SAMVEL AVETISYAN

AGRICULTURE AND FOOD PROCESSING IN ARMENIA

YEREVAN 2010

Dedicated to the memory of the author's son, Sergey Avetisyan

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Peer Reviewers:
Doctor of Economics, Prof. Ashot Bayadyan
Candidate Doctor of Economics, Docent Sergey Meloyan

Technical Editor:
Doctor of Economics Hrachya Tspnetsyan

Samvel S. Avetisyan

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This book presents the current state and development opportunities of the Armenian agriculture. Special importance has been attached to the potential of agriculture, the agricultural reform process, accomplishments and problems. The author brings up particular facts in combination with historic data. Brief information is offered on leading agricultural and processing enterprises.

The book can be a useful source for people interested in the agrarian sector of Armenia, specialists, and students.

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INTRODUCTION

Food and Agriculture sector is one of the most important industries in Armenia's economy. The role of the agrarian sector has been critical from the perspectives of the country's economic development, food safety, and overcoming rural poverty. It is remarkable that still prior to the collapse of the Soviet Union, Armenia made unprecedented steps towards agrarian reforms. Overcoming about seven decades of state monopoly, land and the main means of production were privatized; legislative basis was created for varied forms of ownership, production management, liberalization of prices and for development of the banking system, production and social infrastructures.

These reforms were being implemented in conditions of distorted economic links, blockade of external communications, and the liberation war in Artsakh.

Meeting all these challenges, Armenia maintained its internal stability and developed active political and economic relationships with a large number of countries and international agencies.

There still remain many unsolved problems in the agri-food sector that are being addressed by the President of Armenia and the RA Government while consistently implementing the designed agrarian policies.

Versatile assistance is provided to Armenia by many international organizations and countries and the Armenian Diaspora. We value this assistance and pursue goals that lead to integration with the international community.

Armenia has opened its doors for businesspeople from all countries, tourists, compatriots from the Diaspora, and every visitor of good will.

This book will familiarize readers with Armenia's agrarian potential, accomplishments and existing problems occurred after the declaration of independence in 1991 and, possibly, motivate some of them to become part of agriculture and agribusiness development in this country.

I thank all my colleagues who cordially provided their support in preparation of the materials of this book. I am grateful to Hrachya Tspnetsyan, Heriqnaz Lemberyan, Sos Avetisyan, and my son, Ashot Avetisyan for their valuable advice and contribution.

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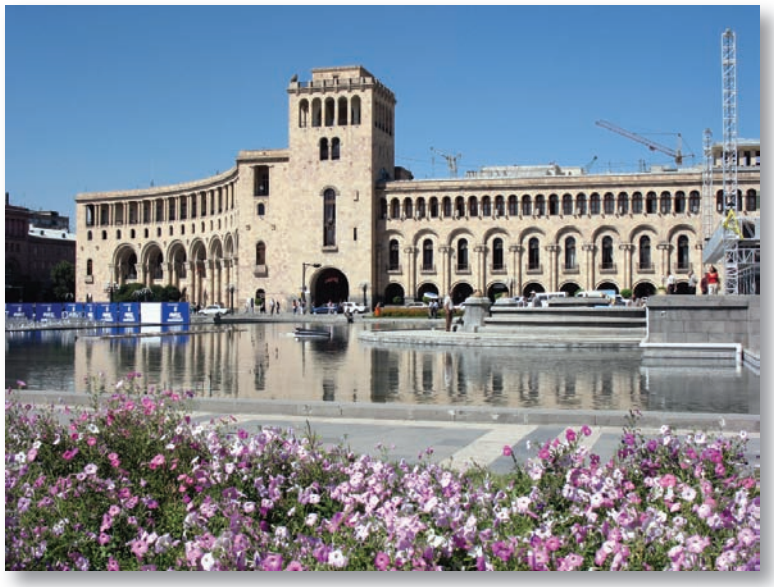
I would much appreciate any comment and recommendation that you can send by email: samavets@yahoo.com.

Samvel Avetisyan

1. ARMENIA: GENERAL INFORMATION

The Republic of Armenia occupies an area of 29,800 square kilometers. It is located in the verge of Southern Caucasus and Asia Minor, in the north-east of the Armenian Plateau.

Armenia borders Georgia in the North, Azerbaijan in the East, Iran in the South, and Turkey in the West. The average altitude is 1,800 meters above sea level. The highest peak is Mount Aragats (4,090m above sea level) and the lowest point is the gorge of Debed River (380m).



Population: The population of Armenia is 3,250,500, of which 98% are ethnic Armenians. National minorities residing in Armenia include Russians, Kurds, Greeks, Yezdis, Assyrians, Ukrainians, Jews, and others. Around 5-6 million Armenians reside outside Armenia, particularly in Russia, the U.S., Georgia, France, Iran, Canada, countries of Latin America and the Near East.

State Structure: Armenia is a republic. The President of the Republic leads the country. The highest legislative body is the National Assembly. The main executive body is the Government of Armenia.

Administrative division: The administrative-territorial units of the country are marzes (regions) and communities. Marzes consist of village and city communities. Armenia is divided into 10 marzes. There is a special law on the capital city Yerevan

that regulates its activity. State self-governance is carried out in marzes and communities. There are 48 urban and 866 rural communities in Armenia.

Language: Armenian is the official language in the Republic of Armenia. It is a separate branch in the Indo-European group of languages. Most of the population can speak also Russian. English is the third language by its dissemination and becoming more and more common in the society.

Alphabet: The Armenian alphabet is one of the most ancient ones in the world. It was created by Mesrop Mashtots in 405 A.D. The first sentence written by St. Mashtots was: “To know wisdom and gain instruction; to discern the words of understanding…”

Religion: Armenians were the first to adopt Christianity as the state religion (301 A.D.). The absolute majority of the population practices the Armenian Apostolic Church. The administrative and spiritual center of the Armenian Church and all Armenians is Holy Seat St. Echmiadzin, located in Vagharshapat, Armavir Marz.

Climate: Armenia has almost all climate subtypes, starting from dry subtropical climate up to cold, highland climate. Average annual air temperature is 5.5 ^{0}C. Summer is moderate, with average monthly temperature of 16.7 ^{0}C, while in Ararat Valley is ranges between 24^{0}C and 26 ^{0}C. Average annual precipitation is 592 mm.

MARZES (REGIONS) OF THE REPUBLIC OF ARMENIA

ARAGATSOTN MARZ

Marz Center: **Ashtarak**
Administrative areas: **Ashtarak, Aparan, Aragats, Talin**
Towns: **Ashtarak, Aparan, Talin**

Aragatsotn marz borders Turkey in the west, Shirak and Lori marzes in the north, Kotayq marz in the east, and Yerevan and Armavir marz in the south-east:

Table 1

Basic indicators in Aragatsotn marz

Area	2,756 sq. km
Share of the area in the overall RA territory	9.3 %
Urban communities	3
Rural communities	111
Cities/towns	3
Villages	117
Population, as of January 2010	141,600

Including:	
Urban	33,100
Rural	108,500
Share of urban population	23.4 %
Share of the population in the overall RA population, 2009	4.4 %
Agricultural lands area (as of July 1, 2009)	217,770.2 ha
Including arable lands	53,904.8 ha

The bases of the economy of the marz are agriculture and industry. The industry is specialized in food and precious item production as well as construction material and mining operations. The climatic conditions and the geographic position of the marz are favorable for both crop growing (cereals, potatoes, fruits, and forages) and for animal husbandry.

ARARAT MARZ

Marz Center: **Artashat**
Administrative areas: **Ararat, Artashat, Masis**
Towns: **Artashat, Ararat, Vedi, Masis**

The marz borders Yerevan, Armavir and Kotayq marzes in the north, Gegharqunik marz in the east, Vayots Dzor marz in the south-west, and Turkey in the south.

Table 2

Basic indicators in Ararat marz

Area	2,089 sq. km
Share of the area in the overall RA territory	7.0 %
Urban communities	4
Rural communities	93
Cities/towns	4
Villages	94
Population, as of January 2010	279,100
Including:	
Urban	82,300
Rural	196,800
Share of urban population	29.5 %
Share of population in the overall RA population, 2009	8.6 %
Agricultural land area (as of July 1, 2009)	156,542.3 ha
Including arable lands	26,120.0 ha

This marz is known for the Khosrov State Nature Reserve (1,600m-2,300m above sea level).

Ararat marz is one of the most economically developed marzes in Armenia.

Agriculture is the basis of the economy. It is mainly specialized in grape growing, horticulture, and vegetable growing.

Processing industry is the main direction in the marz's economy, the following three branches being the most important ones:

a) food processing (fruit and vegetable processing and canning, production of distilled alcoholic beverages);

b) tobacco production (tobacco fermentation);

c) production of nonmetal mineral produce (cement, lime, asbestos cement items, stone cutting and processing).

ARMAVIR MARZ

Marz Center: **Armavir**

Administrative areas: **Armavir, Echmiadzin, Baghramyan**

Towns: **Vagharshapat, Armavir, Metsamor**

Armavir marz borders Turkey in the west and in the south, Aragatsotn marz in the north, and Yerevan and Ararat marz in the east.

Table 3

Basic indicators in Armavir marz

Area	1,242 sq. km
Share of the area in the overall RA territory	4.2 %
Urban communities	3
Rural communities	94
Cities/towns	3
Villages	95
Population, as of January 2010	284,300
Including:	
Urban	101,700
Rural	182,600
Share of urban population	35.8 %
Share of the marz's population in the overall RA population, 2009	8.7 %
Agricultural land area (as of July 1, 2009)	96,976.1 ha
Including arable lands:	41,980.3 ha

Armavir marz is known for its developed agriculture and agribusiness. The geographical position of the marz and its climatic conditions are favorable for development of both crop production and livestock breeding. Fruits, cereals, legumes, vegetables, and melons in crop production and cattle, sheep, pig, and poultry in livestock breeding are the most important.

The industry sector is specializing in production of electric power, food and alcoholic beverages, and in mining operations for building materials.

GEGHARQUNIK MARZ

Marz Center: **Gavar**
Administrative areas: **Gavar, Chambarak, Martuni, Sevan, Vardenis**
Towns: **Gavar, Chambarak, Martuni, Sevan, Vardenis**

Gegharqunik marz borders Lori and Tavush marzes in the north, Azerbaijan in the east, Vayots Dzor marz in the south, Ararat marz in the south-west, and Kotayq marz in the west.

Table 4

Basic indicators in Gegharqunik marz

Area	5,349 sq. km
Share of the area of the marz in the overall RA territory	18 %
Urban communities	5
Rural communities	87
Cities/towns	5
Villages	93
Population, as of January 2010	241,600
Including:	
Urban	79,700
Rural	161,900
Share of urban population	33.0 %
Share of the marz's population in the overall RA population, 2009	7.4 %
Agricultural land area (as of July 1, 2009)	348,286.8 ha
Including arable lands:	80,966.7 ha

Lake Sevan is in Gegharqunik marz. Lake Sevan has a critical importance not only for Gegharqunik marz but also for the entire nation. It is the largest source of fresh water in the South Caucasus region. The lake has a significant influence both

on the ecological balance and the economy of the marz.

Sevan National Park (established in 1978) includes Lake Sevan that makes the bottom of the Sevan intermountain concavity and the adjacent areas freed from water. The surface is 150,100 ha, of which 24,900 ha is the coastal land area. The lake is surrounded by Areguni, Geghama, Vardenis, Pambak, and Sevan mountain ranges. 1,600 types of plants and 330 types of animals have survived here.

Agriculture is the leading industry in the marz's economy. Especially cereal, potato, and vegetable production and livestock breeding are popular. Gegharqunik marz is the main fish supplier of in Armenia.

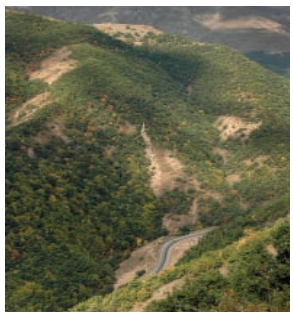
Mining industry is another main branch in economy. Processing industry is also an important trend, with food processing (including beverages) having the largest share.

LORI MARZ

Marz Center: **Vanadzor**

Administrative areas: **Spitak, Stepanavan, Tashir, Tumanyan, Gugark**

Towns: **Vanadzor, Spitak, Stepanavan, Alaverdi, Tashir, Tumanyan, Shamlugh**



Lori marz borders Georgia in the north, Kotayq and Aragatsotn marzes in the south, and Shirak marz in the west.

Table 5

Basic indicators in Lori marz

Area	3,789 sq. km
Share of the area in the overall RA territory	12.7 %
Urban communities	8
Rural communities	105
Cities/towns	8
Villages	122
Population, as of January 2010	281,600
Including:	
Urban	165,100
Rural	116,500
Share of urban population	58.6 %
Share of the marz's population in the overall RA population, 2009	8.7 %
Agricultural land area (as of July 1, 2009)	250,794.0 ha
Including arable lands:	41,992.3 ha

Agriculture and industry are the leading trends in the economy of this marz. Production of cereal crops, potato, vegetables, and animal produce make the significant portion of the overall agricultural product.

The major industrial developments take place in production of metallurgical and meat products.

KOTAYQ MARZ

Marz center: **Hrazdan**
Administrative areas: **Hrazdan, Kotayq, Nairi**
Towns: **Hrazdan, Abovyan, Charentsavan, Byureghavan, Tsaghkadzor, Yeghvard, Nor Hachen**

Kotayq marz borders Yerevan in the south-west, Aragatsotn marz in the west, Lori marz in the north, Tavush marz in the north-east, Gegharqunik marz in the east, and Ararat marz in the south.

Table 6

Basic indicators in Kotayq marz

Area	2,093 sq. km
Share of the area in the overall RA territory	7 %
Urban communities	7
Rural communities	60
Cities/towns	7
Villages	62
Population, as of January 2010	27,7 00
Including:	
Urban	157,500
Rural	123,200
Share of urban population	56.1 %
Share of the population in the overall RA population, 2009	8.6 %
Agricultural land area (as of July 1, 2009)	161,571.4 ha
Including arable lands:	37,878.2 ha

Kotayq is one of the marzes with comparatively developed and versatile economy. Industry is dominating in the overall economic capacity. This marz plays an exceptional role in the energy sector and tourism development.

Agriculture is specialized in poultry production, fruit growing, dairy cattle breeding, and cereal production.

SHIRAK MARZ

Marz center: **Gyumri**
Administrative areas: **Artik, Akhuryan, Ani, Amasia, Ashotsk**
Towns: **Gyumri, Artik, Maralik**

Shirak marz borders Turkey in the west, Georgia in the north, Lori marz in the east, and Aragatsotn marz in the south.

Table 7

Basic indicators in Shirak marz

Area	2,680 sq. km
Share of the area in the overall RA territory	9.0 %
Urban communities	3
Rural communities	116
Cities/towns	3
Villages	127
Population, as of January 2010	281,500
Including:	
Urban	169,700
Rural	111,800
Share of urban population	60.3 %
Share of the population in the overall RA population, 2009	8.7 %
Agricultural land area (as of July 1, 2009)	229,449.6 ha
Including arable lands:	79,838.2 ha

Akhuryan Reservoir on Akhuryan River bordering Turkey is the largest one in Armenia: it contains 526 million m^3 of water.

The leading branches in the industry in Shirak marz are: food (including beverage) production, textile industry, and nonmetal mining. Artik and Ani tuf stones are known well beyond the region.

The most developed agricultural industries are cereal production and animal husbandry. Beekeeping is another developing and prospective sector.

SYUNIQ MARZ

Marz center: **Kapan**
Administrative areas: **Kapan, Goris, Sisian, Meghri**
Towns: **Kapan, Goris, Sisian, Meghri, Agarak, Kajaran, Dastakert**

Syuniq marz is the southernmost marz in Armenia. It borders Vayots Dzor marz in the north, Iran in the south (with a 42 km-long common border), Nakhijevan in the West and Azerbaijan in the East.

Table 8

Basic indicators in Syuniq marz

Area	4,505 sq. km
Share of the area in the overall RA territory	15.1 %
Urban communities	7
Rural communities	102
Cities/towns	7
Villages	127
Population, as of January 2010	152,800
Including:	
Urban	103,700
Rural	49,100
Share of urban population	67.9 %
Share of the population in the overall RA population, 2009	4.7%
Agricultural land area (as of July 1, 2009)	333,855.8 ha
Including arable lands:	43790.4 ha

Syuniq is the richest marz of Armenia in minerals, most important of them being non-ferrous metals (copper, molybdenum, zinc, and lead) and precious metals (gold, silver), as well as nonmetal minerals.

In the gorge of Tsav River, south of city of Kapan, is the largest natural relic pine grove in the world occupying 60 hectares, with hundreds of years old trees. There are 40m-45m high trees with 3-meter diameter in this unique pine grove.

The gorgeous Shikahogh state reserve with its bushy woods is on the right side of Voghji River.

In the overall economic capacity of the marz, industry and agriculture are the leading sectors.

Agriculture is mainly specialized in crop production (in particular, cereals and potatoes) and animal husbandry (in particular, cattle breeding).

TAVUSH MARZ

Marz center: **Ijevan**
Administrative areas: **Ijevan, Tavush, Noyemberyan, Dilijan**
Towns: **Ijevan, Noyemberyan, Ayrum, Berd, Dilijan**

Tavush marz borders Gegharqunik and Kotayq marzes in the south-east and south, Lori marz in the west, as well as Georgia in the north and Azerbaijan in the north and east.

Table 9

Basic indicators in Tavush marz

Area	2,704 sq. km
Share of the area in the overall RA territory	9.1 %
Urban communities	5
Rural communities	57
Cities/towns	5
Villages	60
Population, as of January 2010	134,300
Including:	
Urban	52,600
Rural	81,700
Share of urban population	39.2 %
Share of the population in the overall RA population, 2009	4.1 %
Agricultural land area (as of July 1, 2009)	111,933.2 ha
Including arable lands:	25,288.9 ha

40.3% of the marz's overall area is occupied with mixed forests, remarkable for the diversity of their flora and fauna. The Dilijan state reserve and the Ijevan botanical garden-forest (dendro-park) established in the Aghstev river basin are to preserve the primeval natural state, to develop it and to select new species.

This marz is one of the most pronounced agricultural regions of the country. Cattle and pig breeding are the leading sectors in livestock operations, and cereals and grapes predominate in crop production. Fruit orchard rehabilitation projects are now underway. Beekeeping is another sector facing positive developments.

Food processing industry is developed in Tavush marz. Products of Ijevan and Berdavan wineries, Tavush branch of the Yerevan Brandy Factory, and the branch of Grand Tobacco are marketed locally as well as are exported.

VAYOTS DZOR MARZ

Marz center: **Yeghegnadzor**
Administrative areas: **Vayq, Yeghegnadzor**
Towns: **Yeghegnadzor, Jermuk, Vayq**

Vayots Dzor marz borders Nakhijevan in the south, Gegharqunik marz in the north, Syuniq marz in the east, and Ararat marz in the west.

Table 10

Basic indicators in Vayots Dzor marz

Area	2,308 sq. km
Share of the area in the overall RA territory	7.8 %
Urban communities	3
Rural communities	41
Cities/towns	3
Villages	52
Population, as of January 2010	55,800
Including:	
Urban	19,300
Rural	36,500
Share of urban population	34.6 %
Share of the population in the overall RA population, 2009	1.7 %
Agricultural land area (as of July 1, 2009)	209,193.3 ha
Including arable lands:	16,203.8 ha

Vayots Dzor marz has a rich and diverse fauna and flora. Natural forests make 6.7% (13,240.1 ha) of the marz's territory.

In the overall economic capacity of the marz, agriculture is the dominating sector. Farmers are mainly involved in animal husbandry, the share of which in the gross agricultural output is 60.0%. In the rest of the gross agricultural product volume, poultry, grape, fruits, and vegetables are the most important.

2. BRIEF DESCRIPTION OF THE ECONOMY OF THE REPUBLIC OF ARMENIA

Armenia acquired independence from the Soviet Union on September 21, 1991. Prior to this historical date, impetuous political processes were underway during about three years. Because of those processes, the communist party lost its monopoly position, and political parties with national background and democratic trends took over.

The collapse of the Soviet Union demolished the powerful industry sector, which was the base of the Armenian economy. As a result, during the first two years following the declaration of independence, the country's GDP was reduced by 50%. Such an economic recession was typical for all former soviet countries. In Armenia, however, implications of this recession became especially acute by the devastating earthquake of December 1988 and the conflict over Artsakh (Mountainous Karabagh). The land privatization process started in that period, and establishment of private family farms partially alleviated the negative impact of economic recession. Agriculture became a rather large sphere of employment for the population and an important means for getting better off.

As of 1993, farm production was more than 50% of the dramatically decreased GDP. Starting from 1994, active steps have been taken to stabilize the country's economy. First, due to a tough tax/budget and monetary/credit policy, the existing hyperinflation was restrained, and budget expenses appeared under control. In addition, liberalization of trade and prices, promotion of small and medium size entrepreneurship, activation of privatization of state-owned enterprises, as well as creation of necessary legal bases for business development motivated the development of competition and establishment of market relationships.

Over the recent years the RA Government makes pronounced efforts to improve the general business environment and stimulate investments. The macroeconomic environment was favorable for development of economy until 2008. Indicators of continuous economic growth are the explicit evidence of this. The global economic crisis notably affected the Armenian economy: a 14.4 percent decrease was reported in 2009 which was unprecedented during the last decade (Table 11).

Table 11

Key macroeconomic indicators

	2007	2008	2009	2010
	Actual			Planned
Nominal GDP (billion AMD)	3,148.7	3,646.1	3,165.5	3,214.6
Actual GDP growth (%)	13.8	6.8	-14.4	1.2
Nominal GDP (million USD)	9,204.5	11,919.3	8,713.2	8,328
GDP deflator (%)	4.1	8.4	1.5	2.0
Inflation (end of period) (%)	6.6	5.2	6.5	3.0
Inflation (average, %)	4.4	9.0	3.4	3.2
Exchange rate (AMD/USD, average)	342.1	305.9	363.3	386.4
Total incomes of State Budget (billion AMD)	588.0	759.2	676.4	742.1
Total incomes of State Budget /GDP (%)	18.7	20.8	21.4	23.1
Tax incomes of State Budget /GDP (%)	15.4	16.4	15.9	17.7
Total spendings of the State Budget (billion AMD)	634.7	760.6	824.7	935.5
Total spendings of the State Budget /GDP (%)	20.2	20.9	26.1	29.1

**) export/import of commodities and services

Although the GDP in agriculture and food processing has been growing in absolute numbers over the last decade, however its share in the total GDP has decreased (Table 12). This is logical and indicates that other industries are gradually rehabilitating and expanding their capacities.

Table 12

GDP growth rate in the Republic of Armenia and the share of Gross Domestic Product produced in the food and agriculture sector

Spheres	Share in GDP, %								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
GDP growth rate, %	9.6	12.9	13.9	10.1	13.9	13.2	13.8	6.8	-14.4
Agriculture	25.0	23.6	21.5	22.6	18.8	18.1	18.0	15.7	16.2
Industry	20.3	20.4	21.5	19.1	18.7	15.1	15.7	13.0	13.6
of which: Food processing industry	7.8	9.2	8.0	10.3	8.8	4.8	4.9	4.4	4.8
Total RA food and agriculture sector	32.8	32.8	29.5	32.9	27.6	22.5	21.9	20.1	21.0

In 2003, the Government of Armenia adopted the Strategic Program for Poverty Reduction. Being a long-term development program for the country, this document summarizes the main priorities of the state and serves as a basis for different sector development projects as well as for shaping the state budget. Later on this document was finished off and became the country's Sustainable Development Program.

Increase in foreign investments and export volumes largely promote development

of the Armenian economy. It is a truly positive tendency that the share of industrial production has started to increase; however, unlike the Soviet period, mainly light and medium size industry – especially processing of agricultural products - are now developing (Table 13).

Table 13

Trade balance showings in the Republic of Armenia

(million USD)

	2003	2004	2005	2006	2007	2008
Export	679.6	727.2	973.9	985.1	1,157.4	1,069.1
Of which: Export of food products	81.1	83.5	114.7	121.9	171.8	208.0
Import	1,279.5	1,362.7	1,801.7	2,191.6	3,281.8	4,411.6
Of which: import of food products	223.8	285.6	315.9	343.4	539.3	755.8
Trade balance	-599.9	-635.5	-827.8	-1206.5	-2,124.4	-3,342.5
Of which: trade balance for food products	-142.7	-202.1	-201.8	-221.5	-367.5	-547.8

One of the important priorities of the RA Government's economic policy is facilitating export-oriented productions. The currently negative trade balance more than 3 times exceeds the export volume, which gives rise to concerns from the country's economic security perspective. Import of food products exceeds the export thereof by 3.6 times; this is another serious problem from the food security perspective.

3. AGRICULTURE: BRIEF HISTORICAL OUTLINE

According to the Holy Bible, after the Deluge, Noah descended from his ark sheltered on the Mount Ararat and planted a grape vineyard in the heart of Armenia – Ararat Valley. He got drunk while enjoying the wine that he made of the grapes from his vineyard. We believe that this is a true story, since a large number of rock carvings existing in the Armenian Plateau, irrigation channels surviving from Urartian times; grape and wheat seeds surviving in 3-6 thousand-year-old casks discovered during archeological diggings give evidence that agriculture in Armenia has a history of thousands of years.

The antique historians Herodotus (5th century B.C.), Xenophon (5th - 4th c. B.C.), Strabo (1st c. B.C.-1st c. A.D.) have left valuable information about Armenia, the livelihood of its inhabitants and agriculture.

The oldest state formed in Armenia, Urartu, not only had developed metalworking and architecture but also - compared to the previous historical period - highly developed farming culture and canal building. In agriculture, the use of plowshare and producing vegetable oils by the method of cold press squeezer was a new age in agriculture.

Ancient Armenians had a developed culture of growing cereals, vegetables, fruits and oil-bearing crops. Armenia, together with its neighbors on the Fore-Asia, has given the civilized humankind several varieties of cereals, particularly those of wheat. The Valleys of Shirak, Mush, and Alashkert were distinguished for their cereal crop areas. Rice was grown mainly in the valleys of the rivers Araks, Aratsani, and Euphrates. Xenophon testified that the first time when he saw people drinking beer was in Armenia, and the beer was produced from barley.

Most likely, Armenia is one of the homes of beer, since during the archeological diggings of monuments of 9th-6th centuries B.C., entire beer storages and workshops for making beer were discovered.

Climatic conditions of Armenia were favorable for development of viticulture. Armenian apricots, peaches and grapes, as well as dried fruits and raisins produced of these fruits enjoyed high demand in countries of Fore-Asia.

Just watch the ornaments in the ancient Armenian churches and on cross-stones, visit the unique-in-its-type book depositary – the Yerevan institute of ancient manuscripts Matenadaran - and Armenian grapes, pomegranates, apricots, apples, and peaches will smile at you from thousands-year-old miniatures.

It is known from the history that, in the 4th century B.C., while returning from his eastern invasions, Alexander the Great took seeds and young plants of sun-tasting apricots and he named the new fruit 'Armenian apple' (Malus armenica). Later on, the well-known Strategist of Ancient Rome Lucullus, being unable to stand the battle from the troops of the Armenian King of Kings Tigran the Great, withdrew back to the Mediterranean coast. He took plants of apricots from the Ararat Valley and named them 'Armenian Prune' (Prunus Armeniacum).

Following Lucullus, another well-known Roman having come to the power, Pompeyus, buried the hatchet with Armenia, as a result of which, active trade links started to develop. Armenian merchants themselves started disseminating cultivation of apricots in the Roman Empire maintaining the name 'Armenian Prunes'. Later on apricot was disseminated throughout Western and Southern Europe, and – through European settlers – in America. The prominent Swiss botanist of the 18th century Karl Liney preserved the Armenian origin in the scientific name of apricot and named it Prunus Armeniaca, i.e. 'Prune, Armenian'. And the famous French scientist of the 19th century Jean Batista Lamarck, further developing the classification of plants, decided that apricot is not a sub-type of prune but a species worth of being classified independently, and named it Armeniaca vulgaris, meaning 'Armenian, common'.

As mentioned above, grape cultivation is associated with Noah the Patriarch. According to bibliographic evidences, Armenian grape wine has been one of the most important export products.

Among technical crops, cotton, flax, sesame, hemp, and hook have been growing in Armenia from the times immemorial.

Cotton grown in Armenia not only met the needs of the domestic market, but also was exported as an unprocessed raw product.

Sesame, flax, hemp, and hook were of no less importance. Numerous oil-mills were established on the basis of these crops.

There are more frequent evidences on oil-extraction in sources of 10th-13th-centuries. One of the oil-mills discovered by Russian Academician Nickolas Mar in

Ani was so large that he named it a factory.

Animal husbandry has also been practiced in Armenia for thousands of years. Studies have indicated that the Armenian Highland was one of the cradles of domestication of wild cattle and sheep. Mountainous pastures, spacious grasslands and Alpine meadows have created favorable conditions for animal husbandry. In mountains, one can still find the wild sheep, Muflon, one of the distant congeners of Armenian sheep breeds. In addition to cattle and sheep, a large number of goats, domestic poultry, horses, mules, and donkeys were kept. In plains, especially in marshy places, buffalo breeding was developed. Nonetheless, Armenia was mostly famous for horse breeding. There are historical evidences about the 'runner' type horses being exported in large amounts from the Armenian Highland. The Persian Akemenian kings of kings were taking 20,000 horses from Armenia every year as a tax. Strabo has left writings with evidences that, to his delight, Armenian horses were tall and had "unequaled beauty". The two Armenian regions most famous for their purebred types of horses were Artsakh (Mountainous Karabagh and Valley Karabagh) as well as the Land of Syuniq known for its brave cavalry.

Four maps of the Roman Empire have survived on the wall of the world-famous Forum in Rome. On three of them, in the geographical location of the Armenian Highland, the word "Armenia" is written with large letters. One of the maps has no such record; this one simply relates to the period when Armenia was not under the rule of the Roman Empire. Thus, being in the focus of collision of superpowers, especially that of Iran and Byzantium, Armenia has always suffered incursion; the Armenian statehood has periodically been exposed to dangers and the country was divided into parts between the mighty countries. Being under the rule of Persians, Byzantines, later on – Arabs, Turks, and Russians, Armenia has suffered many losses, however has maintained its language and the faith, its national culture and way of life, an inherent component of which is the farming culture.

In the newest period, the following development phases are distinctive for the Armenian agriculture.

In 1918, 543 years after the loss of statehood, the Republic of Armenia was declared. Although the Republic that survived only two and a half years was extremely poor and the threat of restarting the war was hanging like the sword of Damocles, the Government actively supported villagers by distributing land to them over a short period.

In November 1920, the Bolshevik army of Russia invaded Armenia and, supported by Armenian communists, established a Soviet power. Like in the rest of the Soviet Union, depriving of private property of farm households, forced collectivization and establishment of state ownership on land severely harmed the development of

agriculture. Yet, immense irrigation, land improvement and orchard planting programs were implemented that allowed the food and agriculture sector to become one of the most powerful branches of Armenia's economy. The sector was also stimulated by the development of the food and light industries, development of agricultural equipment capacities, creation of a modern agrarian research and education system.

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In late 1980-es the second largest field of the country's economy was the agri-industrial complex. Its share in the overall public product was 21%, in the number of those occupied in the material production field – 27%, and in the capital assets – 26%.

The Armenian agri-industrial complex included 1,139 enterprises and organizations, of which 865 were agricultural and 135 were food processing enterprises.

Armenia was sending (or - per today's concept – was exporting) to the overall Soviet fund fresh fruits and vegetables, geranium oil, alcoholic beverages, especially brandy and wines, various canned foods and mineral water.

During those years, large state investments were made in social development of rural areas, which contributed to the development of education, healthcare and cultural institutions in villages and implementation of natural gas supply and road building programs.

This said, the right of land ownership and the right of the land user were separated in the Soviet agriculture. There was a non-adequate exchange between the rural and urban areas. This led to activation of emigration among the rural population.

4. CURRENT STATE IN AGRICULTURE

In spring 1991, even prior to the declaration of independence, considering the importance of the sector, a policy of privatization of land and other means of agricultural production, service infrastructures, food marketing and processing facilities was adopted. As a result, a market-driven liberal economic system has now been established in the agri-food sector that includes about 340,000 private farms, commercial agricultural organizations and a large number of private companies involved in agricultural services and in marketing and processing of agricultural products.

Currently, one of the most important branches of the Armenian economy - food and agriculture sector - provides approximately 21.0% of the Gross Domestic Product, of which the share of agriculture is around 16.2% (2009).

In the agricultural production sphere, the main land users are private farmers who own 71.7 % of privatized arable lands, 78.3% of perennial crop areas, and 48.4 % of grasslands.

As a result, the private sector produces over 98% of the gross agricultural product.

In the new conditions of economic management, when the system of land use has been radically changed and the cultivated areas have been divided into more than 1.2 million plots, modernization of production and service infrastructures of agriculture are acquiring a critical importance. International experience indicates that development of the other industries and application of intensive technologies in agriculture sector naturally result in reduction in the number of producers, enlargement of land areas per farm, and decrease in the number of economic entities due to the increase in productivity. These patterns, however, do not have yet striking implications. Therefore, expansion and enhancement of competitiveness in the servicing and market infrastructures should contribute to effective operations

on small land plots. This, along with the development of farm cooperation and land consolidation, is the most effective way to eliminate the constraints caused by small sizes of land plots. This is why the Armenian Government has been consistently implementing projects on development of irrigation systems, land improvement, pasture irrigation, integrated pest management, development of rural infrastructures and other important programs. As a result, there are positive tendencies in cereal, potato and vegetable production, horticulture as well as in animal husbandry. Contractual relationships are expanded between companies involved in production and processing of agricultural products and small and medium size entrepreneurs, which create reliable prerequisites for increasing the production volume and the profitability of tomato, fruit, grape, and milk production.

Over the recent years, due to capacity building, application of new technologies, and activation of marketing processes in the grape processing industry, demand for raw product has notably increased and planting of new orchards has been activated. As a result of effective management practices and adjustment to requirements of export markets, the volumes of export of alcoholic and soft beverages have increased over 10 times in 2008 as compared with the indicator of 1996-1998.

During the first years of agrarian reform, the production capacities of animal husbandry were dramatically reduced. In this sector, compared with plant growing, rehabilitation of the production potential is a more costly and long-term process. Nonetheless, the great market demand in milk, meat, wool, and eggs, expansion of crediting opportunities, implementation of anti-epidemic measures and improvement of veterinary services have promoted the stabilization of the animal breeding sector, with the poultry and pig breeding having high development rates. These sectors use modern technologies.

In 1991-1997, the level of using production capacities and production volumes in the agricultural raw product processing system was also dramatically decreased. However, starting from 1998, the situation in the system has been noticeably improved due to additional investments, enhancement of the competitiveness of products and expansion of export. In 2009, the share of the food industry has made 35.2 percent in the gross industrial product of the Republic of Armenia and 49.8 percent in the overall processing industry.

Activation in the system of agricultural product processing and increase in the

export volumes thereof has definitely contributed to the alleviation of the problem of agricultural product marketing and enhancing the level of commercialization of farms.

Progress could be more tangible, if agricultural crediting was improved and risk insurance was launched. Although volumes of agricultural credits are increasing year after year through commercial banks and micro-financing organizations, it still meets only 10% of the existing demand. Yet, a system of service and market infrastructures is now being developed that is synergic with the principles of a market economy. Another critical achievement is the change in work style and mentality of economic entities; the producer does not totally rely on the Government anymore to provide solutions to his/her production problems. This has created sufficient economic prerequisites for deepening the reforms in agriculture and for its sustainable development.

4.1. LAND RESOURCES

Armenia is a land-poor country. The usable agricultural lands make 71.3% of the country's total area, with arable lands making only 15.2%. Per capita, Armenia has 0.657 hectares of usable lands and 0.14 hectares of arable lands.

Therefore, the imperative is that the intensive use of land resources is to be the main path for development of Armenia's agriculture, i.e. receiving the maximum possible added value per unit of land area.

Armenia is a mountainous country; in mountainous countries, the climatic conditions according to rectilinear elevation changes within even a small distance. Hence – the diversity of land types.

Gevorg Emin, an Armenian poet, has picturesquely described the diversity of the land/climatic zones of Armenia, "When autumn comes to the Ararat Valley, the grapes are succulent and the rosy peaches are ready for picking; nearer to the foot-hills of

mountains it is still summer and the wheat is only just beginning to turn gold.

Meanwhile, in the alpine meadows, the grass is growing lushly and the poppies are in full bloom. Higher still, the snow is just beginning to melt and the snowdrops and violets have just appeared. And the mountain peaks are always adorned with snow.

At the same time in Meghri Gorge, one will find pomegranates, figs and apricots ripening among the scorching rocks.

A mountain stream flowing from the thawing snows on the slopes of Mt. Aragats will cross all four seasons of the year in the same day on its way to Mother Araks River – winter, spring, summer, autumn." [1]

Armenia is a country of stones. This is where the saying 'people squeezing bread from stone' comes from, emphasizing the diligence of Armenian villager-farmers. This is both figurative and appropriate. Evidence of this are the thousand hectares of stony places in Talin and Ashtarak areas of Aragatsotn marz, Nairi area of Kotayq marz, and Baghramyan area of Armavir marz that have turned into vigorous orchards and yielding fields after melioration and improvement. There still are considerable areas for further melioration; however it is very difficult to accomplish it by public funding only. Nonetheless, the "Maintenance and Improvement of Ameliorative Status of Lands" and the "Improvement and Irrigation of natural pastures" programs are being implemented, aimed to prevent the dangers of soil over-humidity and secondary salination, as well as to provide mountainous pastures with drinking water for animals.

Effective organization of agricultural production is still seriously hindered by the small sizes of farms and the diverse forms of farm management systems taking slow root in agriculture sector. Currently, each farm has 1.4 ha of farmland on average, including 1.1 ha of arable land; this does not ensure the opportunity to effectively manage the farm and use new technologies. Meanwhile, according to the data of the

1. Gevorg Emin, Seven Songs about Armenia, Yerevan, 1983, page 137-138, translated from Armenian by Mkrtich Soghikyan

Republic of Armenia National Statistics Service, around 33% of arable lands are not used on target. Part of those lands is within the danger zone of Armenian-Azerbaijani border. Over the recent years, thanks to the demining programs implemented, part of those lands has been included back into production cycle. However, there are still certain plots where it is still dangerous to farm.

This is Armenia; the hardworking people of this country make their land a comfortable place to live by the sweat of their brow.

Especially during the last 30-40 years, intensive cultivation of unutilized lands and expansion of irrigated areas have been observed. Difficulties of the first years of independence are being overcome, and the land is again becoming the most precious asset. The unprecedented activation of entrepreneurship in agriculture and rapid increase in investments are the evidence of this.

Table 14

Land resources and the structure thereof in the Republic of Armenia (as of July 1, 2009)

Land types	Area, thousand ha	Structure, %	Including areas to be irrigated	
			Area ths ha	Structure
1. Total agricultural lands	2,120.1	100	155.76	100
Including arable lands	449.41	21.20	122.42	78.60
Perennials	32.56*	1.54	31.84	20.44
Grasslands	127.35	6.01	1.50	0.96
Pastures	1,116.56	52.66	-	-
Other lands	394.43	18.60	-	-
2. Forests	369.76	-	0.43	-

*) does not include perennials in small holdings

4.2. WATER RESOURCES & IRRIGATION SYSTEM

More than 80% of the gross crop produce in Armenia is produced on irrigated lands. Therefore, irrigation and efficient use of water resources are among the critical priorities of the country's economy overall.

A developed but non-homogeneous water network is typical for the territory of Armenia, like in many other mountainous countries. There are 9,480 small and medium size rivers with total of 23,000 km length; of them, 379 rivers are 10km

and more long. The density of the river network is changed within a large range: from 0 to 2.5 km/km^2, with the national average making around 0.8 km/km^2. As a rule, rivers of Armenia are brooks of the two large rivers in the South Caucasus, Kura and Araks.

In Armenia, the restored stocks of surface waters make 7.2 billion cubic meters annually. 2.3 billion is used (versus the previously used 4 billion cub. m), of which 2 billion cub. m (3 million previously) is used for irrigation and for other fields of production, and 430.0 million cub. m (550 million previously) – for drinking and other everyday use.

Lake Sevan is the most important water resource in Armenia by its size and economic significance. “A piece of blue torn off the sky that by magic has appeared in these mountains”, this is how the prominent Russian writer Maxim Gorki saw Lake Sevan.

The lake’s mirror extends over 1.2 thousand square kilometers, 1,900m above sea level. Prior to brutal release of water during 1949-1962, the volume of water in Lake Sevan was 58.5 billion cubic meters. The average annual release during those unfortunate 13 years has made 1,400 million cub. m, which caused decrease in water amount up to 33.0 billion cub. m and descent of the water level by 19.6 meters. It made an enormous harm to the ecosystem of the lake and caused destabilization of basic hydrological criteria. The rates of water release could lead to final bogging of the lake during short time, if the leader of the Soviet Union Nikita Khrushchev did not visit Armenia in 1961. Different legends are told about how Khrushchev made the decision to dramatically restrict the water release, and, more importantly, instructed the Soviet Government to build a 49km long tunnel enabling to convey 250 million cub. m of water from River Arpa to Lake Sevan.

The reality is that Khrushchev reached to the center of the lake in a boat with then leader of Soviet Armenia, Yakov Zarobyan. He was fascinated with the perfect purity of water and the unspeakable beauty of Sevan. His delight came to its peak when Zarobyan threw a coin into the water, and for a long time they could watch how the coin was sinking deep into the water. At that very moment of enjoyment, Zarobyan

said that this wonder of the nature would be covered with algae and eventually turn into swamp.

“Not a single capitalist would afford this kind of uncaring diseconomy,” the Chief got upset and claimed that prompt suggestions be made on saving Lake Sevan.

This was how the decision on building the Arpa-Sevan tunnel was taken, and the construction itself was launched in 1962. Arpa-Sevan tunnel became one of the huge nationwide construction sites in the Soviet Union. The construction was finally accomplished in 1981. The tunnel allowed raising the level of the lake by 0.9 m by 1990. However, to overcome the energy crisis in Armenia during 1991-2000, water discharge for energy purposes were dramatically increased causing a descent by another 1.5m.

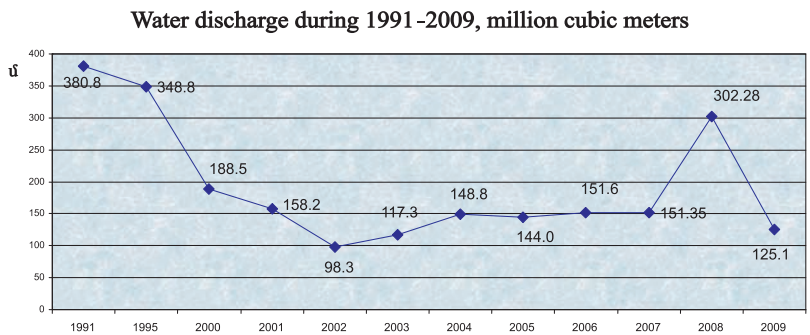


Figure 1

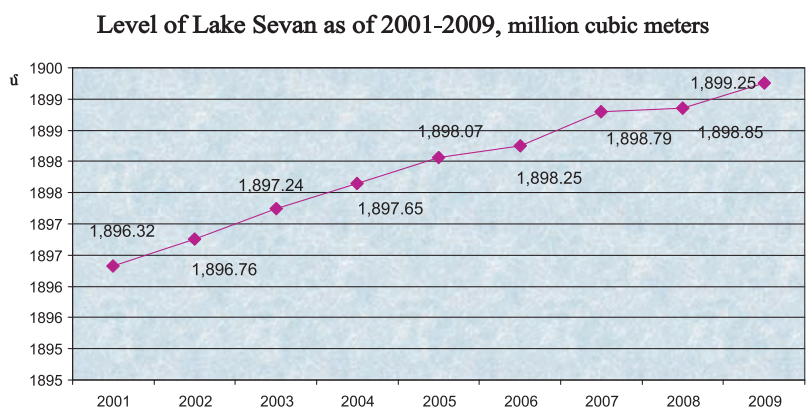


Figure2

To enhance the water resource of the Lake, a smaller tunnel, Vorotan – Arpa, was built in 2004. This tunnel has a capacity of conveying additional 165 million cub. m. of water from Vorotan river to Sevan.

Currently, water release from Lake Sevan is significantly limited, which contributes to raising the level of lake and rehabilitation of its ecological equilibrium.

The most important hydraulic structures for controlled use of Armenia's water resources are the 74 reservoirs operating currently. They accumulate 1,272 million cub. m. of water which makes only 17.7% of the external flow. Elimination of consequences of the global climate change as well as the economic interests of the country require developing a strategic program and reach the volume of water accumulated in reservoirs to 3 billion cub. m. This is required by the dramatic increase in the demand of fresh water in the world and by solution of the existing problems in agriculture, energy sector, and environment.

4.3. CROP PRODUCTION

During the transition to market economy, given the necessity to provide independent production of first priority agricultural products for the country, as well as resource supply, product marketing, blockade of transportation routes and other problems, both structural branches of agriculture and crop production/livestock management sectors underwent considerable changes. Currently (2009), the sectoral structure of agriculture is as follows: crop production – 62.3%, livestock management – 37.7%

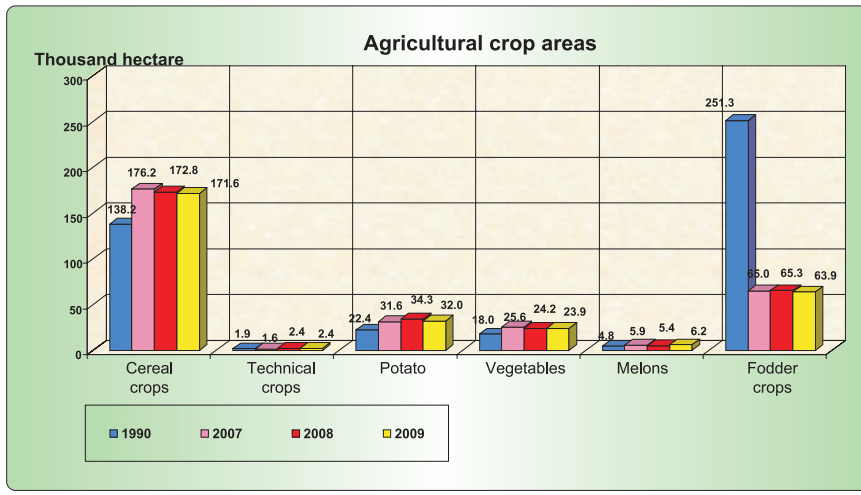


Figure 3

vs. relatively 49.4% and 50.6% in 1990. When compared with the beginning stage of the transition period, areas under agricultural crops have undergone the following changes: cereal crop areas have been increased by more than 24%, while about 43% increase in areas under potato has been recorded. In the meantime, forages have been decreased more than four times.

There are positive tendencies in production of cereals, potato and vegetables. Mutually beneficial contractual relationships are being established between producers and processors, which create prerequisites for increasing the production volumes and profitability in tomato, fruit and grape production.

4.3.1. CEREAL PRODUCTION

Privatization of land was performed in the Republic of Armenia during 1991-1996. Those were difficult years for the newly independent republic. Following the collapse of the Soviet Union, the system of international job division and integration links shaped over decades in the conditions of command-administrative governance were distorted. The external communication routes of the country were blocked, Karabagh conflict had grown into armed collision with Azerbaijan, and, in this situation, bringing in commodity cereals had become extremely difficult.

This situation made farmers to use their plots mainly for growing cereal crops. Moreover, since capacities of food processing enterprises were nearly not used, massive destruction of grape orchards started, and technical crop areas were dramatically restricted, including those of vegetables, especially tomato, to be processed. As a result, cereal crops occupying an area of 138.2 thousand ha in 1990 reached to 206.0 thousand ha in 1993, which was about 54% of the total crop area. In later years, the share of cereal crops in the overall crop areas made over 63% on average. Such a structure is certainly unjustified from the standpoint of economic efficiency and needs improvement. It is enough to state that surveys completed

GYUMRI SEED SELECTION STATION

The Gyumri Seed Selection Station was founded in 1924 to obtain and reproduce selection varieties of crops for mountainous and pre-mountainous zones of Armenia.

During its more than 80 years of activities, the station has become a prestigious scientific/production center for selection and production of wheat, barley, legume, and vegetable/melon crop seeds.

To date, over 40 varieties of agricultural crops have been created in the seed selection station, of which 7 – during the last 10 years, including Leninakani 5, Nirsa, and Makar varieties of winter wheat, Shiraki 2, Ani, and Gohar varieties of spring wheat, and Gyumri variety of spring wheat.

Currently, over 1,500 experimental samples of different crops (wheat - 350, barley -, 630, lentil - 218, chickpea - 156, beans - 12, alfalfa - 75, sainfoin - 57) are tested by the research departments of the Station.

There are dozens of perspective variety samples in the selection nurseries that not only compete with the varieties having worldwide recognition but also exceed by their agrobiologic and economic specificities and properties. For instance, Selenka, Zastava Odesskaya and Prima varieties of winter wheat brought in during 2007-2009 have provided 4.1 – 5 tonnes per hectare yield, while Nirsa and Leninakani 5 varieties created in the Gyumri Seed Selection Station have provided 5.5-6.0 t/ha; Mamlyuk, Scarlet, Nitran, Jersey, and Vacula varieties of spring barley are late season and falling (Vacula) varieties and provide 0.5-0.7 t/ha less yield than Nutans 115 and Gyumri varieties.

Since November 2000 the Seed Selection Station in Gyumri has been managed by a skillful manager and scientist Ruben Karakhanyan. The Station is closely cooperating with world centers of agricultural research, ICARDA and CIMMYT. Different variety samples received from Vir and Lukyanenko Research Institutes, the Russian Federation; research institutions of Odessa and Isakov, the Ukraine, are tested and the best ones are selected and included in seed selection operations as donors; the obtained hybrid variety genes are used as starting material for crops grown in the Station.

Due to their achievements in research over the last decade, Gyumri Seed Selection Station enjoys a good reputation inside and outside Armenia, which is evidenced during international scientific conferences where the Station's specialists present reports and papers.

Gyumri Seed Selection Station provides internship opportunities for students of agricultural education institutions as well as performs extension activities for farmers through operations in the test plots of the Station.

Table 15

Main indicators in crop production, 2003 – 2009

	Metrical measure	Years						
		2003	2004	2005	2006	2007	2008	2009
1	2	3	4	5	6	7	8	9
grain area	ths ha	200.8	206.8	209.6	182.4	176.2	172.8	171.6
average yield*	tonnes/ha	1.54	2.21	1.89	1.17	2.57	2.40	2.18
gross yield	ths tonnes	310.0	456.9	396.2	212.5	452.5	415.4	374.9
potato area	ths ha	32.3	35.7	34.4	33.0	31.7	34.3	32.0
average yield*	tonnes/ha	15.71	16.15	16.40	16.35	18.42	18.91	18.55
gross yield	ths tones	507.5	576.4	564.2	539.5	583.9	648.6	593.6
vegetable area	ths ha	23.1	22.3	22.5	24.4	25.6	24.2	23.9
average yield*	tonnes/ha	24.65	26.94	29.50	31.97	33.02	34.10	34.30
gross yield	ths tonnes	569.4	600.8	663.8	780.0	845.3	825.3	819.8
melon area	ths ha	4.1	4.0	3.9	4.0	5.9	5.4	6.2
average yield*	tonnes/ha	28.15	28.23	30.21	33.73	34.97	33.74	34.85
gross yield	ths tonnes	115.4	112.9	117.8	134.9	206.3	182.2	216.1
fruit & berry area	ths ha	25.7	34.7	34.9	35.4	38.0	36.7	37.0
average yield**	tonnes/ha	4.01	3.28	9.04	8.08	6.85	8.66	8.98
gross yield	ths tonnes	103.1	113.7	315.6	286.0	260.2	317.8	332.2
grape area	ths ha	13.1	14.9	14.9	15.7	15.9	16.8	16.5
average yield**	tonnes/ha	6.23	9.99	11.03	12.83	13.77	11.06	12.64
gross yield	ths tonnes	81.6	148.9	164.4	201.4	218.9	185.8	208.6
forage area	ths ha	53.0	55.3	60.9	65.6	65.0	65.3	63.2

*) Estimated according to planted area.

**) Estimated according to the area of yielding orchards.

by specialists of the Millennium Challenge Account - Armenia and the regional Agricultural Support Centers (ASC) indicated that cereal crops produced the lowest per hectare income.

It would be wrong to state that farmers do not like calculating. They do, and this calculation is based on today's reality. Having a good assumption that per hectare income will be small, farmer prefers cereals nonetheless. Why? This is motivated by the fact that the farmer has certain incomes in the fall and he/she can afford winter planting; secondly, cereals are not costly and labor intensive, and thirdly, this ensures that the farmer's family will have its daily bread, plus a part will go to market to cover the expenses made. Such entrepreneurship is not economically effective. But increasing the profitability of agricultural production requires essential improvement of investment environment.

In particular, taking into account the strategic significance of raising the level of self-sufficiency of the country with commodity wheat, a comprehensive state assistance to this sector has become critical. By the way, cereal crop areas in Ararat Valley should be limited up to the minimum effective crop rotation norms according to agro-technical requirements. From the overall 69,900 hectares of arable lands in Ararat and Armavir marzes, no more than 15,000 hectares should be allocated for cereal crops.

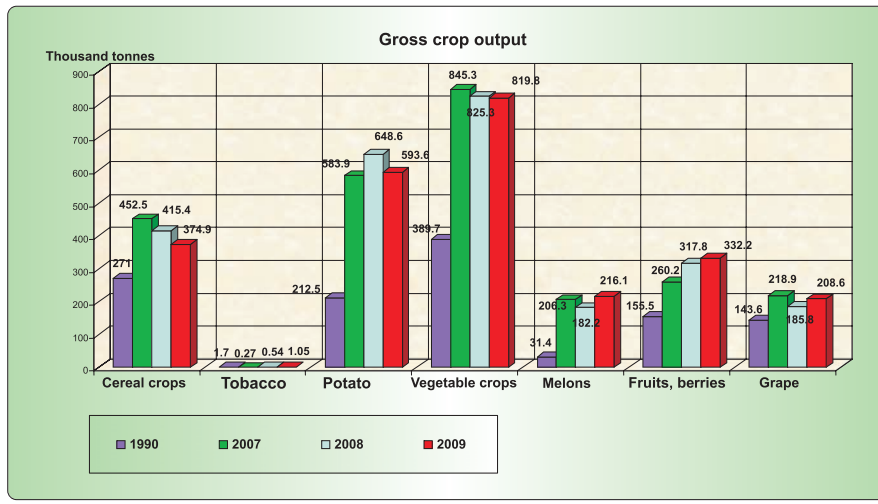


Figure 4

Analysis of cereal industry allows forecasting that cereal crop areas will make 175.0 hectares in the other marzes of Armenia. It is planned to reach the level of wheat self-sufficiency to 75%-80% by 2020 through improvements in seed production system, maintenance of agro-technical requirements, expansion of irrigated areas, and financial assistance from the Government.

4.3.2. VITICULTURE AND FRUIT GROWING

Viticulture and fruit growing are among the priority sub-sectors of the Armenian agriculture. Armenians have always favored viticulture. The fame of Armenian sun-flavor brandies and wines largely depends on the special quality of Armenian grape varieties. Because of the anti-alcohol movement started in 1980-es

in the Soviet Union, as well as the difficulties occurred in export of wine and brandy during 1990-97, the viticulture sector suffered greatly. More than 7,000 hectares of high-yielding vineyards were destroyed. Starting from 1998, difficulties in grape marketing were gradually overcome. Currently, demand in this valuable product is growing year after year.

Armenian researchers have introduced high-yielding, frost-resistant technical and table varieties of grapes. Currently, projects on establishment of vineyards with pure varieties and application of advanced growing technologies are being carried out.

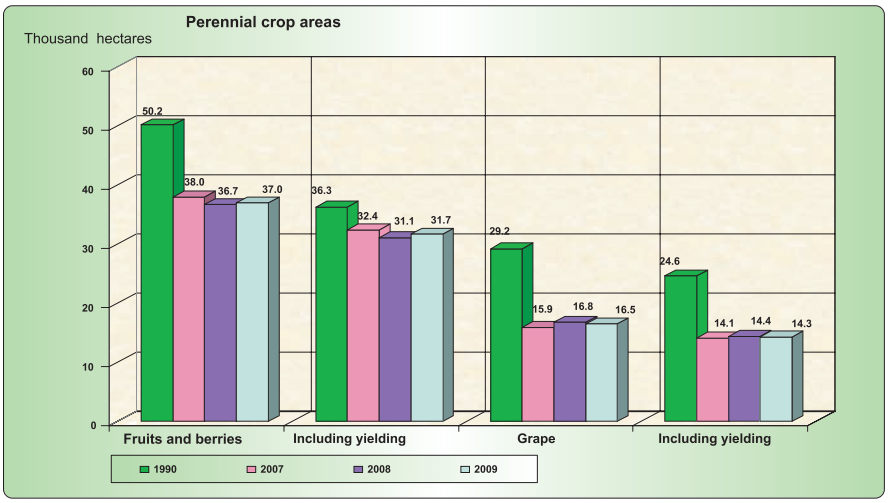


Figure 5

The rectilinear climatic zoning of the country provides non-simultaneous ripening of fruits. This prolongs the shelf life of fruits and loosens the seasonal tension in fruit supply. As a result of climatic changes in different altitudes, special varieties of fruits and berries with unique taste are granted by the nature.

There is an abundant supply apricot, peach, apple, plum, pear, quince, walnut, almond, fig, and other fruits in Armenia.

Currently, selection activities are underway aimed to obtain valuable frost-resistant varieties, which will contribute to expansion of these fruit areas and their geography and supply of domestic and export markets with fresh fruits in the long run.

The best example of this is the Tierras de Armenia project initiated by the Argentinean Armenian businessman Eduardo Eurnekian and implemented on

previous wastelands in Baghramyan area, Armavir marz. This company deserves a more detailed description.

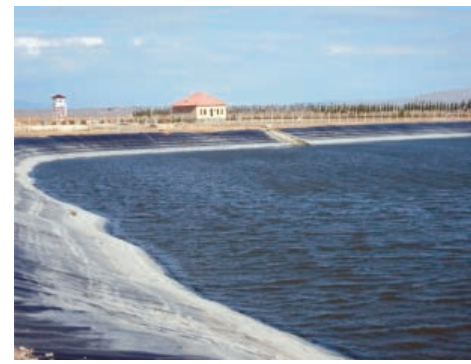
Tierras de Armenia CJSC develops spirit/cognac grape vineyard and plans commodities area production under pressurized irrigation systems. The company started operations in November 2004, looking for a big extension of land not parceled, in a sunny valley, not too far away from Yerevan city. 2.301 hectares of non cultivated lands were purchased in Armavir marz, in the neighborhood of Baghramyan and Arevadasht villages, 1,019 m above sea level.

Based on market research and soil, irrigation water and topographical survey, a 15-year development plan was designed forecasting to have at least 80% of the land under production, while the remaining 20%, which is too rocky and useless for agriculture, will be used for infrastructures.

The land has been fenced with the existing stones, following old traditions ("pirca" fence). Furthermore a windbreaker barrier – planted native poplar trees - has been installed in order to protect the plantation from north-west winds.

Access to water was the first issue to be solved. As of today, the company has two local irrigation water providers: the Water Users Association (WUA) of Karakert and the Water Users Association of Shenik. The WUA of Karakert supplies water through the open concrete channel MX7, which has a maximum capacity of 2.700 m^3/hr; the WUA of Shenik supplies pressurized water through a pipeline of 1.200 m^3/hr maximum capacity.

The company has built two reservoirs within its premises, at its highest point above sea level, and supplies water to the first and second plantations (400 ha and 150 ha respectively) having 90.000 m^3 (see Picture 2) and 105.000 m^3 total capacity each, since the offer of water by the local associations does not correspond to the company's demand, and water is given at inappropriate hours, and the flow does not meet the vineyards' requirement.



Tierras de Armenia has introduced a novelty in the country - a new coating technology with geo-textile cloth and high density polyethylene membrane to avoid water leakage.

The other issue was the plantation of vines. The first stage - already implemented - was a 400 ha vineyard with a standard distance between vines of 2.7m x 1.2m.

The second stage – in process at this moment - is a 50 ha vineyard. Considering

the expertise acquired in the field, the company decided to reduce in this vineyard the distance between rows to 2.2 m in order to increase the production per ha. Thus the plantation will be intensified, which - considering the high investments that land preparation and drip irrigation entails - will allow to better use water and energy resources as well as improve the economic efficiency.

Local concrete poles used in the first step vineyard were replaced in the second vineyard by imported galvanized ones considered more suitable for mechanical harvest.

Soil requires a thorough preparation. Superficial stones have to be removed preventing to take soil with them. For this an open shovel is used. After this, the area is mechanically smoothed.

Additionally, four hectares under a double gable trailing structure will be planted with table grapes varieties so as to introduce another type of vine plantation with more intensive hand labor use.

In the third stage (2011) some additional 100 ha of vineyard is under development.

The entire vineyard is under drip irrigation system, which has high efficiency standards in water and energy use.

In the near future a relevant part of the plantation will be irrigated by gravity energy, taking advantage of the natural slopes.

The main purpose of the vineyard (95%) is to provide grapes to local brandy factories. The remaining 5 % is used for self-testing of high quality table wines.

Some areas of the vineyard are planted with local non-grafted varieties such as Voskehat, Garan Dmak, Rkatsiteli and Kangun and others are planted with French grafted plants of such varieties as Chenin, Ugni Blanc, Folle Blanche, Colombard and Aligoté.

Additionally 20 hectares have been planted focusing on the production of high quality local wine (red, rosé and/or white wine), namely Cabernet Sauvignon, Syrah, Merlot, Cot Malbec, Marselan, Pinot Gris, Merlot, Viognier, Muscat Ottonel, Chardonnay and Sauvignon Blanc.

TDA purchased imported high standard machinery such as John Deere narrow tractors (USA), Caterpillar heavy machinery, Martignani sprayers (Italy). In the near future mechanical pruning and harvest will be tested.

TDA had its first vineyard harvest in fall 2009. The commercial production amounted approximately 3.5 t/ha. Consequently commercial agreements could start with local brandy factories.

Another step forward in this agricultural development is the industrial project so as to transform the grapes into high quality wines and/or spirit. This project at this stage is under study; nevertheless some tests have been already done with the first harvest (September 2009) with interesting previous results. The company hopes to have it ongoing soon.

Other agricultural activities undertaken include 20 ha of sprinkler irrigated crop field under development. Pivot irrigation system imported from USA is currently being assembled. Corn will be seeded. Should the results be satisfactory as per TDA standards, additional 800 ha will be developed under an environmental friendly activity, i.e. taking advantage of the high slope in the farm the watering pivot systems will be powered by hydraulic turbines with 100% renewable energy. Annual field crops such as wheat or corn will be cultivated in that area.

TDA has also developed his own orchard and farmhouse for self consumption including local Armenian fruit trees, salads, vegetables and a small greenhouse.

Hand labor is TDA priority. The company has undertaken a full private health care coverage system for each worker and their families through FIDEC (Fighting Infectious Diseases in Emerging Countries), led by Dr. Daniel Stamboulian. Payment to workers is performed according to productivity, in addition to the basic fixed salaries. The company also supplies each worker with lunch, personal working clothes and tools, as well as transportation to and from the company premises. TDA's workers get also extra annual premiums. The company is very much interested in improvement of its employees' knowledge and professionalism, which is ensure by permanent training courses conducted by the company's leading experts and foreign consultants.

Mr. Eurnekian, the founder of the Armenian Tierras de Armenia company, has been making substantial investments in Armenia's banking system, post service and civil aviation. Thanks to his investment, Zvartnots airport in Yerevan now has as good conditions as many known airports throughout the world.

Similar investment projects are needed in fruit growing, particularly in apricot production.

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In Ararat and Armavir regions, the Yerevani variety of apricot makes 85% of all varieties. This is quite natural since this variety is high-yielding, has large fruits with attractive appearance and the best flavor. From the economic standpoint, however, prevalence of just one variety is not justified; because of the orchards being located predominantly at 700-1000 m above sea level the simultaneous blooming of the trees frequently overlap with the early spring frosts and rainy days resulting in about 50% loss of yield in some years. Even in favorable

years the simultaneous ripening of fruit causes tensions in organization of harvest activities and leads to 20-25 percent losses. There is always the danger that apricots will drop off the trees in a definite ripening phase. In addition, very often seasonal supply remarkably exceeds the market demand, which, considering the insufficient cool storage capacities becomes a reason for abrupt fluctuations in market prices. Therefore, geography and variety composition of apricot orchards need to be diversified. It will enable to alleviate production risks, prolong timeframe for apricot marketing and increase yields per unit of area.

Studies indicate that utilization of different varieties of apricot trees according to elevation will enable to supply fresh apricots to the market starting from early May through first ten days of August. Moreover, fruit growers in comparatively cooler marzes of Gegharqunik and Lori harvest apricots until the first ten days of September.

Establishment of bushy type cultivars has become an important objective. Currently, apricot trees are 5m-8m tall and more, with the width of foliage making 7 m - 8m. Such form creates difficulties in growing and harvesting: in particular, treating and pruning become difficult, fruits do not ripen homogenously because of uneven light, and, most importantly, there is a limited possibility for selected harvest, and

Noratunk Nursery LLC

The company was established in 2003 in Arinj village, Kotayq marz to organize production of tree seedlings. Being initially established on a small land plot, later on the nursery grew in size. Production of Noratunk is now organized also in Kotayq, Ararat, and Aragatsotn marzes.

The company produces 63 varieties of seedlings of 10 fruits including the best local and foreign varieties. New varieties and tree stocks are continuously tried and utilized in the country; in particular, clone stocks of apricot, peach, prune and almond are successfully produced. These stocks have a number of known advantages over seedlings, and development on intensive horticulture largely depends on introduction of these stocks.

As a result of selection, the company has created, respectively, three, two and one new varieties of apricot, peach and prune.

Noratunk has begun the production of high quality berries that have long been in demand in the country.

there is too much loss.

In case of establishing orchards with bushy-type young trees received through clone stocks, the 5m x 3m planting scheme can be applied, thus having more than 600 trees on one hectare. This will enable to use progressive irrigation technologies and protect the orchard from frost and hail damage, and provide a yielding capacity that exceeds the traditional yields 3-5 times.

Production of shallow trees requires establishment of a nursery by applying science-intensive technologies. The firstling of this kind in this area is the Noratunk Nursery.

4.3.3. VEGETABLE GROWING

The agri-ecological conditions, geographical position of Armenia and multipurpose use of vegetables have led to a large diversity of vegetable varieties. The following types of vegetables are grown in Armenia: tomato, cucumber, cabbage, onion, eggplant, radish, carrot, garlic, estragon, asparagus, spinach, pepper, bean, cauliflower, turnip, garden radish, parsley, cilantro, basil, and others. Of melons, watermelon, mast melon, pumpkin and squash are grown. In addition, studies are being carried out also for cultivation of wild leafy vegetables.

Flowers, tomato, cucumber, pepper and other vegetables of high demand are grown in heated and sun-heated greenhouses.

Vegetable growing is one of the leading sectors in the Armenian agriculture and is a traditions of thousand of years.

Due to changes in agriculture, including - first of all - the land privatization, areas under vegetable crops have been considerably increased. According to statistical data of 2009, the areas under vegetable crops make 23,914 hectares, of which tomato is grown on 6,231 hectares, cucumber – on 2,549 hectares, and other vegetable – on 7,056 hectares. Melons are grown on 6,163 hectares, of which 22 hectares are seed plots. 80% of the overall vegetable crop areas are occupied by the main crops: tomato, pepper, cucumber, and eggplant. In addition to these crops, beet, carrot, onion, garlic, and greens are grown on small areas in different marzes of the country.

A considerable growth in the volume of vegetable production is observed, with the yielding capacity of tomato reaching to 70 – 90 tonnes per hectare, that of pepper - 30t/ha -40t/ha, cucumber - 25t/ha -30t/ha, cabbage - 35t/ha -50t/ha, and the melons

- 35t/ha -40t/ha in the best farms.

In the conditions of stabilization of farms and rapid development of market relationships, the diversification of agricultural crops is becoming a critical issue. Through support by the Water to Market activity of the Millenium Challenge-Armenia Project, non-traditional vegetables with high nutrient and medicinal values have begun to play a definite role in the overall assortment of vegetables, which already enjoy demand in the consumer market, both fresh and processed. These non-traditional crops include - from Brassicaceae - Brussels sprout, Chinese cabbage, Beijing cabbage as well as broccoli and kohlrabi, and from foliacea - different form and color lettuces.

In Ararat and Armavir marzes, the areas under vegetable crops as a second yield during a season have increased. These crops include cauliflower, vegetable soybean, beans, squash, cucumber, lettuce and others.

The geographical position and the climatic conditions of Armenia are quite favorable for growing vegetable (cucumber, tomato, pepper) and decorative (carnation, daisy) crops in greenhouses and ensure high yields. Currently, greenhouses are rapidly developing both intensively and extensively. In both cases, it is critical to correctly select production technologies, and types and varieties of crops. In terms of receiving high quality seeds and plants, Armenian businesspersons are successfully collaborating with Dutch research and farmer organizations.

Greenhouses are disseminated throughout almost all regions of Armenia, occupying around 75 hectares. 60% of greenhouses are involved in vegetable growing (tomato, cucumber, pepper) and 40% - in flower growing (carnation, daisy, rose, etc.).

The area of spring and fall membrane greenhouses, which are comparatively less costly, is considerably increasing in Ararat Valley.

4.3.4. TECHNICAL CROPS

A number of technical crops have traditionally been growing in Armenia. In terms of commercial-scale processing, tobacco, sugar beet and geranium are the most important crops.

Following the establishment of independence in Armenia, the tobacco areas have been considerably decreased, and cultivation of sugar beet and geranium has actually disappeared.

The designed capacity of the sugar factory to be put into operation in mid 2010 in Akhuryan community, Shirak marz will be 220,000 tonnes of white sugar. Of this amount, 40,000 tonnes will be produced from sugar beet and the remaining raw product demand will be covered by exported cane. Therefore, after about 20 years, sugar beet growing will be rehabilitated in Armenia. This is a pretty complicated process, since the previous technology, based mainly on hand operations, will hardly attract farmers to get involved in sugar beet growing. Thus the owner of the factory, Lusastgh Sugar LLC, is planning to bring in seeds of high-yield varieties and equipment and chemicals necessary for growing sugar beet. These inputs will be provided to farmers as prepayment for the future yields. The process of signing contract between farmers and the factory has started, where, sales of the total produce and payment within one-month period are guaranteed. In the event if the factory fails to meet the timeframes, the factory takes the responsibility to pay penalty equal to 0.01% of the total value of the produce for each day of delay. In conditions of complex mechanization and utilization of high-yielding varieties, growing of sugar beet will ensure high profitability and will contribute to elimination of poverty in rural Armenia. In addition, there will be no need to import sugar, and prerequisites will be created to increase the production of feed in the sugar beet growing regions.

The rose geranium is a high value volatile oil-bearing crop that was grown until 1980-ies in farms of former Echmiadzin and Hoktemberyan regions of Armavir marz. Unfortunately, this profitable crop is now forgotten, while the demand for high quality volatile oil is growing in the international market. Soybean growing also deserves a special attention. While both foreign and local varieties of soybean provide high yields and high quality, this crop is still not utilized in Armenia.

4.3.5. FORAGE CROPS

The main source of feed base in Armenia are the natural pastures making 1,246 thousand hectares and 58-60 thousand hectares of planted forage crops.

In the recent years, the Government of Armenia has started to implement small-scale programs of pasture irrigation. This is definitely an important step in enhancing the efficiency of pasture use in the country. However, those programs include only 5%-8% of the over 1.2 million hectares of pastures. Not in use and not improved for a long time, the summer pasture sites have greatly suffered. On the other hand, pastures located close to villages are being deserted and eroded because of load infringement.

In case of synchronized grazing and pasture improvement, alpine pastures of Armenia have a great potential for producing high quality milk and cheeses.

From seeded forage crops preference is given to alfalfa, sainfoin, corn for fodder and silage, as well as fodder beet.

4.4. ANIMAL HUSBANDRY

Cattle, pig, poultry, and sheep breeding are the most developed branches in animal husbandry in Armenia.

Animal husbandry seriously suffered during the transition period. In addition to the decrease of buying capacity of the population, because of limitations in volumes of locally produced and imported feed, heads of animals and production of animal products were considerably decreased. However, over the last five years, a tendency of increase in animal heads and productivity is remarkable. Large livestock breeding farms are being formed, most of them being also involved in milk processing.

The climatic conditions of the alpine zone of Armenia are favorable for producing Swiss and Roquefort type cheeses, which are of great demand in the market.

As a result of agrarian reforms, in 1991-1993 almost all livestock was transferred to individual and collective private farms in Armenia.

In 1997, compared to 1990, the heads of laying hens as well as pigs were decreased 4 times, sheep – 3 times, and the cattle – almost twice. During the same period, the meat production volume diminished more than twice (including: poultry – 10 times, milk - around 40%, and eggs – almost 3.4 times.

In animal husbandry sector, implications of stabilization became known only in 1998-2002, when the tendency of decrease in livestock heads stopped, and the annual volumes of animal product production not only were preserved but also a tiny, but steady growth was observed.

The years 2003-2007 were perhaps a turning-point for the animal breeding sector, attributed by abrupt growth in livestock heads and animal product volumes.

Thus in 2007, compared to 1998, heads of cattle have increased by 33%, including cows: by 20%, sheep and goats: by 21.5%, and pigs: for about 2.7 times. However, this tendency was not maintained during the following two years, and the heads of nearly all animal types have noticeably decreased.

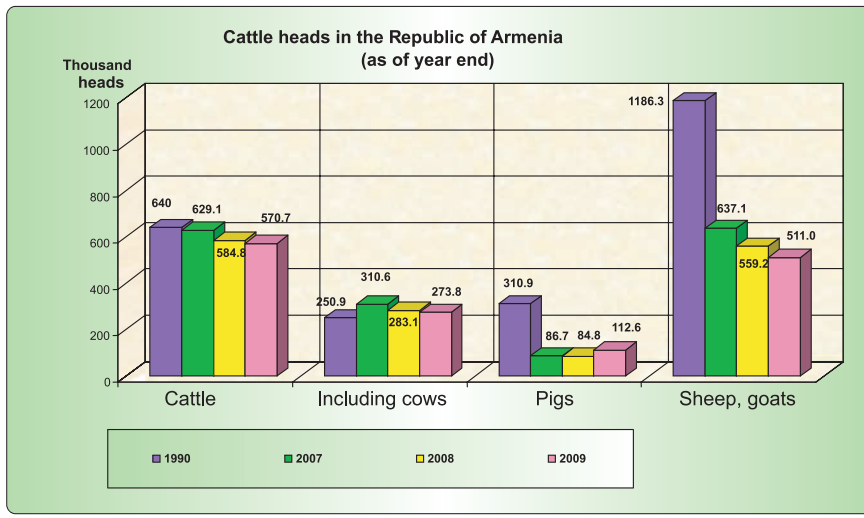


Figure 6

Pursuant to almost the same mechanisms, the annual production volume of animal products was changed. In the beginning stage, they were unstable, however, starting from 2003, milk, meat, and egg production indicators not only were dramatically increased, but also the tendency of exceeding the previous year data became sustainable.

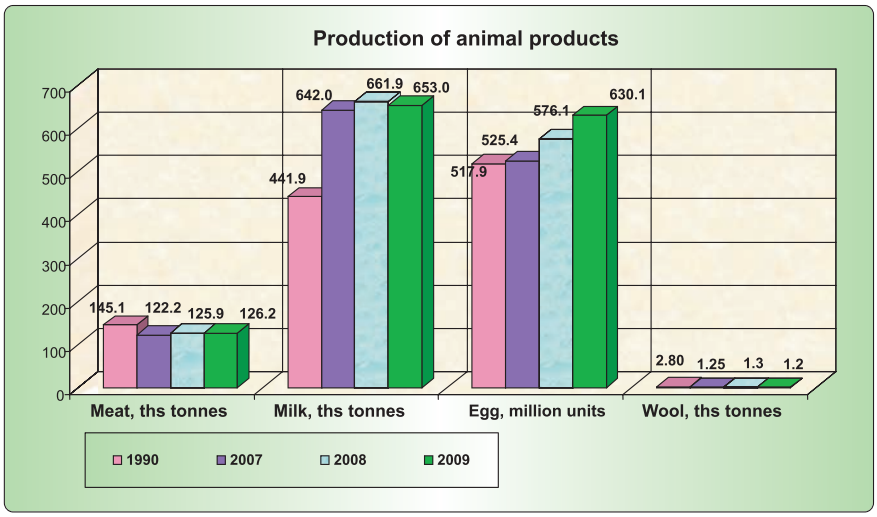


Figure 7

Table 16

Main indicators in cattle breeding, 2003-2009

	Measuring unit	Years						
		2003	2004	2005	2006	2007	2008	2009
Heads of cattle	thousand heads	565.8	573.3	592.1	620.0	629.2	584.8	570.6
Including: cows	,,--,,	291.0	290.1	297.1	307.1	310.6	283.0	273.9
Pigs	,,--,,	85.4	89.1	137.5	152.8	86.7	84.8	112.6
Sheep and goats	,,--,,	628.5	603.3	591.6	632.9	637.1	559.2	551.0
Poultry	,,--,,	5023.8	4861.7	4954.1	4098.1	4450.0	4188.2	4200.0
Animal products								
Total milk yield	thousand tones	513.7	555.2	594.6	620.0	641.2	661.9	653.0
Meat (Live weight)	thousand tones	92.0	94.6	99.1	117.1	122.2	125.9	126.2
Wool	tones	1180	1202	1306	1222	1298	1332	1230
Eggs	million units	502.2	563.0	518.2	463.7	525.4	576.1	630.1
Productivity								
Milk yield per cow	kg	1728	1772	1877		1957	1992	2157
Wool yield per sheep	,,--,,	2.2	2.2	2.2		2.2	2.2	2.2
Egg yield per hen	Units	180	188	145		172	188	195

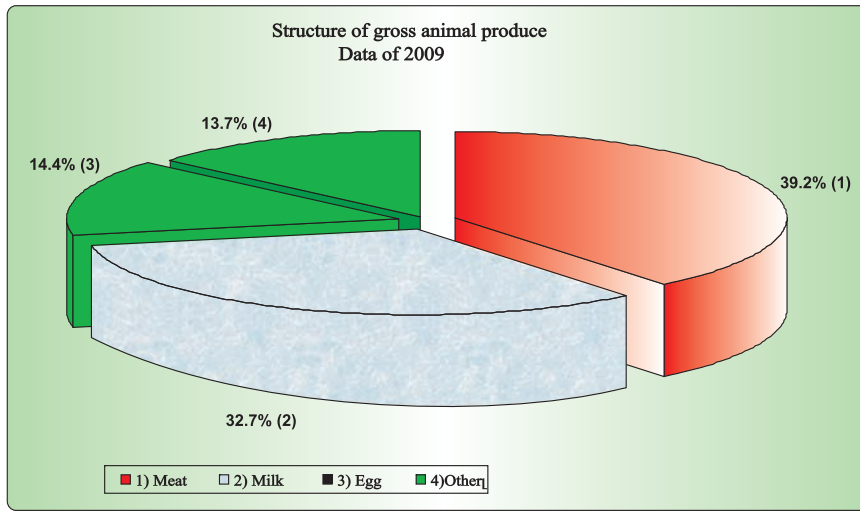


Figure 8

4.4.1. CATTLE BREEDING

Cattle breeding is the most developed field in Armenia's animal husbandry sector. Its share in the overall agricultural product is more than 25%.

Currently, the Caucasian Brown breed of cattle makes 98% of the overall heads in the country, with an average annual milk yield of 1,990kg.

During the first decade of the agrarian reforms (1991-2000), the lack of genetic improvement and artificial insemination led to a definite loss in the high breeding abilities of animals. This is why the number of purebred animals in the herd of Caucasian Brown breed is only 36%. Only in a few large farms (Multi-Agro, AgroService, etc.) purebred herds are preserved. This is a dairy breed that is excellently adapted to local climatic conditions and fully uses the mountainous pastures. However, even in case of proper feeding and best maintenance, the genetic potential of the Caucasian Brown will be enough to get only 4,000kg – 4,500kg annually. The RA Ministry of Agriculture has structured its cattle breeding strategy on two main axes: first, improvement of the genetic properties of the Caucasian Brown breed and, secondly, bringing in high-breed and highly productive animals adaptive to Armenian conditions.

In March 2007, the RA Government has approved "The cattle breeding program of

the Republic of Armenia for 2007-2015", which sets out, in particular, importing at least 1,000 heads of heifers of Simmental, Holstein, and Swiss breeds by 2015. There are already some positive results over the past one-two years: a number of commercial cattle operators, going beyond the stock being provided by the Government and subject to be paid off in different timeframes, bring in additional heads on their own. Farmers are enthusiastic about the program and confess that return on the invested money is high. For instance, in Arzni pedigree farm, the imported first-calving cows give 35kg-40kg of milk daily.

4.4.2. SHEEP BREEDING

Sheep breeding has a history of thousands of years in Armenia, which not only has made it a traditional industry but has influenced the socio-economic life of the Armenian people, cultural values and even folklore. Development in this field is conditioned by the very favorable natural conditions and, more importantly, availability of large mountainous pastures.

Prior to 1980s, the heads of sheep reached almost 2.3 million, followed by the tendency of decrease: 1.0 million in 1991 and 521,000 in 1998. Thus, during the period of 1981-1998, heads of sheep decreased more than 4 times.

A certain growth in the number of sheep has been observed over the recent years. In 2009, heads of sheep and goats made about 560,000. As a matter of fact, the country uses only 25%-30% of the potential of sheep breeding; whereas the low risk and high profitability of this industry is rather favorable for the overall agriculture and light industry development. Moreover, over the last two years export of sheep from Armenia to the Islamic Republic of Iran has been noticeably activated. The gradually growing demand has contributed to the growing of the price of mutton, therefore – to the growing of the profitability of sheep breeding.

It should be mentioned, nonetheless, that, according to marzes, the heads of sheep is not directly comparative to the natural and economic potential of the marzes, which has resulted in abrupt changes in the level of pasture use. As a result, mountainous and especially high mountainous pastures are not used at all, while the limited pastures in the proximities of settlements are overwhelmingly grazed. This has not only brought about low efficiency of pasture use, but also can result in undesirable consequences from the environmental perspective as continuous grazing of sheep produces erosion and can cause disappearance of valuable plants in the plant cover of pastures.

Table 17

Loading of pastures in Armenia (1982-2009) per 1 ha, by marzes

Marz	Sheep, goats, total heads		Loading of pastures, heads/ha	
	1982	2009	1982	2009
Aragatsotn	319,075	78,874	2.31	0.57
Ararat	144,037	69,558	1.83	0.88
Armavir	79,720	59,812	3.53	2.65
Gegharqunik	480,975	100,117	2.71	0.56
Lori	225,413	34,853	1.54	0.24
Kotayq	138,731	39,523	1.65	0.47
Shirak	333,638	71,593	2.66	0.57
Syuniq	264,546	68,236	1.51	0.39
Tavush	81,558	16,122	1.33	0.26
Vayots Dzor	175,836	18,016	1.61	0.17
Yerevan	4,448	2,514	3.71	2.1
Total	2,256,350	559,218	2.02	0.5

Over the last three decades, basically because of reduction of heads, the average loading level of pastures has decreased more than four times (Table 17).

Analyses indicate that in case of full utilization of natural hayfields existing in the Republic of Armenia, the most reasonable number of sheep heads can be around 1.0 million. Simultaneously with the growth of heads, it is necessary to perform irrigation of pasture lands and take measures of surface improvement, which will allow reaching the sheep heads from 560,000 to 1.1 million during the upcoming ten years.

4.4.3. PIG BREEDING

Before 1991, pig breeding was typically developed in large facilities, where modern technologies for fattening were mostly in use. After the liquidation of large state-owned facilities, private farms have become the main producers of pork. The latest achievement is a new breed received as a result of crossbreeding of local wild boars with domestic sows. Being accustomed to local conditions, the new breed provides high productivity. Nonetheless, taking into consideration the preferences of the Armenian people, it is appropriate to breed pigs for pork and fat. This is why it is necessary to bring in boars of the best world-known classical breeds from Europe. Experience has shown that the best-producing breeds are crossbreds with Landras, Dyurok, and Petren boars and the sows traditionally bred in Armenia. The crossbreds of the mentioned parents are known as having a good weight gain, high flesh output, high level of feed compensation as well as high quality and good taste.

Given the interest of Armenian farmers in further development of pig breeding and their readiness to invest their own money, the Government will make financial intervention for importing the above productive animals. Simultaneously, it would be appropriate if the Government partially compensates the artificial insemination expenses and encourages production of root fodders and concentrated feed.

4.4.4. POULTRY BREEDING

Poultry breeding has traditionally been one of the most intensively developing sectors in Armenia.

In 1990, the country produced 640,000,000 eggs and 31,600 tonnes of poultry meat. In early 90-es, during the economic crisis, only 6 incubation stations, 4 pedigree poultry farms and 23 regular poultry farms were in operation, with the

overall production capacity of 2.5 million layers and 25.4 million broilers.

For the known reasons, during 1991-1997, the poultry industry appeared in a poor situation like any other agricultural industry in Armenia, which led to a dramatic decrease in production volumes. However, starting from 1998, due to private investments, further decrease was prevented and good prerequisites were created for development.

The total heads of poultry in Armenia is now more than 6.8 million, of which 4.5 million are in commercial poultry factories, and the remaining 2.3 million – in small-scale family operations.

Most of the poultry products are produced in Kotayq marz only. There are four large factories specialized in egg production:

- Lusakert pedigree poultry factory with about 650,000 layers. The factory produces 120,000,000 – 150,000,000 eggs and 700 tonnes of meat yearly.
- Arzni pedigree poultry factory, where about 550,000 layers produce about 90,000,000 eggs a year, plus 600 tonnes of meat.
- Getamej poultry factory has about 300,000 layers and produces 40,000,000 eggs and 450 tonnes of meat yearly.
- Lusakert poultry factory has about 150,000 layers and produces 20,000,000 eggs and 200 tonnes of meat yearly.

Syuniq poultry factory in Syuniq marz and Shirak poultry factory in Shirak marz are now operating at low capacity.

In Lori marz, the Pyunik pedigree reproduction poultry factory has 30,000 heads of broiler and layer types of mother stock. This factory produces eggs to supply to other factories in Armenia.

Yerevan poultry factory has 650,000 layers and produces 120,000,000 eggs and 700 tonnes of meat yearly.

In addition to the above large poultry operations, as mentioned above, there are also middle and small-scale operations in many different places, especially in Ashtarak, Echmiadzin, Yeghegnadzor, and Ararat.

The Argo poultry farm established on the basis of the former experimental station in Yerevan specializes in breeding of the local Yerevanian breed of chickens, turkeys, and ducks.

Thus, the main suppliers of eggs and broiler to the domestic market are commercial poultry factories. Their further expansion depends on the increase in the volume of production of local grain feeds.

Arzni pedigree PCS OJSC

- After the collapse of the Soviet Union, Arzni poultry factory went bankrupt with almost ruins left. The factory was purchased in 1996 by Marat Janvelyan and, after a short time, thanks to the investments made, the factory started to operate.

-Over time, the company expanded its operations and became the largest poultry, cattle and pig breeding farm in Armenia.

-600,000 hens produce 100,000,000 eggs every year.

-The farm breeds Holstein, Simmental, and Caucasian Brown breeds of cows. Daily growth of calves makes at least 1 kg.

- A unique local pedigree breed of pigs selected by Armenian researchers has 2 extra ribs compared with the regular breeds, which ensures higher pork output.
- Use of mountainous pastures not only enhances the milk yield but also provides ecologically clean cow milk with high fat content.
- The company offers a wide range of high quality milk products to the market.

4.4.5. BEEKEEPING

Armenia has favorable conditions for development of beekeeping. Therefore, beekeeping has been one of the favorite operations in the country since ancient times. In Armenian villages beekeepers were believed to be the people with the most prosperous families, prestigious rank, and developed intellectual faculties.

History tells us that the apiaries in the Armenian Highland were not only producing honey, beewax, bee venom, propolis, and bee bred, but also bees were used to pollinate agricultural crops as well as to combat enemies. Yes, there really are evidences in the history of the 5th-10th centuries that

Armenians were using bees while fighting for freedom against conquerors. This is how it happened. When the enemy was passing through the fathomless canyons or mountain foots, Armenian warriors were first releasing sennits (hives spun from tree sprouts) onto the foe's cavalry, thus creating panic amongst them, and then they were attacking all of a sudden.

By mid 19th century, the beekeeping was developing by primitive methods. Starting from mid 19th century, production of wax paper and creation of honey flow device gave a second swing to the development of beekeeping.

In 1912, there were 26,000 bee families in today's territory of Armenia. Significant development of beekeeping in Armenia occurred in 70-ies – 80-ies of the 20th century. By 1971, the number of bee families had reached to 150,000. According to specialists, full pollination of entomophilous plants in Armenia requires 250,000 bee families.

In the first decade (starting from 1991) of agrarian reform, beekeeping faced decline. Because of rapid dissolution of agricultural enterprises, dramatic reduction in areas under orchards and lack of genetic improvement activities in beekeeping, this sector was almost broken-up. The statistic data of 2003 indicated only 77,000 bee families left in Armenia.

In the new conditions of economic activity, merge of the Apiculture Research Center of the RA Ministry of Agriculture and "Nektar" Research-and-Production

Multi Agro research and production center of the Multi Concern was established in 2003 as a result of merger of Tsarukyan Research/Production Center LLC, the former National Research/Production Center of Apiculture and the Apiculture Research/Production Station of Kotayq marz.

Tsarukyan RPC LLC was founded in 1989 by Gagik Tsarukyan. The goal of the center was to develop animal husbandry in Armenia ensuring a special focus on preservation of local breeds

Multi Agro has continuously succeeded in all fields of its activities. The heads of sheep has reached 2,800 – 3,000 having started from 280. This growth is achieved through natural reproduction of the herd. 46 heads of cows of Caucasian Brown breed acquired in 1991 have now become 680, while the growth obtained each economic year is sold as pedigree calves to needy households at 30 percent lower than market prices.

Fish breeding is another, comparatively small operation of Multi Agro RPC.

There are 52 crossbred English and Arab horses in the Center's herd.

8-10 tonnes of milk is processed daily in the milk processing operation of Multi Agro RPC; high quality milk products, including 9 types of Armenian cheeses are produced.

Union was a reasonable step in putting the beekeeping sector onto scientific bases. The new owner, Multi-Agro Research-and-Production Union LLC preserved the union's research potential and improved its production and technological capacities. Moreover, in the years that followed, under the leadership of Mrs. Roza Tsarukyan, the as-industrious-as-bee CEO of the Multi-Agro RPU LLC, started to unite beekeepers throughout the country and provided free hives and consultancy to socially vulnerable bee farmers. Multi-Agro funds research works in apiculture. Control of bee diseases and pests as well as safeguarding the Armenian Yellow bee's genetic recourses are issues of special focus.

Currently, Armenia has over 250,000 bee families. The honey received from the nectar of the flower-abundant Armenian mountains is unique for its color, flavor, and healing ability. There still are certain technical difficulties in exporting the Armenian honey, which will be addressed in the nearest future.

4.4.6. AQUACULTURE

Armenia has decades of experience in aquaculture (fish farming) development. The first fish farming operations were established in mid 1920-es in Karchakhbyur and Gavar for artificial reproduction of Sevan Trout, followed by similar operations founded in Sevan and Lichk. The latter were releasing 7,000,000 baby fishes and larvae of trout, 100,000,000 baby Koghaks and 20,000,000 White Fish.[2]

The next stage of fish farming development started in 1970–es when commercial level fish farming started to develop. During those years, several state-owned fisheries were established to efficiently use the water resources and water-covered areas in the Ararat Valley. Not only vegetarian fish (White and Black Amur, White and Spotted Silver Carp and others) but also coast Rainbow Trout fed with animal feed was bred on commercial scale. In mid 1980-es, the water surface of only Armash, Sis and Yeghegnut pond farms was about 6,000 hectares, with an annual volume of commercial fish production (mainly Carp and European Carp) making over 5,000 tonnes. Simultaneously, 100 tonnes of high value commodity fish, Rainbow Trout, was bred in the fishery operating in Taronik village in the Valley.

The third stage of aquaculture development in the Republic of Armenia started in 1990-es and coincided with the shift from the former command-administrative

1. Materials by Doctor of Agriculture A. Hovhannisyan have been used in this section.

system to the market economy and the period of economic reforms. Thanks to private investments, currently a number of large fish farms have been established which have effective operations due to rational use of water resources and developed

AquaTechAutomatica CJSC

AquaTech Automatica CJSC was founded in July 1996. The 100% shareholder and the Director of the company is Arkadi Gevorgyan who is also the President of the Association of Armenian Fish Breeders.

The fish farms of the company are located in Ararat and Armavir marzes. Water from Artesian wells is used for fishery operations; this water is absolutely pure, saturated with oxygen, with the water temperature being stable during the entire year: 13^0 C -14^0 C. These properties support the rapid and lasting growth of fish, being optimal for trouts all the year round. Artesian water is close to drinking water by its composition and does not contain pathogenic microbes, thus practically excluding diseases and, therefore – excluding use of medications (antibiotics).

Fish are fed with feed produced by the internationally recognized Coppens International firm.

In 1998, for the first time in Armenia, AquaTechAutomatica experimentally produced sturgeon baby fishes by incubation method. It was in this company that black caviar was obtained through roe for the first time. The company has its maternal stock. Production of black caviar is a perspective program since this is a new field in Armenia and there is no competition in the domestic fish industry.

The company's share in the overall volume of marketing is 20%. Currently AquaTech markets the following products:

- Trout, Golden Trout, (fresh, fresh frozen, cold smoked, and cold smoked chopped filleted fish in vegetable oil)
- River Trout, Gegharqunik, (fresh, fresh frozen, cold smoked, and cold smoked chopped filleted fish)
- Sturgeon (fresh, fresh frozen, cold smoked, and cold smoked chopped filleted fish)
- Sheatfish
- Roe of Trout and Sturgeon

The Director of the company Arkadi Gevorgyan has performed thorough researches in fish industry and has made investments thus contributing to the development of fish industry in Armenia.

The company markets its products in both domestic and export markets such as Russia, the Ukraine, Georgia, Kazakhstan, Canada, United Arab Emirates, and elsewhere.

The company has participated in different international and local exhibitions (ArmProdExpo, PanArmenian Expo, Gulfood, Seafood, Georgia Food Expo, Worldfood Moscow Exybition, etc.) and received a number of awards. The company's produce was awarded the Best quality of the Year prize at the ArmProdExpo 2009.

infrastructures. Some of these enterprises have started feed production and fish processing plants in addition to commercial fish production ponds. A large fish marketing network is now active in Yerevan and throughout Armenia, and a part of product is marketed abroad. In particular, frozen fish as well as processed fish and caviar are exported to the United States, the Republic of Georgia, the Russian Federation, the Ukraine, and elsewhere.

Over the recent years, an abrupt growth in production of high value fish types like Trout (Salmons) and Sturgeons is observed. According to the data of the RA Ministry of Agriculture, 5,000-5,500 tonnes of fish is annually produced in Armenia, of which 30%-35% is the share of fish grown with vegetable feed and 65%-70 % - with animal feed.

The main fish types grown with vegetable feed are White and Spotted Silver Carps, White and Black Amur, and the main fish types fed with animal feed are Sevan Summer Trout, Gegharquni, Rainbow Trout, River Trout and Sturgeons.

Japanese carp and African Sheatfish have been experimentally grown in the Armenian fish farms during the recent years. Commercial breeding has indicated that they have a highly intensive growth and allow to reduce the areas of commercial fish breeding. Moreover, AquaTech Automatica LLC is currently introducing a modern intensive technology of commodity fish production which enables a multiple reduction of water volumes thus allowing to grow 200 kg of commodity fish in one cubic meter of water.

The growth in number of fish farms is combined with expansion of their locations from Ararat Valley to pre-mountainous and even mountainous regions.

It's remarkable that tendencies of establishing cooperatives in the field of fish industry are currently noticed in the country. Fish farms jointly purchase baby fish and concentrated feed or market fish product.

Over the last decade not only the assortment of commodity fish has increased but also the share of fish types grown with vegetable and animal feed has changed dramatically. Thus, while 90% of the commodity fish produced in Armenia in the past were the vegetarian fish (mainly Carp and European Carp), and only insignificant amount of Rainbow Trout was produced, currently this relationship has radically changed in favor of high value fish types fed with animal feed: Salmons and Sturgeons.

There are nearly 40 types and subtypes of fish in natural and artificial water-covered areas in Armenia, of which 15 are used for commercial purposes. Currently, fish types considered non-endemic for the Caucasus region are grown on commercial level, including: White and Black Amur, white and Spotted Silver Carp, Japanese Carp (Koyi), African Sheatfish, Siberian and Russian Sturgeons. These fishes, together with salmons (Rainbow Trout, Gegharquni, River Trout, etc.), make about 70% of the commercial fish produced in the country.

According to the data of the UN Food and Agriculture Organization, the share of fish and fish products in human food has dramatically increased over the recent years. Similar tendencies are observed also in Armenia. This factor has served a serious incentive for increasing the volumes of commercial fish production and continuously establishing new fish farms throughout Armenia. As a result, fish farms are currently operating in all marzes of the country.

According to 2009 data, there are 234 fish farms in Armenia, of which 183 or 78.2% are located only in Armavir and Ararat marzes.

The total water surface of the pond fish farms makes 2,677 hectares, of which 1,860.7 hectares or nearly 70% are located in Ararat marz and 722 hectares – in Armavir marz. According to the water basin surface, the country's 4 largest fish farms have overall 2,000 ha of surface or 74.7% of the total water area. The total surface of the rest of fish farms makes 677 ha, with average farm occupying about 3.0 ha.

From each hectare of water surface used for commercial fish production, average of 1.96 tonnes of commodity fish is produced. This indicator is different for different fisheries; for instance, in the pond farms where mainly thermophilic, vegetarian fish types are bred, 300 fish are produced per 1 hectare; while the output of salmons and Sturgeons per 1 hectare makes only up to 100 tonnes in reservoirs with cold water.

The amount of commodity fish produced per unit of water surface of fisheries still remains rather low. Estimations indicate that in case of efficient use of water surfaces handled by fish farms across the country, it will be possible to increase the volume of commercial fish at least 5 times. Nonetheless, fish farming is one of the profitable businesses in Armenia even with the current level of water resource use.

Calculations indicate that the value of annually produced commodity fish makes about 6.0 billion AMD. In fact, per each hectare of water-covered area used for fish farming, 2.24 million AMD-worth commercial fish is produced. This is a very humble result, to say the least. Moreover, the value of the gross produce of salmons and sturgeons per 1 hectare of water surface of special reservoirs reaches up to 100.0 million AMD. Obviously, no other food product produced in Armenia can ensure similar value of gross product from a unit of surface like fish farming. In addition, considering the fact that infertile, even agriculturally unsuitable land areas are used for fish breeding, it becomes clear that this industry obviously has high competitive advantages.

5. FOOD PROCESSING INDUSTRY

The food processing industry is the locomotive in the overall development of agriculture in Armenia. During the Soviets, processing enterprises with huge production capacities were operating in this system, with the Armenian-produced brandies, wines, canned fruits and vegetables and fruit juices enjoying a very high demand.

Following 1991, during the first phase of the agrarian reform, when Armenia was in the state of economic blockade, processing enterprises almost stopped their activities. In those years, family-size processing operations started to grow since the volumes and prices of raw product supplies had decreased, and the farmers had no other choice but processing their product on their own in homestead conditions just to avoid spoilage of the product.

However, starting from 1998, through investments from the private sector and supported by international agencies, the situation in the agri-processing industry was remarkably improved. Having the active intervention by the RA Government, four fruit and vegetable processing companies - Ararat cannery, Artashat cannery, Armavir cannery, and Armavir wine factory - were included in the Swiss Andre Group's project in 1999 aimed at providing equipment for aseptic packaging of tomato paste and fruit concentrates. The project was supported by the Lincy Foundation and the USDA Marketing Assistance Project. It was a loan project of about $6,000,000. This was one of the first similar projects in Armenia and unprecedented in terms of the amount of loan money. As a result of the measures taken, the amount of canned vegetables made 40,000 tonnes in 1999 versus the 4,000 tonnes in 1998.

In addition to tomatoes, the problem of purchase and processing of apricots, apples, and peaches was resolved. The above companies were able to succeed in production and export operations, and their own working capital was created to purchase raw product. During the next few years, many other companies also acquired similar equipment.

Among large investments, that of the French Pernod Ricard is worth mentioning: they invested $30,000,000 in brandy production. The French Castel invested another

$18,000,000 in beer and mineral water production. The Armenian-Canadian Grant Tobacco, Armenian-Russian Grant Candy, Armenian-Greek Masis-Tabak and Coca-Cola companies invested more than $10,000,000. With the help of large investments, new technologies have been adopted and technical improvements have been performed in EuroTerm CLSC, Tamara Fruit LLC, Yerevan Wine, Vodka, and Brandy Factory, Great Valley, Vedi Alco, A.K.Z., Artashat VinCon, Artashes, Jermuk Group, Bjni, Yerevani Zovk, Yerevani Garejur, Ashtarak Kat, Geghard, Linda, and in a number of other companies.

The development of the processing industry sector greatly benefited from the World Bank, IFAD and USAID. During the last 2 years, funds from these two agencies and the $8,000,000 loan money provided within the “Concept for assessment of the existing agricultural potential in regions of the Republic of Armenia and the perspectives of economic development” developed by the RA Ministry of Agriculture, investments by other international financial structures and foundations as well as the own investments allowed to create and reequip over 170 small and medium size canneries, wineries, dairy and meat processing factories.

While only 8-10 years ago 7 canneries, 12 wineries and a few dairy and meat processing companies were in operation, today, 30 rehabilitated and newly established canneries, 40 wineries, over 250 dairy processors, 70 meat processing and 4 tobacco-processing companies are active.

Activation of operations in the food processing system and comparative increase in the volume of export have definitely contributed to the mitigation of the agricultural product marketing problem and enhancement of the level of commercialization of farms.

The sustainable development of food processing industry is evidenced by the fact that the enterprises active in the field have started to work with farmers on a long-term contract basis, which is a firm guarantee of marketing of agricultural raw product, proper organization of production and increase in production volume.

In 2007, the processing companies purchased about 144,000 tonnes of grape and 72,000 tonnes of vegetables; these volumes exceeded those of 1998 for 3.5 and 5.5 times respectively. As a consequence of the 2008-2009 worldwide financial and economic crisis, the volumes of agricultural product purchase have been noticeably reduced (Table 18).

Table 18

Volumes of fruits, vegetables, and grape purchased by food processing enterprises in the RA during 1998-2009

(tonnes)

Year	Total fruits	Total vegetables	Total grapes
1	2	3	4
1998	9,077	4,200	41,938
1999	12,198	39,226	50,300
2000	21,003	39,440	50,714
2001	10,248	26,142	37,032
2002	5,900	52,065	47,026
2003	4,362	96,570	50,947
2004	4,394	35,806	79,539
2005	20,715	42,925	95,592
2006	12,789	67,563	106,055
2007	14,844	57,111	144,389
2008	19,406	38,999	137,356
2009	11,255	32,309	127,740

In the Soviet period, the produce of the processing industry in Armenia - brandy, wine, tomato paste, canned fruits and vegetables - was mainly marketed in the Soviet Union. Today, the geography of the consumer market has been considerably expanded. To develop this tendency, pronounced efforts are being made to improve the quality and marketability of the products as well as standardization and certification. However, food-processing capacities are not sufficient for the potential of farm production. Hence, making further investments in this profitable industry along with development of small and medium size entrepreneurship are one of the most critical priorities.

Table 19

Fruit, vegetable, and grape processing volumes in Armenia

Type of product	Measuring unit	Average of 1986-1990	2001	2002	2003	2004	2005	2006	2007
1	2	3	4	5	6	7	8	9	10
Total preserved fruits and vegetables	Thousand conditional cans	419,156	39,865	53,524	100,220	47,150	91,920	98,860	96,100
	%	100.0	9.51	12.77	23.91	11.25	21.93	23.59	22.93
Including: Vegetables	Thousand conditional cans	143,330	22,705	45,370	92,872	38,839	43,120	66,160	59,000
	%	100.0	15.84	31.65	64.8	27.1	30.08	46.16	41.16
Fruits	Thousand conditional cans	275,826	17,160	8,114	7,348	8,311	48,800	32,700	37,100
	%	100.0	6.22	2.94	2.66	3.0	17.69	11.86	13.45
1	2	3	4	5	6	7	8	9	10
Grape wine	Thousand decalitres	4,636	639	654	204	232	242.5	383	365
	%	100.0	13.78	14.11	4.4	5.0	5.23	8.26	7.87
Champagne wine	Thousand decalitres	229	58.0	62.0	67.0	57.0	52.0	54.3	57.9
	%	100.0	25.33	27.07	29.26	24.89	22.71	23.71	25.28
Brandy	Thousand decalitres	1,119	503	606	722	710	879	906	1,408
	%	100.0	44.95	54.16	64.52	63.45	78.55	80.97	125.83

Wine and Brandy industry is one of the most important branches of the Armenian economy. Although Armenian winemaking dates back to the ancient times, industrial winemaking started in the country only in 1870-es. Brandy industry was established in 1887. A short time after, due to its supreme flavor and other qualities, the Armenian brandy (cognac) was taken to Europe for diplomatic dinners and elite receptions.

Due to the valuable local raw products and the use of new technologies, Armenian brandies and wines are awarded medals and prizes at international testing events.

Fruit and vegetable processing industry is another important branch of the food and agriculture sector. Armenian sweet jams, juices, tomato paste, vegetable marinades enjoy great demand both in the domestic and foreign markets. Especially apricot and peach preserves, jams and juices are delicious. In addition to outstanding flavor and taste, walnut, fig, berry and other preserves made by traditional technologies are highly nutritious and healthy.

Cheese production is the largest share in **milk processing**. Armenia produces over 30 types of cheese and 80 types of other dairy products and ice creams. Currently, the country exports brandies, wines, preserved fruits and vegetables and cheeses to the CIS and European countries, Middle East, and the American continent.

6. LEADING AGRIBUSINESSES IN ARMENIA

Yerevan Ararat Brandy-Wine-Vodka Factory is located in one of the most beautiful places in Yerevan, in the gorge of River Hrazdan. The factory was built in the place of the 16th century Yerevan Fortress destroyed by earthquake in 1858. The Yerevan Fortress area was purchased by Nerses Tairyants in 1865 to start wine and brandy operation advised by his cousin Vasili Tairov. In 1898 Tairyants leased to and in 1899 sold the factory to Nikolay Shustov and Sons Company which was controlling 80% of the Russian alcoholic beverage market at the time.

The unique flavor and the high quality of Armenian brandy (cognac) were obtained thanks to the years-long efforts by prominent specialist Mkrtich Musinyants, Kiril Sinchenko, Margar Sedrakyan, Academician Janpoladyan, and others. Prime Minister Winston Churchill used to say, “Never be late for dinner, smoke Hawaiian cigar, drink Armenian cognac and you will always be healthy.”

During 1920-1989, the factory had achieved a high level of development and recognition; however, it was nearly abandoned after the collapse of the Soviet Union.

In 2002, the factory was purchased by Multi Group concern. Intensive investments gave a second birth to the factory: traditional recipes and technologies were rehabilitated with new production lines set up. Prominent Russian author Maxim Gorki has written, “It is easier to ascend Mount Ararat than go up from the cellar of “Ararat”… There is so much sun in this drink.”

The assortment of the Yerevan Ararat Wine-Brandy-Vodka plant can be found now in American, European and NIS markets.

Yerevan Brandy Factory’s history goes back to 1887 when Nerses Tairyants, for the first time in Armenia, distilled wine in commercial amounts, following the traditional French method. The reputation of the Armenian brandy (cognac) soon went far beyond the boundaries of the country. The glory of the Armenian brandy

started in 1907 when it was awarded a bronze medal in French Bordeaux. In 1920 the company was nationalized.

The legend of Armenian brandies continue due to such famous brands like Ani, Vaspurakan, Akhtamar, Tonakan, Nairi, Erebuni, and others. The French Pernod Ricard purchased the company in 1998 thus marking a new phase of development. The company has established mutually beneficial long-term contractual relationships with grape growers; a new bottling system was set up; new technology and unique equipment were put into operation; the barrel plant was restored, etc.

The company markets 7 high quality and 4 exceptional quality brandies.

In 1999, by the initiative of the Yerevan Brandy Factory, state standard was developed and adopted which specifies all requirements and criteria that should be met by producers of products labeled “Armenian Cognac”.

92 % of the company’s produce is exported to 25 countries.

Vedi Alco LLC is one of the leading companies in the Armenian wine industry. Vedi Alco incorporates three large companies: Getap Winery established in 1938,

Vedi Winery established in 1956, and Vedi LLC established in 1994. Vedi Alco produces over 50 alcoholic beverages including wheat and fruit vodkas, over 20 high quality dry, semidry, sweet and semisweet wines, brandies produced by traditional technology, and champagnes. Getap Vernashen and Areni wines are in popular demand. Wines produced by this company are exported to Russia, the U.S., the Netherlands, France, the Ukraine, Belarus, Baltic countries, etc. The company’s produce has been awarded over 90 gold, silver and bronze medals.

Getnatun LLC was established in 1991 in Yeghegnadzor, Vayots Dzor marz, by Aghasi Baghdasaryan and his family. In 1999, the company launched production of high quality natural wines from Areni variety grape. Today, Areni and Vernashen brands produced by Getnatun are the most desired wines in the domestic market, while 65% of

the company's produce is exported. Overall, the company produces more than 10 trade names of 7 types of red and white, aged and young natural wines kept in oak barrels. The company has been awarded over 30 medals at international taste testing events.

This success during only 10 years was due to the Black Areni and White Voskahat grapes from the company's grape nursery (aborigine) plantations located on 1,400m-1,450m above sea level and from neighboring farms; the up-to-date European equipment; traditional technology (Vayots Dzor region is known for thousands of years' history of winemaking); certified international quality control and food safety standards.

Getnatun Winery, with its tasting room and its vineyards, has now become an important Agritourism site.

Gyumri- Garejour LLC. Brewing in Gyumri has an ancient history. First written records refer to the 7th of May, 1898. In 1967 the volumes of beer production increased and it became well- known throughout Armenia due to its high quality. This quality was mainly conditioned by the use of the local raw products and the peculiarities of the local spring water, perfectly suitable for beer production.

The disastrous earthquake of 1988 entirely destroyed all the sections of the brewery. Reconstruction activities started only after the privatization of the brewery in 1995. The company emphasizes the preservation of traditional technologies, making them appropriate to the international standards and taking into consideration the applicable innovations. The company currently produces Gold, Classic, and Lager beers. Production of soft beverages was recommenced in 2008.

Currently, a large-scale reconstruction and modernization activities are underway in the company, with up-to-date assembly lines and filling and labeling machines imported from Germany.

In March 2010, Gyumri-Garejur introduced its products in the Georgian market. In addition, agreements have been negotiated about export to other countries.

Aleksandrapol. This is another Gyumri-based company with a history going back to 1881, when famous brewer Tsaghikyants bought hotel Grossi and reconstructed it into a brewery. Tsaghikyants used traditional technologies, at the same time introducing a number of innovations. Barley was used as raw product and ice was

used for cooling the fermented beer; ice was brought from the Akhuryan River in carts.

After the disastrous earthquake of 1988 the brewery was fully destroyed and turned into ruins. Only in 2000-s the brewery was reconstructed by Samvel Balasanyan who preserved the initial architectural style. There is also a chapel in the yard that was also reopened recently after many years of Soviet period when it was serving as a granary.

Aleksadrapol beer is brewed from natural raw products, with no additives used. The company uses the most expensive varieties of hop and malt. Aleksandrapol beer has clear malt and expressed hop flavor and aroma, typical to the lager beer type.

The company's marketing strategy is to ensure a leading role among other premium type beers in the Armenian market. Efforts are now being made to export the produce, even though the production process has started only a few months ago, in October 2009.

Yerevan Brewery was founded in 1952. During nearly 60 years of its existence the company has been one of the leading enterprises in the food industry of Armenia and had its substantial input in the development of this sector. The company has always been faithful to the age-long traditions of the Armenian brewery. 1997 was a turning point for the factory. The enterprise was restructured into a joint-stock company and entered a new phase of dynamic development, conditioned by the need for the renovation and modernization of the production. The *Kilikia* brand came into being in this period. Today, this brand is one of the most demanded and famous products in Armenia.

To ensure maximum consumer satisfaction, the factory produces light, dark and semi-dark varieties of beer. Since 2008 the factory has been producing a new *Hayer* premium beer using state-of-the-art technologies from famous European companies.

Since 2004 the company has confidently assumed the position of the leader of the internal consumer market. In 2009 the Yerevan Brewery produced 668,9 thousand gallons of beer, i.e. 61,8 % of all beer produced in Armenia and 79,7% of all beer exported from the country. Today, you can come across *Kilikia* beer on the markets in Russia, the US and some European countries. *Kilikia* beer has won 3 "Grand Prix", 30 gold, 3 silver and 2 bronze medals at national and international events.

In 2000 the company launched the production of natural fruit juices that are exported to Russia, the U.S., France, Singapore, New Zealand, Malaysia and other countries. In addition, the company produces jams, juice concentrates of different fruits as well as canned grape leaves.

Kotayk Brewery was founded in 1974 by an expert from Czechoslovakia. Thanks to its high production capacity of 500,000 hl and high-standard beer produced with the help of the latest Czechoslovak technology developments, the Kotayk Brewery became a leading supplier of beverages to the Caucasus countries and to Russia.

Like all post-Soviet factories, Kotayk Brewery also encountered many difficulties in the first years of Armenia's independence. In 1996, the shareholders of the privatised factory eventually decided to cooperate with the famous Castel French group. In 1997, the 17 million dollar investment by the Castel group was one of the first major and important investments in Armenia.

Since its establishment, the Kotayk Brewery has satisfied the needs and the demands of its customers both in Armenia and abroad. The high quality of product is guaranteed thanks to local resources: ecologically clean water of Katnaghbyur, known for its great taste and quality, local high quality barley and malt, as well as hops imported from Europe.

Kotayk Brewery does its best to preserve the position of a leader in the local market and to satisfy the increasing needs and demands of its customers.

The success Noyan brand of **EuroTerm CJSC** was guaranteed from the very beginning, 1998, when the company signed an agreement with the world-famous Swedish Tetra Pak, the producer of liquid food packaging equipment, on launching production of aseptic natural juices and sterilized milk. In 1999, the first Noyan juices were produced with equipment that has 5 tonnes per hour capacity. In 2001, the company imported and set up a production line with a capacity of 10 tonnes per hour. In addition to different delicious fruit juices, in 2004 Noyan brand started to produce 22 types of preserved fruits. The company uses ecologically clean raw products.

Noyan juice factory has recorded continuous increase in the volumes of local raw product purchase and production output, new jobs, and volume of export. In 2005, for instance, the company was awarded a gold medal of the Ministry of Agriculture for "Best achievements in agriculture" due to 5,000 tonnes of raw products purchased form Armenian farmers.

Noyan juices enjoy a good reputation and recognition not only in the domestic market but also in a continuously increasing number of markets in the Russian Federation, the United States, France, Georgia, United Emirates, and Australia.

Lusakert Poultry Factory was founded in 1965, in Nor Geghi community, Kotayq marz. The initial capacity was 200 million eggs and 630 t of broiler yearly. Today, this is the largest poultry factory in the South Caucasus. In 1987-88, the production reached its peak: 650,000 eggs daily from 1 million hens.

The factory did not operate during 1992-98. In 1998, the factory was purchased by Max Group and restarted its activity. It occupies a territory of 134 hectares. The company is among the top 300 taxpayers in Armenia. In 2009, the company produced 1 billion 200 million eggs. During the period of 2006-2009, 1,200,000 kg of broiler was produced.

Arpa Alco LLC is the legal successor of the former Kimley winery established in 1999; it was renamed in 2009. In addition to grape wines, the company is now producing also fruit wines. The company has its own 10 hectares of vineyards and 5 hectares of fruit orchards. Respectively another 20 and 10 hectares are now being established. The company is located in the Areni community of Vayots Dzor marz, known for its Areni grape variety and ancient grape growing and winemaking traditions. The company's geographical position is very favorable for not only grape and fruit growing but also for agritourism development since there are a number of historic monuments in the neighborhood, including the gorgeous Noravank monastery. This community is also famous for the nationwide annual wine festival where Arpa Alco takes an active part.

Bari Samaratsi ("Good Samaritan") LLC meat processing company was founded in 1994, by Hovhannes Hovakimyan. Starting from only 50 square meters of production space and 10 employees, the company has now become one of the leaders in the industry with over 70 products (sausages, basturmas, hams, smoked products). Seven recognized technologists from different countries have worked with the company during 2009. German and Swiss equipment are used. 50% of the raw product is purchased locally. The raw product passes a multi-degree testing. Spices and filling membranes are imported from Italy, the Netherlands, and Poland. Sanitation meets

the existing European standards. A number of international awards speak for the guaranteed high quality safe product.

Products of Bari Samaratsi are marketed locally as well as in Artaskh, Georgia, and Russia.

Sis Natural LLC has started its activity in 2000. The company produces natural juices, fruit preserves, jams, marinades and other canned vegetables. In 2005, in addition to Sis brand, the company began to produce also Yan juices. This brands attract the consumer with the delicious taste and the unique design of bottles. Yan juices do not contain sugar, preservatives, and other additives. The delicious assortment of Sis and Yan juices, including especially pomegranate, sea buckthorn, and rosehip juices, are preferred by many thousands of Armenian as well as Russian, Ukrainian, Turkmen, Georgian, U.S. Australian, Hungarian, Belgian, German and other consumers.

Atenk LLC was founded in 1993 and started its activity by producing only three types of sausages. The company currently produces 70 types of products. The company uses local meat as raw product and controls the quality and manages all risks all the way from purchase of raw product through supply to retail outlets in Yerevan and in all marzes of the country. Modern technologies, recognized expertise, and the management strategy make the company one of the leading ones in the domestic market with the guaranteed high quality of produce.

Dustr Marianna LLC is one of the leaders in the country's dairy processing industry. Continuous investments and improvements in the production process have resulted in the high quality products that are unique in the local market. The company is very careful in selecting its employees. In addition, continuous training of specialists is another advantage of Dustr Marianna; in this field, the company cooperates with

the Armenian State Agrarian University. The entire production process meets the international standards, including the requirements for air humidity and temperature.

Thus, selection of high quality raw product, maintenance of strict sanitation norms, advanced technologies, skills and research potential of specialists as well as effective management make Dustr Marianna's products competitive in the market. No wonder, the company has won a number of international quality awards in Switzerland, France, Russia and elsewhere during the period of 2003 to 2008. However, the best prize that Marianna has is the confidence of its consumers.

Meghri Cannery OJSC

Meghri is known for its wide assortment of delicious fruits: apricots, peaches, plums, figs, apples, pears, grapes, persimmons, and quinces. Meghri cannery has been in operation since 1928. Delicious Meghri preserves are made from fruits and berries grown in ecologically clean mountainous areas, at 400m-2000m above sea level. Fertile land and exceptional spring water gives the fruits a unique and succulent taste. Traditional country recipes and handpicked selected fruits and berries are carefully cooked to preserve the fine aroma, taste and abundance of vitamins. In addition to the domestic market, Meghri products are well known in European, Asian and America markets.

Alishan LLC, founded in 2001, is involved mainly in fruit and vegetable processing. In 2008, the company established a greenhouse working by hydroponic technology. The company started production of natural juices and nectars since August 2009. Modern equipment and ecologically clean raw product enables to preserve the initial natural unique flavor of Armenian fresh fruits and vegetables in juices, fruit preserves, marinades, nectars, and dry fruits. The products of the company are much demanded in Armenia and are getting recognition outside the country. The company is planning to produce also steamed beef and fruit and vegetable powders, to substitute, for instance, import of powdered garlic.

Tamara Fruit CJSC was established in 2002. This is the only company in Armenia that is involved in deep freezing of fruits and vegetables. In addition, the company produces juices, compotes, fruit preserves, jams, and canned vegetables. Since 2004, along with traditional production, Tamara Fruit produces organic

frozen and canned fruits. The company produces wild blackberries, rosehip, sea buckthorn as well as certified organic apricot, peach and raspberries. Fruits and berries are purchased from farms certified by EcoGlobe LLC, accredited by DAP. The organic assortment includes: natural juices, nectars, and deep frozen berries and fruits. Tamara Fruit produces also cold teas.

Agrospasarkum CJSC was founded in 1991 on the basis of the Selkhozteknika state enterprise and the Shahumyan collective farm. Vanik Soghomonyan is the president of the company. In 1998, he established the National Union of Farmers and has been its president since then. Currently more than 520 agricultural enterprises and individual farmers are members of the union.

Agrospasarkum specializes in cattle breeding, production of dairy products, construction of rural cottages, and production of tiles, modules, canopies, greenhouse complexes, and profiles.

The main objective of the company is to provide the population of Armenia with high quality products, healthy food and apartments at affordable prices.

Artfood. In 1990-1998, when food processing industry was on the verge of a complete breakdown, Artashat OJSC retained all its equipment and property. In 1998-1999, new equipment and production lines were set up which radically improved the quality and the variety of the produce. The factory became the leader in the canned food industry under the brand name ‘Artfood’.

Today Artfood offers 40 types of ecologically pure, superior quality products in modern packaging. The cannery actively cooperates with farmers through contractual relationship, providing them agricultural inputs for timely farm operations.

The products of Artfood have exceptional aroma and taste.

Yerevan Champagne Wines Factory OJSC was founded in 1939. At the beginning it produced only sweet and dry wines. In 1954 the factory started to produce sparkling wines. In 1995 Yerevan Champagne Wines Factory was privatized and reorganized into an open joint stock company. The company is the only one in the Armenian market that produces a full range of sparkling wines, including classic and collection ones, based on French technologies. For more than half a century the wine produced by the factory has gained love and respect of customers in Armenia

and abroad. The best quality grapes from different regions of Armenia are used in wine production. Due to this, the company's products have won a number of gold, silver and bronze awards at international exhibitions.

VAN 777 Ltd is a small winery in Taperakan village, Ararat marz. The history of the winery started with the purchase of abandoned, marshy land in 1995. The construction started with $5000 initial grant from the USDA Marketing Assistance Project. Then USDA MAP provided the winery with loans to purchase grape from about 100 farmers, as well as for acquisition of production line, bottles from Italy, tanks and semiautomatic filling and corking machines. In addition, USDA MAP and later its successor, CARD, provided technical support in promotion of the wonderful Tushpa wines of VAN 777. Agritoursim and quality improvement topics were provided during trainings and consultations by foreign experts.

Currently Van 777 cooperates with more than 150 farmers from Taperakan and neighboring villages. The company has also become an important agritourism site due to its exceptional wines, attractive tasting room, and its location in the proximity of Khor Virap Monastery, under the gaze of Mount Ararat.

Elola CJSC dairy processing factory is located in Verishen village, district of Goris, Syuniq marz. The company (formerly known as Goris cheese factory) was established in 1929. It used to produce only traditional Chanakh cheese as well as matsun, sour cream and butter. In 2003 the factory was purchased by today's owner and renamed Elola CJSC. The company underwent a capital renovation and re-equipment. Currently the company produces ecologically pure and high quality products made from genuine milk coming from Alpine valleys - Lori, Chanakh, Chanakh in salt water containers, Suluguni, and Smoked Suluguni cheeses as well as sour cream. The company cooperates with 400 farmer families who supply milk. Elola currently exports its products to Russia and is planning to export also to Georgia.

Dustr Melania LLC was established in 1996 in Tashir, Lori marz. The company specializes in high-quality cheese production from high quality milk that comes from the Alpine meadows of the traditional milk producing districts of Tashir and Stepanavan at 1,500m -1,600 above sea level.

Dustr Melania LLC produces Alashkert, Lori, Tashir, Chanakh, Holland, Chechil, and Suluguni cheeses that have distinguished pleasant flavor. Cheeses of Dustr Melania are exported to Russia and the U.S. since 2001.

HAM was established by Armen Mehrabian in 1996 as a small family business. HAM produces wild crafted herbal teas and spices in strict accordance with rehabilitated,

mastered and patented ancient Armenian technologies and recipes. HAM is located in Alaverdi, Odzun, Lori marz, known for its favourable climate and rich fauna. The first year was a trial period, when HAM's management experimented and enhanced the ancient collection and blending techniques. All herbs used in HAM products are handpicked by local peasants. Herbal tea is processed using technology that guarantees no chemicals and pesticides in any of the final products. Currently HAM produces about 15 different herbal teas and tea blends, which are marketed under the name "Ancient Herbals" in foreign and local markets. HAM exports most of its produce to the U.S. and EU countries.

7. FOOD SECURITY

Food security is one of the important elements of the overall national security; therefore it has always been one of the key economic policies.

According to the law of the Republic of Armenia "On Food Security" (2002), the food security of the country is considered guaranteed in case of such level of economic development that ensures the physical and economic access of food that meets the established healthcare (physiological) norms, as well as – in case if food supply is impossible (insufficient) in states of emergency – exclusion of occurrence of food crises. This is possible only in case of ensuring the necessary level (self-sufficiency) of production of vital food products and creation of reliable government food reserves. Therefore, food security in the country largely depends on the overall development of the agri-food system, taking into account also the existing potential of work, production, material and technical, land, water and other resources in this particular section of economy as well as the fact that currently and in the visible perspective the main source for improving the living standards of the rural population is the income received from agricultural activity.

Due to the economic reforms underway over the recent years, definite prerequisites for improving the level of the country's food security have been formed. Nonetheless, there still are a lot of problems in stable and full food security of the population (especially in emergency situations).

Commercial wheat. In 2003-2009, the self-sufficiency in commercial wheat made 38.4 percent on average. The average production indicator in 2003-2009 made 227,300 tonnes. It is envisaged to reach the wheat production volume to 375,000 tonnes in 2020 through application of extensive and intensive factors – mainly by increasing the yielding capacity. In this case the sustainability level will make 64.2%.

Potato. The level of self-sufficiency in this product has increased over the recent years. In 2003-2009 it has made 99.8%, with mainly imported high quality seed potato. Taking into consideration the potential of potato export, especially that of early season potato, essential increase in the volume of export has been set out for a midterm perspective.

Vegetable crops and melons. The population's demand in vegetables and melons is completely met. Real prerequisites and opportunities have been created to increase the volume of raw product simultaneously with increase in the capacities of

processing companies. The average volume of vegetable and melon crop production during 2003-2009 has made 884,300 tonnes. The average annual volume of export has made 22,800 tonnes, including the processed products. The actual self-sufficiency level during 2003-2009 has made 100.8%.

Fruits and berries. The country is providing a high level of self-sufficiency in fruits and berries. Along with increase in processing capacities, fruit and berry production also has all prerequisites and opportunities to increase volume of raw product. The average volume of fruit and berry production has made 246,900 tonnes in 2003-2009. The annual average export volume was 11,400 tonnes; this includes also the processed produce converted into fresh product. The actual self-sufficiency level, according to the 2003-2009 data, has made 93.3%.

Grape. Grape also ensures high self-sufficiency level in Armenia. Again, increase in processing capacities will create prerequisites to increase the raw product volumes. The average volume of grape production during 2003-2009 was 172,800 tonnes, with average annual volume of export making 900 tonnes[3*]. Actual average level of self-sufficiency in 2003-2009 made 98.8%.

Legume crops. Self sustainability in these crops is on average level. According to average data of 2003-2009, it was 57.1%. Taking into consideration the favorable conditions for growing legumes in Armenia, increase in the volume of production is envisaged, in particular, in the midterm perspective (2020) it will exceed the average level of 2007-2009 by 66.7% and will make 9,500 tonnes.

Milk products. Self-sufficiency level in milk and milk products (except for animal oil) is comparatively high. There are real prerequisites and possibilities to increase the milk production volumes. The average volume of milk production has made 606,000 tonnes in 2003-2009. Average level of import has made 20,500 tonnes, while that of export

[*] The RA Statistics Service did not include the volumes of processed grape in the RA food balance in 2003-2009. It is included in “Other use” section, where data on both commercial processing and processing by individual farms have been included.

– 8,700 tonnes. The actual self-sufficiency level for milk and milk products (except for animal oil) has made 98.1% on average in 2003-2009.

Beef. The country provides higher than average self-sufficiency level for beef, with prerequisites and possibilities for increasing the production volumes. The average production volume in 2003-2009 has made 39,700 tonnes deadweight. Average annual import volumes for the same period were 12,700 tonnes. The average export level has made 1,000 tonnes and has included diverse beef products (sausages, smoked beef, etc.). The actual average self-sufficiency level in beef was 77.3% during 2003-2009.

Pork. The country provides average level of self-sufficiency in pork. The average production level during 2003-2009 was 10,300 tonnes deadweight. The average annual import was 9,560 tonnes for the mentioned period, with the average export making only 70 tonnes. The actual average level of self-sufficiency in pork was 52.7% in 2003-2009.

Sheepmeat and goat meat. The country provides a high level of self-sufficiency in sheep and goat meat. There are realistic prerequisites for increasing the production and export. The average volume of production of mutton and goat meat has made 7,100 tonnes deadweight in 2003-2009. Over the recent years no mutton has been imported, and the demand is fully covered by domestic production. 2009 was unprecedented in term of export: 142,000 heads of sheep were exported to Iran. The huge volume of this market and the further sustainable development of export have given rise to a great interest. There is certain concern about the prices going up in the domestic market; however, we believe this is a temporary concern since the development of this industry will eventually result in a balance between the supply and the demand in mutton in the market.

Chicken. There is a low self-sufficiency level in chicken in Armenia. The average annual volume of production in 2003-2009 was 5,370 tonnes. The average import volume for the same period was 22,560 tonnes. The average self sufficiency level was 21.5% in 2003-2009, with a considerable decrease during the last three years. Increase in the production volume is hindered by the lack of necessary feed base. The competitiveness of the locally produced chicken meat remains weak, since the customs value of the imported chicken is more than twice lower than the cost price of the locally produced one.

Table 20

Current and forecasted indicators of self-sufficiency in the most important food items included in the national food balance of the Republic of Armenia (percent)

Products	Average of 2004-2009	2010	2015	2020
Wheat	38,0	40,4	50,1	64,2
Potato	100,0	103,4	107,5	111,4
Vegetables and melons	100,6	100,7	111,0	120,1
Fruits and berries	93,2	94,8	112,1	121,4
Grape	99,3	101,5	105,5	109.1
Legume crops	56,6	57,4	66,7	79,2
Vegetable oil	4,3	7,2	32,0	69,4
Sugar	2,4	57.5	125,0	176,0
Egg	101,4	100,5	107,0	104,6
Milk (except for butter)	98,1	96,9	99,7	100
Beef (deadweight)	77,7	78,6	81,2	82,4
Pork (deadweight)	50,6	33,1	40,9	51,4
Sheep and goat (deadweight)	107,3	134,6	130,8	170,0
Chicken (deadweight)	20,4	17,2	25	33.2
Total self-sufficiency level estimated by energy value	**58,5**	**66,3**	**76,6**	**83,9**

Eggs. The country provides a high level of self-sufficiency in eggs. The average volume of production for 2003-2009 was 29,700 tonnes by physical weight (540,000,000 eggs). The volume of import for the same period has made 310 tonnes on average (5,640,000 eggs). Basically incubation eggs are imported. The average export level was 810 tonnes (14,700,000 eggs). The actual self-sufficiency level of chicken eggs has made 101.8% in 2003-2009.

Vegetable oil. The volume of the locally produced vegetable oil is very little. However, the processing system of oil-giving raw product is gradually being rehabilitad, which still uses exceptionally imported raw product. The average volume of vegetable oil production has made about 1,020 tonnes in 2003-2009, with the average annual import volume making 20,010 tonnes for the same period. The level of actual self-sufficiency has made only 5.1% on average.

Sugar. The level of self-sufficiency in this important food item has made only 2.4% during 2004-2009. In mid 2010 the newly built sugar plant will be put into operation in Akhuryan community, Shirak marz. The plant will work with local raw product in addition to imported one. In case of working with full capacity, 220,000 tonnes of sugar will be produced every year, of which 40,000 – from local raw product. Thus, the demand of the country's population (90,000 tonnes) will be fully met and a rather good export potential will be ensured.

8. AGRICULTURAL MACHINERY AND MATERIAL AND TECHNICAL SUPPLY SERVICE

One of the basic prerequisites in developing a competitive agriculture is mechanization of production processes.

In the Soviet times, the material and technical supplies were performed in a centralized order. The machinery fleet of agricultural enterprises was equipped with contemporary agricultural machines that were serviced by the agro-service centers. The system of supply of fertilizers, plant protection means, and veterinary medicines was also operating in a centralized order.

During 1991-1993, simultaneously with land privatization, equipment and instruments of the liquidated agricultural enterprises were sold mainly to the drivers.

In the initial phase of agrarian reform, an attempt was made to establish agricultural machinery stations on the basis of local units of the former ArmAgroService agency. However, because of the inefficient management and high cost of services, they appeared to be unable to compete with the private sector. As a result, 95% of the technical servicing of farms is now provided by owners of private agricultural equipment.

Table 21

Number of tractors and combine harvesters, according to the marzes of the Republic of Armenia (as of 01.01.2008)

N	Marzes	Total number of tractors	Cereal combine harvesters	Fodder combine harvesters
1	Ararat	1,267	179	32
2	Armavir	1,260	35	12
3	Aragatsotn	1,780	63	27
4	Gegharqunik	2,648	295	111
5	Shirak	1,660	108	11
6	Lori	750	85	17
7	Syuniq	1,598	300	54
8	Kotayq	1,126	172	26
9	Tavush	797	40	-
10	Vayots Dzor	1,166	82	12
11	Yerevan	725	53	5
	Total	**14,777**	**1,412**	**307**

Source: State Agricultural Machinery Inspectorate, RA Ministry of Agriculture

The agricultural machinery fleet of Armenia badly needs renewal. Our estimations indicate that only 4.5 percent of the currently working tractors have been in operation less than 12 years; the rest have been operating for 13 and more years thus causing increased maintenance costs including cost of fuel per 1 standard hectare, which decreases the productivity by 30% on average (Table 22). Thus use of warn out equipment causes great losses to farms from both economic and organizational standpoints. The low solvency of farmers and the slow development pace in cooperative activities in agriculture continue restricting possibilities of purchasing new machinery.

Table 22

Grouping of wheal and caterpillar tractors according to years in operation

Groups	Years in operation	Number of tractors	Share, %	Change in operation costs, %	Change in per-hour productivity, %	Cost of fuel per 1 standard hectare, kg
1	**1-12**	830	5.6	100	100	18
2	**13-20**	2,243	15.2	115	89	21
3	**21-25**	4,558	30.9	122	80	25
4	**26-30**	4,830	32.8	148	71	28
5	Over 30years	2,271	15.4	155	60	30
	Total	**14,732**	**100.0**	**X**	**X**	**24.4**

This problem is partially solved through grants provided within the Japanese Support to Low-Security Farmers project and through grants provided by the Chinese and Indian governments. As a rule, agricultural machinery provided by these countries is sold to farmers through auction, at lower than market prices.

Fertilizers and chemicals are mainly supplied by private companies. However, within the state support of agriculture, the RA Government is providing partial subsidies to farmers in particular years by partially compensating fertilizer prices. In addition, fertilizers received as humanitarian assistance are sold to farmers with lower than market prices.

The most prospective way for organizing the material and technical supply services on farms is developing cooperatives. The experience of the Federation of agricultural associations, Union of Legal Entities (FAA ULE) indicates that farmer cooperatives create favorable conditions both for purchasing seeds, fertilizers, equipment and other inputs, and for marketing the product.

9. FORESTRY

Protection of environment components in the Republic of Armenia has become a critical issue from the perspective of preventing the continuous common degradation of natural resources, loss of biodiversity and desertification.

As a critical component of natural heritage, a special importance is attached to forests, which has exceptional strategic significance for environmental protection, socio-economic development and assurance of national security. However, the forest ecosystems are now seriously endangered due to negative impact of natural factors and overexploitation.

According to the 1993 inventory data, the State Forest Fund of the Republic of Armenia comprises 11.2% (about 460,000 ha) of the country's total area, of which 334,100 ha is the forested area including 50,000 ha of artificial forests.

Forests of Armenia are mountainous and, along with their expressed land-protective, water-protective and climate-regulating significance, they have an important socio-economic and research value and a rich biodiversity.

By significance, forests of Armenia are classified as follows:

a) forests of protection significance (257,000 ha),

b) forests of social significance (106,000 ha),

c) forests of special significance (96,000 ha).

The average efficiency indicator of the forests in the Republic of Armenia equals to 3.6 side index, the average crown coverage – 0.55, average wood stock is 125 m^3/ha, average annual increment is 1.3 m^3/ha. Per capita, there is an average of 0.11 ha of forests in the country, which, by volume, makes about 12 m^3 in wood biomass.

Forests are mainly located at steep severely ragged mountain slopes at the altitudes of about 500-2500 m above sea level. Forested areas are characterized by temperate climate, dense water network, ragged relief and uneven distribution.

In the northeastern parts of Armenia, forest cover makes 29%, in the southern – 13% and in the central – 2%. Uneven distribution of forests is conditioned by natural-climatic peculiarities and negative anthropogenic impact, which over time resulted in the reduction of forested areas and degradation of associations.

Armenia has a rich biodiversity in general with 236 types of trees and bushes growing in forested areas, of which main forest-forming species are: oriental beech, oak, Georgian oak, oriental oak, oriental hornbeam, Georgian hornbeam and pine of Koch. These species occupy 89.1% of the overall forested areas of Armenia and comprise 97.2% of the total forest stock.

Beech forests are located at the altitudes of 950-2,000 and mainly occupy mountain slopes of northern exposition. Pure beech stands are concentrated at the altitudes of 1,000-1,800 m; in the other mixed beech stands, oak, ash, elm, lime, hornbeam, maple and others occur as accompanying species.

Beech forests, in contrast to oak forests, mainly grow on slopes of northern exposition (northern parts of the country).

Oak stands are characterized by complex and diverse typological composition, mainly occupy sunlit slopes of southern exposition and are located at the altitudes of 600-2200m. Oak forests of Armenia are represented by five species and occupy 35.9% of forested areas, with high-trunk seed stands making 19.2% and low-trunk coppice making 16.7%. By 1993 data, the oak stock of the country's forests makes 12.54 million m^3 (or 29,85%).

Hornbeam stands are distributed in the northern Armenia at altitudes of 900-2000m and in the southern Armenia at altitudes of 850-2300 m; they grow at slopes of all expositions as pure (often of secondary origin) and mixed stands. Being more viable, hornbeam is a strong competitor for oak and beech when self-regeneration conditions are bad for oak and beech. At present, hornbeam stands cover 16.5% of forested areas with the stock of 6.0 million m^3 (14,4%).

Pine stands are a constituent part of the forests of Armenia with Pine of Koch (Caucasian) being the main forest forming species. Hornbeam, oriental oak, and rarely beech occur as accompanying species.

There are artificial pine plantations with common pine and Crimean pine as forest forming species.

At altitudes of 1900-2300m, there are sparse sub-alpine not-dense, mainly mixed forests. Here forest forming species are birch, maple, mountain ash and others.

Over historical times, human economic activity resulted not only in the reduction of forested areas in the country but also significant changes in species composition and areas covered by trees. Areas covered by stands with prevalence of Caucasian pine, yew, hazel-nut and others have been drastically reduced; as a result, they occur in groups or as single trees.

During the 20th century, forests of Armenia at least twice were subject to overcutting. It first happened during the Soviet times, in the 1930-50-s, when annually about 450,000m^3 were cut by final fellings for industrial purposes.

The second period of overcuttings started in 1991 due to energetic crisis and economic blockade. Significant areas of the Forest Fund were damaged due to unauthorized massive loggings. This resulted in the reduction of forested areas, increase of low-value stands with different size trees, deep structural and unfavorable species composition changes, stands lost their natural regeneration capacity, productivity has decreased, disturbance of hydrological regime of forests, activation of the erosion processes, landslides and torrents have occurred.

At present, about 70% of natural forests of Armenia are destroyed and aged, significant wood resources are concentrated in relatively inaccessible mature and overmature forests, where many types of forest use are not possible due to ragged relief and inaccessibility.

Pests and diseases, overgrazing, storms and draughts are also among factors causing forest resource degradation in Armenia.

Irregular cuttings and the lack of forest protection measures resulted in the change of climatic conditions in the forests, as well as the increase of fire risk (high temperature, abundant light, branches and leaves fallen down due to cuttings). They created favorable conditions for massive reproduction of pests and diseases, as well as for stands getting dry and conditions creating risk for fires.

Overexploitation, loggings, grazing, harvesting, land occupation, and other reasons resulted in changes of forest structure and composition of species, loss of woodlands' natural regeneration capacity, decrease of the productivity, reduction of forest cover.

Due to deterioration of some forest plots phenomena like erosion, ravine formation, landslide activation, drying of springs, and occurrence of wind spouts have taken place in the logged districts and adjacent territories. The intensiveness of erosion-slides processes has increased, which causes a great damage to communities and agricultural lands.

Over the recent years, the volume of forest rehabilitation activities have been increased; however, additional funds are needed for large-scale forest regeneration, seed-farming, rehabilitation of forest nurseries, land preparation, forestation and irrigation, provision of agricultural services, maintenance and implementation of other necessary measures.

Joint efforts by the RA Government and NGOs have resulted in a situation when in 2009, compared to 2004, the number of illegally logged trees has decreased 20 times, with 15 times less wood mass.

10. GENETIC RESOURCES

In the overall diversity of the Armenian flora, agri-biodiversity deserves special attention. Armenia is fairly considered as one of the centers of emergence of cultivated crops. This is evidenced by the fact that the age of ethno-botanic materials goes back to the eighth millennium B.C. According to archeological studies, Armenia has been home for cereals, vegetables, melons, and essential oil plants, as well as for numerous types of fruit trees (wheat, barley, rye, lentil, oat, pea, melon, watermelon, apricot, grape, quince, pomegranate, etc.). Because Armenia still preserves the wild species of the mentioned cultivars and centralizes the largest amounts of these plants, the country is considered to be one of the world's centers of origin of many cultivated crops.

Armenia's biodiversity is presented in groups of cereals, legumes, fodders, vegetable and melon crops, and oil-bearing crops.

- *Cereal* crop group includes:
  - 13 types and around 360 subtypes of wheat; Wild Single-Grain, Urartu, and Wild Araratyan types grown in Armenia are 3 of the 4 wild ones known in the world and are distinguished by a wide range of subtypes (over 110 subtypes);
  - Aytsakn ("goat's eye") cultivar - presented by 9 types, again with a wide in-type diversity;
  - Rye – represented by cultivated, field-weed, and wild annual and wild biennial types;
  - Barley – represented by 8 wild types with wide in-type diversity, as well as double-row, intermediate, and multi-row cultivated types.
- *Legumes* – aborigine varieties and forms have been discovered. Wild species of lentil, pea, and bean are disseminated.
- *Forages* – represented in the agricultural diversity by gramineae and legumes grown in many types, ecotypes and forms.
- *Vegetable and melon crops* – represented by a large number of cultivated types: ecotypes and forms of wild beet, coriander, carrot, onion, garlic, and those of

many others are known.

- *Oil-bearing crops* – presented by cultivated and wild flax, mey, orange agaric, hemp, poppy, and many other types, ecotypes, and forms.
- *Fruits and berries* – wild, cultivated and wilding apricot, pear, apple, pomegranate, sweet cherry, oleaster, almond, strawberry, water hyacinth, blackberry, red currant, tamarisk, and other types, varieties, ecotypes, and forms.

Currently the significance of maintenance of genetic resources of plants used in food production and agriculture is growing to become one of the critical components of the agricultural and environmental policy.

Plants' genetic resources are valuable starting materials in crop selection promoting the economic growth, national autonomy and food security, simultaneously playing an important role in maintenance of the environmental balance.

It is a common knowledge that the wild relatives of the crops and the original local varieties bear in their genotype stable genes resistant to different diseases, pests, cold, and dryland situation. Not only the efficient use of genetic resources has an exceptional importance, but also it is inevitable in receiving new hybrids and varieties in terms of enhanced capability adapting to the environment.

Currently, because of man-caused effect, worsening of the environment, and climate change, reduction of natural populations of wild relatives of crops and plant symbiosis is taking place. Along with the development of agricultural production and selection, local variety-populations of crops that are less productive than the modern selected varieties are gradually being phased out of cultivation practices. However, they remain valuable starting materials for adaptive selection due to their adaptation capacity, resistance, and some of their biological and economic features. This said, the necessity of maintenance of crops' genetic diversity is growing even more and becoming a critical component of the policy in this sector.

For the genetic resources of plants consisting of modern cultivated varieties, original local varieties, wild relatives of crops and hybrids and selection lines used as starting material, especially in the form of seed collections, ex situ (out of the natural growing locations) maintenance is of vital importance.

In the Research Center for AgroBioTechnologies, a remarkable progress has been achieved from the maintenance standpoint due to creation of gene bank. The seed collection is enriched and updated through research expeditions, exchange

of genetic material, cooperation with the Armenian State Agrarian University, the research centers under the RA Ministry for Agriculture, Institute of Botany under the National Academy of Sciences of Armenia, as well as gene banks and research institutions of other countries, and international agricultural research centers.

In 2007, the Republic of Armenia signed and validated the international agreement on plants' genetic resources for food and agriculture, one of the basic provisions of which is ensuring the accessibility of crop samples included in Appendix 1 of the Agreement. For ensuring the accessibility of genetic resources of crops, availability of sample description and evaluation data, creation of databases, and development and application of mechanisms for providing samples are considered important. Performance of these commitments was largely facilitated by the creation of genetic bank of agricultural crops and their wild congeners at the Research Center for Biotecnologies under the RA Ministry of Agriculture. Implementation of this program is significantly assisted by the regional office of Central Asia and South Caucasus of ICARDA as well as the USDA Caucasus Agricultural Development Initiative (CADI).

11. ORGANIC AGRICULTURE

The Armenian agriculture has a great potential for developing production of organic food. During the Soviet era, chemicalization of agriculture was one of the main directions of production intensification. The index of use of fertilizers and chemicals on a unit of land area was rather high, and the residual amount of nitrates in food was not really controlled.

During the last 15 years, use of chemical fertilizers in agriculture has been reduced 6-7 times. This process has its reasons and is not at all explained by the wish of farmers to produce organic product. Rather, the low solvency of farmers and the high prices of imported chemicals have objectively limited their use. In this situation, farmers have unintentionally begun to apply nearly organic technologies. To view those technologies as organic, they certainly should meet a number of standards set out by the law of the Republic of Armenia “On Organic Agriculture” and the requirements of the Codex Alimentarius Commission. The accumulated experience itself makes the application of organic technologies more accessible.

It is noteworthy that there is still a low demand in organic food in the domestic market. One of the reasons for this, as already mentioned above, are the agricultural production technologies currently in use and already close to those of organic farming; the purely organic product, therefore, might not be any different by its quality. On the other hand, there are not many organic food consumers in the country yet; since those consumers, apart from their purchasing capacity, also need to acquire a culture and traditions of organic food consumption. Thus, for a country with limited organic food market, it is critical to work on export on the one hand and on formation of the domestic demand for those products on the other hand. Through assistance from the Ministry of Environmental Protection of Germany, an Organic Agriculture Development Center has been established at the Armenian State Agrarian University. The Mission of the Center is, on the one hand, implanting organic agriculture in Armenia and, on the other hand, exporting of organic produce. The latter requires certification of organic technologies and products.

Armenia now has its local independent organic certification company, EcoGlobe. Founded in 2002, the company developed and started to introduce organic production standards and manage the organic certification system in Armenia in 2003. In 2008, EcoGlobe received its first international recognition certificate by the German DAP accreditation agency. This recognition enabled Armenian organic producers to export

Armenian organic produce to the EU and other countries. In 2009, the company was also recognized by the USDA National Organic Project/Program. Under these two recognitions, Armenian organic producers now have access to EU and the U.S. fresh and processed organic food markets.

Shen benevolence NGO, Green Lane agricultural development NGO, and the marz Agricultural Support Centers (ASC) have included organic consultancy in their activities. Further encouragement of organic farming, including training of specialists deserves a special attention; this is an important precondition especially in enhancement of plant protection, soil productivity, animal husbandry and veterinary service, and general quality control activities.

Marketing of organic products is also critical in the overall development of organic agriculture. A number of organizations and projects currently implement favorable market development activities. Among most active local agencies, CARD foundation should be mentioned, while among international agencies – USDA, Swiss Development Agency, the German GTZ, the Dutch Avalon Foundation, the USAID SME, the European TAM-BAS, and others.

Due to the relevant measures taken, organic crop areas are gradually expanding in Armenia. As compared with 110 hectares cultivated in 2003 with Shen NGO's programs, about 850 hectares of cultivated and wild species were reported as organically grown in 2009. These are undoubtedly very modest numbers; however, the interest and growing tendencies are obvious. This tendency is mainly dictated by the processing and export companies, which in turn get the signals from international buyers.

We can recently observe another trend: having started with orchards, organic production is now involving beekeeping, more types of wild cultivars, growing of annual and biennial high value crops. In addition, organization of organic production in pastures, animal breeding, and milk industry are now discussed.

Processing of organic raw product and its presentation at international trade shows and exhibitions is even more critical. The fact is that some Armenian processing companies successfully export their EcoGlobe-certified products to EU and other markets during the last 2-3 years.

What we need is to stimulate expansion of export volumes and make it economically sound, which is possible through expansion of the assortment and the volumes of raw products. This is why processing companies themselves make investments in farm operations.

Training programs for the staffs of retail trade, including supermarkets, are underway to ensure consumer awareness about organic food. Starting from 2005, sales of organic products is more and more visible in Yerevan supermarkets and retail stores, with obviously improved assortment, due to exchange visits to abroad, taste testing events, and trainings.

12. AGRITOURISM

Like many other mountainous countries, Armenia also stands out for its rich recreational resources. The beautiful nature, unique landscapes, cultural-historical and nature-made rock carved monuments, rich flora, Armenian cuisine and traditional hospitality are important factors for development of internal and external tourism.

In 1970-es, agritourism was emphasized as a separate direction in the tourism industry. During the last three decades, this direction of tourism has been rapidly developing. Development of agritourism is directly connected with urbanization processes; urban population growth, as a rule, is combined with decrease in the rural areas and rural population. This process limits the urban populations' interactions with nature and the rural life. Therefore, the nostalgia of the urban people having rural background on the one hand and necessity to use the natural environment and organic food as a part of healthy lifestyle on the other hand create a growing demand in agritourism.

Agritourism is now one of the most critical segments of the tourism industry. As compared with the elite, adventure or hiking forms of tourism, agritourism has a number of peculiarities that account for its rapid development. Most important of those peculiarities are provided below.

1. Agritourism is accessible for nearly all strata of population due to being comparatively less costly. For example, at current prices, one man-day of rest in a rural area makes 5,000 – 7,000 AMD, while traditional resorts charge 2-3 times more. In case of family recreation, expenses of an agritourist go down by 35%-40%.
2. Agritourism, as a rule, is a family tourism that allows especially to improve children's health and teach them work skills. As a rule, rural tourism creates the best conditions for participating in agricultural activities and communicate with the rural life.
3. Organization of agritourism does not require huge investments. The key investors are the comparatively wealthy groups of the rural population. Therefore, development of rural tourism in itself is an important incentive for development of agriculture.
4. Development of agritourism contributes to activation of rural life and development of social infrastructures and culture.

Agritourism (also known as “green tourism” in the West) does not have a long history. As a matter of fact, this is a type of tourism that allows people to be part of rural life for some time, directly contact with Mother Nature, be close to fauna and flora, get exposed to traditions and customs, and participate in agricultural activities. Given also the opportunity to visit historic and cultural monuments in the neighborhood and to enjoy ecologically pure natural food, you will have a complete rest and recreation.

The development of agritourism in itself produces demand for healthy organic food. Therefore, rural families can generate considerable incomes from marketing of their products and contribute to general socio-economic development of rural communities.

Study of the experience of a number of developed countries (Argentina, Austria, Germany, Switzerland, Italy, and others) indicates that agritourism has become a preferable form of recreation for urban population. By the way, while 10-15 days are dedicated to rural tourism during the summer months, in winter preference is given to periodic entertainment type of recreation. Specialized agritourism bases, as a rule, are located in gorgeous mountainous nature close to plantations of different agricultural crops, forest areas, and Alpine pastures. There are different small animal breeding operations within farms that focus on not only producing animal products but also meet the interests of children.

Different forms of tourism are currently suggested by Armenian tourism agencies: elite tourism, winter tourism, adventure tourism, hiking tourism, ecotourism, and agritourism. The last two forms of tourism are often merged due to definite commonalities and complement each other. These forms are in their early stages of development in Armenia; however we can be confident that they definitely have perspectives; most of the sightseeings, historic monuments and attractive landscapes are in rural areas; thus they present a special interest for tourists. In addition, about 60 percent of the Armenian urban population has rural background or origin. Some of them meet their “call of blood” by joining horticultural associations; others prefer to have a rest with the family in the village. Many other urban inhabitants who do not have any relation with villages also show similar interests. This is how the demand among groups of people is formed. Unfortunately, the feedback from the agritourism market is still weak, and the above

groups of people do not find any organized and affordable conditions for rest.

Over the recent years, the RA Government has initiated a number of programs that create firm prerequisites for the development of tourism overall and agritourism in particular. From this perspective, “Yerevan-Garni-Geghard”, “Tatev Monastery Complex”, “Development of Jermuk city” and other programs are distinctive. More details on the opportunities of agritourism development in Kotayq marz is presented below.

Kotayq marz can be considered one of the most favorable areas for agritourism in the entire region due to proper prerequisites available here. This marz is known for a great variety of natural conditions and historic and cultural monuments. On a comparatively limited area (the marz occupies an area of only 2,089 sq. km) there are high peaks (Azhdahak, Hatis, Arayi, Gutanasar), deep canyons of Hrazdan and Azat rivers, wide river gorges and moderate slopes in Kotayq and Yeghvard communities. Altitude from sea level ranges between 900m and 3,595m. Armenia is often called an open-air museum. If this is the case, then Kotayq marz is one of the most valuable and prominent ‘show houses’ of this museum. Lots of burial places, fortress-settlements, Cyclopean fortresses and dwelling places speak for the fact that Kotayq had a rather dense population as far back as 3rd to 2nd millenniums B.C. The famous petroglyphs and vishapaqars (dragon stones) in Geghama mountains prove this statement; in addition, the discovered cultivars of wild wheat, wild varieties of grape and fruits indicate that the local inhabitants were involved in farming thousands of years ago.

More than 3,200 historic and cultural values and monuments are registered in Kotayq marz. Garni temple, the rock-cut church in Geghard, and Kecharis monastery have their particular place in the world architectural heritage. There are other beautiful christian temples in Voghjaberd, Yeghvard, Aramus, Ptghni, Tsaghkadzor, Bjni, Meghradzor and elsewhere.

Kotayq marz has always been and remains a known tourism zone not only in Armenia but also in the former Soviet territory with famous resort places like Hanqavan, Tsaghkadzor, Arzakan, Arzni, Buzhakan, and Garni. Although they are mainly elite and resort tourism centers, however having them in the neighborhood with their therapeutic muds and mineral waters contribute to development of agritourism.

Talking about the traditional Armenian cuisine may take a very long time, and

there is no real need for that; virtually any Armenian hostess can prepare traditional Armenian dishes and even involve their guests in the process. Thanks to their conservative nature, Armenians have been able to maintain not only the dishes but also the traditional hospitality procedures. This can play an important role in development of community-based agritourism. Agritourists are really attracted to taste and learn the secrets of the cuisine in a particular community where they stop.

Many countries suggesting agritourism build special villages with small rural cottages, national furniture and utensils, and national environment. Basically, they are caravanserais where every detail and condition for living is accounted for. The little experience that Kotayq marz has in accepting foreign tourists indicates that tourists prefer to stay in houses of local people and communicate with their families. Such tours have been organized by the Armenian mission of the U.S. Peace Corps; PC volunteers enjoyed living with village families, for example, in Solak and Arzakan villages thus adapting themselves to the existing living conditions suggested by Armenian villagers.

Kotayq marz also has proper telecommunication conditions with mobile phone coverage making nearly 90 %.

The regional Agricultural Support Centers (ASCs) under the RA Ministry of Agriculture, in particular Gegharqunik, Tavush, Vayots Dzor and Kotayq ASCs are attempting to implement small-scale agritourism development programs. However, this important section of agribusiness requires serious investments and effective management.

13. FOOD SAFETY

One of the most important functions of the RA Ministry of Agriculture is management of the food safety system. Integration into the foreign food markets is of strategic significance for Armenia. This means a two-way road: import of necessary products and export of locally produced fresh and processed products. Availability of an effective food safety system is an important factor for developing foreign trade relationships. It plays an important role also in supplying safe and healthy food to domestic consumers.

After gaining independence, Armenia as well as other CIS countries inherited the Soviet GOST system and the sanitary and phytosanitary procedures (SFK), which were tailored to the Soviet administrative-command management system and were definitely different from international standards.

This situation was creating constraints in foreign trade relationships. In addition, in 2003 Armenia became a member of the World Trade Organization (WTO) and undertook an obligation to apply sanitary and phytosanitary measures specified by the Codex Alimentarius Commission and meeting the requirements of the WTO Agreement.

In structuring an up-to-date food safety system, Armenia is enjoying assistance from the UN Food and Agriculture organization (FAO), the USDA, the World Bank, and the European Commission.

As a WTO member, Armenia has joined the main agreements concerning food safety and is performing the undertaken obligations in good faith; in particular, measures on plant diseases and pest, prevention and alarm on animal diseases specified respectively by the International Plant Protection Convention (IPPC) and the World Organization for Animal Health (OIE).

As a Codex Alimentarius Commission member country, Armenia has set up a local contact point, and currently efforts are being made to create a National Commission of the Codex.

Armenia is actively collaborating with the respective European Union structures in adapting the sanitary and phytosanitary standards to the European standards. Related laws, in particular the laws of the Republic of Armenia “On Food Safety”, “On Plant Quarantine and Plant Protection”, “On Veterinary Service”, “On Animal Feed” as well as a number of subordinate legislation acts supporting application thereof have been adopted. The State Food Safety and Veterinary Inspection (SFSVI) under the RA Ministry of Agriculture implements functions defined by the laws on food safety. Efforts are continued to build the capacity and improve the institutional structure of this agency.

14. DEVELOPMENT OF RURAL AREAS

To improve the current situation in the rural development, Armenia needs to implement projects focused on poverty reduction, development of social and production infrastructures, and raising the level of rural employment. This is why the RA Government, territorial governance and local self-governance bodies are currently targeting socio-economic development issues in the administrative areas of the country. A number of targeted projects have been implemented in improvement of healthcare, education, utility services, energy and other social and production infrastructures, as well as spiritual and cultural development. Wide-ranging efforts have been made in implementing community development projects in many of the rural areas. They include rehabilitation of irrigation networks, natural gas supply, reconstruction of inter-community and in-community roads, renovation of schools, clinics, hospitals, re-equipment of village outpatient clinics, as well as improvement of livelihoods of rural population. The rural area development programs have mainly been implemented through financial support of the state budget, community budgets, loans, donor community, and private sector investments.

Nonetheless, uniform territorial development is still a critical problem since marzes and communities other than Yerevan and its proximities have low development indicators. This non-uniform development results in a definite social injustice and tension. From this standpoint, it is important to provide assistance in business development in areas that have comparatively unfavorable economic development opportunities. Border and highland areas with comparatively low incomes are believed to have such unfavorable opportunities.

A number of legal acts contain provisions set out for stimulation of development in such unfavorable areas. The most important of these provisions are provided below.

- The RA Land Code defines that state and community-owned plots in border, highland, earthquake-suffered, and abandoned settlements are provided free of

charge for agricultural activity, homestead use or for building houses, to those families who previously did not benefit from the land privatization and did not get small holdings or land plots for building houses.

- The RA law “On Education” defines privileges for teachers of state-owned high schools located in border and highland areas.
- By the decision of the RA Government N 246 of April 21, 1999, a conceptual program and schedule of measures to be taken in solution of priority problems existing in border and highland settlements of Armenia was approved.
- By the decision of the RA Government N 222 of March 22, 2001, the program of development measures for mountainous settlements was approved, as well as the principles of those measures were defined. They are: strengthening of poorly inhabited villages, expansion of derivative transport and engineering infrastructure network, etc.

From the perspective of strengthening the settlements in the border area, the role of the RA law “On Approving the Complex Development Program of the Border Areas of the Republic of Armenia” adopted in 2002 is especially important.

A number of sectors in the border zone have very unfavorable conditions, which are mainly explained by the high riskiness of economic activity; even living is risky there. There are 9 urban and 173 rural communities in the border zone (over 20 percent of the overall number of settlements in Armenia), where over 350,000 people or 26 percent of the population of 9 marzes live. The border zone occupies a territory of 7,155 square kilometers (24.0% of the RA territory), with the border strip making 1,431.0 sq. km. There are 4 urban and 59 rural communities in the border strip with 150,200 inhabitants.

Taking into consideration the necessity to improve the territorial governance and local self-governance in the border zone as well as strengthen of settlements therein, certain privileges have been specified by the RA laws “On Land Tax Privileges”, “On Property Tax”, “On Income Tax”, and “On Profit Tax”.

Nonetheless, the measures undertaken are not sufficient to achieve an essential improvement in the socio-economic state of the population and to resolve the employment problem in the unfavorable areas.

446 communities or 51.0 percent of the Armenian communities are in the upland area. The table below presents the distribution of communities by ascending zones and by marzes.

Table 23

Distribution of upland settlements my marzes and by ascending zones

	Name of the marz	Number of communities				Share, %			
		over 1700 m	1500-1700 m	1000-1500 m	400 – 1000 m	over 1700 m	1500-1700 m	1000-1500 m	400 – 1000 m
1	2	3	4	5	6	7	8	9	10
1	Gegharqunik	82	0	4	0	95.34	0	4.66	0
2	Shirak	73	35	7	0	63.47	30.45	6.08	0
3	Aragatsotn	65	17	30	0	58.05	15.17	26.78	0
4	Syuniq	37	17	44	12	33.63	15.45	40.0	10.92
5	Vayots Dzor	16	13	12	0	39.02	31.72	29.26	0
6	Kotayq	19	14	27	0	31.66	23.34	45.0	0
7	Lori	17	32	48	8	16.19	30.47	45.71	7.63
8	Tavush	1	2	10	45	1.74	3.44	17.24	77.58
9	Ararat	5	1	4	84	5.31	1.06	4.25	89.36
10	Armavir	0	0	3	90	0	0	3.22	96.78
	Total	**315**	**131**	**189**	**239**	**36.0**	**15.0**	**21.6**	**27.4**

The data in the table indicate that nearly all communities in Gegharqunik, 2/3 of the communities in Shirak and more than half of the communities in Aragatsotn are in the highland zone. The share of mountainous settlements is also large in Syuniq, Vayots Dzor and Kotayq.

According to studies, there is also a direct link between the location of a community and the poverty level. Therefore, the territorial development policy should be focusing the uniform distribution of economic activeness in the country. This is possible only in case of dramatic economic growth in the unfavorable areas through stimulation of investment activity, capacity building for territorial and local governance agencies, expansion and strengthening of inter-community and inter-marz cooperation, encouraging partnership between public and private sectors, involving donor community and entrepreneurs in territorial development programs.

15. AGRICULTURAL CREDITING PROGRAMS

1. Agricultural Reform Support PIU

During the fourteen years of its activities, "Agricultural Reform Support" Project Implementation Unit has implemented 3 projects targeted at intensifying the World Bank-funded agrarian reform in Armenia, particularly infrastructure development and upgrading of farm management models.

The first project committed to addressing these issues was "Agricultural Reform Support Project" (ARSP) with a total value of $ 14.500.000 started in September 1998. The Goals of the Project were as follows:

- Support the implementation of development projects and the efficient use of resource potential of rural farms, including collective farms and agro-processing enterprises.
- Contribute to the strengthening and sustainability of the banking system in Armenia and expand the crediting opportunities for agri-food enterprises.
- Strengthen the scientific-research, educational, information and extension institutions and enhance the efficiency of activity of these infrastructures through structural reforms and modernization of their logistics.

The following activities have been implemented under the ARSP by July 2005:

- Short-term and mid-term loans of USD 4.2 million and USD 3.2 million were provided to 4,884 rural farms and 41 organizations, respectively.
- Five research centers were established on the basis of the Scientific Research Institutes under the RA Ministry of Agriculture. This has increased the effectiveness of resource mobilization (buildings, land area, etc.) through reducing the number of administrative staff by around 32%.
- Overall, 45 research - related as well as 71 technology assessment and 14 demonstration projects were implemented. According to estimates, during 2001-2004, the farm households improved noticeably the profitability of production by using novel technologies.
- Necessary vehicles, computer and laboratory equipment, as well as printing and publishing machines were provided to both research centers and the Agrarian University.
- An agro-processing facility was constructed at the Research Center for ***Vegetable*, *Melon and Technical Crops***. Also, practical production lines for tomato, juice and plant oils were obtained for research purposes.
- 1008 copies of 42 magazines and 704 copies of 18 textbooks and manuals were obtained for the Agrarian University. 13 textbooks and manuals of 3000 copies were republished. 26 were printed in 11,050 copies.
- Marz Agricultural Support Centers (ASC) were established in each of the 10 Marzes of the RA to provide comprehensive professional advice to subjects involved in agriculture, particularly rural farms.

In March 2003, within the framework of the "Activities for Overcoming the Effects of Frosting" adopted by the Government of the Republic of Armenia, the ARSP allocated gratuitously 3,480 tonnes of urea (carbamide) and 2,319 tons of **"*Amophos*"** fertilizers, as well as 954 ths pieces of grape stalks and 256 ths saplings of fruit-trees (apricot trees – 30,000, peach trees – 126,000, apple trees – 50,000 and plum trees – 50,000) to farmers.

The **second project** was "Rural Enterprise and Small-Scale Commercial Agriculture Development Project" (RESCADP) which started in 2006.

The objective of the Project was to support the development of Armenia's small- and medium-scale rural enterprises, improve their ability to access markets and raise competitiveness.

To achieve this objective, foreign lending of USD 22 million was spent. The project progress by components to-date is set out below:

Community-Focused Economic Development

Activities were carried out in marzes of Lori, Shirak, Aragatsotn, Tavush, Syuniq and Gegharqunik. According to the World Bank-defined method, 144 communities were selected from these marzes and USD 9.5 million was directed towards their development.

By the way, each community has independently decided how to use the provided grant; as a result:

- USD 3.6 million was allocated to 63 communities for the construction and improvement of 135 km drinking water pipeline;
- USD 2.1 million was allocated to 31 communities for the construction of 88.4 km gas pipeline;
- USD 0.4 million was allocated to 8 communities for the construction and improvement of 12.1 km irrigation water pipeline;
- USD 3.0 million was directed to 61 communities for procurement of 242 units of agricultural machinery (9 combines, 68 tractors and 165 other agricultural tools),
- USD 0.4 million was spent in 6 communities for other activities.

190 permanent and 1,300 temporary jobs were created under is component. The community budget received an additional AMD 63 million owing to the use of agricultural machinery and about 25 million AMD for water supplied.

Under **Loan component,** loans amounting to USD 5,5 million were provided to 100 organizations and private entrepreneurs. As a result, 360 permanent and 720 temporary jobs were created.

With the view to improve women's working and household conditions, as well

as to enhance their role in society, a loan totaling USD 122 ths was provided to 7 business women.

Under **Competitive Grant Program,** 53 innovative projects in the amount of USD 899 ths were implemented. 450 permanent jobs were created as a result of the project implementation. The number of indirect stakeholders benefiting from the project is 3,340. Following the technology transfer activities of grant projects, 139 similar projects were reported in the country. The level of socio-economic efficiency was measured for each project in order to assess the efficiency of investments in all of the projects. It was reported that the provided investments have increased beneficiary income by 80% on average.

The 10 marz ASCs and the Agricultural Support Republic Center (ASRC) received continuous support under the **Strengthening the Agricultural Extension System** Component. Particularly, USD 2.5 million was allocated to these organizations for staff maintenance, technical re-equipment, training needs and strengthening of logistics.

229 permanent and 780 temporary jobs were created as a result of component activities. Total of 202 TAPs in the amount of USD 327 ths were implemented in different farms in 10 marzes.

Under the **Strengthening the Seed and Sapling market** Component, USD 604 ths was allocated to Seed Agency SNCO, which was used to renovate and refurbish 4 regional and central laboratories and to provide computer and laboratory equipment, vehicles and agricultural machinery.

About USD 598.0 ths was provided to Gyumri Seed Selection Station which was used for Construction of irrigation water pipeline with a length of 4.6 km that makes possible to irrigate 300 ha land area, and Procurement of laboratory equipment and agricultural machinery.

"Avian Influenza Preparedness" (AIP) project (USD 5.3 million) was implemented during the period from 2006 to 2010.

Within this project, The central and marz facilities of the Food Safety and State Veterinary Inspection (FSSVI) were renovated and furnished with modern equipment, including staff training and technical re-equipment*;* **The National Veterinary Anti-Epidemic and Diagnostic Center** was constructed and re-equipped.

In April 2010, Armenia's "Rural Enterprise and Small-Scale Commercial Agriculture Development" (RESCAD) project was recognized as one of the 12 winners at the World Bank competition on "Improving the Lives of People in Europe and Central Asia Region".

2. Rural Area Economic Development Project Management and Analysis Office

The Rural Area Economic Development Project (RAEDP) Management and Analysis Office has implemented 4 loan programs starting from 1998.

The first loan program was Agricultural Servces Development Program in North-

Eastern Regions worth of 15.15 million USD, of which $12.94 million was the co-funding loan by IFAD (International Fund for Agricultural Development). The project was implemented in Shirak, Lori and Aragatsotn marzes and was aimed to:

- provide loans for private farms in the intended regions;
- rehabilitate irrigation systems in the communities involved;
- facilitate dissemination of high reproduction seeds;
- rehabilitate, refurbish and equip three seed trial and veterinary laboratories;
- implement social development microprojects in the communities involved;
- establish self-funding public structures that would deliver agricultural services.

The project's main components were: ***Farmer Credits, Rehabilitation of Irrigation Systems, Social Programs, Development Programs, Economic Development of Rural Areas, Rural Financing, Development of Commercial infrastructures,***

Table 24

RAEDP Commerical Infrastructure Development Component's activities in 2005-2009

Indicators	Natural gas	Irrigation system	Drinking water	Rural roads	Total
Number of beneficiaries	32,419	23,786	13,374	28,858	**98,437**
Number of families	10,806	6,796	3,850	8,245	**29,697**
Number of communities	28	18	14	8	**68**
Total project value (thousand USD)	**2,968**	**5,501**	**1,144**	**2,406**	**12,020**

RAEDP had substantial results on the development of rural communities in the above mentioned marzes. In particular, natural gas supply in the communities not only improved the life of the population but also contributed to the reduction of illegal fellings of trees. In addition, each family reduced the use of manure as fuel by 1 tonne on average. As a result, more opportunity occurred to use manure as mineral fertilizer, which eventually led to increase in the gross yield by 15-20 percent.

Availability of natural gas in rural communities became an important condition for developing entrepreneurship, especially for establishing new food producing and processing enterprises. The project provided relevant conditions for everyday operation of schools, kindergartens, and other social institutions.

The next stage of the Rural Area Economic Development Project was the **Farmer Marketing Opportunity (FMO)** project. This project has contributed to the marketing of agricultural products and development of small and medium size entrepreneurship in rural areas. Overall, infrastructure development activities worth of 15.0 million USD have been implemented in 110 communities of the target regions, including capital renovation of irrigation and drinking water networks, drilling of deep water wells, cleaning and rehabilitation of river beds and drainage systems in 36 communities; gas supply in 73 communities; and community road renovation in 1 community.

Within the project, the Fund for Rural Economic Development in Armenia (FREDA) was established by a decision of the RA Government to implement joint funding (investments) for agricultural producers and processors in rural areas of Armenia. One joint investment of 200.0 million AMD was made in fish farming through this fund.

The project has assisted also in vitalization of economic activity in rural areas by making financial products more accessible for small and medium size entrepreneurs. Through prequalified banks, total of 2,975 thousand USD-worth 68 short-term and long-term loans were allocated during 2009 for rural SME development. The loans were provided for the following activities: animal husbandry, milk processing, fish farming, fruit growing, poultry breeding, beekeeping, canning, and cool storage. Most of the loans were provided with 12-13 percent interest rate, for a 3-7 year period.

Table 25

Total number and amount of loans according to marzes:

	Name of marz	**Amount, USD**	**Number**
1	Vayots Dzor	298,500	9
2	Aragatsotn	565 800	13
3	Tavush	221,000	4
4	Gegharqunik	482,500	14
5	Lori	721,500	16
6	Shirak	208,000	2
7	Syuniq	391,700	7
8	Ararat	55,000	2
9	Armavir	30,958	1
	Total	**2 ,974 ,958**	**68**

About 14 million USD-worth agreement is expected to be signed between the Republic of Armenia and IFAD in 2010 to fund a new loan program.

Cooperation between **OPEC Fund for International Development** and the Republic of Armenia is aimed at development of rural areas and elimination of poverty, which is consonant to the Sustainable Development Program.

OPEC has assisted Armenia starting from 2004, providing 5 million USD cofunding to IFAD's projects. This was followed by the new "Production infrastructure rehabilitation" loan program. Irrigation, water supply, and drinking water systems were constructed and reconstructed; inter-community and in-community roads were renovated, gasification was implemented in communities. OPEC's investment in the two projects made 15.0 million USD.

A new agreement on loan program funding with the value of 20 million USD has been signed between the Government of the Republic of Armenia and OPEC.

3. Irrigation system development projects

Water supply development and reform PIU implements loan programs aimed at drinking and irrigation water supply as well as drainage system development.

Irrigation is a vital problem for the Armenian agriculture: 80% of crop production is provided by irrigated crop areas. During the soviets, huge water engineering works were implemented. However, in early 1990-es, due to economic crisis in newly independent Armenia and the hastily performed transformations in agriculture greatly damaged the irrigation systems. The first loan provided by he World Bank and IFAD was used by the RA Government to implement an "Irrigation system rehabilitation" project. The project with a total budget of $52 million was implemented during 1994-2001. This project allowed to rehabilitate and definitely regulate the work of irrigation systems. However this sphere requires to consistently develop infrastructures and improve the management. Therefore, through WB loan funds and co-funding by the RA Government, the Irrigation System Rehabilitation Project was implemented during 2001-2007 with a budget of $30.82 million, of which the shares of the WB, RA Government and the beneficiaries were respectively $24.86 million, $3.89 million and $2.07 million. The goal of the project was to enhance the efficiency in agricultural operations through structural reforms in the management

of irrigation systems; improve the financial state of irrigation water supplying organizations; involve water users in the management of the system; and maintain the system through gradual self-financing.

During the same period, the first stage of the "Dam Safety" project was implemented, with the total value of $30.3 million, including $3.7 million-worth share of the Government. Under the project, 20 dams were rehabilitated together with safety measures taken, as well as 60 reservoirs were studied.

The second stage of the Dam Safety project started in 2004 with a $7.5-million budget.

Over the recent years, considerable efforts have been made also in institutional reforms of irrigation systems. As a result, over 50 Water Users Associations (WUA) have been formed.

4. Crediting of agriculture

In order to enlarge agricultural sphere crediting abilities and to make loan resources more accessible, RA Government draws in foreign funds. In October 2005, "Rural Finance Facility- Program Implementation Unit" (RFF-PIU) State institution was set up to refine the disbursement of those funds, the use of the revolving fund, as well as mechanisms of crediting the agricultural sphere.

According to "RAEDP" Loan Agreement, signed between IFAD and the RA, RFF-PIU must support the activation of agricultural activities. The latter must be implemented by making the loan provision for developing small and medium size enterprises in rural areas more available.

The loan period for the loans provided by RFF-PIU is 1-7 years, the maximum loan amount is 150,000 USD, the maximum grace period is 18 months. As Participant Financial Institutions (PFIs) bear the whole risk, they make the selection of beneficiaries; set the terms and conditions of loan collateral, interest rate and grace period on their own.

The investments intended for farming and livestock breeding, processing, storing, packaging, market entry, service activities and other agricultural subunits development meet the eligibility criteria of RFF-PIU.

RFF –PIU implements its activities using the funds of the following programs:

- Rural Areas Economic Development Program (RAEDP); donor- IFAD
- Rural Enterprise and Small Scale Commercial Agriculture Development; donor- WB
- Farmer Market Access Program; donor-IFAD
- Water to Market Credit Program in the frames of Millennium Challenge Account- Armenia; donor- MCC
- Subsidization of Agricultural Loans' Interest Rate experimental project; donor- RA budget
- Small and Medium Size Enterprises Stimulation in Rural Areas; donor- RA budget

The disbursements of loans in the frames of Rural Areas Economic Development Program launched in April, 2006 and terminated in October 2009. The lending process in the frames of RESCAD Project, financed by WB, started in November, 2009 and finished in September, 2009. Lending activities in the frames of FMAP began in October, 2009.

On October 16, 2007, Water to Market Credit Facility Loan Agreement was signed between MCA-Armenia and RFF-PIU, while the disbursement process was launched in December 2008.

The allocations under RAEDP have made 8,945,000 USD, in the frames of RESCAD Project- 5,500,000 USD. WtM Credit Program allocations under MCA-Armenia, will make 8,500,000 USD by October, 2010. Another 2 mln USD is intended to disburse by RFF-PIU in 2009-2010, in the frames of Farmer Market Access Program, signed between RA and IFAD on January 8, 2008. As stated by 12.05.2008 RA decree, an amount of 100 mln AMD is intended to disburse by "Subsidization of Agricultural Loans' Interest Rate" experimental project.

Participant Financial Institutions (PFIs) have been selected by RFF-PIU to disburse those loan resources according to the stated directions:

For **RAEDP** implementation the following financial institutions have been selected: Anelik Bank CJSC, AREKSIMBANK CJSC, ARDSHININVESTBANK" CJSC, "ARTSAKHBANK" CJSC, "Inecobank" CJSC, "Converse Bank" CJSC, "ACBA CREDIT AGRICOLE BANK"

CJSC, "ARMBUSINESSBANK" CJSC, "Unibank" CJSC.

For **RESCAD** Project, "Anelik Bank" CJSC, "ASHIB" CJSC, "Inecobank" CJSC, "Converse Bank" CJSC, "ACBA CREDIT AGRICOLE BANK" CJSC, "SEF International" UCO LLC, "Aregak, and "UCO CJSC.

In 2009, for MCA- Armenia, Water to Market Credit Program, the following financial institutions were selected: Converse Bank" CJSC, "Armbusinessbank" CJSC, "Ameriabank "CJSC, "ASHIB" CJSC, "Nor Horizon" UCO LLC, "Farm Credit Armenia" UCO, "ANIV " UCO, "Card Agro Credit" UCO, "GFC General Financial and Credit Company" UCO, "SEF International" UCO LLC.

Loan disbursement according to marzes: Investments under RAEDP have been allocated in 7 marzes, except for Ararat, Armavir, Kotayq and Yerevan City. RESCAD Project, FMAP and MCA-Armenia Water to Market Credit Program are implemented throughout Armenia.

Table 26

Loan Disbursement by RFF-PIU According to RA Marz

N	Marz	Number of loans	Amount (USD)	Disbursed Loans in number (%)	Disbursed Loans in Amount (%)
1	Aragatsotn	150	4 339 819	**14,6%**	**15,9%**
2	Armavir	242	4 293 171	**23,6%**	**15,7%**
3	Ararat	213	4 177 152	**20,8%**	**15,3%**
4	Lori	64	2 884 304	**6,3%**	**10,5%**
5	Kotayq	54	2 791 136	**5,3%**	**10,2%**
6	Vayots Dzor	81	2 549 450	**7,9%**	**9,3%**
7	Gegharqunik	115	2 521 522	**11,2%**	**9,2%**
8	Syuniq	48	1 481 882	**4,7%**	**5,4%**
9	Shirak	21	1 278 283	**2,1%**	**4,7%**
10	Tavush	35	1 030 180	**3,4%**	**3,8%**
11	Yerevan	1	9 940	**0,1%**	**0,0%**
Total		**1024**	**27 356 839**	**100,0%**	**100,0%**

The loan disbursement according to financial institutions and types of activities is presented in Table 2.

More diversified investments, according to types of activities, have been made in agricultural sphere by "Inecobank" CJSC, "ARDSHIINVESTBANK' CJSC, "ARTSAKHBANK" CJSC, and "Armbusinessbank" CJSC.

Among the active PFIs, almost all have provided loans for livestock breeding, horticulture and setup of greenhouses. In connection with milk processing and fish breeding, relatively high demand was recorded by "Unibank" CJSC. Large loan amounts intended for fruit processing were provided by "ACBA Credit Agricole Bank" CJSC and "Artsakhbank" CJSC. Other various businesslike programs in rural areas

are mostly financed by “Inecobank” CJSC and “Armbusinessbank” CJSC. At the same time, all PFIs considered farming and beekeeping more risky.

The loan disbursement according to marzes and types of activities is presented in Table 26. RFF PIU loan resources are available for all businessmen in all marzes, despite their legal state and turnover volume.

As for the activity types, agricultural sphere is considered foremost by RFF-PIU SI Managing Committee. In regard to marzes and types of activities, RFF-PIU financial resources are allocated relatively equally in marzes of Aragatsotn, Armavir, and Ararat. As to the types of activities, livestock, fruit and milk processing programs have relatively equal demand in RA marzes.

As mentioned above, PFIs bear the whole credit risk, so they set the terms and conditions of loan collateral, interest rate and grace period, according to their own policy. However, the loan interest rate is the most important indicator in respect of attractively.

The annual interest rate of the loans disbursed by RFF PIU ranges from 10% to 14 %, which is less than average interest rate established in RA financial market by 5 %.

The analysis of the presented data shows that 77.4 % of RFF PIU Loan resources have been disbursed at 12 % interest rate, and 6-18 month grace period was established for 82.5% of the total amount.

16. INTERNATIONAL COOPERATION

Mutually beneficial collaboration with other countries and international organizations is of crucial importance for development of the Armenian agriculture and agribusiness.

Within the frames of membership in international agencies, collaboration is continued with the UN Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), World Bank, and International Episodic Organization (OIE). As a result, projects promoting the development of the agrarian sector of the economy have been implemented.

Further efforts on implementation of agreements on collaboration in the food and agriculture sector signed previously with over 20 countries as well as on signing similar agreements with others (Brazil, Mexico, Kazakhstan, Poland, Lithuania, Hungary, Slovenia, India, and Kuwait) were made.

Efforts have been made toward signing and ratification of agreements prepared by the NIS Inter-State Council on Agri-Food Issues, as well as toward synchronization of the agrarian policy within the World Trade Organization.

Involvement of external financial resources including private investments have been considered very important in development of agri-food system. From this perspective, effective cooperation has been established with the United States, the Netherlands, Japan, Greece, China, and India in the form of diverse assistance programs underway in Armenia.

An active collaboration has been launched with the Islamic Republic of Iran and Thailand Kingdom. Cooperation is being activated with Syrian Arab Republic, Egypt Arab Republic, and Israel.

An important role is attached to regional collaboration within the Black See Economic Cooperation and the International Center for Agricultural Research in Dry Areas (ICARDA), which resulted in programs contributing to agricultural development.

Training of Armenian specialists in foreign countries has been considered critical; a large number of specialists have participated in different training courses.

Cooperation with international research institutions has been expanded to include the International Plant Genetic Resource Institute (IPGRI), International Union of Protection of New Plant Varieties (UPOV), and others. The Republic of Armenia is a member of International Plant Protection Convention (IPPC), and the international agreement on plants' genetic resources for food and agriculture.

The Ministry of Agriculture has been assisting Armenian agribusiness enterprises to participate in international trade shows organized in Armenia and abroad. Armenian-produced food products have been demonstrated in international expos, in particular, in Moscow, Bangkok, Amsterdam, Dubai, Paris, Berlin and elsewhere.

17. INTERNATIONAL AND LOCAL ORGANIZATIONS ASSISTING ARMENIAN AGRIBUSINESSES

The most important outcome of the international cooperation in the Armenian food and agriculture sector is the activity of a number of international missions and Armenian development structures established through their support.

From this standpoint, activity of the U.S Department of Agriculture and in particular the USDA Marketing Assistance Project has been especially valuable.

The U.S. Department of Agriculture Marketing Assistance Project (USDA MAP), active in Armenia since 1992 - almost since the independence of the country through 2005, provided valuable financial and technical assistance in the country's food and agriculture sector. Thanks to this project, over 2,500 jobs were created in agribusiness and over 40,000 farmers and food processors benefited from the Project.

The main outcomes of the USDA MAP's activities were as follows:

intensive promotion of Armenian products in the Russian market; export of hundreds of tonnes of cheeses, hundreds of thousands of cans of fruit and vegetable preserves and juices; hundreds of thousands of bottles of wines; establishment of milk marketing and fruit and vegetable growing cooperatives; development of pedigree goat breeding; variety trials; implementation of technology assessment program jointly with WB Agricultural Reform Project; about 12,000,000 USD-worth agricultural loans; building and rebuilding 128 deep water wells and pipelines for drinking and irrigation water with over 30,000 families benefiting; over 50 production credit clubs, establishment of the Agribusiness Teaching Center within the Armenian State Agrarian University (2000); establishment of the first Armenian leasing company –AgroLeasing Leasing Credit Company LLC (1999), establishment of the Foundation for Applied Research and Agribusiness; Small Farm Water Resource Management Research Center; 160 extension youth clubs (with about 3,000 members), and others.

The following programs continue to provide considerable assistance in the development of the Armenian agriculture and agribusiness.

Center for Agribusiness and Rural Development (CARD). CARD's mission is to assist farmers and agribusinesses in the production and marketing of food and related products to increase incomes and create jobs leading to sustainable livelihoods for rural populations that significantly impacts poverty reduction. CARD offers a complete, integrated package of agricultural development services that are market driven and benefit farmers in developing their capacities. CARD assistance stimulates agribusiness growth and involves marketing, rural development, and financial services.

CARD is the successor of the USDA's Marketing Assistance Program. It was established and registered in 2005 as a Armenian foundation to ensure the continuity of MAP's programs.

Over the five years of activity, CARD programs have responded to a rapidly changing environment. Most of clients are in the wine, fruit and vegetable processing, dairy and meat production and processing industries. These agribusinesses employ over 5,000 people and buy raw product from more than 25,000 farmers. CARD utilizes both local and international best practices and expertise, and has invested nearly $50 million in technical assistance.

CARD provides a wide range of technical and financial assistance to farmers, agribusinesses and rural communities, including but not limited to food processing: new product development and test marketing; food quality improvement and food safety assurance; labeling and packaging; food container/packing procurement; domestic and foreign market research; assessments and feasibility studies; product promotion; export certification and compliance documentation; local and international festivals, exhibitions and tradeshows; export market development; farmer crediting and group lending; women and children empowerment in rural areas.

Below are some of the outcomes of projects implemented by CARD.

- **17 milk marketing associations** were established and 39 **milk cooling tanks** were set up to develop the dairy industry in Armenia on cost sharing basis and financial leasing terms.
- **The Goat Industry Development Project** began and rapidly developed a sustainable dairy goat industry from scratch, with an initial focus on consumer-driven supply chain development connecting with the genetic improvement of Armenia's domestic goat breed, followed by intensive support to establish and develop 6 goat cheese production units and 7 goat cheese varieties in local and export markets.

- Assistance to 60 agribusinesses to **develop and test market 40 new products** as well as build clients' marketing capacity. New products developed with CARD assistance include: goat Feta cheese; sheep Feta cheese; Feta

cheese in oil; white mold cheeses *i.e.* Tom (from cow milk); and Tommy and Chevre (from goat milk); European style yellow hard cheeses (Gouda, Edam, Baby Swiss, Emmentaller); Muenster; Oltermanni; Colby; Mozzarella; Ricotta; Mascarpone; blue cheeses; spreadable blue cheese in clay pots; buried goat cheese in clay pots; fruit-flavored yogurts; kefir; smoked beef jerky; apple & carrot and orange & carrot juices; ketchups; tomato sauces; sun-dried tomatoes in oil; sweet corn; kosher pickles; and dried apricots dipped in chocolate.

- **Technical Assistance Program to Support the Armenian Food Safety System** is to establish an effective Armenian food safety program bolstering the economy through increased demand and sale of food products within Armenia, regionally and for export, and to provide a safe and reliable food supply for the populace. Through the program Armenian food industry stakeholders learn the basic and essential components of food safety as well as internationally recognized food safety regulations and requirements. To date 2800 stakeholders were trained on food safety requirements, National Food Safety Concept draft was developed for the Government of Armenia, new Food Safety law was reviewed and recommendations made, 22 laboratories were assessed and future development strategies were recommended, baseline study on food safety status 7 stakeholder groups was conducted for 150 private and public entities, food safety improvements initiated at 8 food processing plants and 10 farms.
- A constant **export-oriented** approach focuses on providing technical assistance to farmers and agribusinesses while investigating new markets both internally and externally.
- Relevant assistance**,** to train over 60 cheese-making specialists, enhance their skills, as well as organize practical training for more than 30 students from the Armenian State Agrarian University and other educational institution.
- The **Armenian Rural Youth and Gender Development Program** develops the skills of young people. This program has grown to more than 130 clubs located in every region of Armenia with membership reaching more than 2000 youth.
- The introduction of **high quality input supplies and technologies** to Armenian agribusinesses and farmers. High quality dairy ingredients, packaging materials, lab and production equipment has been imported and introduced for the first time to Armenian farmers and agribusinesses to improve milk, wine, fruit and vegetable quality and production processes.

- The **Herd Genetic Improvement Initiative** is gaining momentum in Armenia with the introduction of World Wide Sires' products and advanced Artificial insemination technologies. Each year more than 5000 cows and 1800 goats are inseminated.
- CARD's initiation of a**gritourism development:** Many projects were launched around wineries, a road side fruit market, herbal tea production facility and at the dairy/goat farms. A plan is being developed to expand the range of this program.
- CARD's competitive **Research Grants** Program fosters local research capacity

and links that directly to farmers' needs.

- **Developing small, boutique wineries:** More comprehensive assistance was focused on a dozens small wineries in the form of capacity building as well as strategic loans, equipment leasing, modern chemical analysis tools, *etc*. CARD is also instrumental in introducing Armenian wines at international trade shows, exhibitions, and at wine tasting events around the world.

The Armenian Technology Group was established in 1992 in California as a U.S. non-profit charitable corporation and is registered as a private volunteer organization. It assists in dissemination of new varieties of agricultural crops and institution of progressive technologies in Armenia as well as supplying Armenian farms with agricultural equipment. In addition, versatile benevolent projects are implemented in Armenia and in Artsakh. Below are the projects of special importance:

- Rehabilitation of private seed production by developing small and medium size businesses;
- Bringing in, renovation, and technical service of agricultural equipment;
- Setting up an anti-hail station in Artashavan community of Aragatsotn marz;
- Providing milk cooling tanks to Akhuryan, Talvorik, Vahagni, and Yeghipatrush communities.
- Distribution of wheat, vegetable, and corn seeds to farmers.

T**he Armenia Agribusiness SME Market Development Project (DAI-ASME)** was active in Armenia during 2000-2007. It was funded by the US Agency for International Development (USAID) and implemented by Development Alternatives, Inc. (DAI), a private consulting firm based in Bethesda, Maryland, USA. The project was designed to help the business community increase market opportunities. To achieve this goal, DAI-ASME identified locations where existing and new products could be sold, developed a strategy for accessing those markets and supported particular companies in export of their produce.

ASME assisted Armenian SMEs to expand their market opportunities and access to new markets by providing the following services to them:

- High quality technical assistance in finding new markets and developing a relevant marketing strategy for new product development or for adjusting the existing products to the market requirements as well as in expansion of production volumes aimed at enhancement of competition conditions;
- Financial assistance for performing necessary reforms to improve productivity and for application of marketing strategy;
- Market research in selected geographical areas to find competitive market for Armenian products;

- Market analysis for particular types of products to find potential buyers, assess the competition and get familiar with prices, packaging, quality as well as market and legal conditions for produce;
- Assistance to business support organizations and associations to enhance the capacity of rendering high quality stable services to Armenian companies;
- Assessment of constraints hindering agribusiness and development of tools that will allow to overcome all problems that do not allow companies to operate in a just, transparent, and legitimate form.

As a result of the ASME project assistance:

- Over $34,000,000 in new export and domestic sales have been accomplished.
- Almost 10,000 new, above average salary jobs have been created.
- Over 200 firms throughout Armenia have benefited, including 60 women-owned or women-managed companies.
- Several companies have been assisted to receive international HACCP/ISO certificates.
- A privately financed commercial leasing company has been established in Armenia.
- Over $2,600,000 in Cost-Share Grants have been awarded to assist Armenian companies expand and improve their production capabilities and marketing activities.

The two-year joint efforts with the US counterparts, Agreement was signed between the Armenian Government and the **Millennium Challenge Foundation** on March 27, 2006 with the total value of $235, 650,000.

The goal of the **Millennium Challenge Account - Armenia** Program within the agreement is to reduce the level of the rural poverty through sustainable growth in economic activities in the agriculture sector. It is anticipated that due to the implementation of the Millennium Challenge program, by 2013, the rural poverty will be reduced by 6%.

On August 8, 2003, the RA Government approved the Strategic Program for Poverty Reduction, which set the main ways of eliminating poverty and inequality in rural areas.

Development of infrastructures - in particular improvement of roads and additional investments for enhancement of the efficiency of irrigation system - is an important priority in rural poverty reduction.

- **Building and renovation of rural roads** will make the markets accessible for agricultural producers and create conditions for developing small and medium

size entrepreneurship as well as non-agricultural and social spheres.

- **To make high efficiency possible in horticulture sector, irrigation is of critical importance.**

Federation of Agricultural Association,
Union of Legal Entities (FAA ULE)

FAA ULE was established on December 2001 by the initiative of eight farmer organizations. Currently, FAA joins 21 agricultural consumer cooperatives with 1,700 member farmers (grown from the initial 235). The FAA mission is to support the development of member agricultural organizations by providing technical services, marketing, management, and in solution of other socio-economic issues, as well as assisting in improvement of agrarian legislation.

Through FAA's efforts, the FAA-member cooperatives purchase agricultural inputs with, as a rule, lower than market prices. FAA provides handy assistance in marketing of agricultural produce through an effective marketing system that includes product collection centers, preliminary sorting and packaging as well as wholesale points.

Through assistance of MCA Armenia, FAA has introduced the ARMIS information system that enables farmers and other interested groups to get information on retail and wholesale prices of agricultural products in 3 markets in Yerevan and markets in 4 marzes through SMS and from www.armis.am website.

FAA is also actively involved in programs enhancing the roles of rural women in their communities and the women entrepreneurship. This is done mainly through providing information and exposing them to the related national and international experience.

The president of FAA ULE is Vardan Hambardzumyan.

Currently, 70-80% of the gross agricultural product is produced in irrigated areas.

The Rural Roads component of the Millennium Challenge program envisages 88 routes with total of 943 km length, which is about 45% of the road network of "vital importance". 321 km (34%) of the road network to be rehabilitated is of national significance, and 622 km (66%) – of local significance. Major renovation and rehabilitation of 19 bridges will be included in the program. For this component, 67.1 million USD will be allocated.

About half (113.26 million USD) of the funds of the MCA-Armenia will be directed to solve problems existing in the irrigation. Twenty-one regional irrigation schemes

will be rehabilitated, in particular:

- 18 mechanical irrigation systems will be transferred into gravity flow irrigation systems,
- 5 new reservoirs will be built, and 2 will be rehabilitated,
- total of 200 km of damaged canals will be restored,
- 68 pump stations will be renovated and reequipped,
- in-farm irrigation networks with total area of 75,000 ha will be rehabilitated,
- drainage systems in Ararat Valley will be rehabilitated, which will allow to improve about 25,000 ha of land area.

The most important part of the irrigation component is the Sustainability Component with a total value of 32.4 million USD.

The Management Board of MCA-Armenia reports to the RA Prime Minister. The activities of the Board is alternately participated by representatives of NGOs elected pursuant to democratic procedures.

UNDP Community Development Project has implemented the following projects in several rural communities:

- Lusadzor, Tavush marz - Construction of intra-community gas network; Return of non-cultivated arable land to crop rotation; Planting of persimmon orchards and distribution of seedlings; Enlargement of persimmon planting in the community; Internal irrigation network construction; Artificial insemination of cattle; Cultural Center rehabilitation; Reconstruction of the internal community network of potable water; Establishment of a greenhouses in Lusadzor
- Yeghvard, Syunik marz - Establishment of an agricultural machinery pool in the community; Creation of a grain seed revolving fund ; Construction of a flour mill
- Geghamasar, Gegharqunik marz - Establishment of an agricultural machinery pool in the community; Provision of wheat seeds and nitrate fertilizers
- Pambak (previously Haykashen), Gegharqunik marz - Establishment of an agricultural machinery pool in the community; Provision of pedigree cattle to the households
- Bavra, Tavshut, Sizavet and Saragyugh communities, Shirak marz - Establishment of an agiruclltural machinery pool in the Microregion;

Overall, UNDP has spent $ 1,400.000 on the above projects.

Heifer international

Heifer International is a non-profit organization whose goal is to help end world hunger and poverty through self-reliance & sustainability. Heifer is dedicated to providing permanent freedom from hunger by giving families livestock, tree seedlings, training, and other means to needy families throughout the world to help them overcome poverty.

Since its establishment in 1944, Heifer has provided direct assistance to 9.2 million families in more than 125 countries and in 38 states of the U.S.

Heifer International's specificity is the gift giving practice. The families who are given animals agree to donate the first offspring of those animals or any other equivalent gift to another needy family thus creating a chain of gifts which has positive impact on thousands of families.

Heifer International started its mission in the South Caucasus in 1999. Since that time, Heifer has accomplished 51 projects in this region, with 5,763 rural families benefiting.

Today, 165 rural families are involved in projects underway in Armenia. Under these projects, Heifer International provides cows, goats, sheep, bees, rabbits, chickens, fish, turkeys, buffalos, young bulls, Californian worms, as well as seed potatoes and wheat, fruit and other trees.

Heifer is implementing diverse and innovative projects in Armenia. In addition to animal giving and crop growing, Heifer Armenia is involved in developing leadership skills and professional training among rural youth. Heifer has established "Ayo" youth clubs in 20 rural communities of Armenia through the Development Principles NGO. Six life and leadership skill development trends are practiced in these clubs: agricultural management (through special programs of livestock and crop production), healthy lifestyle, civil education and law, nature protection, logic, and journalism. Over **3,500 children** have been benefiting from these programs.

Heifer Armenia focuses also capacity building for different community groups through training courses conducted by qualified experts. The topics of trainings include: livestock management, field crop production, plant protection, artificial insemination, beekeeping, farm management, and others.

UMCOR

The U.S. **"United Methodist Committee on Relief" NGO Armenian branch (UMCOR)** was established in Armenia in 1994. UMCOR's mission in Armenia is to assist the socio-economic development and to eradicate poverty during Armenia's transition to a healthy and wealthy civil society.

At present UMCOR-Armenia implements humanitarian, agricultural, health and anti- trafficking projects. Following this mission, UMCOR makes its contributions towards community development in Armenia.

The Community Association Program, Farmers Organizations Support Program and currently the Sustainable Cooperative Extension and Agricultural Development Project are the agricultural development projects implemented by UMCOR.

The Community Association Program was implemented in 2000-2001. The program helped communities to establish 6 agricultural consumer cooperatives in two regions of Armenia: Masis and Yeghegnadzor. UMCOR's assistance to the cooperatives has focused on developing the skills and knowledge of cooperative members so that they can eventually manage and operate the cooperatives on their own. Besides technical assistance and training, UMCOR has provided each cooperative with non-interest loans to initiate cooperative business activities.

Farmers Organizations Support Program was implemented in 2003-2006. The project was financed by ICCO, RABOBANK, Jinishian Memorial Foundation and UMCOR NGO. The project was implemented in Yerevan, Ararat, Armavir and Vayots Dzor regions. It helped establish 9 agricultural cooperatives which became members of the Federation of Agricultural Associations (FAA). The credit allocation component of the project was implemented by Aregak, the micro-financing project of UMCOR.

Sustainable Cooperative Extension and Agricultural Development Program.

Since July 2009, UMCOR has been implementing its Sustainable Cooperative Extension and Agricultural Development Program (SCEAD). The program is funded by the U.S. Department of Agriculture (USDA). The duration of the program is 2 years. The main objective of the program is to establish agricultural cooperatives in Ararat, Armavir and Vayots Dzor regions, and also to assist newly founded and operating cooperatives in sustainable development. The SCEAD Program supports member farmers and small-scale agricultural entrepreneurs to improve their livelihoods through development of their production management skills, and pre-processing and marketing capacities. Technical assistance, training and demonstration projects are provided for this purpose.

The objectives of the program are to:

- Create 14 new agricultural consumer cooperatives and support to 10 existing cooperatives;
- Provide technical assistance and training to the cooperative members;
- Provide agricultural machinery;
- Support organizing the pre-processing and marketing of agricultural products;
- Produce and broadcast 56 films on the current agricultural problems faced by individual farmers from Armavir and Ararat marzes.

To reach large numbers of beneficiaries, UMCOR's Mobile Extension Team has been producing and broadcasting educational/training films that have duration of 15-20 minutes, which are broadcast by Armavir and Ararat regional TV channels. UMCOR closely cooperates with the Regional Centers of Agricultural Support in Armavir and Ararat marzes in the selection of the topics for the films and in ensuring feedback from the beneficiaries.

Selection of the rural communities is done after taking into consideration the economic situation of the community, opportunities for further development, the level of activity of farmers and their organizational skills, the need for agricultural machinery and improvements in relevant skills, and the existence of other cooperatives and organizations.

After selecting the communities, UMCOR supports the established cooperatives

with legal registration, furnishing an office area, procuring computer equipment and, afterwards, organizing training based on community needs. Within the framework of the project, each cooperative will be provided with agricultural machinery (one tractor with equipment). Advisory assistance will be provided in the form of agricultural product marketing as well.

Within the scope of the project, UMCOR cooperates with the Center for Agribusiness and Rural Development (CARD), the Ministry of Agriculture of the Republic of Armenia, municipalities, Regional Centers of Agricultural Support, and other organizations.

Accion Contra el Hambre (ACF) is an international humanitarian organization created in Paris in 1979. It is a non denominational, non-political organization intervening regardless of race, religion or gender, active in over 40 countries worldwide.

ACF has been working in Syuniq marz, Armenia since 1994 in various activities, all related to food security. Initially ACF was involved in emergency food assistance, in response to the consequences of the war and the breakup of the Soviet Union. From 1998 onwards the organization has focused on agricultural programmes with a more strategic economic and community development approach.

In October 2007, ACF started new phase of Sisian Self-Reliance Development programme, which focused on market development approach to be applied in the dairy sub-sector in the Sisian region. Cross cutting sub sectors are artificial insemination and market access services, fodder production and management of community owned assets such as pastures and lands. The project will end in September 2010.

The project goal in this phase is: “A contribution has been made to poverty reduction of rural households in Sisian Region”. The Swiss Agency for Development and Cooperation (SDC) is the donor of the programme. About 20 rural communities are involved in the programme.

Improved performance of the milk market system supporting the economic security of poor producers in the Sisian Region of Armenia is the purpose of ACF Sisian Rural Self Reliance Development Program third phase. The intervention plan is designed for three main outputs:

1. Increasing access and usage of Artificial Insemination (AI) service,
2. Improving production and use of more nutritious fodder and
3. Improving market access.

The intervention of ACF in Artificial Insemination sphere expanded the geographical area of the service. New specialists and technicians were trained in far and remote villages. Those specialists keep contact with the Artificial Insemination Centre in Sisian and CARD (Center for Agribusiness and Rural development) Foundation in Yerevan to acquire inputs and get technical support. ACF supports the marketing activities of AI Centre in Sisian and individual technicians through published brochures and booklets. ACF also financed the AI centre and technicians to acquire new and modern equipments and tools.

ACF has chosen the Syuniq marz ASC as a partner in fodder subsector. ASC is building the capacity of farmers in villages to grow high value fodder crops such as

alfalfa, sainfoin, barley, oats, etc. Together with this activity, ACF support farmers to have access to inputs. Inputs such as seeds, concentrated fodder, and twine are acquired from private input suppliers, Seed Producers Union and Ashtarak Kat.

In fodder sub sector ACF supports the communities to have pasture management plans. The aim is to reduce the overgrazing problem and increase access to highland pastures.

By strengthening the capacity of Sisian WUA ACF wants to stimulate the expansion of high value irrigated crops.

ACF has also supported links between the retailers of spare part suppliers and machinery operators. The aim was to increase the accessibility of spare parts to machinery operators and reduce the time for reparation of machines.

ACF has long been collaborating with milk marketing cooperatives. The cooperatives collect milk from villagers and resell it to processors such as Ashtarak Kat or Elola. ACF intervention aims at increasing milk quantity collected and the quality. ACF builds the capacity of cooperatives to run sustainable business.

Oxfam (Great Britain) Armenia. Oxfam works with others with the mission to overcome poverty and human suffering.

Since 1994, Oxfam GB Armenia has implemented various humanitarian and community development projects in about 165 remote and isolated communities of Armenia.

On the agrarian sector, **Supporting Rural Smallholders' and Small Farmers' Livelihoods Programme** is being implemented, which enables the livelihoods of impoverished rural communities. Oxfam GB Armenia gives preference to community initiatives aimed at market-oriented agricultural development.

Oxfam livelihoods projects foster sustainable utilization of community resources by supporting income generation activities for small farmers in the areas of dairy processing as well as high quality crop production. The project provides increased access of the beneficiary communities to agricultural inputs, technical support and markets for high quality seeds. The project also provides trainings in marketing, assists in establishment of business clubs as organized entities for improved agricultural output and technical knowledge sharing. Project also helps in development of entrepreneurship in rural communities by creating jobs

Oxfam livelihoods projects strengthen communities' resilience to natural disasters and promote community flexibility in emergency situations.

Within the 2010 program, the project will set up 4 agriculture cooperatives and 2 cool storage facilities in several communities of Tavush and Vayots Dzor marzes. They will be managed by newly established agricultural cooperatives.

According to Oxfam's five years Livelihoods Strategy, in total 3,500 beneficiary farmer households from 40 communities in Vayots Dzor and Tavush regions will be involved in this project.

18. ACTIVITIES OF UN FOOD AND AGRICULTURE ORGANIZATION (FAO) IN ARMENIA

FAO's mandate is to improve levels of nutrition, increase agricultural productivity, better the lives of rural populations and contribute to the growth of world economy.

Today, FAO is the lead agency for agriculture, forestry, fisheries and rural development in the United Nations system. FAO has 192 member countries plus one member organization, the European Community.

The Republic of Armenia became a member of FAO on 8 November 1993. The FAO Representation office in Armenia was founded in September 2004. Since the beginning the Armenian Government has received FAO's support in implementing various development and emergency projects aiming at increasing agricultural productivity and the level of food security in the country.

The FAO office in Armenia, jointly with the RA Ministry of Agriculture, Armenian State Agrarian University, UN agencies, NGOs, and other organizations involved in agriculture, each year organizes interesting events dedicated to the World Food Day.

FAO priority areas in Armenia include: increasing the food security and living standards of the rural population, maintaining the safety and quality of food products, the sustainable management of natural resources, and institution and capacity building to support the transition process to a market-based economy in the rural sector.

Currently the following projects are being implemented in Armenia:

- **Emergency Assistance for the Control of African Swine Fever (ASF) (TCP/ ARM/3102)**. The project aims at enhancing the monitoring and disease control surveillance system for ASF in Armenia which should stop the spread of the disease in non-affected areas of the country or to the neighboring countries.
- **Afforestation and Reforestation (TCP/ARM/3203).** The project focuses on the development of human resources in the fields of seed collection, nurseries, plantations and natural regeneration. In close collaboration with the National Forest Program, it intends to implement capacity building measures as well as small pilot projects
- **Establishment of a virtual research information and communication network (TCP/ARM/3103 (D))**.The development objective of the project is to improve, through strengthened research and development extension linkages, the agricultural advisory services provided to resource poor farmers, in support

of rural livelihoods and development.

- **Assistance to Brucellosis Control in Armenia - Phase 1 (GCP/ARM/001/ITA)**. The development objective of the project is to enhance family livelihoods by reducing brucellosis disease in animals and in humans in Armenia.
- **Support for pesticide quality control and residue monitoring in Armenia (GCP/ARM/003/GRE).** The aim of the project is to contribute to sustainable development of the agricultural sector through less hazardous agricultural inputs leading to improved agricultural practices, safer food and a cleaner environment as well as to the reduction of risks associated with the use of pesticides.

- **Support for abattoir development in Armenia (GCP/ARM/004/GRE)**. The development objective of the project is to demonstrate and produce safe hygienic meat production in selected Marzes (regions) in Armenia. Its medium-term objective is to enable the livestock development institutions (both private and public) to effectively improve the safety and quality of meat and meat products.
- **Food Safety Capacity Building (TCP/RER/3003 (A)).** The project contributes to food security and safety and supports economic development of the rural communities in Armenia and Georgia by improving the performance of national food control programmes.
- **Co-ordination of FMD surveillance and control in the Transcaucasian countries and strengthening of emergency management capacity (Georgia, Armenia and Azerbaijan- EU MTF/INT/003/EEC).** The project aims to strengthen the veterinary services of the Transcaucasian countries in FMD surveillance and control as well to re-enforce regional bio-security, especially at the borders between the Transcaucasus and Turkey and Iran.
- **Emergency Assistance for Early Detection and Prevention of Highly Pathogenic Avian Influenza in Armenia.** The project aims to strengthen the capacities of the veterinary services in early detection and prevention of Avian Influenza in the country**.**

- **Capacity building in agricultural biotechnologies and biosafety (TCP/RER/3102 (D))**.The overall objective is to enhance food security and income of the rural population through increased productivity and quality in a sustainable and environment-friendly manner through, where appropriate, the safe use of conventional and modern biotechnologies in Armenia, Georgia and Moldova.
- **Increasing resilience of small scale farmers to the impacts of soaring food prices by improving capacity and institutional environment for seed production and the use of irrigation technologies (GCP/RER/026/AUS).**

Within the framework of the project component it is foreseen to improve the livelihood for small scale farmers in Armenia and Kyrgyzstan affected by the soaring food prices though improved policies in the area of seed production, diversification and irrigation management.

- **Capacity building on Obsolete and POPs Pesticides in EECCA countries (FSP) (GCP/INT/062/GFF).** The aim is to create a strong platform on the elimination of obsolete pesticides and POPs in 9 countries of Eastern Europe, Caucasus and Central Asia.
- **Improving management of migratory and other locust in the Caucasus and Central Asia (TCP/INT/3202**). The immediate objective is to improve national and regional locust management in Caucasus and Central Asia through regional cooperation and capacity-building.
- **EC/FAO Programme on information systems to improve food security decision-making in the ENP-East Area (GCP /GLO/275/EC).** The Programme is designed to enhance national capacity in generating, analyzing, communicating and mainstreaming reliable food security-related information into food security related policies and programmes.

FAO Representation Office in Armenia organizes substantive and instructive events in the framework of the annual World Food Day Celebration in cooperation with the Ministry of Agriculture of the Republic of Armenia, State Agrarian University of Armenia, UN Agencies, NGOs, agriculture related organizations. In addition, cooperation with FAO has contributed to preparation of natidonal personnel and development of partnership with other interantional organizations. From this perspective, the 36th session of FAO European Commission and the 27th FAO European Regional Forum to be held in Yerevan On May 10-14 are of special importance.

19. RESEARCH, EDUCATION, EXTENSION

To ensure development of the agricultural research, education, and extension system adequate to the reforms in food and agriculture sector underway in the country, the RA Ministry of Agriculture has developed a concept paper (approved by Statement #53 of December 30, 2004 of the RA Government) that includes the basic steps being taken in these spheres during 2005-2010.

Seven research organizations operating within the ministry system are implementing fundamental and applied agricultural research activities. These organizations involve 249 research workers including 25 doctors and 122 candidate doctors.

In the present development phase of the Armenian agrarian science, a key objective is to define the priority directions of the agrarian science and research taking into account the peculiarities of the Armenian agriculture, the existing resources, the research potential, nationwide goals of socio-economic development as well as the world experience of the agrarian science and its development trends. The RA Ministry of Agriculture has developed a “Concept on priority directions of development of the agrarian science in the Republic of Armenia” (for 2009-2013), which will be suggested for the RA Government’s approval.

The research centers under the RA Ministry of Agriculture are collaborating with a number of international research centers (CGIAR, ICARDA, CIMMYT, IPGRI, ISNAR, AZJRO, CIP), as well as with research organizations from Greece, Iran, Egypt, and other countries.

Currently, the six research centers under the RA Ministry of Agriculture are introducing new technologies in horticulture and animal husbandry. New varieties of crops and valuable breeds of animals have been imported.

Over the last years, Armenian researchers have selected Akhtamar, Victoria, Armsim wheat varieties, Mush, Utiq-2, Sasun barley varieties, Urartu-85 alfalfa variety, Akhuryan 107 sainfoin variety, Vagharshapati-1, Vagharshapati-2, Kotayq-3, Kotayq-4 soybean varieties, Haghtanak, Svetlana, Lia, Araqel, Armenian-Greenhouse tomato varieties, as well as new varieties of pepper, eggplant, cucumber, melon, watermelon and squash.

Table 27

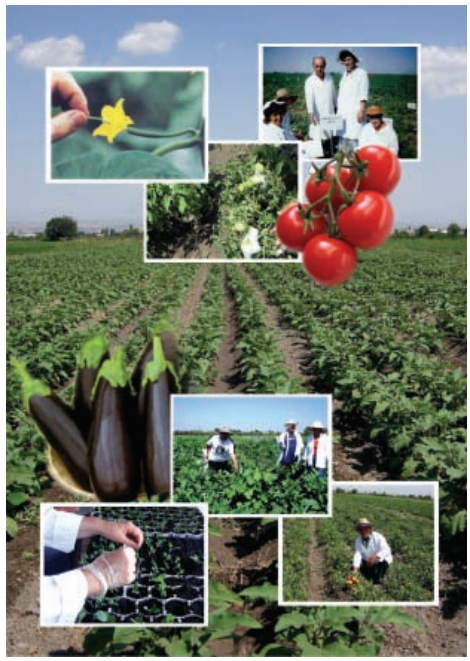
Showings illustrating the research organizations under RA Ministry of Agriculture

Name of research organization	**Research directions**	**Number of research specialists**	**Including**	
			Doctors	**Candidate doctors**
Research Center for Agriculture and Plant Protection, State Non-Commercial Organization	- winter wheat and barley selection and seed production, - agri-technologies in field crop growing, - development and application of effective methods for diseases and pests management	66	5	36
Research Center for Vegetable and Technical Crops, SNCO	- improvement in technologies of receiving new elite and super-elite varieties of vegetable crops, - development of new vegetable and technical crop varieties	23	2	12
H. Petrosyan Research Center for Soil Science, Agricultural Chemistry and Land Improvement, SNCO	- identification of land origin and geography appropriateness, - study of land fertility showings and nutrition conditions, - establishment of soil erosion processes, soil salination rates, and optimal fertilizer amounts	53	6	27
Research Center for Horticulture, Viticulture and Winemaking NCO	- creation of new and more valuable varieties of grape vines and fruit trees, - development of differentiated grape and fruit tree maintenance agro-techniques	41	6	19
Research Center for Livestock Management and Veterinary Research Center, SNCO	- improvement of genetics and productivity of locally bred agricultural animal breeds, - development of methods for controlling infectious and non-infectious diseases of agricultural animals	47	4	22
Research Center for Agri-BioTechnology, SNCO	- development of bio-technological methods for seed potato production, - implementation of researches on bio-technological growth of vegetable crops, valuable forest trees and decorative plants, - improvement of modern bio-technological methods existing in the agriculture sector	10	-	3
Technical Crop Experimental Center, SCJSC	- Development of new varieties of technical crops and seed selection	9	1	3
Total		**249**	**25**	**122**

Within the international programs, the research organizations under the RA Ministry of Agriculture implement joint researches as well as exchange research information, training of researchers, faculty and students. The agricultural colleges under the Ministry are now in reform process, which progresses pursuant to the overall educational reforms underway in the country, national program of socio-economic development and the general priorities in the agrarian sector.

The following 6 **Agricultural Research centers** are active in the system of the RA Ministry of Agriculture: Research Center for Vegetable and Technical Crops; Research Center for Agriculture and Plant Protection; H. Petrosyan Research Center for Soil Science, AgroChemistry and Melioration; Research Center for Viticulture, Horticulture and Winemaking; Research Center for Animal Husbandry and Veterinary Service, and Research Center for Agri-BioTechnologies.

Research Center for Agriculture and Plant Protection was established in 1926 in Vagharshapat, Armavir marz. This huge scientific complex is involved in selection, seed breeding, agro chemistry, biochemistry, agro technology, physiopathology and pesticide residues studies. Recently, the Research Center implements fundamental and applied research operations funded by Ministry of Agriculture and the Ministry of Education and Science. Researches in the Center mainly focus on development of more efficient crop technologies for short crop rotations, in particular, emphasizing crop diversification, production of legumes, mineral fertilizers, up-to-date pest, disease, and weed control methods. New, resistant varieties are being introduced. The Center cooperates with international organizations such as ICARDA, CIMMYT, ICRISAT, IPGRI, and others. Over the last 3 years, due to this cooperation, hundreds of winter wheat, winter barley, chickpea, lentil, soybean, peanut, and other crops are being experimented. Some of the local varieties are introduced into the farm production.



H. Petrosyan Research Center for Soil Science, AgroChemistry and Melioration was established in 1958. Departments of soil genesis, soil geography, melioration, agrochemistry and erosion are functioning in the center together with respective laboratories. The center is involved in wide-ranging soil researches in Armenia, including classification soil types based on genetic-geographical

properties. Based on hierarchic scheme of classification, 228 soil groups were distinguished and described, related atlases and maps compiled. The technology of chemical melioration of saline-alkali soils developed by the center has received a worldwide recognition.

Handy soil protection and fertility enhancement measures, regularities of rational use of macro- and micro-, bacterial, organic and other fertilizers and growth' stimulators were have been developed and proposed.

No-till technology application, methods of re-cultivation of depredated and man-caused polluted lands, dynamics of organic carbon (humus stock) dependence of global processes of desertification and climate change are some of the current research subjects in the center.

Research Center for Viticulture, Horticulture and Winemaking was founded in 1927. The Center has received over 150 certificates of authorship for obtaining new grape varieties. Among these varieties introduced in Armenia are: Azateni, Karmrahyut, Hadisi, Armenian Muscat, Sevaki, Taroni, Tigrani, Urartu, Karmreni, Meghrabuyr, Aygezard, Arevshat, Kaputan, Masis, Tokun, and many others (Plant varieties 2002, State register of the selection achievements, Yerevan, 2002). The last two varieties introduced in 2008 to grow in Ararat Valley and in pre-mountainous zone are Red Itsaptuk, Charentsi and Muscat. Over 100 certificates of authorship have been awarded for new fruit varieties. The Center was awarded an authorship license in 2006 for producing vintage wines and two licenses in 2008 and 2009 for aging of brandy spirits.

The Center is also active in publication of guides and research books in viticulture and grape growing. In addition specialists of the Center have developed the draft law of the RA "On Alcoholic Beverages Produced from Grape Raw Product" as well as 80 related sublegislative acts.

Research Center for Vegetable and Technical Crops, located in Darakert, Ararat marz, was established in 1949 by famous plant breeder Anahit Ananyan, initially as a Pedigree Seed Production National Station. In 1993 the Station was reformed into Research Institute of Vegetable and Melon cultures. In 1998 it was renamed as Research Center for Vegetable and Technical Crops. The Center has 27.5 hectares of land, of which 21.0 ha is arable. The Center currently has five departments and a biotechnology laboratory.

The Research Center offers over 80 varieties and hybrids of vegetable and melon crops to farmers, a number of new technologies for crop cultivation, as well as 30 different processed food products. Over the recent years, 20 new vegetable crop varieties and hybrids have been selected and introduced in Armenia by the researchers of the Center. Variety trials have also been implemented to introduce

high value non-traditional crops like Brussel's Sprout, Chinese Cabbage, Beijing cabbage, broccoli, kohlrabi, etc.

The Research Center is cooperating with international agencies like AVRDC, ECPGR, MCA's Water to Market activity, and others.

Research Center for Animal Husbandry and Veterinary Service was founded in 1930 as Veterinary Research Institute. In 1998, the research institutes of animal husbandry and veterinary service merged and were renamed as Research Center for Animal Husbandry and Veterinary Service SCJSC.

The animal husbandry department of the Center is involved in preservation of gene pool of cattle, sheep, pigs, and birds; scientific researches aimed at animal productivity; and development of feed production.

The veterinary department is involved in studies of virus diseases of agricultural animals, microbiology, cell culture as well as diagnosis and treatment of infectious diseases.

The Center also performs expert examination of biological preparations, means of diagnostics and wheys, as well as trains research personnel.

Research Center for AgroBioTechnologies. In 2004, the Biotechnological Laboratory functioned previously within the Research Center for Agriculture and Plant Protection was separated and became an independent Research Center for Soils Science, AgroChemistry and Melioration. In 2005, the RA Ministry of Agriculture established the Gene Bank of Plant Genetic Resources within this center. The Center's mandate includes: mass propagation of virus free potato planting material by use of tissue culture; development and application of biotechnological methodologies for rapid propagation of prospective crop varieties represented by single samples; immunodiagnostics of plant viruses; collection, evaluation and storage of PGRFA accessions; Gene Bank maintenance and database conducting, etc.

The Center has been actively cooperating with USDA, FAO, WB, CGIAR, research institutions from Russia, the Netherlands, Czech Republic, Moldova, Georgia, Slovakia, Japan, Belgium, Poland, India, Uzbekistan, and others.

To ensure sufficient number of specialists in the intermediate links of agri-food system enterprises in the Republic of Armenia, **10 state colleges operating in 7 marzes** are providing valuable input: over 3,500 students are acquiring 23 specialties. Taking into account the demand in the agri-food enterprises for a number of specialties, some new specialties have been introduced in the education process of the colleges during the recent years, including: Quality Examination of Consumer Goods; Canning and Food Concentrates, Technology; Agrarian Management; Fermentation Technology and Winemaking; Meat and Meat Product Technology; Translation and Customs Service; Calculus and Automated System Software.

Armenian State Agrarian University

From the standpoint of agrarian reform intensification and efficient management, it is critical to supply the sector with relevant qualified specialists. The Armenian State Agrarian University (ASAU) is the only higher educational institution providing the agri-food sector with university-degree specialists.

ASAU (formerly Armenian Agricultural Academy) was founded in 1994, as a result of merge of the Armenian Agricultural Institute and the Yerevan Zoo-Veterinary Institute.

ASAU prepares specialists in 36 specialties. The University has 7 departments of daytime studies with 46 chairs, master and PhD degree studies, Agribusiness Department (Agribusiness Teaching Center), correspondence study department, center for lifelong learning, training, supplementary education and strategic planning, base school with classrooms in regions, and a state agricultural college. The university has over 10,000 students.

Today's food and agriculture sector job market demands new specialties that are now included in the curriculum of ASAU: Agricultural Ecology; Children's and Functional Food Technologies; Expert Examination of Agricultural Raw Product and Foodstuff; Standardization and Certification; Insurance Business, Consultancy and Information in Agri-Food System; and others.

ASAU has qualified faculty and research potential. Five specialty councils certified to award scientific degrees operate in the university: agronomy, vet, livestock management, engineering, and economics.

The 9 problem-based laboratories implement research activities aimed at enhancement of the efficiency of agricultural production. Currently, the RA Government is funding 12 contractual research topics. Applied researches are implemented jointly with a number of foreign universities.

ASAU has two test/demonstration farms in Kotayq and Armavir marzes.

The *Bulletin of the Armenian State Agrarian University* is published since 2003. Due to English and Russian versions of articled the Bulletin is made accessible to a large number of specialists in many countries; on the other hand, authors from many countries publish their articles in the Bulletin. Two student newspapers, *Hask (Ear)* and *Student's View* are also published by the University.

ASAU closely cooperates with a number of international and local agencies including USDA, CARD, FAO, ICARDA, SIDA, German Technical Cooperation (GTZ), the International Cooperation Institute of the German Union of People's Higher Education (IIZ/DVV), and others. The University is actively cooperating with leading European universities with in the TEMPUS and Erasmus Mundus exchange projects. The Agribusiness Teaching Center is a joint successful project of regional significance with the ASAU's partner University in the United States, Texas A&M (see below).

Agricultural colleges active under the RA Ministry of Agriculture

- S. Lukashin State Agricultural College in Armavir,Armavir marz, founded in 1952
- Gavar Academician Tamamshev State Agricultural College, Gegharqunik marz, founded in 1929
- Goris Agricultural College, Syuniq marz founded in 1931
- Masis State Agricultural College, Ararat marz, founded in 1928
- Nor Geghi G. Aghajanyan State Agricultural College, Kotayq marz
- Stepanavan Prof. Qalantar State Agricultural College, Lori marz, founded in 1929
- Spitak State Agricultural College, Lori marz, founded in 2000
- Vanadzor State Agricultural College, Lori marz, founded in 1925
- Gyumri State Agricultural College, Shirak marz, founded in ……
- Yerevan State Agricultural College, founded in 1928

Due to close collaboration with a number of international agencies (including TACIS and GTZ), the technical basis of colleges has been notably modernized; all colleges now have up-to-date computer labs.

To use their potential in providing consultancy for rural population, the colleges cooperate with the regional Agricultural Support Centers (ASC). The leading faculty members of the colleges and the ASC village agents are organizing seminars, training courses, and field demonstrations in rural communities adjacent to the colleges.

The **Agribusiness Teaching Center (ATC)** plays a special role in preparing specialists who would meet today's market economy challenges. The ATC was established in 2000 through the collaborative effort by the Armenian State Agrarian University, Texas A&M University and the U.S. Department of Agriculture. The ATC provides agribusiness education to achieve sustainable entrepreneurship in the food and agriculture and related sectors in Armenia and Georgia. It prepares agribusiness specialists armed with broad economic, marketing, and managerial views, up-to-date communication skills and excellent knowledge of English. Around 30 students are enrolled every year, of whom 5-6 are from the Republic of Georgia.

The ATC suggests a 2 year and 3 month agribusiness and marketing program which is incorporated in the 4 year and 3 month program of the same ASAU specialty. The ATC curriculum comprised of a set of required courses and internships is western-structured, based on the undergraduate degree agricultural economics curriculum of Texas A&M University and Mays Business School . Courses are taught in English by Armenian and American instructors with graduate degrees from U.S. and European universities. The graduates receive a State Diploma from ASAU (the Georgian students - respectively from the Georgian State Agricultural University and the Batumi Shota Rustaveli State University), as well as a Certificate from the Texas A&M University.

The knowledge and experience acquired by the ATC Armenian and Georgian graduates make them competitive in the growing agribusiness sectors, non-agricultural field, banks, international agencies, and in other sectors of the job markets of the two countries. These are actually the main fields where the ATC graduates currently work in Armenia, Georgia and in other countries.

The ATC ensures a unique educational environment where capacity, initiative, independent work, creative approach and the wish to help your country are highly valued. The classrooms, the computer lab and the faculty/administrative facilities are furnished with modern equipment and technology, which gives the students a complete working environment for both classroom and independent study. A high-tech computer lab with unlimited internet access is at students' disposal. The classes are conducted exceptionally with the help of computers, relevant software and video materials.

The credit system of student evaluation has been practiced in the ATC since the day of its establishment in 2000. In 2007, the ATC shifted to the ECTS (European Credit Transfer System) within the Bologna process.

As of November 2009, **228 students have graduated** from the ATC, of whom **over 40 have continued** their education in MS and PhD degree studies in leading U.S. and European universities.

Internship makes a valuable part of the ATC education program in terms of preparing the students for a professional career. The main focus of the eight-week internship program is to get involved in marketing, management, and finance activities of businesses in real life situations. On the other hand, due to the modern knowledge acquired at the ATC, students suggest effective advice to the hosting companies to improve their works. Internship opportunities for the students are provided in agribusiness enterprises, farmer organizations, banks, and NGOs not only in Armenia and Georgia but also in Ukraine, Germany, the US, Greece and other countries.

ATC Outreach Program includes: Student Exchange and Study Abroad programs, field trips, Friday seminars. Student Exchange and Study Abroad programs include student exchange through the European Erasmus Mundus program between Armenia and European countries as well as organization of internships, through ASAU and the ATC, in Armenian agribusiness companies, international agricultural and agribusiness missions. Within these programs, students from Greece, the Netherlands, Portugal, Latvia, Bulgaria have studied in the ATC for one or two semesters, while others form the U.S., Georgia, Greece, the Netherlands, Columbia, Portugal, Argentina, Gana, Macedonia, Albania, and Slovenia have spent their internships in Armenia on the basis of the ATC. In turn, ATC students have studied and/or spent internships in Greece, the U.S., Ukraine, Georgia, Turkey, and Poland.

Within the outreach program, training courses on teaching methods, student evaluation, and curriculum reforms were provided for dozens of faculty and administrative staff representatives from the Georgian State Agricultural University Tbilisi and the Shota Rustaveli State University Batumi.

Each ATC class goes on at least two field trips per semester to agribusinesses throughout Armenia to observe the production, marketing, finance, and management situation in real businesses.

The traditional Friday Seminars are organized to expose the ATC students to the recent developments, ideas and schemes in the local and international real-world businesses.

In 2005, the **International Center for Agribusiness Research and Education (ICARE)** was founded to manage the activities of the ATC. The other three components of ICARE are: Career Placement and Counseling Center involved in finding jobs for ATC and ASAU graduates; Teaching and Learning Excellence Center involved in reform of higher agricultural education; and Agribusiness Research and Outreach Center involved in research on different agribusiness topics and presenting their results at national and international meetings.

The **Agricultural Extension system** under the RA Ministry of Agriculture includes the Agricultural Support Republic Center (ASRC) CJSC and the marz Agricultural Support Centers (ASC) in all 10 marzes. The scheme of the consultancy system is presented below. 145 village agents are involved in the ASC system. They provide consultancy services to 916 communities in all marzes. Priority topics are determined based on needs assessments conducted among farmers. Researchers from the agricultural research centers and the Armenian State Agrarian University are actively involved in rendering advisory services. The diverse advisory services provided by them during 2007 included: 25,650 consultations and 2,361 marketing interventions; in addition, 679 different extension materials were published.

Table 28

Main indicators of marz ASC activities

Activities Years	2000	2001	2002	2003	2004	2005	2006	2007
Seminars	782	1807	3428	27040	8172	2948	2241	1685
Consultations	3427	2654	2526	2765	1386	3294	18222	25650
Article and other materials	744	484	685	1125	828	882	407	679
Radio and TV programs	145	279	165	165	111	49	38	56
Establishment of associations and farmer groups	80	237	195	135	184	139	224	110
Business and other programs		371	190	644	685	291	733	508
Fact sheet development	343	248	208	456	471	397	305	334
Marketing intervention	2014	1114	788	1704	3616	3154	2114	2361

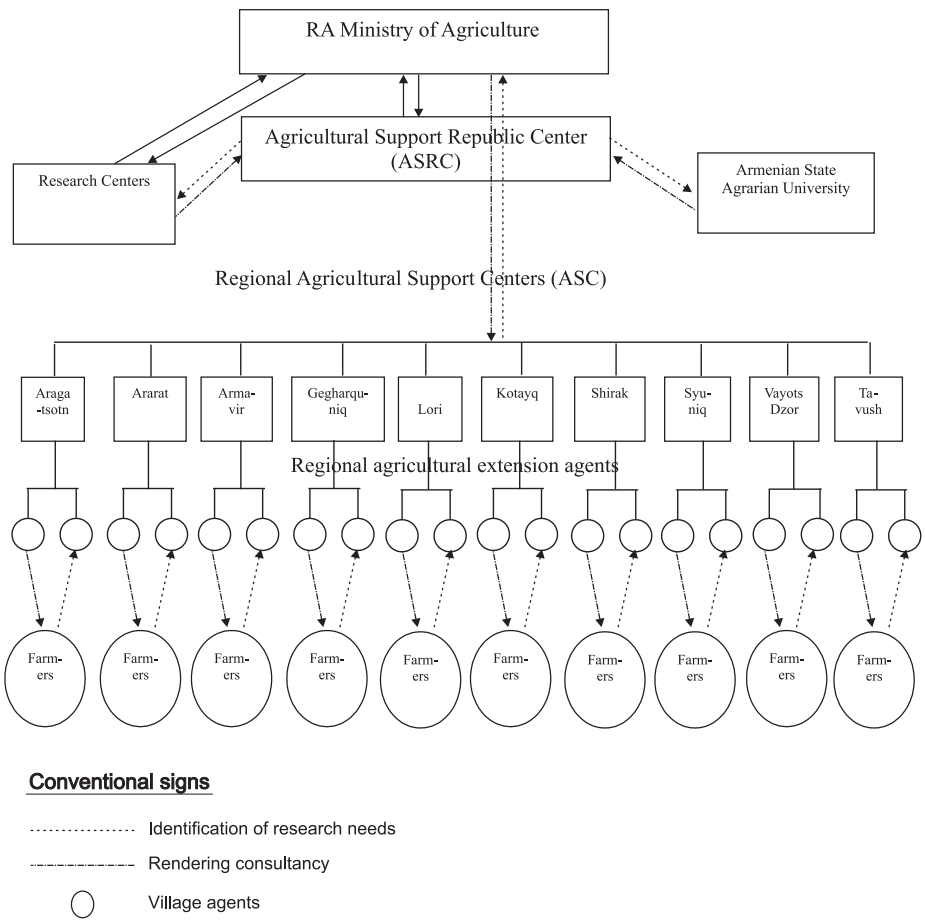
Agricultural Support Republic Center (ASRC) CJSC (www.asrc.am) was established in 2002, by a Government decision. It provides extension and information services to farms throughout Armenia. ASRC closely cooperates with marz ASCs, local self-governance bodies, research centers, agricultural and agribusiness enterprises, as well as a number of international agencies.

The basic goal of ASRC is to facilitate and support the capacity building for researcher – advisor – farmer links by providing hands-on information and advice on the latest research and technology achievements.

ASRC, jointly with ASCs and researchers active in the agrarian sector, have implemented over 950 participatory projects based on survey results conducted by ASCs on priority research needs. The results were provided to farmers through fact sheets, AgroLratu newspaper, AgroGitutyun magazine, and Agro-TV programs on a timely basis. Information on technology assessment programs together with data on researchers is maintained in ASRC's database.

ASRC is currently engaged in UN FAO-run "Establishment of Research Information and Communication Virtual Network in Armenia" project. As a result of the project, ASRC will establish and manage a nationwide agricultural communication network, which will enhance the information and knowledge transfer between the research and extension organizations.

The agricultural consultancy and information system



20. STATE AGRICULTURAL ASSISTANCE PROGRAMS

Unlike other industries, where the market economy mechanisms can be fully operational, agriculture requires definite state regulation and state support due to some objective peculiarities. From this standpoint, the summarization of international experience indicates that state assistance is implemented in the following main directions:

1. Land improvement and development of irrigation systems;
2. Development of rural areas (socio-cultural infrastructures, building of road network, gas supply, etc.);
3. ensuring access to loan resources for producers and processors of agricultural products;
4. development of pedigree cattle breeding and implementation of veterinary epidemiological measures;
5. Development of elite seed selection and implementation of plant protection measures to control quarantine pests and diseases;
6. development of a system of agricultural risk insurance;
7. Development of organic agriculture;
8. support in marketing of agricultural produce and purchase of production means;
9. Development of agrarian research, delivery of consultancy and information as well as preparation of professional personnel;
10. Application of different forms of subsidies to enhance the competitiveness of agricultural products.

The Armenian Government also is implementing diverse state agricultural assistance programs. For this purpose both state budget means and external credits and grant are used. Over the recent years agriculture has received state assistance in the following directions:

1. **State assistance to agricultural land users**. Since 2007, the Ministry of Agriculture has been implementing state assistance to agricultural land users. In 2007 this program was a pilot one and was implemented in 3 communities of Chambarak area of Gegharqunik marz and in 12 communities of Aragats area of Aragatsotn marz. A state assistance of 35,000 AMD per hectare was envisaged for each hectare of agricultural land. 846 beneficiaries were included in the first year's program; about 166,200,000 AMD was allocated for cultivation of 4,800 hectares.

The capacities of the program were expanded in 2008 to cover 253 communities of eight marzes; 28,065 beneficiaries received assistance of 1.6 billion AMD to cultivate 49,855.1 ha of land on the same conditions.

In 2009, the program was directed to beneficiaries of 181 communities in highland areas of 8 marzes. They received a state assistance of 1.6 AMD to grow cereals on 45,073.3 hectares.

The crop areas included in the program were expanded in 2009 by about 2,492 hectares, and the gross produce has increased by about 403,700,000 AMD.

2. **Assistance in Animal breeding.** Artificial insemination is an important development tool in animal breeding. In 1980-es 200,000-220,000 cows were artificially inseminated yearly. Starting from 90-es, this activity was ignored for over a decade. In 2003, 11.5 million AMD was allocated from the state budget for storage of semen received from high-productivity bulls by the deep freezing method. The state assistance projects in artificial insemination are shown in Table 29.

Table 29

State assistance to artificial insemination of animals

		2004	2005	2006	2007	2008	2009
1.	Storage of semen with deep freezing method						
	a) storage volume (thousand dosages)	560	525	491	388.5	370.6	346.4
	b) storage cost (million AMD)	11.5	10.8	10.0	7.9	7.5	6.3
2.	Artificial insemination of cows						
	a) number of heads (thousand heads)	23.4	17.0	14.1	9.1	13.4	
	b) cost (million AMD)	30.0	28.0	17.4	15.2	16.8	
3.	Artificial insemination of other animals						
	a) number of heads (thousand heads)		3.3	4.9	3.7	4.7	
	b) cost (million AMD)		9.9	14.0	11.0	13.9	

The state budget supports the development of cattle breeding since 2007.

To stimulate expansion of milk production and development of dairy cattle breeding, within the project, 110, 415, and 269 heads of Holstein, Swiss and Simmental breed pedigree heifers were brought in to Armenia respectively in 2007, 2008, and 2009, which were sold to farmers on terms of diverse payment period (for a 4 year period). The productivity of imported animals exceeds about 2 times that of the local breeds.

3. **Setup of anti-hail stations.** Anti-hail systems are not properly operating since the collapse of the Soviets; as a consequence of different disasters, farm households suffer losses of 20-25 billion AMD on average, a large portion of which is hail damage. According to data provided by marzpetarans (regional governors' offices), during 2009, 35,368.8 hectares of agricultural lands belonging to 270 communities have suffered from different natural disasters, with the overall losses making 11,894.8 million AMD.

To settle the issue, process of setting up anti-hail stations started in 2005. In 2005, 15 such stations were set up in Aragatsotn marz worth of 294,300.0 ths AMD. In

2007, 15 anti-hail stations were set up in Armavir marz worth of 186,700.0 ths AMD. In 2009, 12 stations were set up in Ararat marz with 120,000.0 ths AMD value and another 80 are planned for 2010 worth of 700.250.0 in Ararat and Armavir.

Setting up anti-hail stations by state assistance enables to considerably alleviate the hail damage risks and enhance the investment attractiveness of the agriculture sector.

4. **Development of seed growing**. Seed breeding is critical in improvement of the yielding capacity of agricultural crops. Taking into consideration the fact that elite seed breeding of cereal crops is science-intensive and costly activity, a support program has been implemented starting from 2007. Sixty tonnes of winter wheat and 15 tonnes of spring barley super elite and elite seeds worth of 29,175.0 ths AMD were purchased in 2007 and delivered to 14 seed farms to ensure further multiplication. In addition, to support local seed production base, the research centers in the system of the Ministry of Agriculture were allocated 34,597.6 ths AMD-worth subsidy. The mentioned organizations have produced 700 tonnes of super elite and elite seeds of winter and spring wheat and spring barley.

In 2008, 42 tonnes of corn hybrids and varieties were purchased for 32619.4 ths AMD and provided to seed farms. Research centers and private seed farmers have been allocated subsidies of 62,893.0 ths AMD for production of 1,104.0 tonnes of base seeds.

In 2009, the state assistance to seed production has made 76,495.3 ths AMD and 1,205.9 tonnes of winter and spring wheat and spring barley super elite and elite seeds were produced.

5. **Veterinary and sanitation-epidemiological measures.** Taking into consideration the importance of food safety, provision of stable animal epidemiological situation in the country as well as prevention of general infectious diseases of people and animals, 948.4 million AMD was allocated in 2009 from the state budget, which exceeded the relative indicator of 2008 by 17.4 percent.

Meantime, during 2007-2010, over 800 refrigerators were purchased and given to community vets for storing the medicines according to veterinary norms.

Starting from 2004, the Government has delegated the veterinary services to community leaders. As of 2009, 850 vets work throughout the country with a monthly salary of 56,000 AMD.

In addition, according to the RA laws “On Food Security” and “On Veterinary Service”, animal and vegetable food is subject to obligatory expert examination and plant-sanitary quarantine. 5,931.5 ths AMD, in 2008 -21,443.2 ths AMD and in 2009

– 26,713.0 ths AMD were allocated from the 2007 state budget for implementation of this project.

The world financial and economic crisis had its negative impact on the overall economy and in particular on the agrarian sector. Within its anti-crisis activities, the RA Government implemented agricultural and food processing assistance projects. In particular, those economic entities whose products had export trend and demand in the export market, pursuant to the submitted business plans, received assistance in the form of grants, loan guarantees or concessional loans. A special attention was paid to development of agriculture through organic technologies as well as to capacity building for food processors.

The financial means allocated form the state budget to agriculture over the last 3 years, are presented in Table 30.

Table 30

Funding of agriculture from the state budget, thousand AMD

#	Measures taken	Years		
		2008	2009	2010
1	Plant protection	300,0	300,0	150,0
2	Vaccination of agricultural animals	1,353,8	1531,4	1,000,0
3	Funding of national and marz ASCs to implement advisory services	141,5	183,1	293,1
4	Laboratory diagnosis of animal diseases and expert examination of animal raw products and materials	184,3	217,4	185,0
5	Maintenance and improvement of agricultural lands and rehabilitation of engineering structures	369,1	844,7	547,1
6	State assistance to agricultural land users	1,645,0	1,602,4	558,0
7	Project on development of cattle breeding in the Republic of Armenia	500,0	500,0	0,0
8	Cattle breeding development project within the “Grant support to lower income farmers” project implemented through the support of the Japanese Government	0,0	0,0	345,0
9	Seed breeding development project in the Republic of Armenia	105,1	188,2	76,6
10	Implementation of forest maintenance, forest protection and afforestation activities	1,465,5	1,465,5	765,5
11	Afforestation measures implemented at the expense of partnership fund formed within the “food production growth” project of the Japanese Government	400,0	300,0	0,0
SUB-TOTAL		6,464,3	7,132,7	3,920,3
Other projects		2,275,6	1,925,6	1,874,8
Loan means		589,5	4,408,4	3,387,3
TOTAL		9,329,4	13,466,7	9,182,4

21. VISION AND PRIORITIES OF AGRICULTURAL DEVELOPMENT

The vision of the rural and agriculture development, in light of agrarian reforms and the state assistance, is as follows:

1) development of family farms integrated with commercial agricultural organizations, cooperatives, and market infrastructures;
2) sustainable food security through realistic coordination of food safety interests and comparative advantage of export of agri-food products and through meeting the raw product needs of the processing industry;
3) increase in gross agricultural output mainly through productivity growth, decrease in number of people involved in agriculture and using the excess labor in agricultural service and non-agricultural fields;
4) processing of the considerable part of agricultural raw product by processing plants formed as a result of developing small and medium size entrepreneurship in rural communities;
5) prevalence of value added agricultural products within the crop and livestock production structures;
6) high level of food safety in the country, self-sustainability in the vital food products, reduction of rural poverty and emigration.

To make this vision to come true, development of agriculture and food processing should be focused on the following priorities:

- Deepening of agrarian reforms, development of cooperatives, associations, unions, and market infrastructures;
- Raising the food security level and ensuring the minimum self-sustainability level in the main food products;
- Making the locally produced agricultural products more competitive, import substitution, and development of export-oriented agriculture;
- Enhancing the efficiency of land use;
- Development of and technical support to agricultural services industry;
- Development of rural social infrastructures,
- Alleviation of agricultural risks;
- improvements in agricultural crediting;
- Upgrading of agrarian research and education systems.

22. INTENDED MAIN INVESTMENT DIRECTIONS IN ARMENIA'S AGRARIAN SECTOR

The current situation in the agrarian sector provides a wide opportunity for development of entrepreneurship in different fields of agribusiness. The basic directions for profitable investments include, first of all, processing capacity building for and rational distribution of the production potential among players in agricultural raw product production, especially in vegetable, grape, fruit, potato, and dairy production. Secondly, agricultural services and production tools for those services are still weakly developed in Armenia. Thirdly, seed production is a rather profitable and prospective sector, thus investments in production of high quality seeds can ensure rapid and high returns. Fourthly, use of progressive technologies in organization of agricultural production, in particular – in establishing intensive apricot, peach, sweet cherry, apple, and grape orchards. Fifthly, strengthening post-harvest infrastructures such as cool storages and fruit driers and packaging and export of products that have export capacity. Sixthly, development of new directions of agribusiness, especially agritourism and ecotourism.

Within the above main investment directions, the following operations have capacities for high returns:

- production and marketing of certified, ecologically pure fresh and processed agricultural products,
- organization of small productions of alcoholic and soft drinks,
- production and processing of oilseed plants
- development of greenhouses, in particular – for flower production,
- establishment of dairy farms,
- intensive fattening of cattle and swine,
- organization of concentrated feed production,
- organization of wholesale agricultural commodity market,
- production of cheeses, in particular Swiss, Holland, Roquefort, and Goat cheeses,
- organization of small-scale slaughter facilities and production of meat products,
- cool storage,
- production and marketing of potato and other seeds,
- production of dry fruits,
- application of up-to-date irrigation technologies and organization of irrigation equipment production,
- providing private veterinary services,

- bringing in and leasing of agricultural machinery,
- organization of small-scale agricultural equipment production,
- organization of fertilizer, chemical and veterinary medications productions,
- development of reservoir fishing and processing of raw product,
- agritourism.

These investment directions are presented in the Strategic Program for the Sustainable Development of Agriculture in the RA. They are based on the assessment of the competitive and comparative advantages in the domestic and export markets. The spheres of investments are not limited to the above statements. Continuous studies are undertaken in this area.

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