FISHERY COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/ARM
PROFIL DE LA PÊCHE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	
RESUMEN INFORMATIVO SOBRE LA PESCA POR PAISES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	December 2004

THE REPUBLIC OF ARMENIA

GENERAL ECONOMIC DATA - December 2004

Area:	29 800 km²
Water Area:	1 400 km²
Pond Area:	1 265 km^2
Population (2003):	3.1 million
GDP at purchaser's value (2003):	$US 2.8 billion
GNI per head (2003):	$US 950
Agricultural GDP (2003):	24.1% of GDP

FISHERIES DATA

Commodity Balance (2001):

	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes liveweight				kg/year
Fish for direct human consumption	2 197	651	79	2 769	0.9
Fish for animal feed and other purposes	-	-	-	-	

Estimated Employment (2001):	
(i) Primary sector (including aquaculture)	n/a
(ii) Secondary sector:	n/a

Trade Value of Fisheries Imports (2002):	$US 3 575 000
Value of Fisheries Exports (2002):	$US 1 727 000

Commodity balance for 2003 (updated 26/07/2005):

2003	Production	Imports	Exports	Stocks variation	Total Supply	Per Caput Supply
	tonnes liveweight					kg/year
Fish for direct human consumption	1 633	1 564	794	0	2 402	0.8
Fish for animal feed and other purposes	0	-	-	-	-	

Trade (2003):	
Imports:	$US 1 988 000 2 950 tonnes
Exports:	US$ 3 171 000 789 tonnes

Introduction

Armenia is a landlocked country with an area of 29 800 km^2 and limited natural resources. The country is divided into two major catchments: the Araks basin in the southwest and the Kuri basin in the northeast. The Black Sea cannot be reached without passing through Georgian and Turkish territory. Access to the Mediterranean is only possible through Turkey. Towards the east, Armenia's route to the Caspian Sea passes through Azerbaijan.

General resources

The country has hundreds of water bodies countrywide, with 10 major natural lakes, 15 major rivers and 5 canyons. The catch from these waters is an important element in Armenian food supply. The largest water body is Lake Sevan, almost 100 m dep in places and lying at 1 924 m above sea level. It is fed by 28 streams but has only a single outlet. Species found include Sevan trout, whitefish, carp and rainbow trout. Sevan Lake trout is much in demand, not only in Armenia but also in the Russian Federation and elsewhere. However the Sevan lake trout is in danger due to overfishing and serious action is needed to saving the species.

Both capture and farmed fish contribute to Armenian fish production. Being landlocked and without access to major rivers, fishery potential is mainly determined by the Lake Sevan fishery.

Armenia's continental climate favours carp farming at lower elevation, but average rainfall is low and water supply is a constraint in many areas. However, farmers in the Ararat Valley have access to well water and can keep their fish in water with a stable temperature of 11 to 15°C, independent of season. In this way, fish grow all year round, so production potential much higher than in areas where growth stops in the winter due to low temperatures. In Lake Sevan, fisheries low water temperature and low natural fertility limit fish production.

Water resources of Armenia

River	Length within Armenia (km)	Lake	Surface area (ha)
Akhuryan	186	Sevan	124 000
Hrazdan	146	Arpi	2 200
Vorotan	119	Kari	12
Arpa	90	Ayghr	16
Kasakh	89	Sev	192
Vedi	58	Kaputan	10
Voghji	56	Akna	50
Azat	56	Parz	3
Yeghegis	54		
Meghri	32		
Darb	20		

Number, size, ownership and interdependence of production units

According to the Armenian National Statistical Department, 142 legal entities (individuals or companies) people were registered as being involved in fishing and fish breeding businesses on 1 December 2002. Various sources indicate that the number of farms is about 200, of which some 70 are active. The disparity with the official statistics is caused by the shadow economy, where a number of fish farms are registered only as landowners in order to avoid taxes. This naturally also distorts official production statistics. The production capacity of active fish farms varies from 5 to 100 t/year.

The exact number of fishermen on Lake Sevan is not known. They are not organized and officially without work, since all fishery in the Lake Sevan is prohibited. Due to lack of alternatives in the current poor economic situation, they fish, although illegal. There is no effective control system.

Performance of fish farming sector

Commercial fish farming in Armenia started in the 1950s in the Lake Sevan area, with the construction of hatcheries for Sevan trout and coghak. The second development was construction of pond farms for production of table fish, mainly carp species (common, bighead, silver) and trout. The farms were big, normally hundreds of hectares, and mostly constructed in areas with salty soils (poor land unsuitable for other agriculture). Water was pumped from rivers. In the 1980s, the effects of pollution reduced the wild catch of fish, and in some cases also negatively affected the health of fish in ponds. Nevertheless, in this period, pond farms produced 5–6 000 t/year.

Although most of the state farms were built in the Ararat Valley, other districts, such as Jermuk and Hrazdan, had some fish farms. Wells with a depth of between 50 and 250 m can deliver high quality water year round, with a constant temperature of 11–15°C and constant flow. These wells were initially appreciated for good water quality. After independence, energy costs rose tremendously, the wells had an important additional advantage: no energy is required to get the water into the ponds. Consequently the state farms that produced cheap fish (mostly carp) at high cost (due to pumping) were supplanted by private farms producing more expensive fish (mostly trout species) using cheap, clean well water.

The modest size of Armenian farms, 5–100 t/year production, means that the sector does from quantity discounts on feed, chemicals and other services. Trout ponds in Armenia are of various types: ponds dug in the ground, with or without bottom layer of gravel, and concrete or lined with local stone blocks. Recent trout farming entrepreneurs almost all use concrete ponds. Some farmers have experimented with round or oval ponds to better utilize feed and speed growth.

In contrast to Western European practice, Armenian farms have no mechanized fish sorting systems but manually by means of weighing samples of fish. Exact sorting, however, is required to produce size-controlled product. Harvesting is by means of nets.

Most of the carp in the Erevan market seems to come from capture fishery in lakes and rivers. Some trout farmers produce carp in ponds along the periphery of their farm. Such ponds also help protect property against intruders. Management of these ponds costs virtually nothing: the fish are not fed and are kept in the drainage water from ponds with more valuable fish. Carp production in ponds is still carried out on a few former state farms in the Ararat Valley.

Primary Production

Rainbow trout

Direct estimation of production in Armenia is difficult since official data do not distinguish between capture and farm fish. In addition, it seems unlikely that all farmed fish are properly reported. Feed has to be imported using the few existing trade channels. A peculiarity of Armenian trout farming is the almost exclusive use of well water with a constant temperature, allowing year round production.

Sevan trout

Probably more than 90% of the imported fish feed is used to produce rainbow trout, but culture of the indigenous Sevan trout is gaining popularity. Although annual production is still limited to some tens of tonnes, production capacity is expanding. In the past two years, culture of Sevan trout under controlled conditions has provided sufficient knowledge to sustain a small industry. Considerable progress can be expected through improved management practices, development of species-specific fish feed and selection of fish with good genetic potential. Although the average temperature in its natural habitat is much lower, the optimal temperature for growth of Sevan trout is 14 to 18°C.

In the Ararat Valley, Sevan trout grows much faster than in Lake Sevan, but Sevan trout has a slower growth rate than rainbow trout. Also, differences in growth rate among fish of the same batch are much higher than in rainbow trout. Grading (size-selection of fish) every 3 to 4 months is necessary to prevent aggressive behaviour. Sevan trout is less domesticated than rainbow trout and easily excited. A net above basins is required to avoid them jumping out. However, while rainbow trout dies within minutes outside the water, Sevan trout can easily survive ten minutes in the air. Sevan trout is very strong and diseases are less frequently reported than in rainbow trout.

Sturgeon

Sturgeon species are available now in Armenia. Siberian sturgeon is optimally sold at a weight of 2 kg, although fish available in markets ranges from 200 g to 6 kg. Standard trout feed is used. Sturgeon eggs were imported from Russia and so far have demonstrated good growth and an extremely good feed conversion of 0.7 to 0.8.

Currently, development of sturgeon culture in Armenia is still in its infancy, and market demand seems limited. If there were an increase in demand for sturgeon, production would be no problem as several farmers report experience with sturgeon fish farming.

Carp

As carp is considered a low quality consumption fish, prices are generally low. Therefore, with current energy costs, carp production is not economic. Some carp production still takes place on trout farms that use their drainage water to fill carp ponds. Carp is not fed, because fish feed is too expensive. However, if demand for carp increased, carp feed could be imported.

In all, carp production is probably a few tens of tonnes per year. From contacts with marketers and their suppliers, most carp on the market comes from fishery in rivers and dams.

Feed Situation

Before 1990, all fish feed in Armenia came from the USSR. These pellet feeds were cheap and not very efficient: to produce 1 kg of fish required 2.5 kg of feed.

The change from carp farming to trout farming justified a change from cheap, low

quality feed from Russia and Turkey, to more expensive, high quality fish feed from Western Europe. In modern fish farming practice, high quality fish feed is indispensable. The currently used fish feeds from Europe are made with high quality ingredients, prepared by the so-called extrusion process, and consequently twice as expensive as the older types of feed. With these Western European feeds, only 1 kg of feed is necessary to produce 1 kg of fish.

In Armenia, fish feed is almost exclusively used for rainbow trout culture. Minor quantities might be used for Sevan trout and sturgeon. Carp are never fed. To produce trout meat with a nice salmon color, some Armenian farmers use feed with a natural colorant during the last 3–6 weeks before harvest.

Processing

The fish processing and storage facilities available in Armenia are 15–20 years old, although in recent years vacuum packaging machines have been imported for packing export products. Armfish had four major fish processing facilities, with smoking kilns and canning lines. Inappropriate size, poor canning technology, erratic raw material supply and mangement constraints meant that the units were no longer economicaly viable, and they were closed down.

Other smoking kilns are primitive and have problems with hygiene. Small farm units for smoking are inefficient. Freezing is often done in old freeze-store facilities that are unsuitable for the purpose.

There are two cold stores in Erevan, with a total storage capacity of about 6 000 tonne. The largest cold store, dating from Soviet times and belonging to the former Armkholod company, holds about 5 000 tonne, but is poorly insulated and with obsolete equipment. Running costs are very high and temperatures in summer can not be maintained properly. The store operates at only 30–50% of full capacity.

Retail, distribution and sales channels

There is no wholesale structure for fish in Armenia. Farmed fish is sold by the farmers to individuals who sell the fish on the market, in shops, or export to neighbouring countries and Russia. There is also a move to some shops operating as wholesale centres. For the domestic market, fish is mostly sold in special fish shops or kiosks and at the market. Many farmers also have their own direct-sales outlet.

The fish is sold alive or freshly-killed. Sales of live fish have increased significantly in the past few years and has led to new facilities developing in the distribution chain,

such as specialized transporters, and aquariums and basins of considerable volume in shops, kiosks and markets. Some fish farmers finance the purchase of proper live fish storage for their clients.

Export markets

Before 1991, Armenia exported rainbow trout to Russia (roughly 400 t/year), constituting around 40% of the total production volume. Total export volumes (all species) decreased in the period 1991–1995, but started to increase again in 1996, reaching around 300 tonne in 1999.

The increased exports are due to a new development: the catching and exporting of live crayfish to European markets. As crayfish is more valuable, unit value of exports increased, from US$ 1/kg in 1995 to nearer US$ 1.6/kg now.

According to the State Register and Analysis of the Ministry of Statistics, in 1998 fishery products were exported to Belgium, Estonia, France, Germany and Islamic Republic of Iran. Currently, the main export markets for Armenian fish products are France (35%), Germany (12%), Georgia (28%), Russia (20%) and other European countries (5%).