the Kashkadarya and Zarafshan rivers, and in the Khorazm region, which together provide 1 100 t/yr.

**Table 3.** Fisheries main landing places in Uzbekistan

Regions	Area, ha*	Quantity of harvested fish tonnes, 2006 (2000)
Lakes and reservoirs in Karakalpakstan (mainly Amudarya river delta)	97 000	803 (1 600)
Aydar-Arnasay Lake System, located in the Zhizak and Navoi regions	350 000	1 500 (1 600)
Other water bodies	350 000	1 100 (598)

Note: \* surface area can change between years due to natural hydrological regime, irrigation needs and water balance

### **3.2.3 Fishing production means**

After the break-up of the former Soviet Union, local fisheries and aquaculture farms were only fragments of the former planned economy, without the required infrastructure. Fishers found themselves in the unfamiliar conditions of a market economy. The overall economic crisis and the loss of economic links with suppliers of equipment in the former USSR have also adversely affected fisheries. Over the last two decades, the fishing equipment has deteriorated. The number of fishing boats, set nets and seines has dropped. In the 1990s, there were only 20 fishing boats with 130 hp engines, 40 boats with 20 to 60 hp engines, and 250 other types of motorized boats. All fishery companies combined had only 5 000 gillnets and 36 beach seines, which were worn out. There are about 860 simple boats.

## **IV. MAIN RESOURCES**

There are manifold interactions between fisheries and agriculture through the common use of land and water resources and concurrent production activities to support rural village communities and supply urban areas with the needed quantity and variety of food. Such interactions extend to the institutional sphere, as fisheries and agriculture often fall within one government ministry. Improved integration between the two sectors is therefore an important means for enhancing fish production and food security.

Uzbekistan uses about 85 percent of total water runoff for irrigated agriculture, producing mainly cotton, rice and wheat. Water for irrigation is taken from the middle courses of rivers, and drainage water is returned to the rivers further downstream or collected in depressions (lakes without outflow). The total length of irrigation canals is 170 000 km.

Only 5 or 6 large main canals, with a length of 100-350 km and a capacity of 100–300 m<sup>3</sup>/sec each, are at present of fishery significance. These include the South Golodnaya Steppe main canal, the Karshi main canal, the Amu-Bukhara main canal, and the Amu-Zang canal. In most canals, water flows under gravity, but the Karshi and Amu-Bukhara main canals use pumping.

There are about 100 000 km of collector-drainage canals in Uzbekistan. For fisheries, only the large main collectors longer than 100 km and with water flow rates of 40–100m<sup>3</sup>/sec each are important. The annual discharge of some of these collectors is comparable with that of some rivers, e.g. Ozerny (2.3 km<sup>3</sup>) and Central Golodnostepskaya Collector (2.1 km<sup>3</sup>).

## **V. MANAGEMENT APPLIED TO MAIN FISHERIES**

There was no overall vision for the sector in place when the abrupt privatization process was implemented, and so no fisheries management plans. Recently (2007) FAO provided assistance to develop a "Policy and Strategy of Aquaculture and Capture Fisheries of Uzbekistan 2008-2016" as part of project FAO-MAWR<sup>1</sup> TCP/UZB/3103(D). This is now under active consideration for official acceptance.

Fisheries management is currently very poor. The main reasons are that (i) the fish capture harvest is very small (thousands of tonnes) and is more or less important only at a local level; and (ii) fish resources are controlled by irrigation management requirements rather than fishery potential. If irrigators pass water to lakes, reservoirs, and even the whole region, then there is noticeable increase in commercial species. But

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<sup>1</sup> Ministry of Agriculture and Water Resources

irrigation is considered to be much more important for the country in comparison with fishery. Many traditional methods of regulation have been lost. There has been no real study of fish stocks because of lack of finance for research. Methods of regulation such as minimum mesh size, catch limits in total and by species, closed areas and closed seasons, and other management tools are no longer effective.

Modern fish capture regulations do not develop the sector. Fish capture regulation is under the State Nature Protection Committee. This Committee has goals to protect but not develop productive use of natural ecological systems to provide fish productivity. In legislation, fish capture is not considered a commercial activity but rather an amateur hunting activity. All theoretical bases for fish capture in inland water bodies have been lost.

The State Nature Protection Committee of Uzbekistan has adopted "Hunting and Fish Catching Regulations on the Territory of Uzbekistan", registered at the Ministry of Justice on 2 May 2006. The regulations extend to all rivers, with their tributaries and channels, lakes, reservoirs and other fishery water bodies in the country. This regulates commercial fish capture, catch of freshwater invertebrates, sport and recreational fishing, and also rearing, scientific research and other activities connected with fish catching. The regulations provide a framework for conservation of fisheries in water bodies.

The regulations deal with the manner of fishing; prohibited means of fishing in various water bodies; mesh size regulations for various fishing gear; quotas for various species; and prohibit unecological fishing methods.

Fishery is controlled by the regulation "On the order of allocation and use of natural fishery water bodies of the republic", approved by enactment No. 350 of the Cabinet of Ministers of 13 August 2003 "On measures on the intensification of demonopolization and privatization in the fishery sector". It identifies the procedures for the rent of natural water bodies in Uzbekistan.

The legal and physical persons who have the right to commercial capture fishery conclude a rent contract for a period of more than ten years.

The determination of the rent payment for a natural water body:

- 1) is determined by the area of the water body;
- 2) the catch for the last three years;
- 3) the average catch based on the catches of three years;
- 4) the average annual catch is divided by the area of the water body and the yield per hectare is determined;
- 5) The average volume of productivity from 1 ha is multiplied in the first year of rental by 1.5 percent; second year by two percent and subsequent years by three percent of the minimum salary. The determined sum is the rent payment per hectare of the water body.
- 6) Payment for rent is determined at the beginning of each year.

Fishery is regulated by the Regulations for Hunting and Fishery, which indicate the minimum sizes of mesh during prohibition of fish catches from natural water bodies. The control is carried out by the Inspection of Gosbiokontrol (State Commission of biologic resources control) under the State Committee for Nature Protection. The officers of Gosbiokontrol keep records of nets for catches and the fishing equipment.

## **VI. FISHERMEN COMMUNITIES**

In Uzbekistan, there are no unions, cooperatives or associations for aquaculture and fishery at the national level.

Non-governmental associations of fish-breeders have been created in Karakalpakstan

and Bukhara province, and recently in 2008 in Samarkand province. The association of fishermen in Karakalpakstan unites more than 50 fish farms; the association of fishermen of Bukhara province unites 16 fish-catching units and one fish farm.

The Karakalpakstan fish farmers have taken the initiative and founded an Association of Fishery Enterprises, with 50 members. The association registered in November 2006 as an NGO. The major objectives of the association are:

- Protection of rights of fish farmers registered as members
- Business support to members
- To provide market support for selling fish
- To present issues of fish farmers to government for providing solutions

The management of the association is on democratic principles. The Chair and six members are elected from the management committee. Members contribute UZS 10 000 per month and government has also promised to provide funds to the association. This will allow the association to provide fishing inputs and equipment to members on credit and at a cheaper rate.

There were a few attempts during the Soviet period to create fisher communities in some areas of Uzbekistan, including the fishermen village "Navruz" in the Zhizak province, fishermen village Beruni in south Karakalpakstan on the coast of Akchakol lake, and Khorazm in Khorazm province. However, after independence there were no subsidies for them and they were abandoned by many young fishers seeking higher salaries elsewhere. Porlatau fish farm was destroyed by locals and ceased production.

## **6.1 Recreational subsector**

Recreational and sport fishing is carried out by members of hunting and fishing clubs.

There was an attempt to create a recreational complex based around Tavaqsay fish farm in Tashkent region by a private businessman two years ago. It included a fish restaurant, two ponds for angling, and attractions for children. However, after one season it closed. The Balikchi JSC had also to close its recreational fishponds after a couple of years' exploitation.

## **6.2 Aquaculture subsector**

Aquaculture is important and the most promising sector, supplying almost half of the fish production of Uzbekistan. But, in 2008, only one aquaculture system was well developed in the country: pond culture of cyprinids. In each region of the country there is one or two privately owned fish farms. The only facility that remains under state ownership is a fish hatchery in the Tashkent region.

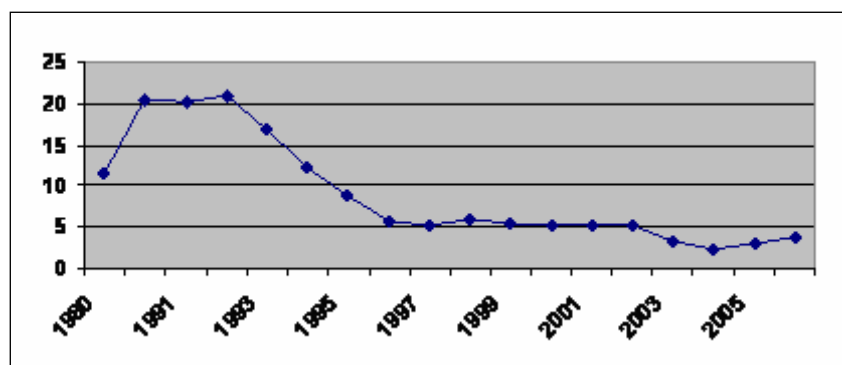
The total area of fish farms in Uzbekistan is about 10 237 ha, which includes fattening ponds (8 619 ha) and nursery ponds (1 618 ha). Potentially, these farms can produce 26 000 t of fish per year at an average productivity of 3 t/ha of pond area, but in the middle of the decade (2000 – 2010) aquaculture production is about 3 500 t/yr, thus much below the 20–25 000 t/yr recorded in the 1980s. The ponds have received no major maintenance in the last 15 years.

The nursery ponds can produce as many as 93 million yearlings/yr. Due to poor financing of the industry, actual production is much lower.

Farmers use a variant of carp polyculture practised in Soviet times that require very low investment. Silver carp is the main cultured species and provide 40–85 percent of total production, followed by common carp, grass carp and bighead carp. While some farmers use supplementary feeds (mainly bran, husk of cotton seed, wheat) for common carp feeding, others do not. Occasionally grass carp is fed with cut plants (mainly reed). Artificial reproduction using hormonal or pituitary injections, egg incubation, larvae and

fry raising to fingerlings/summerlings, and wintering are used less than in former times. Huge fattening ponds (50–100 ha or more) are filled with fresh river water every year in spring. This represent a large investment. Such ponds are stocked with 1 500–2 000 fish seed per hectare (one-year old, 15–25 g) and harvested in the autumn.

[http://www.fao.org/fishery/countrysector/naso\\_uzbekistan/en](http://www.fao.org/fishery/countrysector/naso_uzbekistan/en)



**Figure 3.** Pond fish production in Uzbekistan in 1980–2006 ('000 tonnes).

## VII. POST-HARVEST USE

### 7.1 Fish utilization

Processing and storage facilities are poor in the country. Fish is mainly distributed as live or fresh.

All processing enterprises have to obtain national certificates for any type of products for each production lot. Enterprises test production and obtain certificates in Tashkent, at the certification centre, or in regional centres.

The biggest enterprise is 'Baliksavdo' ('Fish trade') situated in Tashkent. The company was created during privatization on the basis of the fish processing facilities of state owned Uzribsbit. Baliksavado mainly imports frozen fish which it salts and smokes. Annually the company processes 3 500–4 000 t of frozen herring, capelin and mackerel. The company also processes fish from local aquaculture farms and imports canned fish and other fish products which are sold in Uzbekistan.

Other enterprises have been created in the last few years:

- In the Town of Dustlik, Zhizak province, Turkish entrepreneurs created enterprises processing pike-perch for export.
- In Karakalpakstan and Samarkand provinces, private entrepreneurs created mini workshops for the production of canned roach.
- In Tashkent province, the firm 'Balykchi' JSC produce frozen silver carp (gutted, free of scales and headed) obtained from local aquaculture farms.
- At 'Navoibalikichlik-2003', situated in the Town of Navoi, entrepreneurs produce frozen and smoked roach, some of which is exported.

## 7.2 Fish markets

In every green market of Tashkent city, there are three to five shops selling imported high value fish and fish products from Russia and other former Soviet countries. The products are frozen, canned, salted or dried, and caviar is packed in convenient and attractive packets. These products are expensive, varying from UZS 25 000 to 40 000 per kg ( $\approx$ USD 20–32).

In the town of Chinaz, Tashkent province, there is a wholesale fish market. From this market, fish is transported to Tashkent, which is 70 km away. Fish is transported to this market from the Aydar-Arnasay lake system and Chardara reservoir in Kazakhstan. There are refrigerators in the market with ice, as well as special places for selling fish. It is very difficult to estimate the exact quantity of fish sold via this market, as almost all fish is illegally caught and unregistered. According to various unofficial sources, on average three to five tonnes of fresh fish (maximum registered quantity 20 tonnes as reported by fish sellers) are sold every day in this market.

Fish farms mainly sell fish on the shore at the prices proposed by producers, which is about half that of the wholesale price. Fish brigades catch ca. 200–300 kg of fish per day. Most small-sized enterprises use passenger vehicles for transporting fish. Large enterprises (e.g. Balikchilik-2003 in Navoi town) have trucks and refrigerators. All catch is transported to the refrigerator (more than 200 km); part of the fish is processed and the other part is sold in both fresh and frozen forms.

Pond farms are situated near cities and towns and sell their harvest in autumn. Part is sold to traders in small lots (up to 200 kg) on the pond bank, for which contracts are concluded. Part of the fish is sold by pond farms in markets and shops.

All trade entrepreneurs have a licence for the trade. The trade in fish is seasonal; therefore, there are only a few enterprises specializing in fish trade. There is only one large-sized enterprise, 'Baliksavdo', which imports canned fish for special consumers (Home Ministry, Ministry of Defence and National Security Service). It has special shops in markets. There is also a shop processing imported herring into salted herring.

Most fish (60 percent) is sold in markets; 15 percent is sold through shops and supermarkets; and about 25 percent of fish (mainly frozen and processed) are sold from warehouses to special consumers and wholesale buyers.

Local producers of live and frozen fish supply more than 90 percent of the annual quantity consumed; 8 to 9 percent is shipped to the Chinaz wholesale market from Kazakhstan, and the fish sent from Turkmenistan to southern regions (Surkhandarya and Kashkadarya) account for about 1 percent of the total supply.

The share of local producers in the smoked fish trade is also about 90 percent; about 10 percent is imported.

## VIII. FISHERY SECTOR PERFORMANCE

Fishery is an important source of livelihood for the rural population of some less-developed areas in the Lower Amu Darya and Middle Syr Darya. For those in the Amu Darya River delta region it has been a main economic activity for centuries. Inland water bodies can maintain production of healthy protein food as well as promote development of recreational fishing. This provides avenues for foreign exchange earning through export. The sector provides an opportunity for the rural population to diversify their economic activities and earn additional income. Development of culture-based fisheries by organizing fish seed production in hatcheries may allow rehabilitation of rare, vulnerable and extinct species.

### **8.1 Economic role of fisheries in the national economy**

The Fisheries Sector contributes less than 0.1 percent to national GDP. It is nevertheless an important sector of agriculture, providing rural people and traders in urban areas with employment.

### **8.2 Demand**

Fish production in Uzbekistan declined significantly, from 27 400 t in 1991 to 7 200 t in 2006. As a result, per capita consumption decreased to less than half a kilo (in comparison with 5–6 kg during the late 1980s), far below the average 16.6 kg per capita in the world. Based on a population of 26.7 million (2007), the country needs an additional 250 000 t of fish annually, to reach 10 kg per capita.

### **8.3 Supply**

Fish consumption in Uzbekistan is very low. The annual per capita availability of fish is less than 0.5 kg, although it varies between provinces. It is not known how much of the animal protein consumption is made up of fish protein for an average inhabitant in Uzbekistan.

### **8.4 Trade**

Fish are exported fresh mainly to Afghanistan, and imported from Turkey and Russia. Frozen fish are imported from Norway, Russia, United Arab Emirates, Turkey and the UK. Fish are also imported in dried, smoked and salted from the Republic of Korea, Norway, Russia, Latvia, Turkmenistan, etc., while canned fish are imported from Belgium, Canada, Germany, Italy, Latvia, USA, Turkey, Russia, New Zealand, United Arab Emirates, etc.

There are legislative acts concerning marketing standards for various products, including fish and fishery products. Specifically, marketing standards address content, main characteristics and name of foodstuffs, as well as labelling, packaging and promotion.

### **8.5 Food security**

The present contribution of the fisheries sector to food security is negligible; it contributes less than 0.1 percent to national GDP. However, taking into account vast water (rivers, lakes, reservoirs) and human resources, the fisheries sector has the potential to play a much greater role in the economy and for food security in Uzbekistan.

### **8.6 Employment**

After Decree No.350 (2003), where full privatization in fisheries was declared, the number of enterprises increased, as existing enterprises were split to form several smaller ones, and new enterprises were created. Thus the number of workers also increased compared with 1994–2003.

It is believed that about 5 700 people are engaged in primary fishing, of which 11 to 15 percent are administrative staff.

There are 3 700 personnel in 288 private enterprises involved in fishery. More than 2 000 work on 21 aquaculture farms. It is estimated that about 10 000 people are employed in the overall fishing industry including support services.

## 8.7 Rural development

Fisheries are an important sector of agriculture, providing rural people with employment. Recognizing this, the Cabinet of Ministers of the Republic of Uzbekistan instruction No.21–f of 20 January 1991 places fish farms situated in rural areas and involved in the cultivation of pond fish on an equal basis to agricultural enterprises in terms of obtaining credits, and purchasing fuel and oil, mixed feeds, mineral fertilizers, agricultural equipment and other production inputs. Pond farms can apply to the Ministry of Agriculture and Water Management and the Cabinet of Ministers of the Republic of Uzbekistan for beneficial credit.

Cabinet of Ministers enactment No.289 of 6 July 2001 “On the improvement of the system of fishery sector management” states that fish farms in terms of taxation have equal rights to agricultural organizations. Pond farms pay a single land tax instead of payment of all current state and local taxes (except excise tax) and fees established for agricultural producers.

Fisheries currently play a social role, e.g. by maintaining populations *in situ*. The social role of fisheries is especially high in Amu Darya River delta in Karakalpakstan, where dozens of families declared that if fisheries were to cease they would leave their native villages for better job opportunities. At the same time, they expressed a wish that they would not have to do this and could have the possibility of sustainable fisheries.

## IX. FISHERY SECTOR DEVELOPMENT

### 9.1 Constraints

- Poor equipment for catching fish.
- The water levels of all water-bodies on the plains of Uzbekistan are determined by irrigation goals which usually conflicts with those established for commercial fish production.
- Lack of storage and processing facilities.
- Economic constraints, i.e. lack of government financing and private investment in the industry. Absence of specialized credit lines.
- Poaching of common carp, asp, catfish and pike-perch is a problem.
- Absence of material and technical resources for improvement of profitability.
- Stocking of fish seed in water bodies is poorly organized. The expenses for stocking with fish seed were previously covered from the government budget by allocating centralized capital investments.
- Institutional constraints – lack of governmental and non-governmental institutional structures to promote the use of irrigation systems for fish production. Absence of legislation ensuring the rights of private fish farmers to a guaranteed water supply.
- Lack of fish protecting devices on diversion structures, which would prevent young fish from being discharged with irrigation water into irrigation fields; lack of corridors between water bodies, including floodplains, river reaches and canals, to make possible the migration of fish and fish fry from and to places of spawning, reproduction, etc.; absence of fish passes; priorities for water use for irrigation demand and hydropower production, which often conflicts with maintaining optimal water supply for fish spawning and nursery grounds.
- Ecological constraints of water pollution in irrigation systems, including increased mineralization and concentrations of toxic substances of agricultural and industrial origin. Total amount of mineral salts introduced into the hydroecosystems through CDW is about 70–80 million tonnes/year.

- Social and cultural constraints. A low level of public awareness that the irrigation network can be used for fish production. Shortage of fisheries experts and fisheries training programmes.
- Investment. After independence, aquaculture and fisheries production decreased dramatically due to the economic crisis. Even today, the natural water bodies and fish farms are exploited insufficiently. This may be due to bad management and lack of investment. Capital is still a very limited resource in Uzbekistan.
- Feed. The main limitation in aquaculture is the absence of formulated fish feed. The intensification of aquaculture and the efficient production of high value (mainly carnivore) fish species require the use of commercial fish diets adapted to the species produced. These fish feeds are still not available in Uzbekistan.

Beside the main problems mentioned above, there are further issues to be considered.

- Fish processing and the infrastructure for trade in fish are barely developed. As a result, fish has to be sold within a few hours of harvest.
- Nowadays, the local market is provided with 7–10 000 t/yr. The most prominent species are Silver carp (80 percent) and Common carp (10 percent). More valuable species, such as Pike-perch, European catfish or Snakehead are available only in small quantities from capture fisheries.
- Future aquaculture development in Uzbekistan will be limited by a lack of educated staff. Even if aquaculture in Uzbekistan has a long tradition of cyprinid culture, there is a distinct lack of expertise for new aquaculture species and technologies.
- Technical factors (e.g. lack of academic and vocational education in fisheries and aquaculture, resulting in limited numbers of skilled aquaculture and fisheries workers; closure of facilitating industries (e.g. feed production, vessel repair); insufficient access to imports of good quality fry; and lack of high quality feed).

## 9.2 Development prospects and strategies

There is no official policy and strategy for fisheries development in Uzbekistan. In an FAO-supported project, MAWR and FAO have been developing such a policy. Using a participatory process of involving all stakeholders through consultations, and organizing two national participatory workshops and two training programmes, a proposed National Policy and Strategic Plan for nine years, from 2008 to 2016, was prepared. This policy also emphasized the need to strengthen the fisheries arm in the Ministry by elevating it into the Department of Fisheries, for effective operation. Policy and Strategic Plan is currently under active consideration by MAWR.

It is impossible to achieve a significant increase in fish production based on the available technologies alone. They are outdated, fall short of market expectations, require significant land and water resources, and show low productivity. The development of the fishery sector must be based more on modern intensive technologies. The main emphasis should be laid on the following:

- Aquaculture in order to increase fish yields;
- Aquaculture using available water resources;
- Culture-based fishery; and
- Recreational fishery and ecotourism.

The development of new technologies requires fishery policy, strategy and related programmes, which have been implemented where possible. Uzbekistan, with its century-old experience in agriculture could significantly improve the production of fish by using a small amount of water currently diverted to other uses, so that it will not only provide the local market with this most valuable food, but also significantly develop its export. The principle of private interest will be used with the creation of favourable conditions by the state. There is considerable potential from intensified production systems, and the state must work with the private sector to encourage this.

The proposed policy and strategy of fishery development set the goal of adapting expertise worldwide to Uzbekistani conditions in the next ten years, creating the respective infrastructure, research and educational potential, and equipping private entrepreneurs with attractive technologies that will stimulate their involvement in the sector. Highly profitable technologies are in demand, both for individual small-sized family farms and for large enterprises.

The most promising aquaculture concepts for Uzbekistan are:

- Integrated and polyculture pond systems
- Flow-through farming; and
- Fisheries enhancement

### **9.3 Research**

The main research on fish breeding development is conducted under the umbrella of the Coordination Committee on Science and Technologies Development, under the Cabinet of Ministers of the Republic of Uzbekistan. There is one research institute in the field of aquaculture and fisheries: the Uzbek Research Centre for Fishery Development at Uzbek Scientific Production Centre for Agriculture of MAWR. There are four research institutions with departments conducting research in the field of ichthyology, hydrobiology, fishery and aquaculture: Laboratory of Hydroecology at the Institute of Water Problems of Uzbek Academy of Sciences (UzAS); Laboratory of Ichthyology and Hydrobiology at the Institute of Zoology of UzAS; Institute of Bioecology of Karakalpak Branch of UzAS (Nukus); and the Department of Ecology at the National University.

On-farm participatory research in aquaculture is not practised in Uzbekistan. There are no technical schools offering training in aquaculture.

In 2006–2007 in the frame of a research grant named “Sustainable Aquaculture in Recirculating Systems – Feasibility Study for the Catchment Area of the Aral Sea”, funded by German Federal Foundation for Environment (DBU), new sustainable aquaculture concepts were developed for Uzbekistan (<http://www.usf.uos.de/projects/AquacultureUzbekistan>). The study was done by the Institute of Environmental Systems Research at the University of Osnabrück. The project was a cooperative effort involving various fisheries research institutes and enterprises in Germany and Uzbekistan. A multi-disciplinary approach was chosen to consider the biological, ecological, technological and economic criteria for aquaculture development.

### **9.4 Education**

In the past, specialists in aquaculture and fisheries at graduate level studied in the Department of Hydrobiology and Ichthyology in the Biology Faculty of Tashkent State University (now the National University of Uzbekistan), graduating 8 to 20 students annually. In 2003, that department became the Department of Ecology, and now there is no centre for high education for the fishery sector in the country. At one time, opportunities for fisheries higher education were available in the Russian Federation (Kazan, Sankt-Petersburg, Moscow, etc.) but it is now too expensive. Today, highly educated people from the State University (biologists), the Agro University (agriculture), and the Technical University (engineers, food industry) can become fisheries specialists.

### **9.5 Foreign aid**

There are no projects on fisheries development financed by foreign aid.

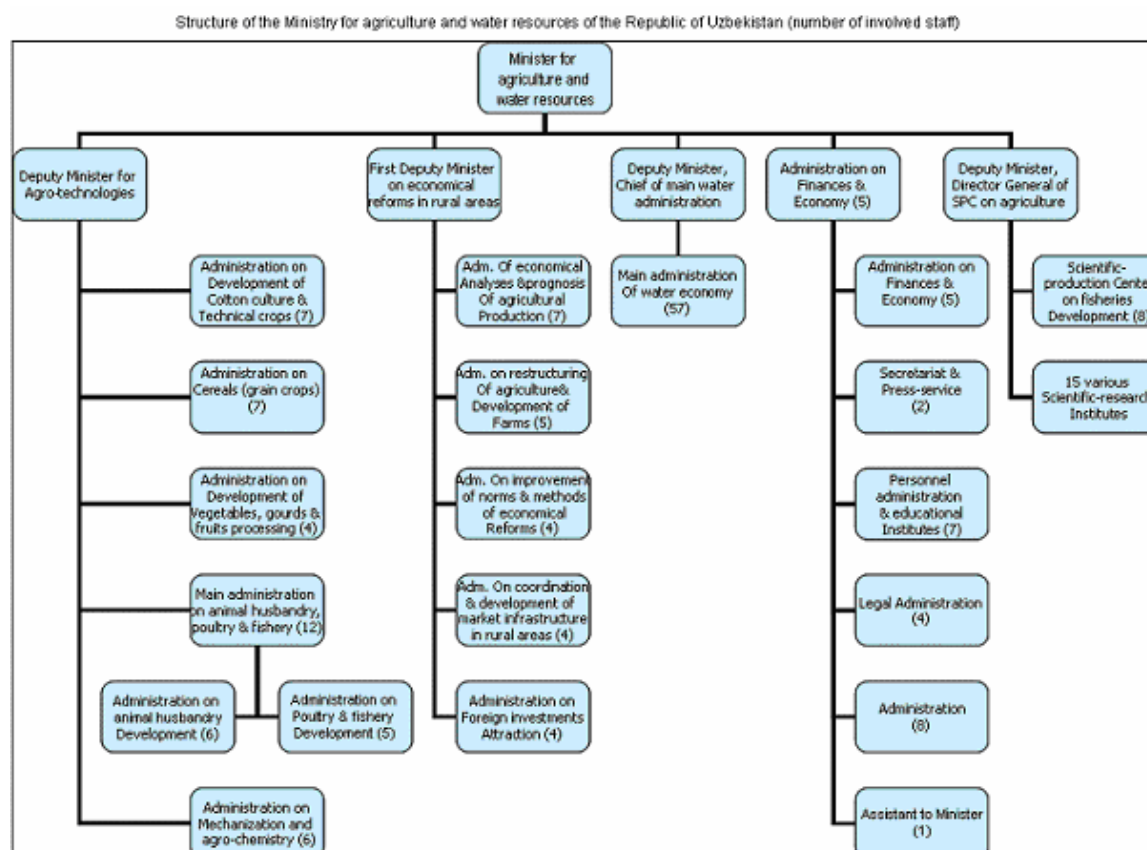
## X. FISHERY SECTOR INSTITUTIONS

The main fish industry authority of Uzbekistan is the Ministry of Agriculture and Water Resources (MAWR). There is a main administrative department for animal husbandry, poultry and fisheries at this Ministry.

According to Decree No.350 of August 2003, the management of the fishery sector is entrusted to MAWR. To that end, the Main Administration for Development of Animal Husbandry, Poultry Farming and Fishery, consisting of 12 officers, was established. Of these, five officers work at the Department for the Development of Poultry Farming and of Fishery. Two officers work at the department for the development of fishery, both having education in aquaculture.

Departments for the development of animal husbandry, poultry farming and fisheries have been established in regional departments for agriculture and water management (one person), entrusted with the function of promoting the development of fishery.

Commissions have been established under the Council of Ministers of Karakalpakstan and regional hokimiyats (governments) and charged with ensuring that water bodies are leased under fair and transparent conditions in a process of competitive bidding.



There is no specific internet Web site for the fisheries sector at the national level. Some information can be found on Web sites of related organizations and ministries, including:

[www.nature.uz](http://www.nature.uz)

www.gov.uz  
www.stat.uz  
www.statistics.uz

## **XI. GENERAL LEGAL FRAMEWORK**

Uzbekistan has no specific laws for fisheries. Inland water bodies are managed first and foremost for irrigation supply; natural fish resources are poor for large-scale fish capture; the main potential fish producer is aquaculture, and aquaculture can be regulated by general agricultural legislation. Government pays strong attention to nature protection and fish biodiversity. The management of fishery is regulated by several laws of the Republic of Uzbekistan.

A number of laws, inter alia, "On joint-stock associations and protection of rights of stock holders", "On associations of limited liability", "On farming", etc, govern the format and ownership of economic enterprise.

In addition, the management of farms is regulated by codes, laws and decrees of the President of Uzbekistan and enactments of the Cabinet of Ministers, namely "The Tax Code", "the Land Code", "On Protection of Nature", "On Water", the decree of the President of Uzbekistan No. VII-2086 of 10 October 1998 "On introduction of a single land tax for agricultural producers", the regulation of the Cabinet of Ministers No.21-f of 21 January 1997, No. 289, "On the improvement of the system of fishery sector management" of 6 July 2001, the enactment of the Cabinet of Ministers, No. 258 "On improvement of the organization of the activity of the Ministry of Agriculture and Water Management" of 28 June 2003, No. 350 "On measures to intensification of demonopolization and privatization in the fishery sector" of 13 August 2003, the enactment registered by the Ministry of Justice No. 1292 of 20 December 2003 "On the approval of the regulation of the calculation and levying of rent payment for the use of natural water bodies by fish farms", and the regulations on hunting and fishing in the territory of the Republic of Uzbekistan.

Considering that the agrarian sector occupies an important place in the Uzbek economy, significant benefits were given to agricultural organizations, including aquaculture enterprises. In the enactment of the Cabinet of Ministers No.21-f of 20 January 1997, fish farms involved in cultivation of pond fish have equal status to agricultural enterprises in terms of credit, fuel and oil purchase, mixed feeds, agricultural equipment, spare parts, etc.

The enactment of the Cabinet of Ministers, No. 289 of 6 July 2007 "On the improvement of the system of fishery sector management", states that fish farms in terms of taxation have the same rights as agricultural organizations. Pond farms pay a single land tax instead of payment of all current state and local taxes (except excise tax) and fees established for agricultural producers: including income tax (profit); value-added tax (except the import of commodities (work, services)); tax on use of water resources; tax on use of subsurface resources; property tax; land tax; tax for improvement of territory and development of social infrastructure; and other local taxes and fees.

The State Nature Protection Committee of Uzbekistan has adopted "Hunting and Fish Catching Regulations on the Territory of the Uzbekistan", registered at the Ministry of Justice on 2nd May 2006 (annexure VI). The regulation extends to all rivers, with their tributaries and channels, lakes, reservoirs and other fishery water bodies in the country. This regulates commercial fish capture; catch of water invertebrates; sport and recreational fishing; and also rearing, scientific research and other works connected with fish catching. The regulations provide a framework for conservation of fisheries in water bodies.