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STUDY OF POSSIBLE EXPORTING VOLUMES OF ARMENIAN FRUITS AND VEGETABLE

Report

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Dear reader,

Study of possible exporting volumes of Armenian fruits and vegetables relates to agricultural sphere that significantly lacks statistics for various reasons. While analyzing the process of statistical data collection on Armenian agriculture we came to conclusion that some sources are trustworthy, while many are not. The main reason of shortcomings is that until now there is no agricultural register in Armenia and no Agricultural Census has been implemented. For various reasons data collection is partially distorted at the very sources of origin.

Enormous digital data has been used in the report of this study. They concern the production, export, import, consumption and prices of the last 5-10 years of 14 types of fruits and vegetables. There are many data sources and sometimes they are contradictory. We did our best to present indexes confirmed by several sources. In case it was not possible we made reservations. Though, the reader may also find data arguable for him. Unfortunately, it was impossible to avoid these problems. Thus, in such cases we offer not to concentrate on certain figures, but on tendencies. On our viewpoint, this report gives full image of the fruit and vegetable export and can be useful for interested readers to find answers.

Wish you nice reading,

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1 INTRODUCTION

Study of possible exporting volumes of Armenian fruits and vegetables was initiated by **"Armenian Development Agency"**[1] (henceforth ADA). The study implementation was financed by "Foreign financial programs management center" (henceforth FFPMC) of the RA Ministry of Finance from the financial means of the Second grant project for foreign investments and export promotion (grant No TF TF091254) and RA state budget. The study has been conducted by **AM Partners Consulting Company LLC**[2] during the period of September-December, 2010.

1.1 SURVEY OBJECTIVE

Agriculture has a pivotal role in the RA from the viewpoint of food safety. The RA Government is taking active and continuous actions to develop the agricultural field: one of them is to encourage the export of Armenian agricultural products.

In order to encourage the export of agricultural products a project was carried out to create Free Economic Zone (henceforth FEZ) nearby the Zvartnots airport in Yerevan, which was approved by the RA Government. Its purpose is to increase the export of Armenian agricultural products by full utilization of production-reprocessing-market chain. Initially the FEZ is intended to ensure the export of fresh fruits and vegetables. The implementation of the project will give a chance to increase agricultural income.

The FEZ is meant to fill the gap that exists in sales channels and respective infrastructure of agricultural products. As a logistics center of exporting products, it will allow organizing quickly the export of agricultural products both by plane and by other means of transportation. The FEZ will have all the necessary conditions for agricultural products' storing and treatment. There will be a check-up laboratory in the FEZ which will meet European standards; network of collection points will be created, which will work with the agricultural producers, providing them missing opportunities.

The FEZ Project is in process. According to those who are in charge of it, it will be in operation from the second half of 2011. Until then the organizational activities are being implemented. Particularly, draft of the RA Law on FEZ, (developed by the RA Ministry of Economy), is in the phase of discussion; the use of tax privilege regime rules in the FEZ are being clarified; the activities of creating necessary infrastructures (e.g. refrigerators) will start soon, etc. There are additional important problems as well, and success of the FEZ Project depends on their resolution. In particular, it is important to understand whether the FEZ will have enough chances to provide the expected export quantity of fresh fruits and vegetables, or whether there is a demand of such quantity of Armenian fruits and vegetables for which the use of FEZ capacities will be feasible. The study of possible exporting volumes of Armenian fruits and vegetables (henceforth Study) intends to answer all those questions.

The purpose of this research is to study Armenian fruits and vegetables, evaluating the present volumes of agricultural products, consumption of local market, import and export volumes, identify main producers and exporters, evaluate possible export volumes for different agricultural products based on market peculiarities, price and seasonality. From this point of view the subject of the Study are the following issues concerning Armenian fruits and vegetables.

[1] www.ada.am
[2] www.ampartners.am

1.	**Production quantity**	**2.**	**Consumption quantity**	**3.**	**Export quantity**
4.	**Import quantity**	**5.**	**Producers**	**6.**	**Exporters**
7.	**Production geography**	**8.**	**Seasonality**	**9.**	**Prices**

The objective of this survey is the assessment of possible exporting volumes of Armenian fruits and vegetables by discussing the above mentioned issues, as well as evaluating the impact of possible growth of export volumes on local market prices.

1.2 METHODOLOGY ARRROACHES

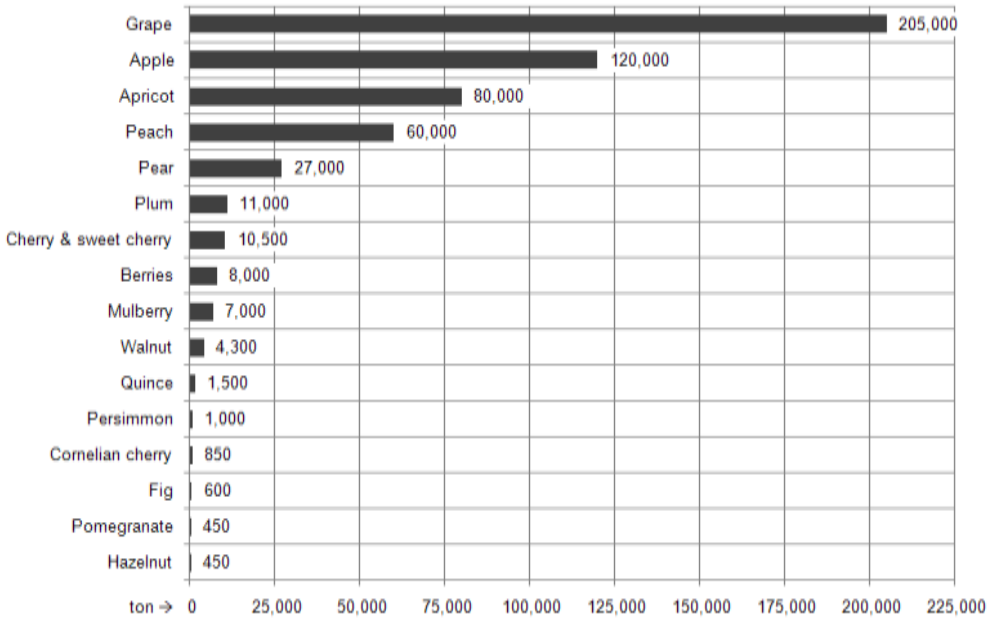
1.2.1 Studied products

Even the superficial observation of Armenian fruits and vegetables dictates that this research should be done by product types. The tens of fruit and vegetable types that grow in Armenia differ from each other by their production volumes, by number of cultivating husbandries, by their value and demand. In order to define the structure of necessary products for evaluating the possible export volumes of Armenian fruits and vegetables two factors were taken into consideration:

1) Supply, important components of which are large volumes of production and stability;
2) Availability of actual exports and traditions.

Fruit supply varies greatly from year to year. The volumes of fruit production vary strictly depending on climate conditions. From the viewpoint of climate conditions production volumes of certain fruit types can vary up to 10 times depending on favorable and unfavorable years. Thus, in order to have an idea about the production volumes of Armenian fruits, the following indicators may be helpful: *avarage of favorable years* or *gross potential supply*. In this sense, the production of Armenian fruits has the following indexes:

Chart 1 - The fruit production quantities in Armenia for the average favorable year[3]



Sources: 1. Official statistical data
2. Field experts and farmers

[3] Data is correct for 2005-2010 favorable years of harvest

In Armenia, mainly pome fruits, stone fruits and grapes grow in large quantities, because of its climate and relief condisions. Though, there are not such types, production of which is more or less exceeding Armenian population's local demand. That is why; today only 5 (table grapes, apricot, peach, plum, cherry) out of 17 fruit types are presented in Chart 1. Another two types of fruits (apple and pear) are exported not sustainably and in little quantities. The other fruits are consumed locally.

Some types of Armenian fruits are produced in so little quantities that they are even imported to Armenia, such as nuts: Greek nut, hazelnut, almond. Having quite large quantity of grape production, Armenia imports 900-1000 ton raisin per year. In order to cover the seasonal deficit, apple and pear are also imported. There is an opinion that if Armenia had road communication and trading relations with Turkey and Azerbajian it could import cherry, peach, apricot from these countries. Thus, the quantities of even the most produced Armenian fruits cannot be called *very large* or even *large*.

It's also a fact, that some types of Armenian fruits are being exported, and a few of them are well-known in consuming markets. If we observe the data on 2008-2009 fruit exports, 8 different types of fruits have been exported from Armenia, 5 of which have been exported in significant quantity, at least in a 20 ton sized container. All the fruit types that are being exported from Armenia as well as their classification by export quantities are presented in the table below.

Table 1 - Types of fresh fruits exported from Armenia in 2008-2009

Symbols			
★ ★ ★	→	Large quantities	→ Export >200 ton per year
★ ★	→	Low quantities	→ Export 20-200 ton per year
★	→	Insignificant quantities	→ Export < 20 ton per year

Types of fresh fruits	Fruits by 8 digit classification of PLEEA[4]	Export	
		2008	2009
1. Nuts[5], including			
- Coconut	08011900		
- Cashew nut	08013200		
- Peeled almond	08021290	★	★
- Hazelnut	08022200		
- Peeled Walnut	08023200		
- Pine nut	08029085		
2. Grape	08061010	★ ★ ★	★ ★ ★
3. Apple	08081080	★ ★	★
4. Pear	08082050	★	★
5. Apricot	08091000	★ ★ ★	★ ★ ★
6. Sweet cherry	08092050	★ ★ ★	★ ★ ★
7. Peach	08093090	★ ★ ★	★ ★ ★
8. Plum	08094005	★ ★ ★	★ ★ ★

Source: "Foreign Trade of the Republic of Armenia", NSS, 2008-2009

The indicators of two year export show that the export of Armenian fruits is mainly presented by the group of stone fruits (apricot, cherry, peach, plum) and grapes. It's true even in the case if we take in consideration even longer periods.

[4] Products list of external economic activity

[5] The export of the fruits that do not grow in Armenia (coconut, cashew nut) means that they have been initially imported, after which some part of them was exported (usually by little quantity)

At the same time, 7 types of fruits which are presented in Table 1 (i.e. exported) with the exception of nuts, greatest part of which was re-exported, match the 7 fruit types presented in Chart 1. This means that only fruits that are produced in significant volumes (i.e. more than 10,000 ton per year) are being exported from Armenia. This doesn't mean that Armenia cannot export cornel or pomegranate, especially that there has already been such experience. Though their production quantity is so little that creates serious problems for collecting, storing and transportation. That is why; the pivot of this study are 7 fruit types, based on which the analysis of Armenian fruit export and the forecast of upcoming years were done. These are:

1. Apricot 	**2. Sweet cherry** 
3. Peach 	**4. Plum** 
5. Grape 	**6. Apple** 
7. Pear 	

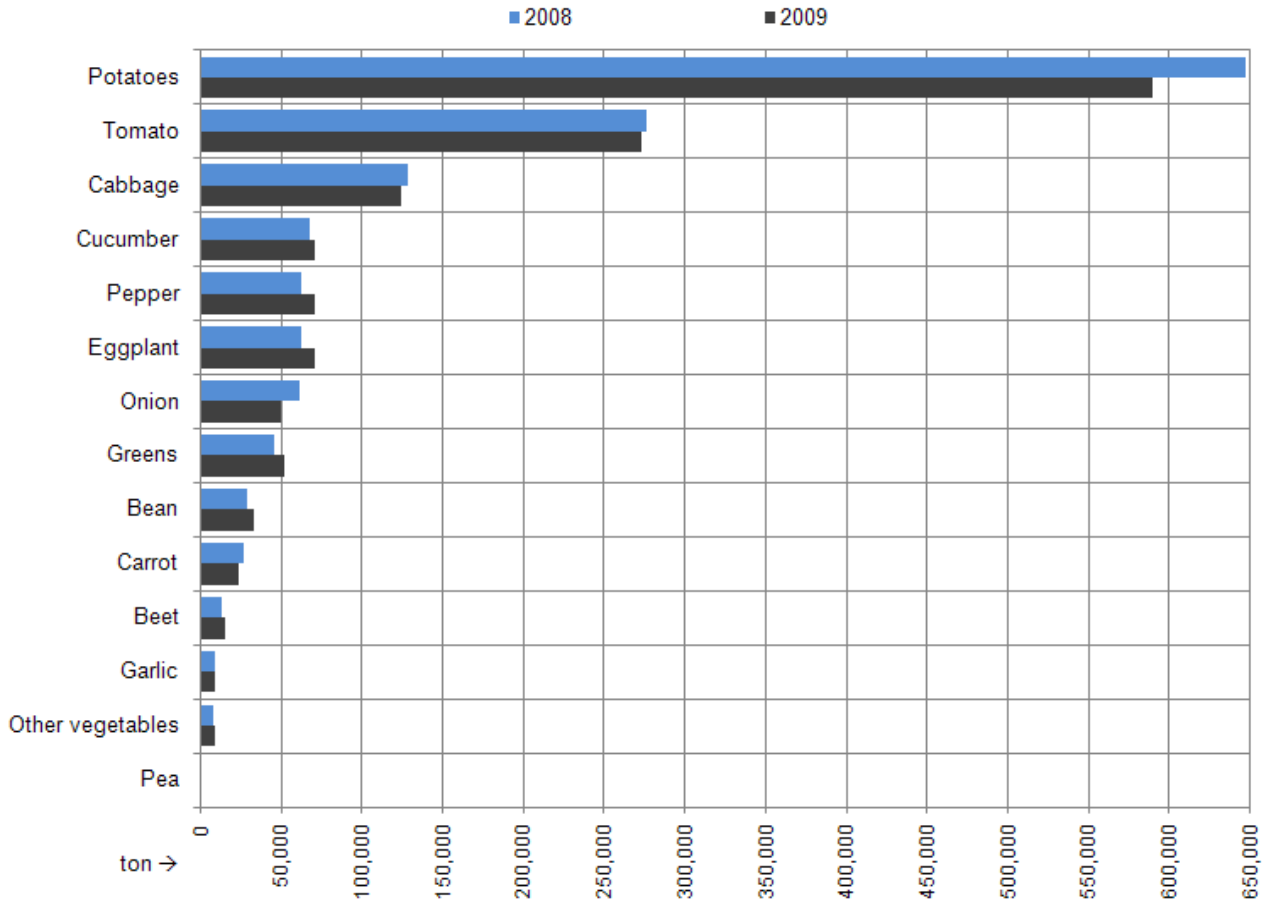
Among the mentioned fruits only apple and pear export volumes are little, despite their comparatively large quantity of production. Special attention was paid to the study of apple in order to understand the preventing reason of this fruit export, especially that it has quite good types and wide distribution.

The production of potatos and other vegetables in Armenia includied in the study is presented in the following list:

- Potatos
- Cucumber
- Onion
- Beet
- Kohlrabi
- Cabbage
- Pepper
- Green onion
- Greens
- etc
- Cauliflower
- Okra
- Garlic
- Pea
- Tomato
- Carrot
- Eggplant
- Broccoli

Only 10 friuts of this list are being produced in significant quantity. In case of potatos and other vegetables it is hard to talk about the stability of production quantity. Their production cicle is just a year. Depending on demand, availability of production capacity and production peculiarities (e.g. necessity of crop rotation) their production quantity varies greatly year by year. Thus, while defining the study group of products the supply stability was not applied as a factor. Instead, the indexes of **comparatively large production**and **exports are** taken into consideration. Below are presented the volumes of potato and other vegetable production.

Chart 2 - Quantity of vegetable production in Armenia in 2008-2009



Sources: 1. "Area Under Agricultural Crops and Gross Harvest 2008-2009", NSS, 2008-2009
2. Field experts and farmers

Among the mentioned vegetables only potato production exceedsArmenia's local demand. Thus, it became a special subject of our study. Other vegetable production and especially export volumes are quite small. Among them tomato, cucumber, pepper have been chosen as subjects of study. They have comparatively large volumes of production and export. These three vegetables are also among most grown in greenhouses, which allows to assure the offer of these products during the whole year. Cabbage, eggplant and onion are included in the study because of their comparatively large production. In certain years they have also been exported in small volumes.

Thus, within the frame of this study the following products have been selected in the category of *vegetables*.

8. Potatos 	**9. Tomato** 
10. Cucumber 	**11. Pepper** 

12. Cabbage 	**13. Eggplant** 
14. Onion 	

It doesn't mean that all the other products have been neglected. The study of the selected 14 vegetables has the following inclusion:

- The plots of selected fruits comprise 88% of all Armenian fruit plots;
- The plots of chosen vegetables comprise 95% of all plots of vegetables in Armenia.

! Hencforth the7 selected products of the study, i.e. grapes, apricot, peach, plum, cherry, apple and pear, will be characterized as *fruits*, and the other 7 products, i.e. potato, tomato, cucumber, cabbage, pepper, eggplant and onion, as *vegetables*.

1.2.2 Sources of information

Methods of data collection, classification, adjusting and summarizing have been applied for the study implementation. Data about fruit and vegetable production, consumption, export and import was received from all the competent sources. Conditionally, the sources of information can be divided into three groups.

Table 2 - The sources of information used for study implementation

1. Official sources	▶ RA National Statistics Service ▶ RA Ministry of Economics ▶ RA Ministry of Agriculture ▶ RA State Revenue Committee, with its two structural subdivisions:Armenian Customs Service and Tax Service ▶ Regional governorates, including their Agricultural Departments
2. Non- official or experimental sources	▶ Large producers of fruits and vegetables ▶ Exporters of fresh fruits and vegetables ▶ Importers of fresh fruits and vegetables ▶ Agricultural Support Republican Center (ASRC) ▶ Marz Agriculture Support Center (MASC) ▶ IFAD ▶ Millennium Challenge Account - Armenia (MCA-Armenia) ▶ Associations of agricultural product producers
3. Publications	▶ Press, analytical reports

Data collection from various sources and its analysis was conditioned by the following:

- There is no other structure that has all the necessary information for this study implementation: it is spread among different sources;
- Armenia has not done census so far. National Statistics Service, which is in charge of it, receives main indicators of agriculture through various researches. For instance, separate surveys are done for agricultural machinery, plots, productivity and crop quantity, and livestock quantity. Though the system of surveying agricultural indicators has some defects. Thus, the information

which was not trustworthy was collated with other information which came from totally different sources. If differences appeared, we tried to understand their reasons and do adjustments on the basis of expert opinions.

The below presented matrix shows the exact information sources of this study.

Table 3 - Classification of information sources according to the subject of research

Sources of information ↓	Subject of research								
	Production quantity	Consumption quantity	Export quantity	Import quantity	Producers	Exporters	Production geography	Seasonality	Prices
National Statistics Service	★	★	★	★			★		★
RA Ministry of Economy									
RA Ministry of Agriculture	★		★		★	★	★	★	★
RA State Revenue Committee			★	★		★			
Regional Administration Agricultural Departments					★		★	★	★
Producers	★				★	★	★	★	★
Exporters			★		★	★	★	★	★
Importers				★				★	★
ASRC	★		★				★	★	★
MASC	★				★	★	★	★	★
IFAD	★				★		★	★	
MCA-Armenia	★				★		★		
Associations	★		★		★	★	★	★	★
Press, analytical reports	★	★	★	★	★	★	★	★	★

1.2.3 Information Collection

Various methods have been applied for receiving necessary information for the study. The necessary information for the study is divided into three groups according to its accessibility.

1) *Easily accessible (available, not secret) information*
   This group includes quantitative data of fruit and vegetable production, exports and imports, indexes that comprise the base of fruit and vegetable production, i.e. cultivation territories and productivity indexes. This data is available for Marzes, as well. Information about fruit and vegetable prices is also easily accesible, including retail and wholesale prices, final consumption and processing prices. It is possible to present all these figures for a quite long period of time.
2) *Medium accessible information*
   The identification of all exporters, importers and large producers is connected with some difficulty, i.e. there is not such ready information and it had to be found out during the study.
3) *Low accessible information*
   The information, concerning the operation of separate enterprises, is usually difficult to obtain. Particularly, it is about the turnover of separate exporters and importers, realization of their structure. Armenian Customs Service became another source of information.

The evaluation of fruit and vegetable consumption volumes and demand was difficult itself for two reasons:

- There is no information about the real consumption volumes of fruits. Based on data provided by RA Ministry of Health, according to which the norm of fruit consumption for one person is 200 gr and for potato it is 250 gr, it is possible to calculate their demand. Although that demand may not be satisfactory for two reasons: a) lack of supply, and b) low level of demand by those who are able to buy. The last factor has one more effect on the calculation and forecast of fruit and vegetable consumption volumes, which will be presented later.
- The demand for special fruit types has a dual manifestation: a) demand based on organism's physiological requirements, and b) payable demand. The consumption level of any fruit is connected only with payable demand. The latter is a dynamic indicator and changes as a result of socio-economic conditions' variation. Thus, it is difficult to evaluate the degree of variation of coming years' payable demand.

  Study method of individual interviews, official written applications, Internet investigations and available published materials have been applied in order to obtain easily accessible information. Other information (medium or low accessible) was obtained via interviews and inquiries, mainly inofficially.

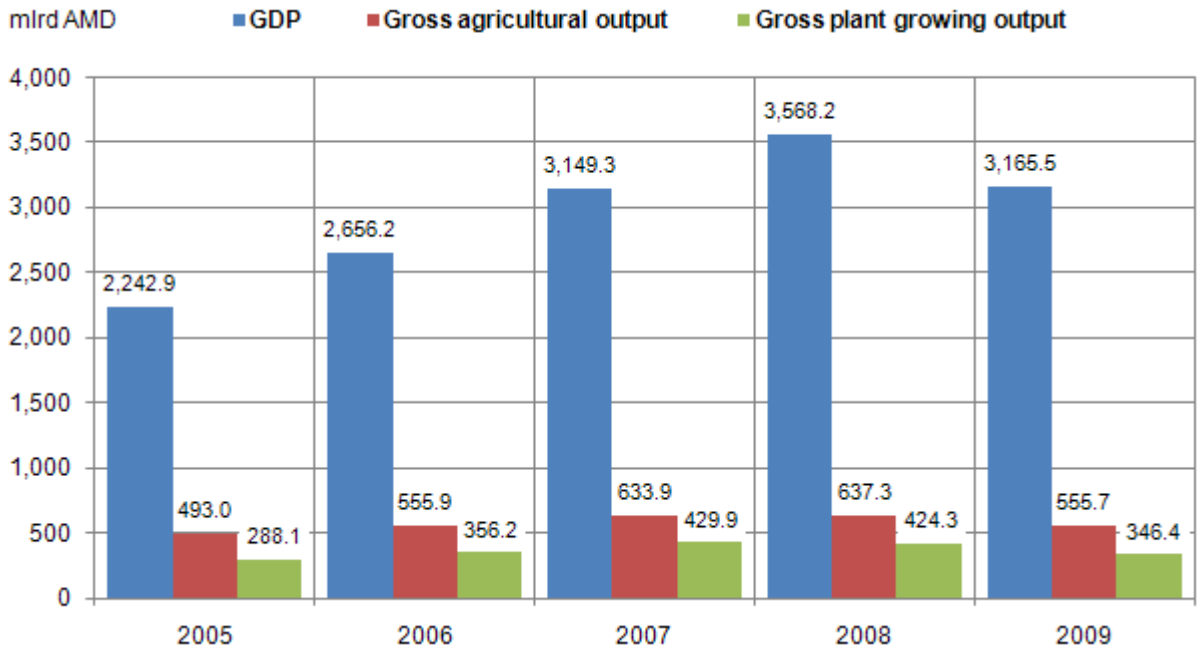
Data collection was conducted at the very sources. This means that all the involved consultants have visited all Marzes and several communities in each Marz. *Snowball method* was widely applied during the period of obtaining information (espcially in Marzes), during which the interviewed people themselves gave information about other sources (e.g. one producer or exporter gave information about other producers or exporters).

1.3 FIELD WORK. GENERAL DATA

Agriculture is one of the pivotal fields of Armenian economy. Being the base of food safety and self-sufficiency protection, which are one of the most important components of national security, agriculture is under the constant attention of Armenian authorities. Unfortunately, the field is full of problems, which greatly prevent its development, at least corresponding to the general development rates of the country. Until the Global Crisis of 2009 Armenian economy has registered an impressive and stable growth, more than 10% per year. Agriculture also developed, though by slow speed, which has resulted in some reductions. Thus, if in 2005 agricultural gross product comprised 22.2% of Armenian GDP , then in 2007 (before-crisis period) it comprised 20.1%, and in 2009 (during-crisis) it was 17.6%.

Plant growing is the dominant branch of Armenian agriculture. In 2009 2/3 of Armenian agricultural products was produced in plant growing. Volumes of agricultural and horticultural gross products are presented below:

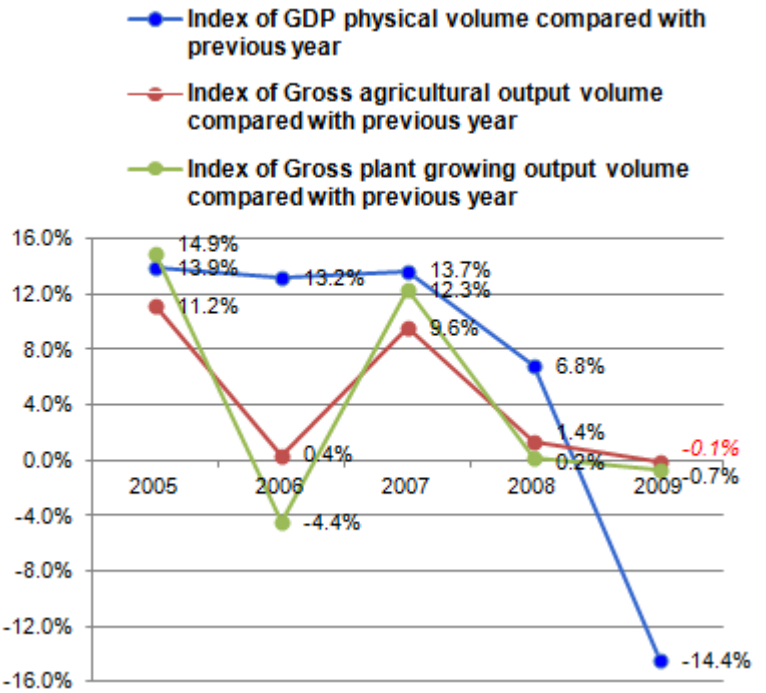
Chart 3 - Armenian GDP, agricultural and horticultural gross products (constant prices), 2005-2009



Source: "Armenian statistics yearbook", NSS, 2009

Dynamics of agricultural and plant growong products at present prices are stable and have slow growth. Analysis of physical volume of agricultural and plant growingl products at constant prices results in different conclusions. Plant growing varies sharply resulting instability and variations among all the agricultural production (see Chart 4). There are several reasons for this:

Chart 4 - Indexes of Armenian GDP, Agricultural and Plant growing outputs (by adjustment prices) physical volumes, 2005-2009



Sources:
1. "Armenian Statistics Yearbook", NSS, 2009
2. "Armenian socio-economic situation", NSS, 2006-2010

- Sharp variations of Armenian climate result frostbite, hail, drought;
- Possibilities of selling agricultural products constantly change and not always they increase. Interruption of road communication with neighbor countries, or creating obstacles for any product export often leads to product stagnation (as in potato's case). This, in its turn, reduces the prices for agricultural products, and sometimes they are even lower than costs.
- Most of the farmers dealing with agricultural production (especially small ones) have significant shortcomings concerning the implementation of agricultural and technical processing activities.

The main factor affecting the volumes of Armenian horticultural production is the climate. Abrupt temperature falls can change the whole year's harvest in 1-2 days. Particularly multi-year plots are

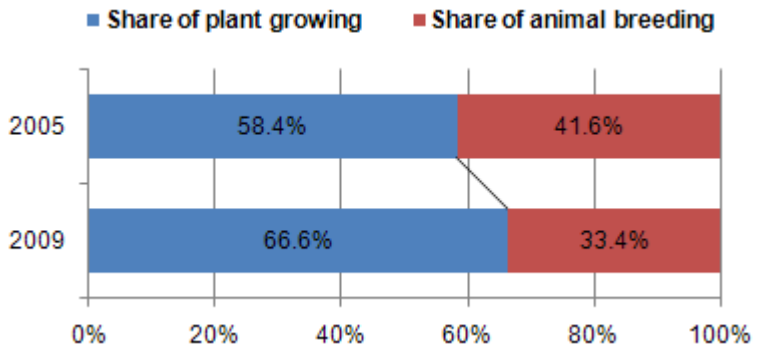
sensitive towards temperature falls. The observations of last 10 years prove the unfavorable regularity: once in every 3 year the fruit types that blossom earlier suffer from unfavorable climate conditions. These are mainly such fruits that have greater demand and more export possibilities (apricot, peach). The chronology of fruit losses is as follows:

2002/2003 winter	▶ In Ararat valley great quantity of vine yards get damaged because of unprecedented cold (-20-25^{o}C)
2004 april	90% of apricot harvest was lost due to early spring frostbites
2007	▶ 80% of apricot harvest was lost due to early spring frostbites
2008	▶ 80% of peach harvest in Armavir Marz was lost due to unpleasant climate conditions (50% of Armenia's peach harvest grows in Armavir Marz)
2010 march-may	▶ 90% of apricot harvest was lost due to early spring frostbites as well as rainfall and wet weather
2010	▶ 90% of peach harvest in Ararat valley was lost due to rainfalls and wet weather. Wholesale price of peach registers a record:1,000-1,200 dram/kg

Despite the affect of unstable weather conditions, significant changes take place among the structure of agricultural products. At the expense of livestock products plant growing products gradually grow (see Chart 5). It is conditioned by the following factors:

- Trying to reach strategic meaning in the field of agricultural products, i.e. providing self-sufficiency for grain, RA Government puts forth great efforts in order to stimulate the volumes of production;
- Since 2005 a system of seed and plot certification has been adopted, which gave the farmers the opportunity to obtain aprobated and certificated high quality seeds from seed producers. Today it is possible to obtain certified seeds for grain, potato, vegetables, as well as certified fruit plotsfrom the market.
- Improvement of agricultural infrastructure is still in process. Within the "Millenium Challenge" Program, "Improvemement of agricultural enterprises and low volume trade agriculture" Project, and "Agricultural services" Project, as well as at the expense of private investments arable soils have significantly enlarged, **irrigation system has been improved.**

Chart 5 - The structure of Armenian agricultural products, 2005-2009



Despite the dependence on weather conditions, vineyards and fruit plantations stably grow for the last 10 years, and correspondingly the volume of production grows. The same trends are not available for vegetable production. Thorough analysis of such product groups is presented in the next chapter.

2 PRODUCTION OF FRUITS AND VEGETABLE

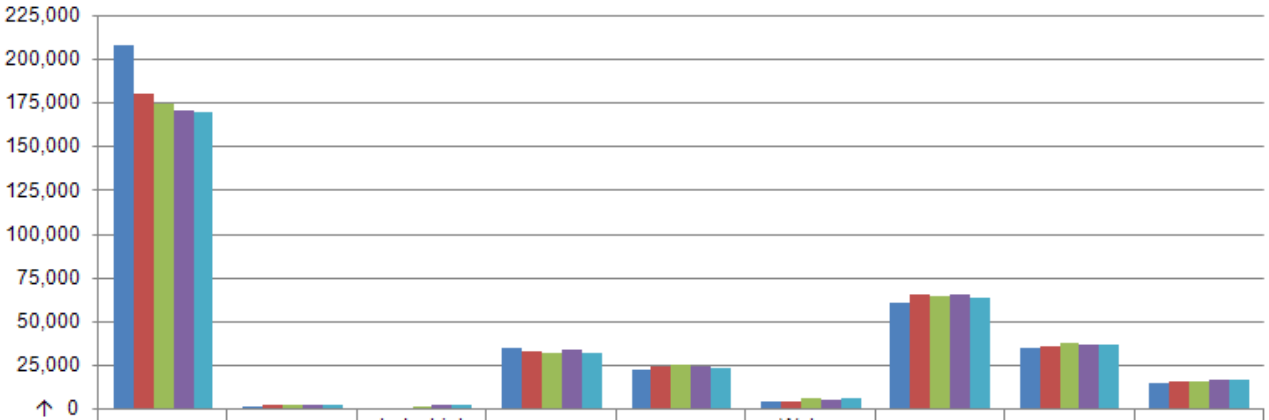
2.1 PRODUCTION BASE AND FIGURES

2.1.1 Plots

It is not possible to observe the plots of fruit and vegetable apart the total plots of agricultural products. Those areas constantly change, sometimes at the expense of one another. There are several reasons for this, which will have their effect in coming years as well. Agricultural products in Armenia have been reduced during the last 5 years. If in 2005 all the plots of agricultural products, including multi-year plots, comprised 382,000ha, in 2009 it was 353,000 ha. Decline was recorded mainly among the plots of grain products, which have been reduced by 38,000 ha[6] during 2005-2009. Those areas, as well as newly obtained ones, have been used for cultivating other agricultural products. Though it comprises only 10,000-12,000 ha during 5 years.

In the case of fruits and vegetables there is a trend of increase and stability (see Chart 6).

Chart 6 - Agricultural plots and plots in Armenia in 2005-2009



ha	Cereal crops	Legumes	Industrial crops	Potatoes	Vegetable	Water-melons	Forage crops	Fruits	Grape
2005	207,741	1,849	536	34,440	22,539	3,865	60,854	34,879	14,932
2006	180,432	1,974	773	33,045	24,364	4,025	65,550	35,403	15,746
2007	174,224	1,989	1,616	31,674	25,607	5,884	64,989	38,020	15,888
2008	170,630	2,208	2,386	34,298	24,219	5,446	65,272	36,748	16,796
2009	169,548	2,085	2,418	31,998	23,914	6,163	63,888	36,959	16,480

Sources: Heads of Regional Administration Agricultural Departments and NSS

The trend of increase or relative stability in fruit and vegetable plots is connected with the gradually increasing possiblilities of selling those products or with disatisfactory internal demand. However, the possibilities are different for special types of fruits and vegetables. The analysis of these types is in the next chapter.

[6] The drop of plots of grain products is connected with low indicators of productivity, which in its turn is connected with unsatisfactory qualified seeds, scarcity of arable soil and unfavorable weather conditions

2.1.1.1 Fruit plantations

As of the end of 2009 fruit plantations comprised 37,000 ha, and vine yards comprised 16,500ha. It is 10% more than those that were in the early 2000s. The distribution of fruit plantations by their types shows that the main processed fruits in Armenia are grapes, apricot, apples and pear (see Piture 7).

Chart 7 - Fruit plantations by their types in 2009

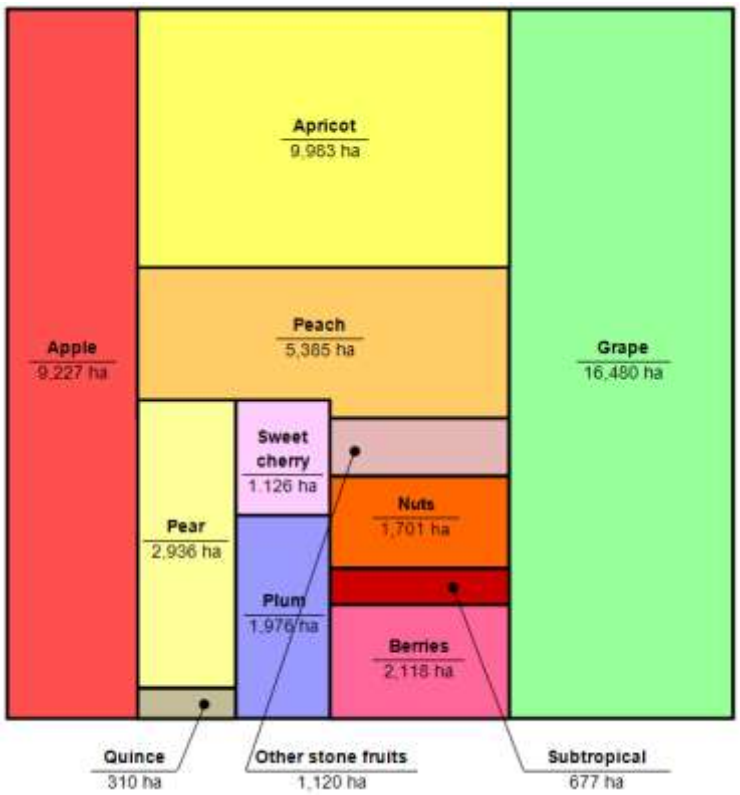


Table 4 - Distribution of fruit plantations by their types in 2009

Fruits	The part of fruit plantations within the total
Grape	30.8%
Apricot	18.7%
Apple	18.0%
Peach	10.1%
Pear	5.5%
Berries	4.0%
Plum	3.7%
Nuts	3.2%
Sweet cherry	2.1%
Other stone fruits[7]	2.1%
Subtropical	1.3%
Quince	0.6%
Total	**100.0%**

Sources: Heads of Regional Administration Agricultural Departments and NSS

The sizes of fruit plantations constantly change at least for two reasons: a) each year new lands are planted, and b) each year some part of available fruit plantations is destroyed for various reasons (frost, low productivity). The sizes of fruit plantations change according to the positive and negative balance of those processes.

Creation of new orchards and destroying the old ones is a continuous process and was actual for the last five years. Pre-conditions of stimulation for creating new orchards are as follows:

- Those who invest in the production of agricultural products prefer the creation of new fruit plantations**,** as it gives the opportunity to capitalize investments. Besides, according to the specialists, it is easier to take care of orchards and vineyards, as they require less time.
- In order to obtain raw material, that is cheaper and corresponds to self demands, some manufacturers ("MAP", "Tamara Fruit","Avshar Wine Company") create their own orchards. Such trend exists among the exporters as well. The latters are ready to invest in the production of some fruits, if they had free financial means or cheap (not more than 10-12%) and long term (at least 7-8 year) loan measures.
- Year by year the volumes of Armenian fruit collection grow for processing or exporting purposes. Certainly, the trends are different for certain fruit types, but the general figure is positive. Thorough information is presented in the chapter of "Fruit and vegetable export" (see page 58).

[7] Cherry, cornel

- Fruits are relatively high-valued among traditionally produced products of Armenian plant growing, which increases the economic attraction of cultivating such products.
- There is no such type of fruit the production volume of which exceeds the own consumption demand.

As a result of this process the variation of fruit plantations has the following figure for the years of 2004-2009.

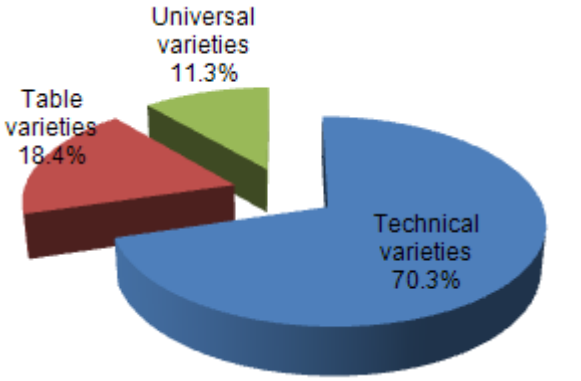
Table 5 - Variation of fruit plantations for 2004-2009

Fruits	2004		2009		Variation for the period of 2004-2009	
	All plots	Incl. those of prolific age	All plots	Incl. those of prolific age	All plots	Incl. those of prolific age
Grape	14,856	13,560	16,480	14,292	+1,624	+732
Apricot	9,692	7,635	9,983	7,808	+291	+173
Apple	9,861	8,839	9,627	8,811	-234	-28
Peach	4,670	3,126	5,385	4,283	+715	+1,157
Pear	3,159	2,856	2,936	2,756	-223	-100
Plum	1,521	1,355	1,976	1,536	+455	+181
Sweet cherry	1,054	920	1,126	997	+72	+77

Sources: 1. Heads of Regional Administration Agricultural Departments and NSS
2. RA Ministry of Agriculture
3. NSS

As shown in the Chart 7 and Table 5, the sizes of fruit plantations are presented according to official data. Comparing these data with the non-official information obtained from field experts and specialists, we came to the conclusion that data is not complete. Before addressing the problem we will present you the explanation of trend variations of special fruit type plantations.

Chart 8 - Distribution of grape plot according to their varieties, 2009



The increase of **vineyards** is conditioned by the development of Armenian wine and brandy production during 2004-2009. Not only the volume of processing enterprises has increased, but also the volume of products procured by them. Particularly, in 2004-2009 collection volume of grapes for the purpose of brandy and wine production has increased 2.7 times. More details are presented in the Section 5.1.3 “Procurements of processing enterprises” (page 71). However, processed products do not attract people from the viewpoint of consumption or export. The problem lies within grape sorts. Technical sorts are dominant among grapes growing in Armenia (see Chart 8). The demand for them is presented by processing enterprises. There are various estimations for plots of table sorts: i.e. 10-12% according to the experts' data of RA Ministry of Agriculture and 18.4% according to the data provided by Regional Governorate Agricultural Departments.

Grape plots’ increase has slowed down because of the Global Crisis of 2008-2009. For 2009-2010 processing enterprises have reduced their collection volumes. As a result, there is an excess of them. The difficulty is that processing enterprises procure technical sorts, and it is impossible to sell most of them in local market or export them. That is why; many manufacturers, that do not have the possibility

to sell their products, are compelled to sell them to the same processing enterprises even by less price than they cost (85-95 AMD/kg). This is a serious problem those who cultivate grapes and if the procurement volumes of 2008 do not increase for the coming 1-2 years (about 145,000 ton per year), a process of destroying vineyards may start.

Apricot, peach, plum and **cherry** do not face such problems. The demand for these fruits gradually increases, which stimulates the process of creating new orchards. **Apricot is the most required fruit**, all types and qualities of which have their consumers: high quality product (large size, nice product appearance) is procured by exporters, high and medium quality product is sold at local market, and low quality apricot is procured by processing enterprises. Dry fruit producers are the procurers of "Sateni" apricot sort, which is useless for export. Due to the internal demand and expansion of export possibilities the plantations of peach, plum and cherry increase. This is also connected with new apricot plantations, as in order to increase the efficiency of tree pollination peach and plum trees are also planted in apricot plantations.

The decline of **apple** plantations (as it is seen from Table 5) should not be considered as a trend, but accepted as a sign of stability. During 2004-2010 the variation of apple plantations has been between 9-10,000 ha, increasing for 200-250 ha per year. According to the estimations of field experts, the reason of general stability is that the volumes of internal demand coinside with apple production. Besides, apple has one advantage over stone fruits: its production is diverse from the viewpoint of geography, sort and seasonality. Apple is produced in all Marzes. In fact, harvest becomes ready during four months (July - October) and is consumed during ten months (July - April). Thus, apple is considered the most consumed fruit in Armenia during medium favorable year. However, the lack of demand by exporters prevents the increase of apple plantations.

In case of **pear** the matter is different. The relative stability or the trend of small decline is explained by the lack of large producers and scattered pear plantations. Pear, like apple, is known for its sorts, but as its production volumes are small, it is hard to speak about its wholesale trade. There is no stimulus from the exporters for expanding pear plantations.

Thus, the trends of fruit plantations change. Official statistical data is generally true. However, this data cannot serve as a basis for the forecast for upcoming years' fruit production and changes of export volumes. The problem lies within the fact that some of the available fruit plantations are not registered or are not reflected in official data. The problem is not connected with the National Statistics Service, but with the existence of subjective reasons. A trend is notable for the last few years, that not only individual farms invest in multi-year plots, i.e. in fruit plantations. There are many local and foreign businessmen who have free financial means and prefer to invest in agriculture. The main direction of these investments is the cultivation of new fruit plantations. Most of the investors keep the requirements of agricultural and technical activities for cultivating fruits. Some of them have imported new methods, and among them drip irrigation. New orchards are planted not on the places of old ones, but on new lands, which are mostly arables. That is the root of incorrectly information on fruit plantations: after creating new orchards the owners avoid registering their land as multi-year plots, and keep them registered as arables. Such behaviour has the following explanation: the owners of arables pay land tax, and one of its main components is the land's cadastral income. In the case of multi-year plots the land cadastral income significantly exceeds the coefficient of arables, which makes the land tax for multi-year plots more expensive. The owners of fruit plantations prefer to have their land registered as arables in order not to pay more land tax. It is notable that even the fact that if the owners of fruit plantations register their land as multi-year plots, they won't have to pay land tax until the fruit plantations become productive, doesn't attract them. Insufficient work of local governing bodies (community leaders and councils), regional governorates, and cadaster contribute to the problem.

In order to understand the dimensions of the problem and make some corrections in fruit plantations we have also obtained non-official data from heads and employees of Regional Administration Agricultural Departments[8], large fruit producers, associations of producers. It shoud be noted that the obtained data is in the range of estimate; it is approximate, and should not be considered as complete.

The analysis of obtained non-official data shows that new orchards have been planted mainly in Armavir, Ararat and Aragatsotn Marzes for the last 5 years. Generally, at least 2,300 ha of the fruit plantations in these three Marzes are not registered, and they are mainly stone fruits and grapes. The creation of new orchards was done intensively in Armavir and Aragatsotn Marzes, in which there are large territories for investments (in Armavir Marz Baghramyan and in Aragatsotn Marz Ashtarak and Talin). Young and not registered fruit plantations are distributed in the following way according to Marzes, main years and separate fruit types:

Table 6 - Distribution of fruit plantations planted in 2005-2009 and not registered as multi-year plots

Fruits	Main years of fruit plantations →	2005	2006	2007	2008	Total
Grape	Ararat Marz	≈30 ha	≈15 ha	≈25 ha	≈50 ha	
	Armavir Marz					
	Aragatsotn Marz					
	Total	**≈30 ha**	**≈15 ha**	**≈25 ha**	**≈50 ha**	**≈120 ha**
	First years of becoming productive	2009	2010	2011	2012	-
Apricot	Ararat Marz	≈20 ha	≈25 ha	≈30 ha		
	Armavir Marz			≈200 ha	≈200 ha	
	Aragatsotn Marz		≈140 ha	≈140 ha		
	Total	**≈20 ha**	**≈165 ha**	**≈370 ha**	**≈200 ha**	**≈755 ha**
	First years of becoming productive	2010	2011	2012	2013	-
Peach	Ararat Marz	≈10 ha	≈15 ha	≈20 ha		
	Armavir Marz			≈100 ha	≈100 ha	
	Aragatsotn Marz		≈60 ha	≈60 ha		
	Total	**≈10 ha**	**≈75 ha**	**≈180 ha**	**≈100 ha**	**≈365 ha**
	First years of becoming productive	2009	2010	2011	2012	-
Plum	Ararat Marz	≈10 ha	≈10 ha	≈12 ha		
	Armavir Marz			≈150 ha	≈150 ha	
	Aragatsotn Marz		≈140 ha	≈140 ha		
	Total	**≈10 ha**	**≈150 ha**	**≈302 ha**	**≈150 ha**	**≈612 ha**
	First years of becoming productive	2010	2011	2012	2013	-
Sweet cherry	Ararat Marz	≈5 ha				
	Armavir Marz			≈150 ha	≈150 ha	
	Aragatsotn Marz		≈60 ha	≈60 ha		
	Total	**≈5 ha**	**≈60 ha**	**≈210 ha**	**≈150 ha**	**≈425 ha**
	First years of becoming productive	2009	2010	2011	2012	-

Source: Non-official data. Trustworthiness of data: approximate

Besides the mentioned fruit types, there are also apple orchards in not registered fruit plantations (mainly in Ararat and Armavir Marzes). Data about their sizes is not accurate and probably comprises 50-100 ha. In order to evaluate the volumes of upcoming years' fruit production, harvest of not

[8] They have expressed their personal opinion and haven't appeared as state officials

registered fruit plantations should also be considered. This regards up to 1,500 tons of grapes and up to 25,000 tons of extra fruit products.

2.1.1.2 Plots of vegetables

As of June 1st, 2010 plots of vegetables (including potato) comprised 51,918 ha, including 94.8% of 7 products of our study. Other plots are including carrot, beet, garlic, green pea. The dynamics of plots of vegetables, observed by us during the past 6 years, is the following:

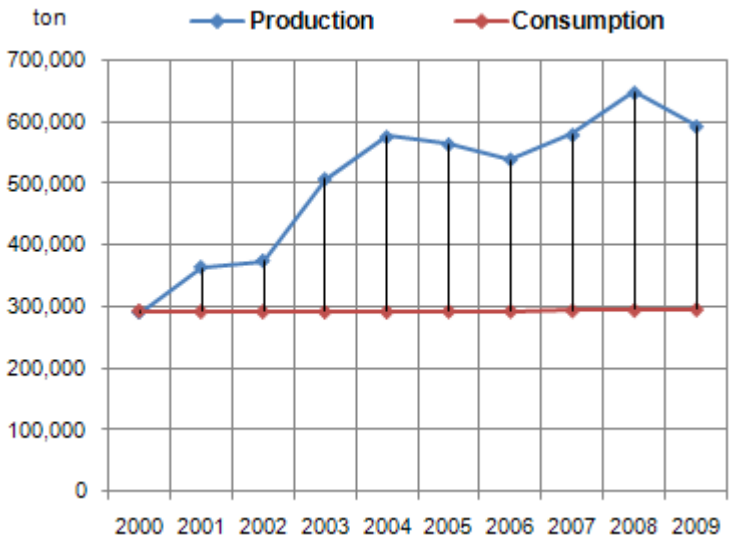
Table 7 - Distribution of plots of vegetables by their types, 2005-2010

Vegetable	2005	2006	2007	2008	2009	2010
Potatos	34,440	33,045	31,674	34,298	31,998	28,314
Tomato	6,291	7,212	7,375	6,257	6,231	6,533
Cucumber	2,368	2,364	2,412	2,339	2,549	2,248
Cabbage	3,687	3,813	3,844	3,668	3,376	3,585
Onion	2,079	2,397	2,229	2,487	2,085	1,868
Pepper	5,681	5,834	7,000	6,829	7,056	6,649
Eggplant						
Greens						
Other vegetable	2,433	2,744	2,747	2,639	2,617	2,721
Total	**56,979**	**57,409**	**57,281**	**58,517**	**55,912**	**51,918**

Sources: 1 "Total Sum of 2010 Census of Area Under Crop", NSS, 2010
2. "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009

In 2006-2010 plots of vegetables have declined by 9.6%, which is mainly conditioned by decline of plots of potato (14.3% in the same period). From the viewpoint of other products there is relative stability: they may increase or dicline by 200-300 ha each year, but the general figure is stable.

Chart 9 - The volumes of potato production and consumption in Armenia, 2000-2009.



Potato has a special significance among the above mentioned products. It has a great demand and consumption in Armenia and is included in the "food basket". Potato is one of the products which is produced more than the internal demand of RA is. In particular the local demand for potato is about 300,000 ton per year, which remains the same during relative stability of population's quantity. The demand for seeds comprises up to 120,000 ton per year. Even though since 2001 continuous increase of potato production has been recorded, which has reached a record volume, i.e. 648,000 ton, which is 1.5 times more than the internal consumption demand (see Chart 9). The notable part of these changes is that the volumes of potato production have been increased due to intensive growth through productivity increase. However, the plots have not increased at all: in 2000 they comprised 34,000 ha, while in 2009 they were 32,000 ha. This, of course, is a notable example of economic efficiency increase.

Meantime, it has caused also several problems, which usually come from product excess (consuming difficulties, decline of plots, price abatement). These problems have reached their peak in 2008-2009, when some part of potato was spoiled and thrown away, not having any possibilities of consumption (potato is not being procured for the processing, and there is verly little export). The result of this was the reduction of plots in 2008-2010: in 2010 plots of potato were the least for the past 10 years. However, in 2010 potato production again exceed the internal demand (not by the same size as in 2007-2008), and it seems like the previous problems will again come up. Although, this year potato prices are on such level, that it seems like there is a deficit in the market. Even the experts find it difficult to give an explanation to the situation, and those who give any explanation, are not convincing. The problem is addressed to also in "Consumption prices" section.

Tomato is the second by its volume among the vegetables produced locally. Each year 6,500-7,500 ha (+/- 500 ha) tomato is seeded if there are relatively stable conditions. Tomato has almost the same role among vegetable varieties as grapes have among the fruits: it is the most procured vegetable for processing. However, it is not a satisfactory stimulus for increasing production volumes of tomato and its plots. The problem is that for the past 6-7 years when it is noted that the prices for first necessity products increase, the procurement prices for processing remain on a very low level: 25-35 AMD/kg. Manufacturers separate the qualified product in order to sell in markets expensive price, which is a laborious process. Thus, the real stimuli for increasing plots of tomato are quite limited.

Tomato has one advantage that other products, such as cucumber and pepper, do not have: it is produced also in greenhouses. In fact, tomato is produced not only in ordinary greenhouses, but also in self built greenhouses with polyether cover. Nowadays 114 ha greenhouses and 30-40% of 446 ha self built greenhouses in Armavir Marz are engaged in producing tomato, which comprises 224 ha. Tomato, which is produced in ordinary greenhouses, is meant for spring consumption, and its harvest comprises 8,200 ton. Fast-ripening tomato is produced in self-built greenhouses with polyether cover. In Armavir Marz it is done intensively (especially in the villages of Ejmiatsin), where more than 6,600 families together have 446 ha greenhouses. Each year 1,500 ton tomato is produced in these areas. The advantage of fast-ripening tomato and the one produced in greenhouses is that they can be sold by relatively expensive price because of the seasonal deficit.

There is a lack of stimulus of increasing plots for other vegetable types as well. According to the experts' estimations there won't be significant changes in upcoming years. The main reason is that other products, such as cucumber, pepper, eggplant, cabbage and onion are produced approximately as much as there is internal demand for them. Processing manufacturers store only first three of these products, in fact in very little volumes. Production capacity and volumes are very little so far. These products are also imported, but in very little volumes and it is done mainly during the months of seasonal deficit or in order to present it in larger markets as a variety.

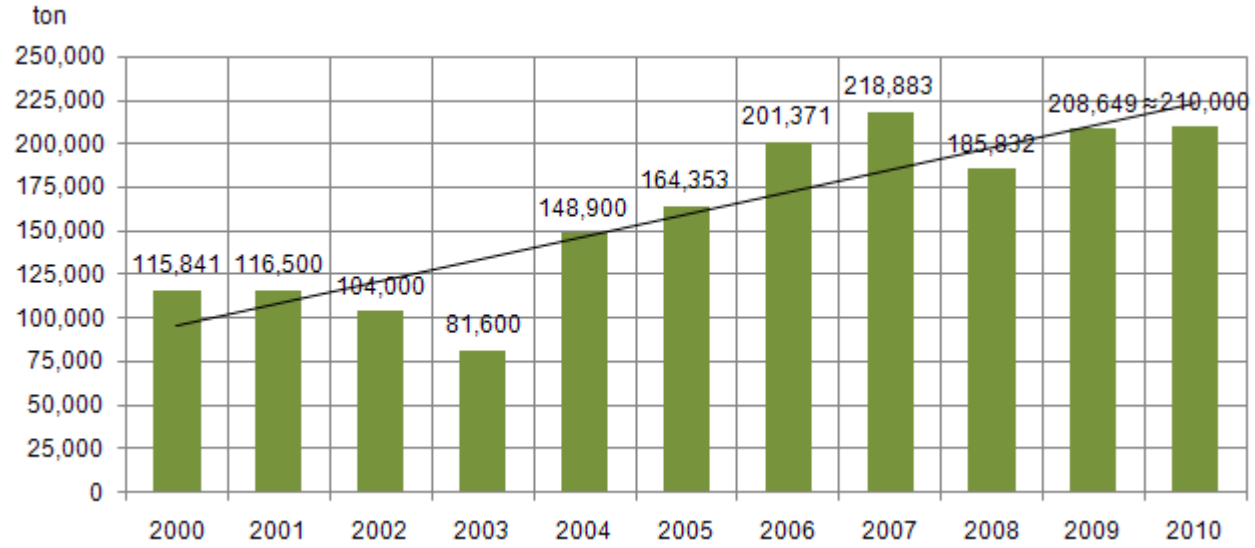
2.1.2 Production volumes

2.1.2.1 Fruit production volumes

As it has been already mentioned, in 2000 fruit plantations have increased. Naturally, the volumes of fruit production also increase. Even in case of apple there is an increase of production volumes connected with the increase of the productivity.

In case of grape production volume there are clear trends: its production is on its rise. Since 2000 the only decline was in 2003, when there was an unprecedented low harvest: 81,600 ton, conditioned by 2002-2003 winter frosts. After that grape rise has began, which remains until now (see Chart 10).

Chart 10 - The volumes of grape production 2000-2010



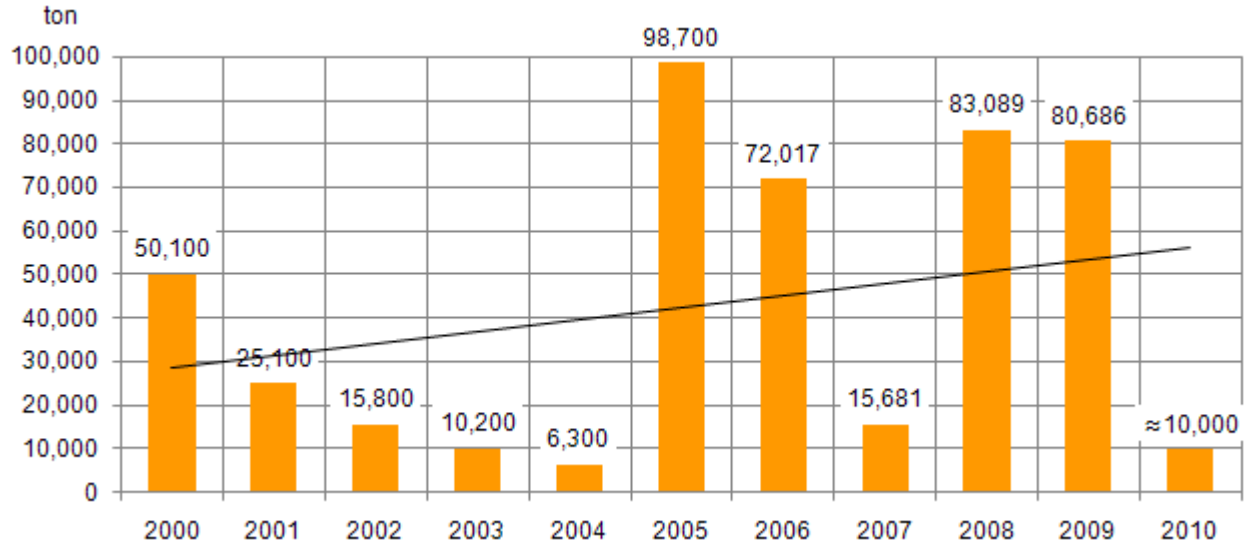
Sources: 1. "Marzes of the Republic of Armenia in figures, 2000-2004", NSS, 2005
2. "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009
3. RA Ministry of agriculture

According to the varieties, 70% of the produced grapes comprise the technical sorts. It comprises about 147,000 ton among the estimated volumes of 2010. Table sorts comprise 45-50,000 ton and, so called, universal varities comprise 13-18,000 ton (which are being processed and at the same time can be consumed by people). In Ararat and Armavir Marzes there is an underlined difference between the sorts of processed grapes. In Armavir Marz table sorts are increasing. For the past few years new technologies are applied, which created good conditions for crop production and ensured 40-60 ton harvest per ha. There are communities (such as Arevik village) where grapes are cultivated mainly according to such technologies.

The Global Crisis has created serious problems for grape production. Mainly in 2009-2010 processing companies have reduced procurement volumes, which created excess of technical sorts, resulting in difficulties for producers. There is a risk that if the situation does not change during the next 1-2 years the grape plots, as well as the harvest may reduce, although this does not concern table varieties. The frequency of grapes export has not declined, which gives a hope that the difficulties are already behind. The main exported varieties are: "Qishmish", "Black Qishmish", "Shahumyan", "Itsaptuk".

The situation with **apricots** is quite dual. On one hand, the increase of export volumes contributes to the development of apricot production; on the other hand sensitivity towards weather conditions causes harvest loss**.** This is confirmed by the dynamics of 2000-2010 apricot production volumes.

Chart 11 - The volumes of apricot production in 2000-2010.



Sources: RA Ministry of Agriculture and NSS

Apricot plantations have suffered from weather conditions (mainly early spring frosts, spring rains, damp weather) at least once per three years during the past 10 years, which has become a regularity. 2004, 2007 and 2010 were critical for apricot harvest. At the same time exporters were active even during these years: perhaps they couldn't procure the needed volume, but they procured at unprecedented high prices, which are 4-5 times higher than the prices of regular apricot harvest years. This situation becomes a reason for many farmers to plant new apricot orchards. According to the estimations the following situation will be recorded connected with the volumes of apricot production during the next few years:

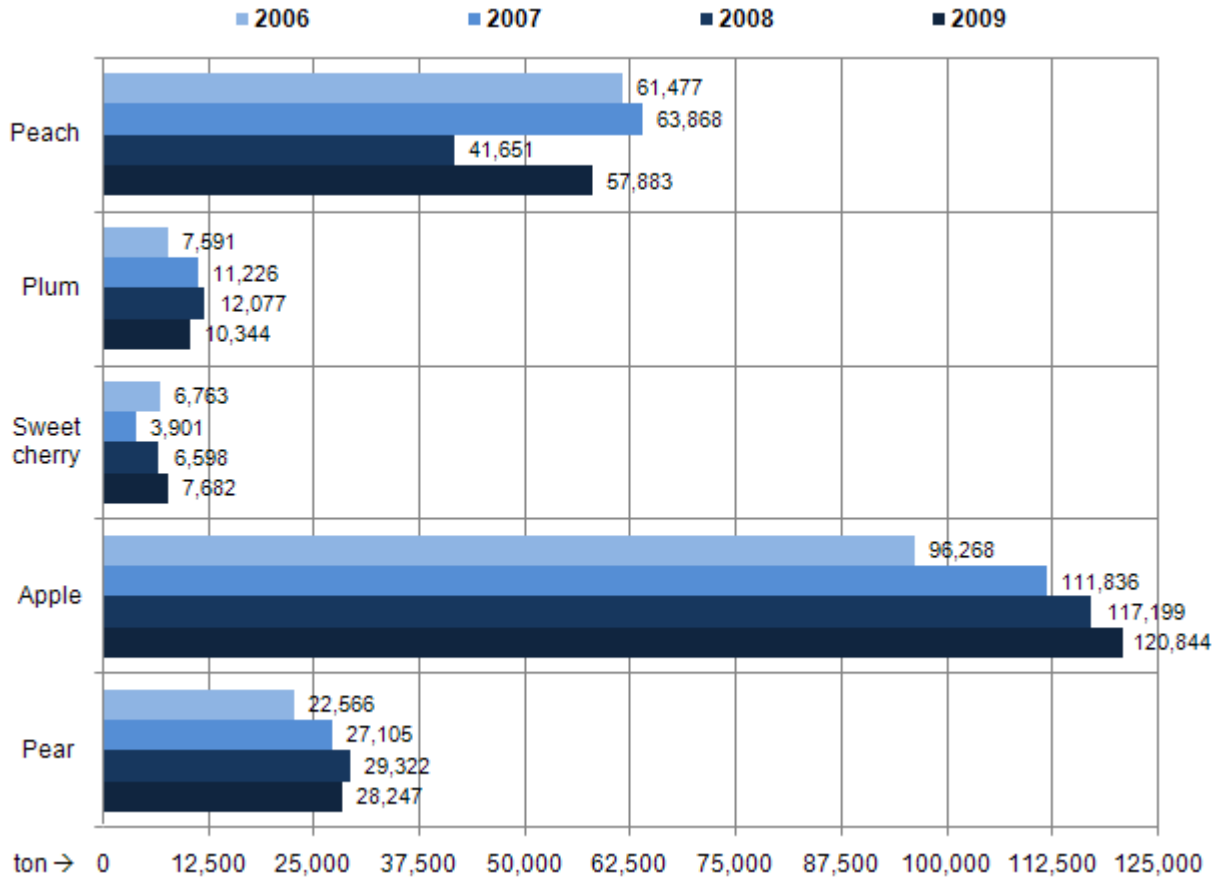
1. The volumes of apricot production will continue to grow for two reasons:
   - About 3,000 ha young fruit plantations (about 2,200 ha registered and more than 800 not registered) of 2006-2009 will become productive, which will ensure 25-30,000 ton excess in the case of 8-10 ton harvest from 1 ha;
   - Some new technological inventions are applied in newly planted fruit plantations, which later will increase the apricot productivity. Some farmers came to the conclusion that it is better to have more small trees for 1 ha (like in apple's case) than to have less trees with the hope of seeing them 10-12 m tall after 10-15 years. The difference is that in the first case it is much easier for harvesting and sorting; it is possible to distinguish more qualified fruits and lessen the volumes of low quality or spoiled fruits.
2. The increase of apricot export volumes will continue. According to the exporters' data, if before (10-15 years ago) they exported apricot to 2-3 big cities of Russia, such as Moscow, St. Petersburg, Doni Rostov, now the geography has broadened and now direct deliveries are done also to Krasnodar, Samara, Novosibirsk. Armenian apricot has already entered to Ukraine and Belarus.
3. Considering the dynamics of the past few years' weather changes, the experts think that our exporters should be ready for the risk to lose their harvest once in 3-4 years. Although this opinion is not supported by weather forecasters, however the experience of the past 10 years has created such expectations.

Apricot can be divided into 3 groups: 75% (during medium favorable year 60,000 ton) of the harvest comprises the sort called "Yerevan", which is more known as "Shalakh". This is the sort that is exported and is known in Russia. About 20% (during average favorable year 15,000 ton) of the

harvest comprises the variety called "Sateni", which is mostly demanded in local market: among processing and dry fruit producers, as well as among housewives, who use this sort for canned products. Other sorts comprise about 5%.

In 2008 and in 2010 great quantity of peach harvest loss was recorded (see Chart 12). In 2008 in Armavir Marz only 6,600 ton peach was harvested because of frosts, while this Marz usually gives up to 30,000 ton harvest of peach.

Chart 12 - The volumes of peach, plum, sweet cherry, apple and pear production in 2006-2009



Sources: RA Ministry of Agriculture and NSS

The volumes of **plum** and **sweet cherry** production are low. Even if there is a lack of exports, these fruits can be fully consumed in Armenia. However, some part of the harvest is being exported because of the available possiblilities of exporting these fruits to foreign markets and the possibilities of transportation. This is a serious stimulus for expanding (mainly "Victoria" sort) and sweet cheery plantations. Today young plum and sweet cherry plantations comprise correspondingly 1,000 ha and 500 ha, which will increase the volumes of plum and sweet cherry at least by 50% for the next 2-3 years, making them 17,000 ton (plum) and 12,000 ton (sweet cherry).

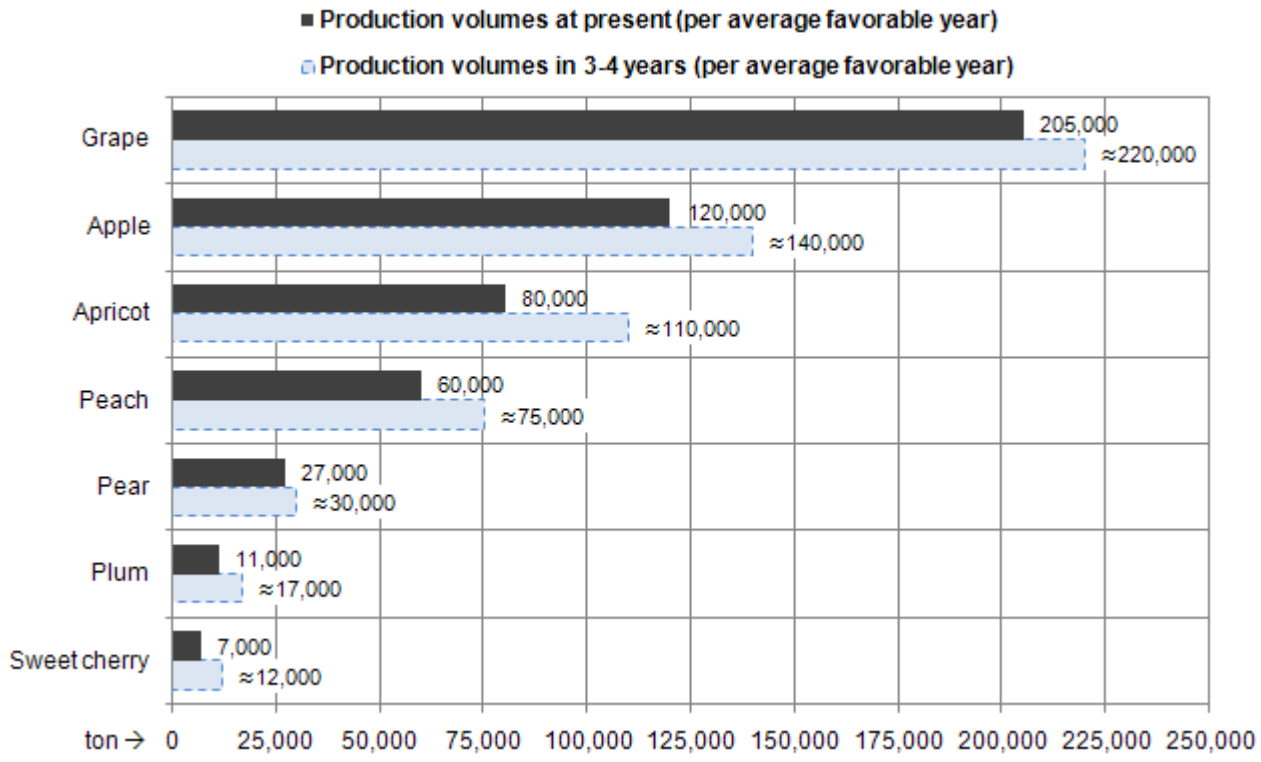
According to experts, for the upcoming years apple production will slowly increase. The main advantage of apple is its long lasting possibility and the long period of consumption. Based on the size of young apple plantations (about 900 ha) and the trends of creating new plantations, it is expected that the harvest of apple will increase for the upcoming 2-3 years by 20,000 ton (about 15-16%).

It is very difficult to foresee when it comes to pear. There is no process of creating new pear orchards. The export is very low and unstable. A great part of the varieties is not transportable for export. The main expectation is that the main location of Armenian pear consumption will remain the local market,

and the production volumes will remain the same (25-30,000 ton per year) or will increase a little (young plantations comprise only about 200 ha).

Thus, based on the presented data on fruit production and consumption and on the evaluations of experts, it is possible to summarize the topic of fruit production volumes and present the expectations connected with it.

Chart 13 - The estimation of fruit production volumes for the next 3-4 years

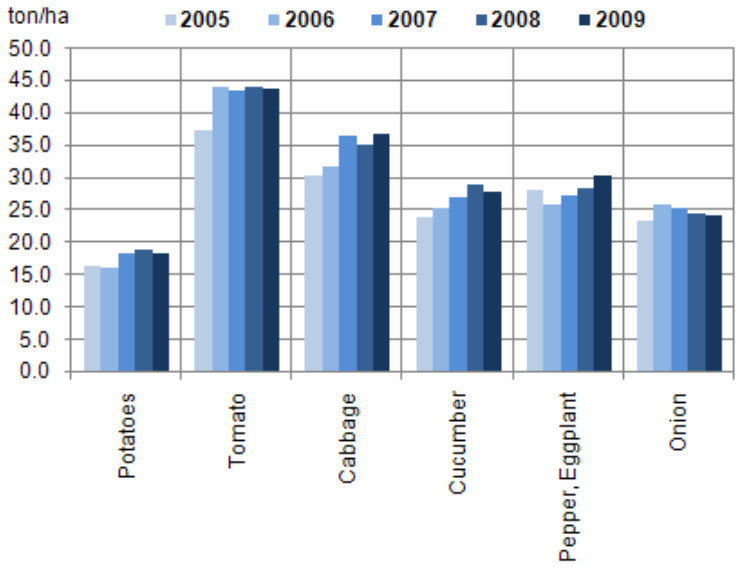


Source: Expert evaluation

2.1.2.2 The volumes of vegetable production

It has been already mentioned that the plots have not significantly changed for the past 5 years. In comparison with 2005, in 2009 plots have declined by 7.1%, but the same index of vegetable have increased by 6.1%. However, the changes of potato and vegetable production for the period of 2005-2009 shows different dynamics. In potato's case despite the reduction of plots, 5.2% increase of production volume has been recorded, and in the case of vegetables the volumes of production have increased by 23.5%. This proves that the increase of potato and vegetable production volumes has been ensured due to the increase of

Chart 14 - The indicators of potato and vegetable production for 2005-2009, ton/ ha

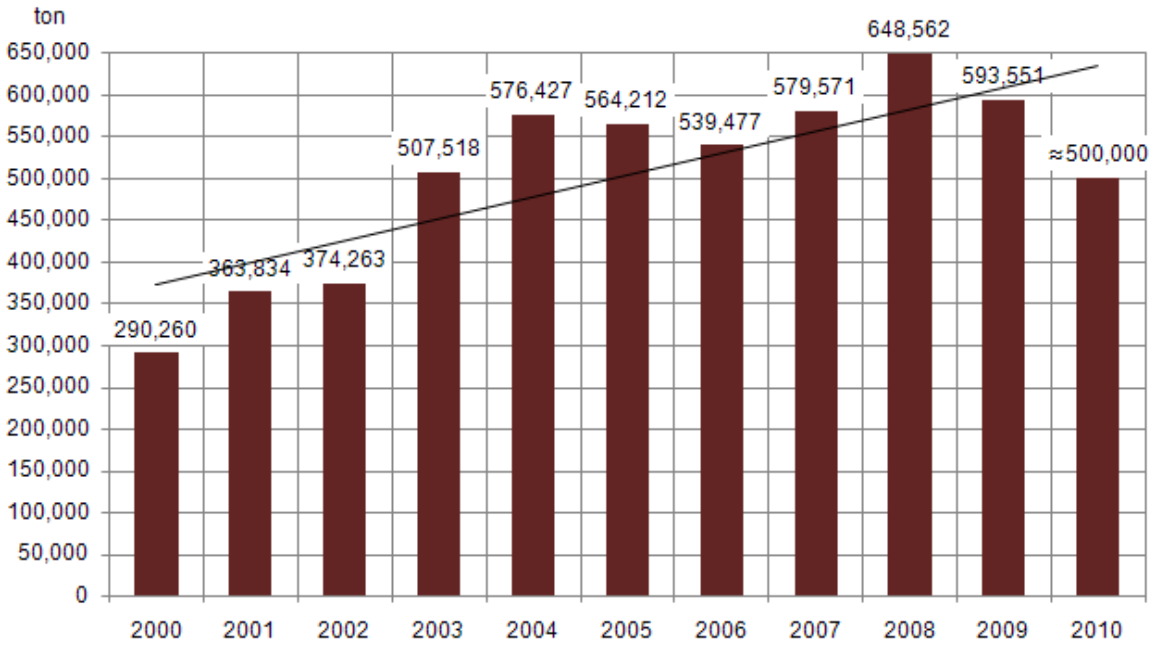


Source: "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009

productivity (see Chart 14). This is a very cheering fact and proves that producers gradually improve their efficiency. It is a cheering fact that the volumes of potato and vegetable production have increased mainly by intensive method. It's connected with the improvement of applied seeds' quality and agricultural and technical activities. However, this does not release the producers from the sales difficulties, which has a negative effect on the production of the last 3 years.

There are actual problems in the field of potato production. It has already been mentioned that in 2000 there has been little increase of plots and bigger increase of productivity. As a result, during 10 years the production volumes have been doubled. 2008 was a record year from the viewpoint of obtained harvest, when the biggest volume of potato was produced, i.e. 648,600 ton (see Chart 15). It is almost two times more than the volumes of local consumption. If we add the fact that potato is not processed, and the volume of export comprises only 1%, it will become clear that there is an overproduction. Even if a part of potato harvest is used as seed (about 100-120,000 ton), and the other part is used as fodder, anyway at present in terms of production volumes and low export volumes the potato production in Armenia increases.

Chart 15 - The volumes of potato production in 2000-2010.



Sources: 1. "Marzes of the Republic of Armenia in figures, 2000-2004", NSS, 2005
2. "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009
3. Expert assessment

There is a reduction of the plots of potato and its production volumes because of sales problems. The foreseen volume of harvest for 2010 is about 500,000 ton. Relatively low volume of harvest in 2010, the low volumes of early-ripening potato and the few successful deals have caused increase in price in the market.

The high speed economic growth recorded in pre-crisis period had its positive effect on Armenia's socio-economic situation and agricultural products processing. It was reflected by slow increase of vegetable consumption among the population. The effect of the processing development was greater. The continuing increase of vegetable procurements by the processing enterprises has reached its peak in 2006. The volume of procured vegetables for processing comprised 67,600 ton, which was 8.7% of vegetable's gross product (excluding potato). In 2007, feeling the increase of demand and

having the opportunity[9] to immediately respond, the farmers expanded the plots[10] and the volumes of harvest, making them 845,300 ton (see Table 8).

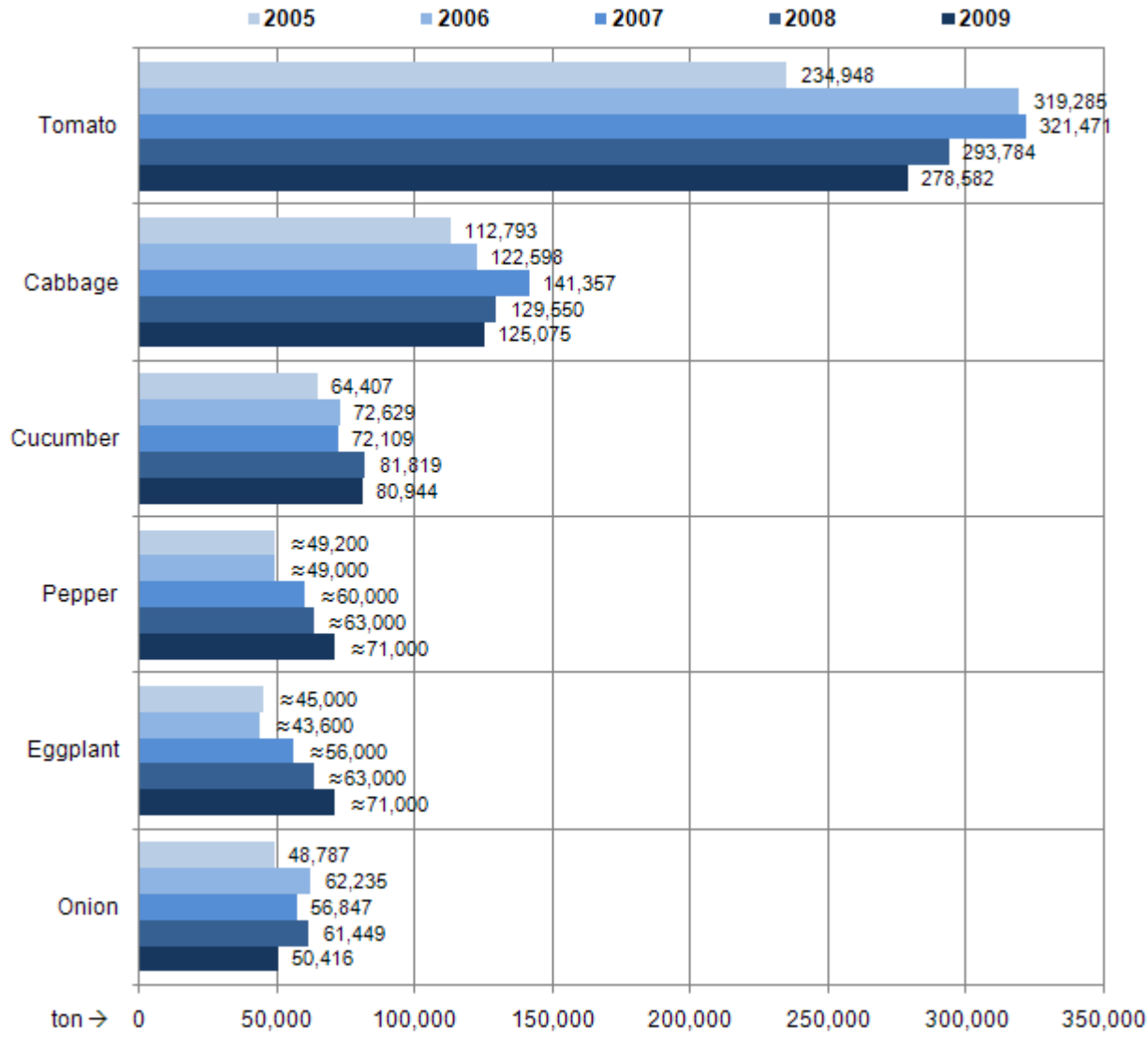
Table 8 - The volumes of vegetable production in 2005-2009, ton

	2005	2006	2007	2008	2009
Vegetable	**663,770**	**780,026**	**845,285**	**825,338**	**819,804**

Source: "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009

However, in 2007 the processing enterprises have procured less than in 2006, i.e. 57,100 ton (6.8% of vegetable harvest), which has caused overproduction. As a result, the difficulties connected with product sales and the financial and economic crisis of 2008 have reduced the plots of vegetables and the volumes of harvest. It was first expressed by the reduction of production volumes of tomato, cabbage and onion (see Chart 16).

Chart 16 - The volumes of vegetable production in 2005-2009, ton



Source: "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009

[9] All vegetable types are presented by annual plants. That is why the farmers who are involved in vegetable production can easily change their activity profile and produce the types that were the most demanded during previous year

[10] Making them 25,600 ha, which is the greatest indicator during the past 10 years

It is almost impossible to give estimations for the volumes of vegetable production of coming years. The plots are managable factor[11] and their greatness will be connected with various external factors. Such factors are the changes of processing and exporting possibilities, the reduction of poverty and the increase of payable demand. The expectations of processing enterprises and exporters are not positive yet, besides the economic situation of the country is recovering with difficulty after the Crisis. According to the experts, it is more probable that volumes of vegetable production will not change during the next 2-3 years and will remain relatively stable.

2.2 PRODUCTION GEOGRAPHY AND SEASONALITY

2.2.1 Production geography

Fruit and vegetable production geography and seasonality in Armenia are defined by Armenia's vertical relief zone. The geography of the chosen products' production has several peculiarities. Objectively, the main area of production is Ararat valley, which coincides with Armavir and Ararat Marzes (see Chart 17). The best lands (according to productivity) of Armenia are located here, agricultural infrastructures are relatively developed, the area has lowlands and has more favorable weather conditions.

Figures on cultivated plots and yield should be analyzed in order to understand the role of Ararat valley.

Chart 17 - Physical map of Armenia

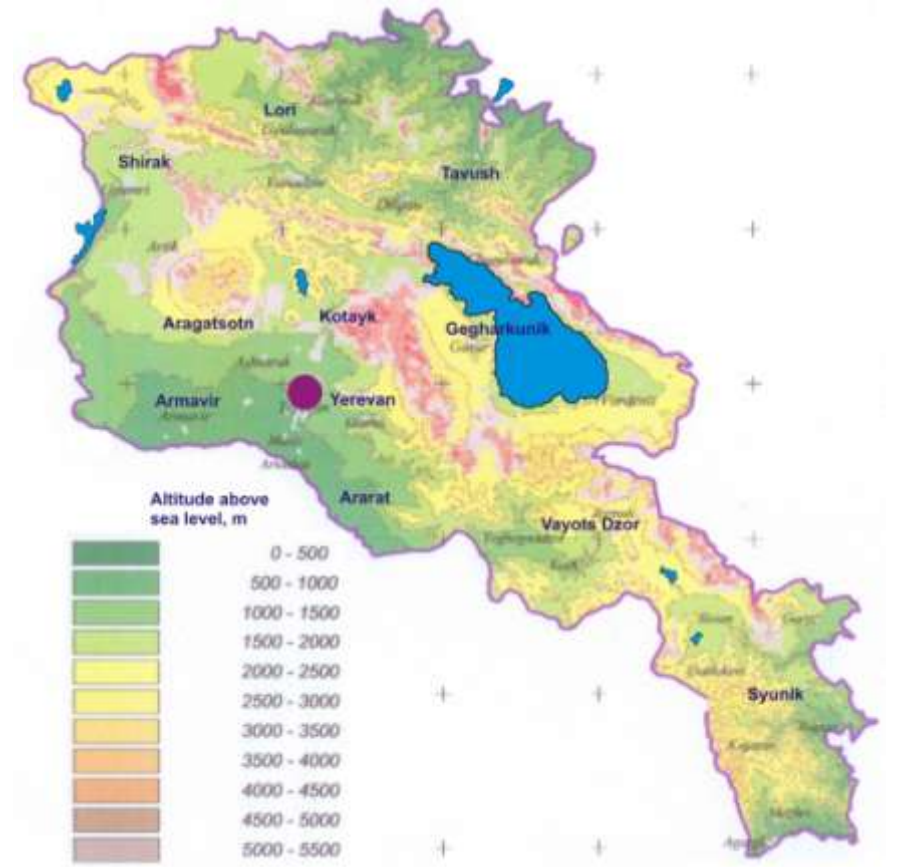


Table 9 - The portion of produced fruits and vegetables in Ararat Valley (Ararat and Armavr Marzes) among the general indiactors of Armenia in 2009

	Fruits			Vegetables	
	The portion of plots	The portion of harvest		The portion of plots	The portion of harvest
Grape	69.6%	86.2%	Potatoes	7.3%	13.9%
Apricot	68.1%	91.2%	Tomato	83.7%	94.6%
Peach	73.3%	85.9%	Cucumber	69.3%	87.0%

[11] Unlike fruit plantations, which are multi-year plots, the plots can be easily expanded or reduced

Plum	41.9%	70.7%	Cabbage	22.0%	29.9%
Sweet cherry	43.3%	65.4%	Pepper	88.0%	88.2%
Apple	13.9%	23.3%	Eggplant		
Pear	21.2%	32.8%	Onion	67.2%	84.9%

Sources: RA Minstry of Agriculture, NSS and Regional Administration Agricultural Departments

Table 9 shows that out of 14 selected products there is a strict concentration on 9 products in Ararat Valley. From the viewpoint of Free Economic Zone this is positive, as the majority of products that have bigger production volumes and export perspectives are produced nearby maximum on 40-50 km radius area.

There are different degrees of concentration in the case of those fruits and vegetables that are produced outside of Ararat Valley. The reasons are again the relief of Armenia and the peculiarities of weather conditions. Mainly in Shirak and Gegharquniq Marzes the production of some fruits and vegetables (tomato, cucumber) is very low or missing, although half of Armenia's potato harvest is produced in these Marzes. There are Marzes, such as Lori and Kotayk, where the arable soil is equally divided between different crops. That is why; the geography of fruit and vegetable production dictates that these products should be divided into two groups:

1) Products, production of which is equally spread between Marzes or they are produced in all Marzes in significant volumes. Such products include apple, pear, potato, cabbage. These are products which can be produced at different zones starting from low up to mountainous. The difference is in the variations of productivity in different zones or in difference of product varieties.
2) Products, which have certain concentration of production. Such goods include grapes, apricot, peach, plum, sweet cherry, tomato, cucumber, pepper, eggplant, onion. These products are very sensitive towards the weather conditions and are produced only in certain zones.

Taking into consideration the above mentioned peculiarities of our research products, geographical distribution of their production can be presented by two methods:

a) from the viewpoint of production the geographical distribution of these products will be presented according to Marzes,
b) geographical distribution of the products, which have concentration of production, will be presented according to the main areas of production.

2.2.1.1 The geography of fruit production

Grape production is strictly concentrated and is implemented in three regions (see Chart 18).

1) Ararat valley, lowlands of Aragatsotn and Kotayk Marzes, where 81% of grape plots are located and 92% of grape harvest is obtained.
2) Tavush Marz, where 8% of grape plots are located and 5% of grape harvest is obtained.
3) Vayots Dzor Marz, where 6% of grape plots are located and 1.5 % of grape harvest is obtained.

Chart 18 - The geography of grape production

The production of technical and table sorts of grapes are concentrated in Ararat valley. "Shahumyan", "Ararat", "Kardinal", "Lalvar", "Qishmish" sorts are the most produced among table sorts. Most of the grape in Tavush and Vayots Dzor Marzes is of technical sorts. Among other Marzes grape grows only in the lowlands of Lori and Syuniq Marzes, although they comprise very low volume and do not present industrial interest.

Apricot production is fully concentrated in Ararat valley, in the lowlands of Aragatsotn and Kotayq Marzes (see Pcture 19) on 600-1,500m altitude. Almost 96% of Armenia's apricot harvest is produced in the mentioned areas. From the supply side this region is divideded into two parts. Apricot first ripens in the low zone (Ararat valley, up to 1,000m), where the harvest begins in June. In the submontane area (low zones of Aragatsotn and Kotayq Marzes, 1,000-1,500m) apricot harvest starts 1-1.5 months later. Some limited quantity is produced in a few villages of Vayots Dzor, which are located on the valley of Arpa river. The apricot of this area is known for its high quality. According to the exporters, they often reach Yeghegnadzor in order to procure apricot. This usually happens when the harvest of Ararat valley is low.

Chart 19 - The geography of apricot production

Just like apricot, **peach** production is also concentrated in Ararat valley and in the low zones of two neighbor Marzes (see Chart 20). 90% of peach harvest is produced there. However, unlike apricot, there are peach orchards in other lowlands and solar areas, in Tavush Marz (Noyemberyan), in Vayots Dzor Marz (Arpa valley), in Syunik Marz (Meghri). In Tavush Marz the most intensive period of creating peach orchards was in the early 2000s within the frames of IFAD projects. Nowadays, peach orchards are planted in Armavir and Aragatsotn Marzes on a large scale.

Chart 20 - The geography of peach production

Plum production is very low and at the same time the geography is wider(see Chart 21). There are three main areas of plum production: Armavir, Lori and Tavush Marzes. Plum is produced also in Ararat, Kotayk, Syunik and Aragatsotn Marzes by less volume. The reason of such spread is that there are almost no large plantations of plum (for industrial purpose) excluding the ones in Armavir and partly in Ararat Marzes. Plum grows

mainly under wild conditions, i.e. in the forest, and in household plots. This is the reason that procurements of plums for exports are mainly made from Armavir Marz.

The areas of **sweet cherry** production are almost the same as in the cases of apricot and peach. 90% of sweet cherry production is obtained from Ararat valley, lowlands of Aragatsotn and Kotayk Marzes. The main large plantations are located in Armavir and Ararat Marzes. Sweet cherry is procured from Armavir and Ararat Marzes, as well as from Karbi and Ohanavan villages of Aragatsotn Marz for the export. There are no large sweet cherry plantations in the latter (unlike the villages of Armavir Marz), however, most of the rural land is under sweet cherry plantation (like in the case of Arevik village of Armavir Marz, where most of the land is under grape plantation).

Chart 21 - The geography of plum production

Chart 22 - The geography of sweet cherry production

Depending on their varieties and physical peculiarities, apple and pear grow almost in all the areas of Armenia. Apple is the first common fruit among the others. Even though there are few areas of apple orchards (presented in Chart 23), where about 70% of Armenia's apple harvest is produced.

Chart 23 - The geography of apple and pear production (according to the results of 2009)

Apple

Pear

Leading regions of apple production are the low zones of Aragatsotn Marz, i.e. Ashtarak area (1,200-1,800 m altitude, about 40% of productivity), the low zone of Kotayk Marz, i.e. Nairi and Abovyan

areas (1,000-1,500 m altitude, 11-14% production), the low zones and submontane areas of Ararat Marz, i.e. Artashat and Ararat areas, where 15-18% of apple harvest is produced. The case of pear is quite different. Unlike the above mentioned fruits, there are almost no large orchards, no large producers, and no significant supply of a product, which is the worst from the viewpoint of exports. Two different sorts of pear grow in two leading Marzes from the viewpoint of production, i.e. in Gegharkunik and Ararat Marzes, during different periods. As a conclusion of fruit production geography, below is presented the distribution of fruit plots and production volumes according to Marzes' 2008-2009 results, which summarize the above mentioned information about the main areas of fruit production in Armenia.

Table 10 - The distribution of fruit plots and production volumes by Marzes, 2008-2009

Grape

Marzes ↓	The plots, ha		The harvest, ton		The portion of plots		The portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	612	612	4,178	2,500	3.6%	3.7%	2.2%	1.2%
Aragatsotn	1,934	1,566	10,125	11,645	11.5%	9.5%	5.4%	5.6%
Ararat	4,853	4,978	81,317	88,168	28.9%	30.2%	43.8%	42.3%
Armavir	6,486	6,490	80,144	91,584	38.6%	39.4%	43.1%	43.9%
Gegharkunik	-	-	-	-	0.0%	0.0%	0.0%	0.0%
Lori	64	64	192	127	0.4%	0.4%	0.1%	0.1%
Kotayk	393	349	184	283	2.3%	2.1%	0.1%	0.1%
Shirak	-	-	-	-	0.0%	0.0%	0.0%	0.0%
Syunik	184	184	995	1,040	1.1%	1.1%	0.5%	0.5%
Vayots Dzor	925	925	2,400	3,021	5.5%	5.6%	1.3%	1.4%
Tavush	1,345	1,312	6,297	10,282	8.0%	8.0%	3.4%	4.9%
ARMENIA	**16,796**	**16,480**	**185,832**	**208,649**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Apricot

Marzes ↓	The plots, ha		The harvest, ton		The portion of plots		The portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	403	403	4,180	2,540	3.9%	4.0%	5.0%	3.1%
Aragatsotn	1,105	1,115	2,179	2,028	10.6%	11.2%	2.6%	2.5%
Ararat	3,071	3,045	29,461	32,248	29.6%	30.5%	35.5%	40.0%
Armavir	4,151	3,753	41,233	41,786	39.9%	37.6%	49.6%	51.8%
Gegharkunik	5	5	14	11	0.0%	0.1%	0.0%	0.0%
Lori	51	51	96	49	0.5%	0.5%	0.1%	0.1%
Kotayk	978	982	4,452	1,593	9.4%	9.8%	5.4%	2.0%
Shirak	1	-	1	0	0.0%	0.0%	0.0%	0.0%
Syunik	63	62	124	28	0.6%	0.6%	0.1%	0.0%
Vayots Dzor	547	548	1,342	355	5.3%	5.5%	1.6%	0.4%
Tavush	16	19	7	48	0.2%	0.2%	0.0%	0.1%
ARMENIA	**10,391**	**9,983**	**83,089**	**80,686**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Peach

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	222	222	773	586	4.0%	4.1%	1.9%	1.0%
Aragatsotn	308	269	1,050	1,978	5.6%	5.0%	2.5%	3.4%
Ararat	2,265	2,160	29,694	27,658	41.0%	40.1%	71.3%	47.8%
Armavir	1,800	1,787	6,567	22,065	32.6%	33.2%	15.8%	38.1%
Gegharkunik	-	-	-	-	0.0%	0.0%	0.0%	0.0%
Lori	148	149	450	536	2.7%	2.8%	1.1%	0.9%
Kotayk	114	127	364	461	2.1%	2.4%	0.9%	0.8%

Shirak	-	-	-	1	0.0%	0.0%	0.0%	0.0%
Syunik	78	78	153	23	1.4%	1.4%	0.4%	0.0%
Vayots Dzor	199	200	594	285	3.6%	3.7%	1.4%	0.5%
Tavush	393	393	2,005	4,290	7.1%	7.3%	4.8%	7.4%
ARMENIA	**5,527**	**5,385**	**41,651**	**57,883**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Plum

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	51	51	157	215	2.8%	2.6%	1.3%	2.1%
Aragatsotn	76	99	199	387	4.1%	5.0%	1.6%	3.7%
Ararat	145	143	1,143	1,350	7.9%	7.2%	9.5%	13.1%
Armavir	601	686	4,359	5,955	32.5%	34.7%	36.1%	57.6%
Gegharkunik	44	44	50	42	2.4%	2.2%	0.4%	0.4%
Lori	292	296	947	558	15.8%	15.0%	7.8%	5.4%
Kotayk	134	160	777	760	7.3%	8.1%	6.4%	7.3%
Shirak	33	33	122	175	1.8%	1.7%	1.0%	1.7%
Syunik	77	77	709	465	4.2%	3.9%	5.9%	4.5%
Vayots Dzor	45	45	124	66	2.4%	2.3%	1.0%	0.6%
Tavush	349	342	3,491	372	18.9%	17.3%	28.9%	3.6%
ARMENIA	**1,847**	**1,976**	**12,077**	**10,344**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Sweet cherry

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	55	55	295	368	5.1%	4.9%	4.5%	4.8%
Aragatsotn	176	178	1,206	706	16.4%	15.8%	18.3%	9.2%
Ararat	99	103	591	665	9.2%	9.1%	9.0%	8.7%
Armavir	358	385	2,808	4,356	33.3%	34.2%	42.6%	56.7%
Gegharkunik	14	14	48	36	1.3%	1.2%	0.7%	0.5%
Lori	52	53	121	83	4.8%	4.7%	1.8%	1.1%
Kotayk	166	184	823	1,146	15.5%	16.3%	12.5%	14.9%
Shirak	3	3	6	17	0.3%	0.3%	0.1%	0.2%
Syunik	74	74	596	201	6.9%	6.6%	9.0%	2.6%
Vayots Dzor	30	30	45	38	2.8%	2.7%	0.7%	0.5%
Tavush	47	47	58	67	4.4%	4.2%	0.9%	0.9%
ARMENIA	**1,074**	**1,126**	**6,598**	**7,682**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Apple

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	214	214	706	514	2.3%	2.2%	0.6%	0.4%
Aragatsotn	1,537	1,955	46,389	51,024	16.7%	20.3%	39.6%	42.2%
Ararat	872	890	19,193	20,999	9.5%	9.2%	16.4%	17.4%
Armavir	458	452	8,163	7,184	5.0%	4.7%	7.0%	5.9%
Gegharkunik	860	860	11,255	10,709	9.4%	8.9%	9.6%	8.9%
Lori	894	954	2,847	2,939	9.7%	9.9%	2.4%	2.4%
Kotayk	1,883	1,863	15,556	13,879	20.5%	19.4%	13.3%	11.5%
Shirak	274	256	1,353	2,323	3.0%	2.7%	1.2%	1.9%
Syunik	983	979	7,449	6,836	10.7%	10.2%	6.4%	5.7%
Vayots Dzor	638	635	2,636	2,429	6.9%	6.6%	2.2%	2.0%
Tavush	568	569	1,654	2,009	6.2%	5.9%	1.4%	1.7%
ARMENIA	**9,181**	**9,627**	**117,199**	**120,844**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Pear

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	162	162	446	282	5.5%	5.5%	1.5%	1.0%
Aragatsotn	154	160	770	1,580	5.2%	5.4%	2.6%	5.6%
Ararat	451	444	7,475	6,118	15.3%	15.1%	25.5%	21.7%
Armavir	182	180	2,937	3,139	6.2%	6.1%	10.0%	11.1%
Gegharkunik	391	391	10,345	9,835	13.3%	13.3%	35.3%	34.8%
Lori	335	341	973	1,043	11.4%	11.6%	3.3%	3.7%
Kotayk	543	527	2,423	2,399	18.5%	17.9%	8.3%	8.5%
Shirak	81	89	505	634	2.8%	3.0%	1.7%	2.2%
Syunik	261	261	2,301	1,960	8.9%	8.9%	7.8%	6.9%
Vayots Dzor	170	170	339	463	5.8%	5.8%	1.2%	1.6%
Tavush	209	211	810	794	7.1%	7.2%	2.8%	2.8%
ARMENIA	**2,939**	**2,936**	**29,322**	**28,247**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Sources: RA Ministry of Agriculture, NSS and Regional Administration Agricultural Departments

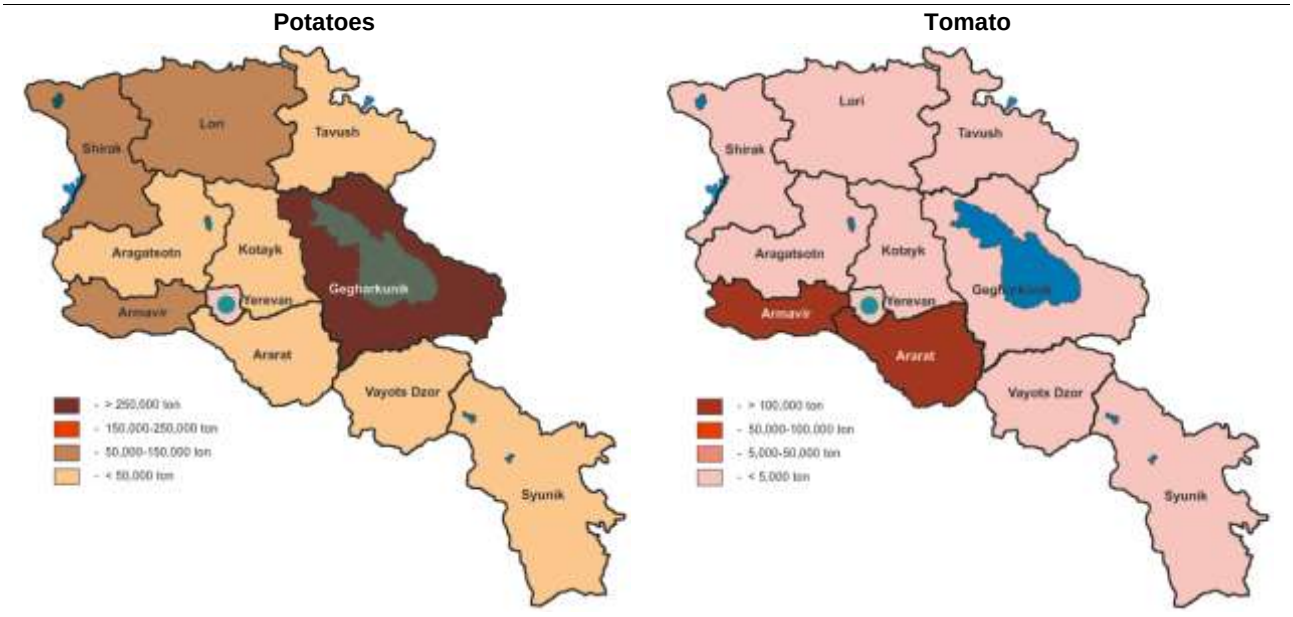
2.2.1.2 The geography of vegetable production

The geography of vegetable production is strictly concentrated. Two of Armenia's 10 Marzes dominate in the vegetable production (see Chart 24). They are:

- Armavir Marz, which is dominant for the production of tomato, cucumber, pepper, eggplant and onion, and
- Gegharkunik Marz, which is dominant for potato and cabbage production.

Distinct separation of fruit and vegetable production areas in Armavir Marz is obvious. Armavir and Baghramyan areas of the Marz are known for fruit production, and the area of Ejmiatsin is known for vegetable production. There are wholesale vegetable markets near Arshaluis and Taronik villages of Ejmiatsin, which also confirm the availability of large volumes of vegetable production in the area.

Chart 24 - The geography of vegetable production (according to the results of 2009)



Cucumber

Cabbage

Pepper, Eggplant, Greens

Onion

Yearly the plots of vegetables expand in the villages of Ejmiatsin area, as well as new methods of cultivation are applied. Inparticular, sizes of self-built greenhouses have expanded in the last few years, and much attention is paid to the cultivation of early-ripening sorts of tomato and cucumber.

The total volume of ever exported vegetables from Armenia (excluding potato and cabbage) was procured in Armavir and Ararat Marzes. It is only in these Marzes that privatized and relatively larger lands are used for vegetable production. The vegetable produced in other Marzes is meant for internal consumption or for selling them in the markets of the same Marze's cities.

Potato and cabbage production takes place in all Marzes, however, Gegharkunik is the leading Marz concerning the concentration and production volumes. In the case of potato production in Armenia there is some geographical separation and specialization, i.e. when it comes to potato production as seed or provision. Gegharkunik is the leading Marz concerning the provisions of potato production, while Shirak Marz is the first from the viewpoint of high productivity seed production. According to the results of October, 2009, 7 out of certified 11 seed producers were operating in Shirak Marz, including the leading company of the field Gyumri Selection Station.

Distribution of the volumes of potato and vegetable production by Marzes is presented below. In order to neutralize the factor of unfavorable years, figures of two years are presented. In order to understand the difference of productivity indicators in various Marzes the sizes of plots are also presented along with production volumes.

Table 11 - Distribution of potato and vegetable plots and production volumes by Marzes, 2008-2009

Potatoes

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	90	95	1,255	1,390	0.3%	0.3%	0.2%	0.2%
Aragatsotn	1,703	1,568	34,034	34,215	5.0%	4.9%	5.2%	5.8%
Ararat	1,037	905	32,834	28,852	3.0%	2.8%	5.1%	4.9%
Armavir	1,875	1,453	63,448	53,224	5.5%	4.5%	9.8%	9.0%
Gegharkunik	15,589	14,742	277,979	254,302	45.5%	46.1%	42.9%	42.8%
Lori	4,655	4,543	54,491	55,031	13.6%	14.2%	8.4%	9.3%
Kotayk	841	830	17,333	16,075	2.5%	2.6%	2.7%	2.7%
Shirak	4,590	3,997	104,902	89,740	13.4%	12.5%	16.2%	15.1%
Syunik	1,852	1,803	33,300	32,371	5.4%	5.6%	5.1%	5.5%
Vayots Dzor	214	174	3,518	2,865	0.6%	0.5%	0.5%	0.5%
Tavush	1,852	1,888	25,470	25,485	5.4%	5.9%	3.9%	4.3%
ARMENIA	**34,298**	**31,998**	**648,562**	**593,551**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Tomato

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	122	88	2,037	1,411	1.9%	1.4%	0.7%	0.5%
Aragatsotn	106	89	2,661	2,611	1.7%	1.4%	0.9%	0.9%
Ararat	3,012	3,078	150,556	142,368	48.1%	49.4%	51.2%	51.1%
Armavir	2,149	2,137	126,428	121,100	34.3%	34.3%	43.0%	43.5%
Gegharkunik	33	32	336	390	0.5%	0.5%	0.1%	0.1%
Lori	107	104	860	580	1.7%	1.7%	0.3%	0.2%
Kotayk	266	250	4,929	4,241	4.3%	4.0%	1.7%	1.5%
Shirak	27	31	319	428	0.4%	0.5%	0.1%	0.2%
Syunik	154	155	2,534	2,433	2.5%	2.5%	0.9%	0.9%
Vayots Dzor	96	82	1,589	1,629	1.5%	1.3%	0.5%	0.6%
Tavush	185	185	1,536	1,393	3.0%	3.0%	0.5%	0.5%
ARMENIA	**6,257**	**6,231**	**293,784**	**278,582**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Cucumber

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	67	77	917	1,053	2.9%	3.0%	1.1%	1.3%
Aragatsotn	91	82	2,594	2,347	3.9%	3.2%	3.2%	2.9%
Ararat	397	443	16,104	18,521	17.0%	17.4%	19.7%	22.9%
Armavir	1,143	1,323	55,057	51,863	48.9%	51.9%	67.3%	64.1%
Gegharkunik	37	35	325	395	1.6%	1.4%	0.4%	0.5%
Lori	101	105	772	500	4.3%	4.1%	0.9%	0.6%
Kotayk	124	120	1,479	1,715	5.3%	4.7%	1.8%	2.1%
Shirak	43	44	520	495	1.8%	1.7%	0.6%	0.6%
Syunik	108	108	1,652	1,625	4.6%	4.2%	2.0%	2.0%
Vayots Dzor	68	57	853	973	2.9%	2.2%	1.0%	1.2%
Tavush	160	155	1,548	1,456	6.8%	6.1%	1.9%	1.8%
ARMENIA	**2,339**	**2,549**	**81,819**	**80,944**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Cabbage

Marzes ↓	Plots, ha		Harvest, ton		Portion of plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	11	17	293	348	0.3%	0.5%	0.2%	0.3%
Aragatsotn	210	156	11,750	8,190	5.7%	4.6%	9.1%	6.5%
Ararat	205	243	9,780	11,749	5.6%	7.2%	7.5%	9.4%
Armavir	450	498	22,081	25,696	12.3%	14.8%	17.0%	20.5%
Gegharkunik	1,471	1,058	46,722	40,610	40.1%	31.3%	36.1%	32.5%
Lori	477	493	12,365	13,409	13.0%	14.6%	9.5%	10.7%
Kotayk	232	238	10,402	7,792	6.3%	7.0%	8.0%	6.2%
Shirak	282	333	8,126	8,758	7.7%	9.9%	6.3%	7.0%
Syunik	200	211	6,258	6,259	5.5%	6.3%	4.8%	5.0%
Vayots Dzor	21	17	261	263	0.6%	0.5%	0.2%	0.2%
Tavush	109	112	1,513	2,002	3.0%	3.3%	1.2%	1.6%
ARMENIA	**3,668**	**3,376**	**129,550**	**125,075**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Pepper, eggplant and greens

Marzes ↓	Plots, ha		Harvest, ton		Portion of Plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	243	226	3,980	2,270	3.6%	3.2%	1.9%	1.0%
Aragatsotn	243	265	5,566	9,501	3.6%	3.8%	2.7%	4.0%
Ararat	2,035	2,048	77,408	82,169	29.8%	29.0%	37.1%	34.8%
Armavir	2,938	3,163	106,366	126,087	43.0%	44.8%	50.9%	53.4%
Gegharkunik	212	185	3,525	4,651	3.1%	2.6%	1.7%	2.0%
Lori	232	212	1,108	939	3.4%	3.0%	0.5%	0.4%
Kotayk	264	264	2,423	2,393	3.9%	3.7%	1.2%	1.0%
Shirak	161	155	2,302	2,829	2.4%	2.2%	1.1%	1.2%
Syunik	205	214	3,130	3,010	3.0%	3.0%	1.5%	1.3%
Vayots Dzor	122	102	1,374	1,137	1.8%	1.4%	0.7%	0.5%
Tavush	174	222	1,638	1,323	2.5%	3.1%	0.8%	0.6%
ARMENIA	**6,829**	**7,056**	**208,821**	**236,308**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Onion

Marzes ↓	Plots, ha		Harvest, ton		Portion of Plots		Portion of harvest	
	2008	2009	2008	2009	2008	2009	2008	2009
Yerevan	26	40	233	320	1.0%	1.9%	0.4%	0.6%
Aragatsotn	185	155	2,649	2,214	7.4%	7.4%	4.3%	4.4%
Ararat	217	201	7,687	7,613	8.7%	9.6%	12.5%	15.1%
Armavir	1,605	1,202	46,142	35,174	64.5%	57.6%	75.1%	69.8%
Gegharkunik	16	34	195	277	0.6%	1.6%	0.3%	0.5%
Lori	64	77	279	284	2.6%	3.7%	0.5%	0.6%
Kotayk	70	70	630	556	2.8%	3.4%	1.0%	1.1%
Shirak	26	29	298	466	1.0%	1.4%	0.5%	0.9%
Syunik	53	53	709	723	2.1%	2.5%	1.2%	1.4%
Vayots Dzor	108	98	1,650	1,682	4.3%	4.7%	2.7%	3.3%
Tavush	117	126	978	1,108	4.7%	6.0%	1.6%	2.2%
ARMENIA	**2,487**	**2,085**	**61,449**	**50,416**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

2.2.2 Production Seasonality

It has been already mentioned that fruit and vegetable production seasonality in Armenia is conditioned by vertical relief. Concerning the seasonality it is expressed by the same plant's ripening in different periods. Depending on their peculiarities, different fruit and vegetable types have different

seasonality. Among fruits apple, pear, peach and plum have the longest supply of fresh fruits, and among vegetables they are tomato, cucumber, pepper and eggplant. The harvest of these products is done in 100-140 days conditioned by the sorts of these products (early-ripening, mid-ripening, late-ripening sorts), as well as with weak concentration of plot areas (or with wide spread). Unlike the mentioned products, apricot, sweet cherry and grapes among fruits and potato, cabbage among vegetables, having large production concentration, are harvested in a relatively short period of 90 days. About 90% of apricot harvest and 60-65% of sweet cherry harvest are obtained in 30 days, and 90% of grape harvest is obtained in 45 days. In order to present the seasonality of fruit and vegetable supply, the regions of Armenia were defined (based on the goegraphical distribution of' production), which are considered as main areas of production (see Table 12).

Table 12 - Main areas of fruit and vegetable production in Armenia

Areas of production	Geographical areas	Zone
Ararat valley ▶	Armavir and Ararat Marzes, Yerevan area	600-1,000 m
Lowlands ▶	Lowlands of Syunik, Vayots Dzor and Tavush Marzes	400-1,000 m
Submontane area ▶	Lowlands of Aragatsotn, Gegharkunik, Lori, Kotayk and Shirak Marzes	1,000-1,500 m

Distribution of selected products' production volume according to months by decades is presented below (seeTable 13). The volume of certain product production is taken according to the volumes of favorable year, i.e. according to the production capacity.

Table 13 - Fruit production seasonality

Grape (Table sorts)

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	46,072	92%												10%	25%	40%	15%	10%						100%
Lowlands	2,707	5%												15%	35%	30%	10%	10%						100%
Submontane area	1,221	2%															30%	40%	30%					100%
ARMENIA	**50,000**	**100%**												**10%**	**25%**	**38%**	**15%**	**11%**	**1%**					**100%**
Volumes,ton																								
Ararat Valley	46,072	92%												4,607	11,518	18,429	6,911	4,607						46,072
Lowlands	2,707	5%												406	947	812	271	271						2,707
Submontane area	1,221	2%															366	488	366					1,221
ARMENIA	**50,000**	**100%**												**5,013**	**12,465**	**19,241**	**7,548**	**5,366**	**366**					**50,000**

Apricot

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	75,923	95%					10%	40%	40%	10%														100%
Lowlands	428	1%					10%	20%	20%	25%	20%	3%	2%											100%
Submontane area	3,649	5%							7%	13%	35%	35%	7%	3%										100%
ARMENIA	**80,000**	**100%**					**10%**	**38%**	**38%**	**10%**	**2%**	**2%**	**0%**	**0%**										**100%**
Volumes, ton																								
Ararat Valley	75,923	95%					7,592	30,369	30,369	7,592														75,923
Lowlands	428	1%					43	86	86	107	86	13	9											428
Submontane area	3,649	5%							255	474	1,277	1,277	255	109										3,649
ARMENIA	**80,000**	**100%**					**7,635**	**30,455**	**30,710**	**8,174**	**1,363**	**1,290**	**264**	**109**										**80,000**

Peach

Production regions	Production capacity		Months by decades																				Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	52,150	87%									5%	10%	20%	20%	20%	15%	5%	5%						100%
Lowlands	4,766	8%							2%	4%	8%	12%	16%	19%	14%	12%	6%	4%	2%	1%				100%
Submontane area	3,084	5%												15%	15%	25%	25%	12%	6%	2%				100%
ARMENIA	**60,000**	**100%**							**0%**	**0%**	**5%**	**10%**	**19%**	**20%**	**19%**	**15%**	**6%**	**5%**	**0%**	**0%**				**100%**
Volumes, ton																								
Ararat Valley	52,150	87%									2,608	5,215	10,430	10,430	10,430	7,823	2,608	2,608						**52,150**
Lowlands	4,766	8%							95	191	381	572	763	906	667	572	286	191	95	48				**4,766**
Submontane area	3,084	5%												463	463	771	771	370	185	62				**3,084**
ARMENIA	**60,000**	**100%**							**95**	**191**	**2,989**	**5,787**	**11,193**	**11,798**	**11,560**	**9,165**	**3,664**	**3,168**	**280**	**109**				**60,000**

Plum

Production regions	Production capacity		Months by decades																				Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	7,230	66%					1%	3%	10%	25%	25%	14%	12%	10%										100%
Lowlands	1,923	17%					2%	3%	7%	13%	18%	16%	18%	11%	7%	3%	2%							100%
Submontane area	1,847	17%								5%	10%	20%	31%	20%	8%	4%	2%							100%
ARMENIA	**11,000**	**100%**					**1%**	**2%**	**8%**	**20%**	**21%**	**15%**	**16%**	**12%**	**3%**	**1%**	**1%**							**100%**
Volumes, ton																								
Ararat Valley	7,230	66%					72	217	723	1,807	1,807	1,012	868	723										**7,230**
Lowlands	1,923	17%					38	58	135	250	346	308	346	212	135	58	38							**1,923**
Submontane area	1,847	17%								92	185	369	573	369	148	74	37							**1,847**
ARMENIA	**11,000**	**100%**					**111**	**275**	**858**	**2,150**	**2,338**	**1,689**	**1,786**	**1,304**	**282**	**132**	**75**							**11,000**

Sweet cherry

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	4,911	70%			2%	5%	10%	25%	25%	25%	5%	3%												100%
Lowlands	278	4%				2%	10%	18%	30%	25%	9%	4%	2%											100%
Submontane area	1,811	26%						3%	6%	15%	38%	36%	2%											100%
ARMENIA	**7,000**	**100%**			**1%**	**4%**	**7%**	**19%**	**20%**	**22%**	**14%**	**12%**	**1%**											**100%**
Volumes, ton																								
Ararat Valley	4,911	70%			98	246	491	1,228	1,228	1,228	246	147												**4,911**
Lowlands	278	4%				6	28	50	83	70	25	11	6											**278**
Submontane area	1,811	26%						54	109	272	688	652	36											**1,811**
ARMENIA	**7,000**	**100%**			98	251	519	1,332	1,420	1,569	959	811	42											**7,000**

Apple

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portion, %																								
Ararat Valley	28,496	24%					2%	3%	10%	12%	15%	13%	12%	13%	10%	10%								100%
Lowlands	11,195	9%					1%	2%	3%		4%	7%	15%	18%	17%	12%	10%	5%	3%	2%	1%			100%
Submontane area	80,309	67%									1%	1%	1%	2%	3%	10%	17%	23%	24%	16%	2%			100%
ARMENIA	**120,000**	**100%**					**1%**	**1%**	**3%**	**3%**	**5%**	**4%**	**5%**	**6%**	**6%**	**10%**	**12%**	**16%**	**16%**	**11%**	**1%**			**100%**
Volumes, ton																								
Ararat Valley	28,496	24%					570	855	2,850	3,420	4,274	3,704	3,420	3,704	2,850	2,850								**28,496**
Lowlands	11,195	9%					112	224	336		448	784	1,679	2,015	1,903	1,343	1,120	560	336	224	112			**11,195**
Submontane area	80,309	67%									803	803	803	1,606	2,409	8,031	13,653	18,471	19,274	12,849	1,606			**80,309**
ARMENIA	**120,000**	**100%**					**682**	**1,079**	**3,185**	**3,420**	**5,525**	**5,291**	**5,902**	**7,326**	**7,162**	**12,224**	**14,772**	**19,031**	**19,610**	**13,073**	**1,718**			**120,000**

Pear

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	9,117	34%										5%	8%	8%	15%	15%	25%	20%	4%					100%
Lowlands	3,074	11%											15%	20%	25%	25%	15%							100%
Submontane area	14,808	55%													15%	25%	35%	25%						100%
ARMENIA	**27,000**	**100%**										**2%**	**4%**	**5%**	**16%**	**22%**	**29%**	**20%**	**1%**					**100%**
Volumes, ton																								
Ararat Valley	9,117	34%										456	729	729	1,368	1,368	2,279	1,823	365					**9,117**
Lowlands	3,074	11%											461	615	769	769	461							**3,074**
Submontane area	14,808	55%													2,221	3,702	5,183	3,702						**14,808**
ARMENIA	**27,000**	**100%**										**456**	**1,191**	**1,344**	**4,357**	**5,838**	**7,923**	**5,526**	**365**					**27,000**

Studied fruits

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Volumes, ton																								
Ararat Valley	223,899	63%			98	246	8,726	32,669	35,169	14,047	8,935	10,535	15,447	20,194	26,165	30,469	11,798	9,038	365					**223,899**
Lowlands	24,371	7%				6	221	417	735	617	1,286	1,687	3,263	4,153	4,421	3,554	2,176	1,021	431	272	112			**24,371**
Submontane area	106,730	30%						54	364	838	2,953	3,102	1,667	2,548	5,241	12,578	20,010	23,032	19,825	12,911	1,606			**106,730**
ARMENIA	**355,000**	**100%**			**98**	**251**	**8,947**	**33,140**	**36,268**	**15,502**	**13,174**	**15,324**	**20,377**	**26,895**	**35,827**	**46,600**	**33,983**	**33,091**	**20,621**	**13,183**	**1,718**			**355,000**
Portions, %					**0%**	**3%**	**9%**	**10%**	**4%**	**4%**	**4%**	**6%**	**8%**	**10%**	**13%**	**10%**	**9%**	**6%**	**4%**	**0%**	**0%**			**100%**

Table 14 - Vegetable production seasonality

Potatoes

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	82,967	14%						30%	35%	35%														100%
Lowlands	19,170	3%												25%	25%	25%	25%							100%
Submontane area	487,863	83%												5%	5%	10%	10%	15%	20%	20%	15%			100%
ARMENIA	**590,000**	**100%**						**4%**	**5%**	**5%**				**5%**	**5%**	**9%**	**9%**	**12%**	**17%**	**17%**	**12%**			**100%**
Volumes, ton																								
Ararat Valley	82,967	14%						24,890	29,038	29,038														82,967
Lowlands	19,170	3%												4,792	4,792	4,792	4,792							19,170
Submontane area	487,863	83%												24,393	24,393	48,786	48,786	73,179	97,573	97,573	73,179			487,863
ARMENIA	**590,000**	**100%**						**24,890**	**29,038**	**29,038**				**29,186**	**29,186**	**53,579**	**53,579**	**73,179**	**97,573**	**97,573**	**73,179**			**590,000**

Tomato*

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	**261,472**	95%							3%	4%	5%	10%	12%	15%	15%	15%	10%	8%	3%					100%
Lowlands	**2,692**	1%										10%	15%	20%	20%	15%	10%	8%	2%					100%
Submontane area	**10,835**	4%											15%	20%	20%	25%	10%	7%	3%					100%
ARMENIA	**275,000**	**100%**							**3%**	**4%**	**5%**	**10%**	**12%**	**15%**	**15%**	**15%**	**10%**	**8%**	**3%**					**100%**
Volumes, ton																								
Ararat Valley	**261,472**	95%							7,844	10,459	13,074	26,147	31,377	39,221	39,221	39,221	26,147	20,918	7,844					**261,472**
Lowlands	**2,692**	1%										269	404	538	538	404	269	215	54					**2,692**
Submontane area	**10,835**	4%											1,625	2,167	2,167	2,709	1,084	758	325					**10,835**
ARMENIA	**275,000**	**100%**							**7,844**	**10,459**	**13,074**	**26,416**	**33,406**	**41,926**	**41,926**	**42,334**	**27,500**	**21,892**	**8,223**					**275,000**

* - In the Table of the production volumes and seasonality of tomato growing on open ground are presented**.** Tomato, just like cucumber and pepper, also grows on covered ground (i.e. in greenhouses).The vegetable volume, growing in greenhouses**,** comprised 1,300 ton in 2009, 92% (1,200 ton) of which comprised tomato. In spite of constant **sowing circulation** in greenhouses, covered ground tomato production follows cucumber harvest. Main production season is April-July. Productivity indicator is 18kg/$m^{2.}$ The highest prices for greenhouse tomato are in April-June. It concedes its place in the market when the first harvest of open ground tomato is obtained (i.e. in July). Thus, during April-July period 1,200 ton tomato is consumed in Armenian market. No deficit of local tomato production is recorded in Armenian market. During November-June period there is only some deficiency.

Cucumber*

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	70,604	88%				3%	4%	5%	10%	10%	5%		9%	10%	10%	11%	12%	7%	4%					**100%**
Lowlands	3,046	4%											15%	15%	20%	15%	15%	13%	7%					**100%**
Submontane area	6,350	8%								10%	10%	15%	20%	20%	15%	10%								**100%**
ARMENIA	**80,000**	**100%**				**3%**	**4%**	**4%**	**9%**	**10%**	**5%**	**1%**	**10%**	**11%**	**11%**	**11%**	**11%**	**7%**	**4%**					**100%**
Volumes, ton																								
Ararat Valley	70,604	88%				2,118	2,824	3,530	7,060	7,060	3,530		6,354	7,060	7,060	7,766	8,473	4,942	2,824					**70,604**
Lowlands	3,046	4%											457	457	609	457	457	396	213					**3,046**
Submontane area	6,350	8%								635	635	952	1,270	1,270	952	635								**6,350**
ARMENIA	**80,000**	**100%**				2,118	2,824	3,530	7,060	7,695	4,165	952	8,081	8,787	8,622	8,858	8,929	5,338	3,037					**80,000**

* - In the above given Table only the volumes of cucumber production and seasonality that grow on open ground are presented. Cucumber, just like tomato and pepper, can also grow on covered ground (i.e. in greenhouses). Among the vegetable volumes (1,300 ton in 2009) that grow in greenhouses cucumber comprises only 65 ton. According to the main cycle of sowing circulation, **from the viewpoint of time** cucumber production is the first among vegetables that grow in greenhouses. The cucumber of Armenian greenhouse production enters markets at the end of October and is consumed till the end of December. Before the Christmas holidays, when intensive vegetable trade is done, the volumes of imported cucumber limits at the expense of local cucumber production. This does not happen in the case of tomato. The indicator of greenhouse production comprises 8-10kg/m^2. After the harvest of greenhouse cucumber, the greenhouse is used for tomato production. 100% deficit of local cucumber production is recorded from January to May.

Cabbage

Production regions	Production capacity		Months by decades																					Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	37,770	30%					2%	3%	5%	10%	5%	3%	2%	2%	15%	18%	15%	10%	10%					**100%**
Lowlands	826	1%							15%	30%	35%	20%												**100%**
Submontane area	86,404	69%													15%	25%	35%	25%						**100%**
ARMENIA	**125,000**	**100%**					**1%**	**1%**	**2%**	**3%**	**2%**	**1%**	**1%**	**1%**	**15%**	**23%**	**29%**	**20%**	**3%**					**100%**
Volumes, ton																								
Ararat Valley	37,770	30%					755	1,133	1,889	3,777	1,889	1,133	755	755	5,666	6,799	5,666	3,777	3,777					37,770
Lowlands	826	1%							124	248	289	165												826
Submontane area	86,404	69%													12,961	21,601	30,241	21,601						86,404
ARMENIA	**125,000**	**100%**					**755**	**1,133**	**2,012**	**4,025**	**2,177**	**1,298**	**755**	**755**	**18,626**	**28,400**	**35,907**	**25,378**	**3,777**					**125,000**

Pepper*

Production regions	Production capacity		Months by decades																				Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	57,908	89%								4%	8%	10%	12%	16%	25%	15%	10%							**100%**
Lowlands	119	0%								4%	8%	10%	12%	16%	25%	15%	10%							**100%**
Submontane area	6,972	11%											15%	25%	40%	20%								**100%**
ARMENIA	**65,000**	**100%**								**4%**	**7%**	**9%**	**12%**	**17%**	**27%**	**16%**	**9%**							**100%**
Volumes,ton																								
Ararat Valley	57,908	89%								2,316	4,633	5,791	6,949	9,265	14,477	8,686	5,791							57,908
Lowlands	119	0%								5	10	12	14	19	30	18	12							119
Submontane area	6,972	11%											1,046	1,743	2,789	1,394								6,972
ARMENIA	**65,000**	**100%**								**2,321**	**4,642**	**5,803**	**8,009**	**11,028**	**17,296**	**10,099**	**5,803**							**65,000**

* - In the above goven Table the seasonality and volumes of pepper production that grows on open ground are presented. Pepper, just like tomato and cucumber, can also grow on covered ground (i.e. in greenhouses). Among the volumes of greenhouse vegetable (1,300 ton in 2009) pepper comprises only 35 ton. According to the main cycle of sowing circulation, the pepper is sowed in greenhouses in August and becomes productive in December-May.

Eggplant

Production regions	Production capacity		Months by decades																				Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	57,908	89%								4%	5%	10%	12%	13%	13%	13%	13%	12%	5%					**100%**
Lowlands	119	0%										10%	15%	20%	20%	20%	15%							**100%**
Submontane area	6,972	11%												15%	25%	35%	25%							**100%**
ARMENIA	**65,000**	**100%**								**4%**	**4%**	**9%**	**11%**	**13%**	**14%**	**15%**	**14%**	**11%**	**4%**					**100%**
Volumes, ton																								
Ararat Valley	57,908	89%								2,316	2,895	5,791	6,949	7,528	7,528	7,528	7,528	6,949	2,895					57,908
Lowlands	119	0%										12	18	24	24	24	18							119
Submontane area	6,972	11%												1,046	1,743	2,440	1,743							6,972
ARMENIA	**65,000**	**100%**								**2,316**	**2,895**	**5,803**	**6,967**	**8,598**	**9,295**	**9,992**	**9,289**	**6,949**	**2,895**					**65,000**

Onion

Production regions	Production capacity		Months by decades																				Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Portions, %																								
Ararat Valley	48,999	89%								25%	45%	30%												100%
Lowlands	101	0%								25%	45%	30%												100%
Submontane area	5,900	11%											15%	25%	35%	25%								100%
ARMENIA	**55,000**	**100%**								**22%**	**40%**	**27%**	**2%**	**3%**	**4%**	**3%**								**100%**
Volumes, ton																								
Ararat Valley	48,999	89%								12,250	22,050	14,700												48,999
Lowlands	101	0%								25	45	30												101
Submontane area	5,900	11%											885	1,475	2,065	1,475								5,900
ARMENIA	**55,000**	**100%**								**12,275**	**22,095**	**14,730**	**885**	**1,475**	**2,065**	**1,475**								**55,000**

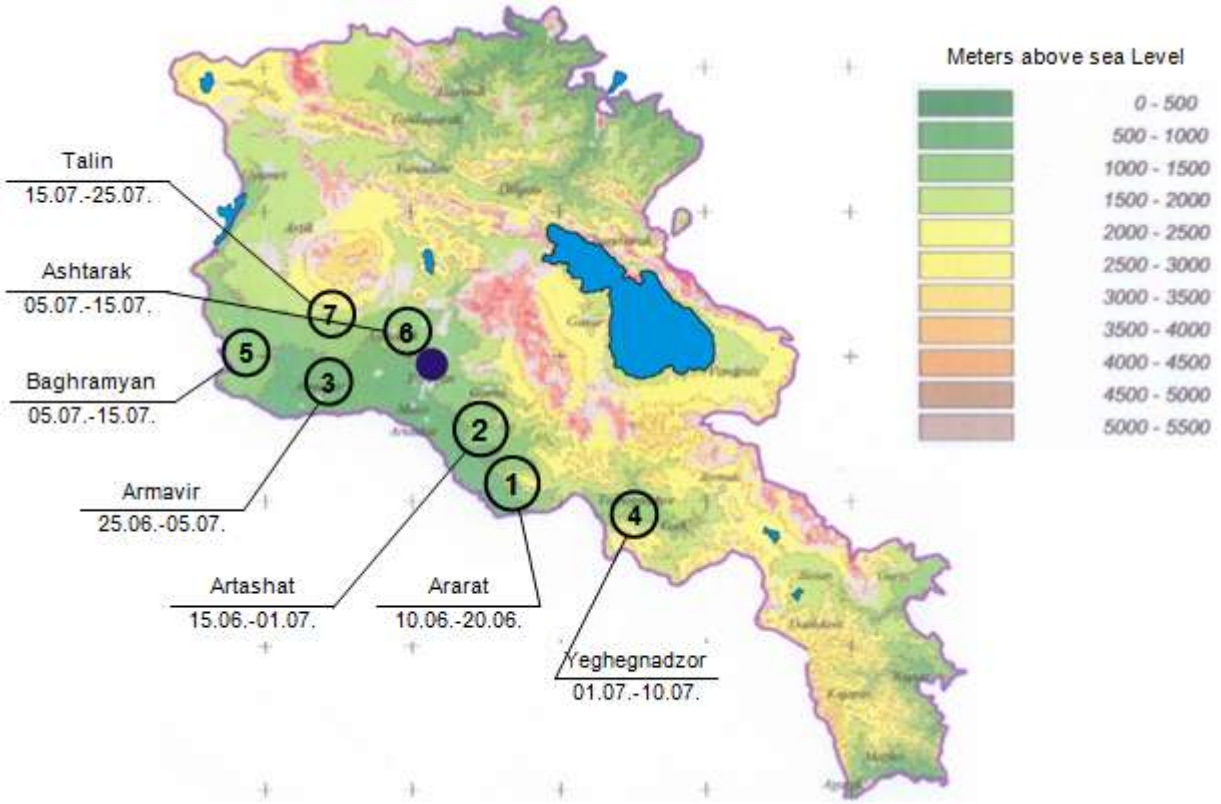
Studied vegetables

Production regions	Production capacity		Months by decades																				Total
			May			June			July			August			September			October			November			
	ton	%	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
Volumes, ton																								
Ararat Valley	617,630	49.2%				2,118	3,580	29,553	45,832	67,217	48,070	53,562	52,385	63,830	73,952	70,000	53,604	36,586	17,341					617,630
Lowlands	26,073	2.1%							124	278	344	488	893	5,831	5,994	5,695	5,548	611	267					26,073
Submontane area	611,297	48.7%								635	635	952	4,826	32,094	47,070	79,041	81,854	95,539	97,898	97,573	73,179			611,297
ARMENIA	**1,255,000**	**100%**				**2,118**	**3,580**	**29,553**	**45,955**	**68,130**	**49,049**	**55,003**	**58,103**	**101,755**	**127,016**	**154,736**	**141,007**	**132,736**	**115,505**	**97,573**	**73,179**			**1,255,000**
Portions, %						**0%**	**0%**	**2%**	**4%**	**5%**	**4%**	**4%**	**5%**	**8%**	**10%**	**12%**	**11%**	**11%**	**9%**	**8%**	**6%**			**100%**

In order to consider the data of Table 13 and Table 14 we must apply two restrictions:

1. Fruit and vegetable ripening periods can differ even in the same zone conditions. For instance the case of apricot: in Ararat Valley, which is located on the areas of Ararat, Artashat, Armavir and Baghramyan (main areas of apricot production), the harvest begins during 4 different periods (see Chart 25). This is connected with physical peculiarities of different apricot types, when 50-100m relief difference can change the ripeningby 5-10 days.

Chart 25 - Apricot harvest periods according to main areas



Sorts of fruits and vegetables can also make corrections in the periods of harvest, as there can be various sorts with different ripening periods (the cases of apple and pear).

2. It should also be mentioned that the seasonality of fruit and vegetable production is not *immobile*, i.e. when the temperature is higher than the norm, harvest season may start earlier, and the vice versa, if the temperature is lower than the norm, harvest season may start 10-15 days later. The presented data of fruit and vegetable production seasonality can be used as a base for average favorable year.

2.3 LARGE PRODUCERS

During the first years of RA independence, when land resources were privatized, thousands of **rural farms** were created**,** the main defect of which were their small sizes. From the very beginning small lands made their agricultural activities inefficiently. Available agricultural subdivisions, i.e. irrigation network, system of providing fertilizer and therapeutic agent, were not able to satisfy the demands of new reality.

Later, especially in the early 2000s, when Armenia began to develop economically, some activities began among farmers to improve their professionalism and enlarge the farms. Some sold their lands (either the whole land or part of it), not being able to effectively organize their activities. Instead, others

succeeded in production and sales, and began to enlarge their farms at the expense of their arables. It was implemented by buying new lands or by leasing state or community lands.

Thus, new farms with larger lands were formed. Now, strive for productivity increase is noted among these farms. It should be noted that in the case of certain plants and certain areas the activities have some peculiarities. Diversification of large farms' operation is noted in Ararat Valley. Considering last few years' weather conditions, some farmers try to cultivate several fruits (apricot, peach, plum, grapes) simultaneously.

In highlands (mainly in Shirak, Gegharkunik and Syunik Marzes) the attention is mostly paid to scale effect. In these areas potato and cabbage cultivation is dominant, and such areas are relatively large.

3 FRUIT AND VEGETABLE EXPORTS

3.1 EXPORT VOLUMES

The analysis of fruit and vegetable export proves that it is prospering. It is expressed by the incease of export volumes and exporters' quantity, low increase of consumption markets' diversification and increase of so called experimental markets. Before talking about the export volumes, we must first observe one important circumstance.

There are two statistics concerning the fruit and vegetable export volumes, which are obtained from the following sources: a) Armenian Customs Service, and b) State Inspectorate on Plant Quarantine (henceforth SIPQ). As a rule, the figures of the latter exceed the indicators of Armenian Customs Service (the data of Armenian Customs Service is a base for official statistics of RA external trade). This phenomenon has two possible explanations:

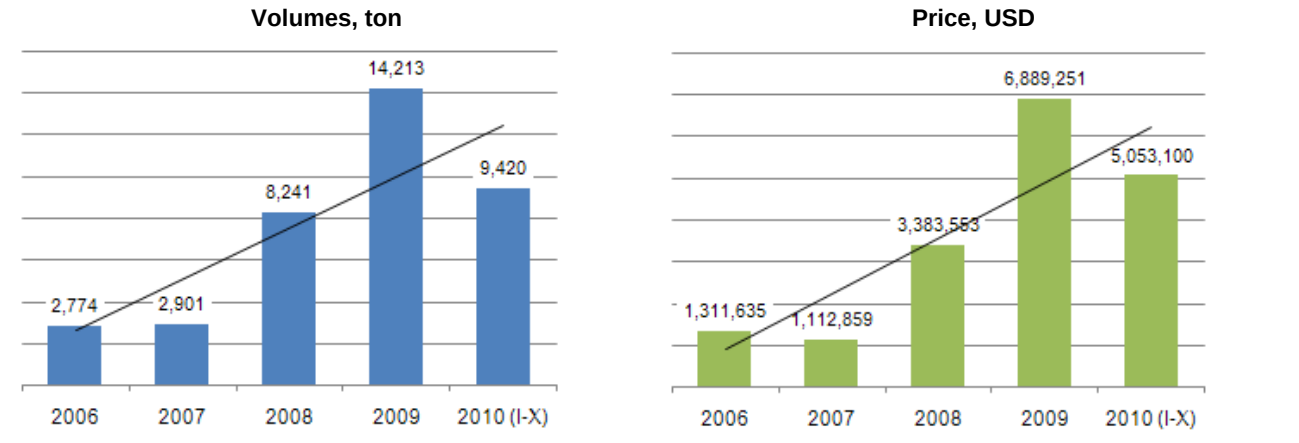
1) A lot of people who cross the boarder of Armenia take with them some fruits and vegetables, such "microexport" (50-100 kg) can receive an accompanying document from SIPQ, but it may not be recorded by RA Customs Service. Thus, it is possible, that the products which were not recorded by RA Customs Service may be added to each other and cause notable differences among the data of those two different registering bodies.
2) Exporters may receive accompanying documents for larger volumes of fruit and vegetable export (based on a contract), but may not export the recorded volume. In this case Armenian Customs Service will record the actual exported volume, while SIPQ will record the initial volume shown in the accompanying document.

In any case it will be logical to think that the right volumes of Armenian fruit and vegetable exports are between the numbers of Armenian Customs Service and SIPQ.

3.1.1 Exporting volumes of fruits

The export of fruits is known for its dynamic and stable development. According to NSS data (base of which are the numbers of Armenian Customs Service), if in 2004 the export of Armenian fruits comprised 2,400 tons with the price of $580,000, during 10 months of 2010 the same indicator comprised 9,400 tons with the price of more than $5 million. Moreover, a lot of exporters could not export their planned volume because of the unfavorable agricultural year of 2010 and low volumes of harvest. Below the volumes of 2006-2010 fruit exports are presented.

Chart 26 - Export volumes of Armenian fruits, 2006-2010



Sources: 1. "Foreign Trade of the Republic of Armenia", NSS, 2006-2009
2. Armenian Customs Service

Export volumes directly depend on production volumes: in order to export any fruit, first it should be produced. Production volumes can vary significantly only because of one factor, i.e. weather variations. Such a case was recorded in 2010, when very low volume of apricot and peach harvest was obtained due to unfavorable weather conditions (7-8 times less than the capacity). In this situation 9,400 tons volume exported during the 10 months of 2010 should be considered as a good. If regular volume of fruit harvest was obtained in 2010, it would surely exceed the export amount of 2009. The "Spayka" company, which has the largest export capacity, could not procure even half of its planned 10,000 ton volume because of harvest deficiency. Other exporters also had such problems.

The volumes of fruit production and exports will vary for the next few years as well. Although the trends of increasing export will remain the same, there are several pre-conditions for them. Chapter 6 has detailed information about this (see "Estimation of Fruit and Vegetable Exporting Volumes", page 99).

As it has been already mentioned at the beginning of this report, the list of frutis which are exported from Armenia regularly and by significant volumes, include 5 products. They are: grapes (table sorts), apricot, peach, plum, sweet cherry. Apple, pear, nuts (mainly walnut), berries and pomegranate were also exported in certain years, even though such export was not stable and was in a very low volume. Indicators of Armenian fruit exports for 2006-2010 are presented below.

Table 15 - Export volumes of Armenian fruits by their types, 2006-2010

Fruits	Indicator	2006	2007	2008	2009	2010 I-X
Table grapes	Volume, ton	219	1,349	2,182	3,501	3,948
	Price, $	201,090	531,362	917,935	2,000,248	2,426,500
Apricot	Volume, ton	1,929	905	5,280	9,082	4,627
	Price, $	771,129	264,589	2,002,784	3,691,311	2,039,700
Peach	Volume, ton	135	315	271	654	194
	Price, $	39,577	137,957	161,248	338,445	113,000
Plum	Volume, ton	91	214	270	314	351
	Price, $	35,913	69,015	89,788	130,095	151,300
Sweet cherry	Volume, ton	264	96	201	599	267
	Price, $	171,550	93,598	184,169	687,486	314,100
Apple	Volume, ton	-	-	34	2.3	34
	Price, $	-	-	8,546	794	8,500
Pear	Volume, ton	-	-	0.1	0.6	-
	Price, $	-	-	98	2,162	-
Nuts	Volume, ton	11.7	0.1	3.1	3.5	-
	Price, $	29,280	1,029	18,985	12,035	-
Berries, pomegranate	Volume, ton	124	24	-	55	-
	Price, $	63,096	15,309	-	26,675	-
Armenia	**Volume, ton**	**2,774**	**2,901**	**8,241**	**14,213**	**9,420**
	Price, $	**1,311,635**	**1,112,859**	**3,383,553**	**6,889,251**	**5,053,100**

Sources: 1. "Foreign Trade of the Republic of Armenia", NSS, 2006-2009
2. Armenian Customs Service (for 2010)

In order to understand Table 15 we must take into consideration the following. Bigger export values are based on customs value and does not give the right idea about their actual consumption price. Thus, higher export price should be taken into consideration but no conclusions should be made on them.

According to the data of the State Inspectorate on Plant Quarantine, the volumes of Armenian fruit export for 2008-2010 were the following.

Table 16 - Export volumes of Armenian fruits according to their types, 2008-2010

Fruits	2008	2009	2010 I-X
Table grapes	3,015	3,939	4,284
Apricot	7,519	13,418	1,970
Peach	527	993	195
Plum	402	326	154
Sweet cherry	232	638	283
Apple	463	1,594	-
Pear			-
Berries	-	15	-
ARMENIA	**12,157**	**20,923**	**6,885**

Source: State Inspectorate on Plant Quarantine

The most important difference between the data of Armenian Customs Service and State Inspectorate on Plant Quarantine in 2008-2009 are the export volumes of apple and pear. It is assumed that all the difference was exported to Georgia by physical individuals and at small quantities.

Apricot and grape stand apart by their volumes among the structure of exported Armenian fruits. Apricot is the best known Armenian fruit in foreign markets. "Armenian apricot" expression has already become a brand. According to exporters, there are many cases when in order to sell their apricot in Moscow markets, merchants, who brought their product from Uzbekistan and Dagistan, present it as "Armenian apricot". This recognition has assured serious competitive advantages for apricot, which is successfully used by exporters. The thought that apricot has the most perspectives of export makes investors and farms invest funds in orchards. The main competitor of Armenia in foreign markets could be Turkey (which is the first country in the world concerning the production), but in Turkey much attention is paid to apricot processing, mainly drying. That is why; Armenian apricot partly "got rid of" its serious competitor.

Armenian grape, with its exported 5-6 table sorts (Black and Red Qishmish, Shahumyan, Itsaptuk, etc.) meets tougher competition in foreign markets than apricot. The main competitors are Moldova and Uzbekistan. Although the consumption market (Russia) is so large, that consumes all the volumes of present exports.

According to the exporters, there are possibilities of expanding exports of peach, plum and sweet cherry. The last two are not exported much because of their low production volume. Plum, having satisfactory product appearance and being transportable, is procured only from Armavir Marz, while sweet cherry is procured from Artashat area of Ararat Marz, Armavir area of Armavir Marz, Ashtarak area of Aragatson Marz and Abovyan area of Kotayk Marz. Other regions of Armenia do not supply notable volumes of plum and sweet cherry yet. As for peach, there are a few little problems, and they all together hinder the increase of export volumes. Peach is more sensitive towards transportation conditionds and temperature, and is known for its sort varieties and harvest seasonality varieties. These are the main reasons why it is exported in smallquantities in spite of its relatively high production volume.

The statistics of apple and pear export is more noteworthy. The problems presented in the case of pear, i.e. lack of large producers, variety of sorts and seasonality, lack of concentration, scarcity of transportable sorts, low level of product appearance, were expressed by the absence of exports. The lack of apple exports (or its low volume) is very notable, if we take into consideration the fact that it is

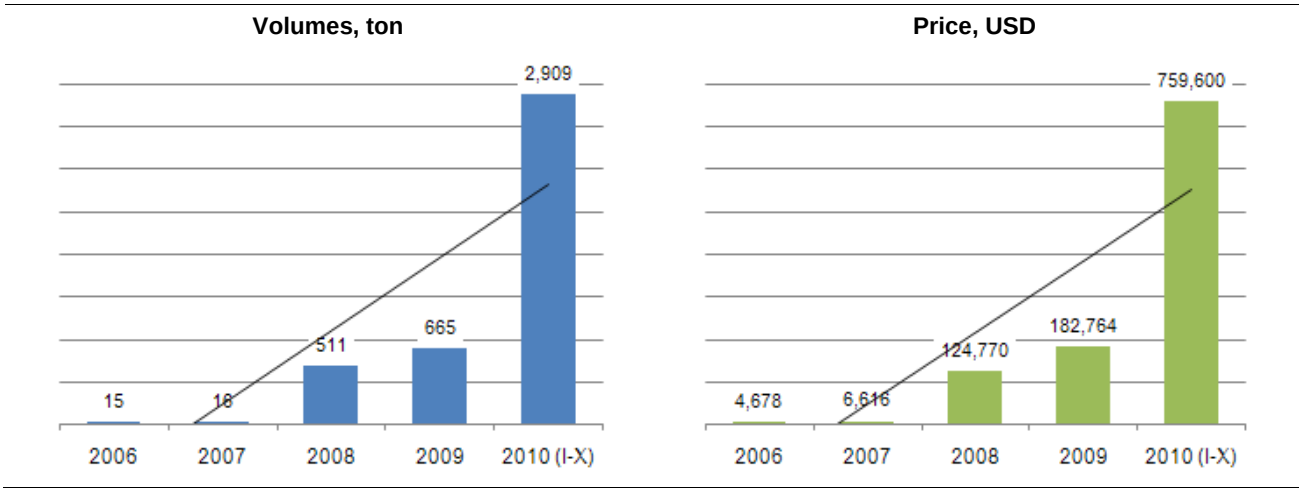
the most produced fruit. The problem has the following explanation. According to the exporters, Armenian apple can be exported for its transportable quality and good product appearance, but there are two preventing circumstances.

- Russia, being the main market of exports, is a large apple producer itself. Nevertheless, Russia imports apple. The main importers are such apple producing countries as China, Poland and Germany. The supply in these countries from the viewpoint of stability, volume and price, creates serious difficulties for Armenian apple.
- Armenian apple has the longest period of production (supply) and consumption. It can be kept for a long time thanks to its peculiarities, which makes it possible to organize its consumption during 6 months after its harvest. Diversification of such consumption allows to fully solve the problem of apple consumption in the local market. Thus, even the large producers do not have serious problems in selling their produce.

3.1.2 The volumes of vegetable exports

There are even larger differences in the data of Armenian Customs Service and that of the SIPQ when it comes to Armenian vegetable exports. According to NSS data (based on data of Armenian Customs Service) the volumes of vegetable exports were quite low until 2010. Majority of the exports belongs to potato. Most of it was exported to Georgia. After 2004-2005, when for different reasons potato exports were interrupted (forbidden now), vegetable export indicators also came close to zero. During 2006-2007 almost no vegetable was exported. Below the volumes of 2006-2010 vegetable exports are presented.

Chart 27 - Export volumes of Armenian fruits by their types, 2008-2010



Sources: 1. "Foreign Trade of the Republic of Armenia", NSS, 2006-2009
2. Armenian Customs Service

Low volumes of vegetable exports prove not the existence of the problem but the normal situation. Thus, among the Armenian vegetables only potato and tomato are produced in large volumes. These two plants comprise more than 60% of total harvest. Only these two plants are produced in volumes exceeding local demand. The volumes of other plants simply meet the domestic demand. Moreover, in order to fill the seasonal deficit of certain vegetables, Armenia imports tomato, cucumber, pepper, eggplant, onion, garlic, carrot (see Chapter 4. "Fruit and Vegetable Import", page 63). Thus, it is normal that vegetable is not exported but is addressed to the satisfaction of local demand. Distribution of Armenian vegetable exports is presented below.

Table 17 - Volumes of Armenian vegetable exports by types, 2006-2010

Vegetables	Indicator	2006	2007	2008	2009	2010 I-X
Provisions potato	Volume, ton	-	-	484	614	2,332
	Price, $	-	-	102,495	80,122	465,000
Tomato	Volume, ton	0.2	-	7.2	8.4	358
	Price, $	147	-	5,638	18,379	235,400
Cucumber	Volume, ton	0.1	-	7.4	5.5	5.8
	Price, $	80	-	5,785	7,929	4,900
Cabbage	Volume, ton	-	-	-	-	172
	Price, $	-	-	-	-	24,000
Pepper	Volume, ton	14.2	15.9	12.6	15.5	41.4
	Price, $	4,451	6,616	10,726	24,207	30,300
Eggplant	Volume, ton	-	-	-	0.9	-
	Price, $	-	-	-	1,627	-
Onion	Volume, ton	-	-	0.1	20	-
	Price, $	-	-	126	50,500	-
ARMENIA	**Volume, ton**	**15**	**16**	**511**	**665**	**2,909**
	Price, $	**4,678**	**6,616**	**124,770**	**182,764**	**759,600**

Sources: 1. “Foreign Trade of the Republic of Armenia”, NSS, 2006-2009
2. Armenian Customs Service (for 2010)

The rise of exported volumes recorded in 2010 has two explanations:

- Part of the produced and procured potato of 2009 was possible to export to Georgia in the beginning of 2010.
- In 2010 the drought in Russia negatively affected the agriculture. Mostly plots of grains and plants suffered from it. This caused vegetable deficit, and in order to fill it Russia imported large volumes of tomato, cucumber, cabbage and other vegetables.

Thus, in 2010 Armenian exporters have exported significant volume of tomato to Russia, and till the end of the year the export of cabbage will reach a record volume (3,000 - 4,000 ton).

The data of the SIPQ notably and significantly differ from those of Armenian Customs Service (see Table 18).

Table 18 - The volumes of Armenian vegetable export according to their types, 2006-2010, ton

Vegetables	2006	2007	2008	2009	2010 I-X
Provisions potato	22	50	4,468	7,039	3,724
Tomato	-	-	-	2,169	n/a
Cucumber	-	-	-	213	n/a
Cabbage, beet	-	-	804	299	n/a
Carrot, turnip, radish	-	-	619	317	n/a
Pepper, eggplant, greens	57	21	364	1,160	n/a
ARMENIA	**79**	**71**	**6,255**	**11,196**	**-**

Source: State Inspectorate on Plant Quarantine

As it is seen from the comparison of

Table 17 and Table 18, there are significant differences of export volumes for almost all the vegetables. We again came to the conclusion that the difference was exported by physical individuals. The following circumstance is another proof of it. Within the frames of this study our consultants have met with more than ten fruit and vegetable exporters, mainly with big companies. None of them exported tomato, cucumber, cabbage or carrot during 2008-2009.

3.2 EXPORT MARKETS

The geography of Armenian fruit and vegetable exports is very small. It is limited to a few former Soviet Union countries, such as Russia, Georgia, Ukraine, Belarus. Besides the small geography, the exports of Armenian fruits has a very low degree of diversification. It fully depends on one market, i.e. Russia. If the low volumes of fruits exported to Georgia by physical individuals are not counted, then 90% of large-scale exports is done to Russia. There have been and still are several reasons for that:

- Since the independence (1991) Russia has been and still remains the main political and economic partner of Armenia;
- Russia is the closest large market for Armenia, and there are no significant road communication problems;
- Because of its geography and climatic conditions, the fruits which are exported from Armenia, are mainly not produced in Russia. Armenian fruits compete with the fruits imported from other countries (i.e. Moldova, Rumania, Turkey, Greece, Azerbaijan, Uzbekistan);
- In order to operate in Russia Armenian exporters do not have language problems. It allows to communicate not only with consumers, but also with controlling and managing state officials;
- The biggest Armenian diaspora lives in Russia (about 2 million Armenians) which is another factor that forms a demand for Armenian fruits (as well as other products);
- Armenian fruits were known in Russia even during the Soviet time, which contributes to the promotion of Armenian fruits in that country.

Below the export markets of 2009-2010 Armenian fruits with their volumes and portions are presented; again the role of Russian market for Armenian exporters is obvious.

Table 19 - The volumes of Armenian fruit export by their consumption markets, 2009-2010

2009

Fruits		Countries					Total	
		Russia	Georgia	Ukraine	Belarus	Belgium	ton	%
Grape		3,883.2		18.0	37.6		**3,938.8**	**18.8%**
Apricot		8,303.3	4,023.4	1,036.8	54.2	0.2	**13,417.9**	**64.1%**
Peach		724.8	268.0				**992.8**	**4.7%**
Plum		187.0	26.9	76.2	36.1		**326.2**	**1.6%**
Sweet cherry		566.2	34.3	38.4			**638.9**	**3.1%**
Berries			15				**15.0**	**0.1%**
Apple, pear			1,594				**1,594.0**	**7.6%**
Total	**ton**	**13,664.5**	**5,961.6**	**1,169.4**	**127.9**	**0.2**	**20,923.6**	
	%	**65.3%**	**28.5%**	**5.6%**	**0.6%**	**0.0%**		**100.0%**

2010 (I-X)

Fruits		Countries					Total	
		Russia	Georgia	Ukraine	Belarus	China	ton	%
Grape		4,283.9					**4,283.9**	**62.2%**
Apricot		1,739.4	17.9	211.6		0.6	**1,969.5**	**28.6%**
Peach		195.2					**195.2**	**2.8%**
Plum		153.9					**153.9**	**2.2%**
Sweet cherry		276.3	6.4				**282.7**	**4.1%**
Total	**ton**	**6,648.7**	**24.3**	**211.6**	**0.0**	**0.6**	**6,885.2**	
	%	**96.6%**	**0.4%**	**3.1%**	**0.0%**	**0.0%**		**100.0%**

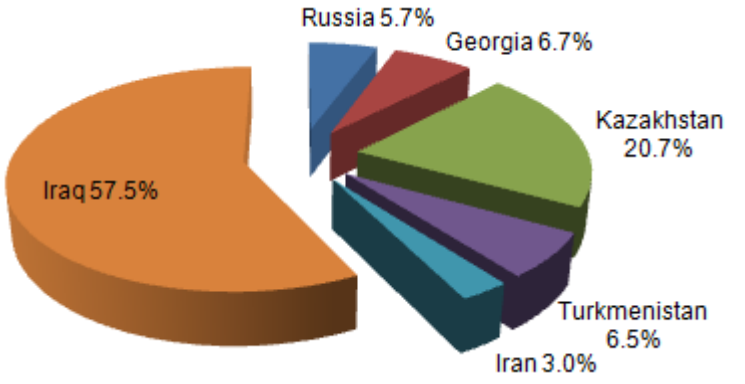
Source: State Inspectorate on Plant Quarantine

The second market, where Armenian fruits are always presented, is Georgia. Georgia is the closest neighbor of Armenia and its market is open for Armenian fruits (unlike two other neighbors, i.e. Turkey and Azerbaijan). Armenian fruits are exported to Georgia not only by exporters but also by physical individuals, both Armenians and Georgians.

Armenian fruits don't have the same ranking in other markets as they do in Russia. The low and unstable fruit exports to Ukraine and Belarus come to confirm this statement. Armenian exporters have paid much attention to those markets in 2010. Although those countries were not targeted, the main task was to expand the geography of fruit exports. Today it is a strategic problem for Armenian exporters. Some events that take place in Russia for the past 1-2 years make Armenian exporters find ways to diversify consuming markets. Despite the fact that Armenian exporters have began exporting fruits to Russia since 1990s, until today they work with the same method: the whole product is sold at the open markets of big cities. Moscow is a leader among the big cities, where Armenian fruits are sold. Here consumption was organized in two big markets, i.e. "Cherkizovski" and "Pakrovski". "Cherkizovski" market was closed two years ago and "Pakrovski" market became the biggest wholesale market for fruits. Now there are some rumors that it will be moved to another place. This will create a serious problem for Armenian fruit exports, if no alternative markets will be found. Besides, for the past few years fruit and vegetable exports gradually penetrate big trading centers in Russia, where Armenian exporters don't have experience yet. In 2010 Samara and Novosibirsk were added to the cities where Armenian fruits are consumed, i.e. Moscow, St. Petersburg, Doni Rostov, Pyatigorsk, Kharkov, Minsk. Taking into consideration the distance of these two new cities, it can be concluded that Armenian exporters have serious intentions. Exporters tell that they don't think of exporting to European markets yet, although the reason is not the long distance. Exporters' policy has decisive role here (see Section 3.4 "Exporters", page 58).

The markets of vegetable exports are more limited than in the case of fruits. The main direction of exports was Georgia until 2010, and the main product, as it has been already mentioned, was potato. In order to overcome the difficulties with vegetable exports, the RA Government is making serious efforts. Those efforts were intensive especially in 2008-2009, when sales problems became constant because of large volume of potato yield. The Government's interference is already notable. Potato was exported to 6 directions in 2010 (see Chart 28).

Chart 28 - The distribution of potato export according to their markets , 2010 (I-X)



The other part of exported vegetables (tomato, cucumber, cabbage, pepper) was exported to Russia in 2010 (see Table 17, page 54).

This export was done by the same fruit exporters. Vegetable exports to Russia will still increase in 2010 at the expense of large-scale delivery of cabbage by the largest export company called "Spayka". Although, as it has been mentioned above, the export from Armenia to Russia was increased because of the drought and harvest scarcity in Russia. That is why; the exporters don't know yet whether it will be possible to ensure the same volumes of exports next year, if it is a favorable harvest year in Russia. All the exporters, except "Spayka", doubt it.

3.3 TRANSPORTATION TYPES

Fruit and vegetable exports from Armenia are conducted in two ways: a) land transportation, and b) airlift. Land transportation is done by trucks. The volumes, by which Armenian fruits are exported, and the technical conditions (temperature, transporting speed) that are necessary for transportation of fresh fruits, can be ensured only by transporting in trucks; railway transportation is not convenient. Fruits are transported by refrigerator trucks with 20 ton capacity (effective load weight is 18 tons).

Before the checkpoint of Upper Lars was opened (located on Georgian - Russian boarder), the itinerary of Armenian fruit transportation was the following: land transportation by trucks till Poti port (Georgia), then ferry to Ilichevsk (Ukraine) or Novorossisk (Russia), then land transportation by trucks until the assigned location (Moscow, St. Petersburg, etc). In such cases the transportation took 5-10 days. The transportation (Yerevan - Moscow) costed approximately 15,000 USD, which includes customs, transportation costs and bribes (at the passable point / boarding point, Russian food safety contolling bodies, etc). There are rare cases when the product got spoiled not even reaching its assigned location because of delays.

After the opening of Upper Lars checkpoint, the exports technically improved. Products reach final destination in 3 days by Yerevan - Moscow route, cost of transportation is reduced by about $2,000.

Utilizing the peculiarities of Russian market, some exporters organize their fruit exports by airplanes. It is usually done at the very beginning of harvest, when there are no fruits in the consuming markets or when there is a deficit in the market. Air transportation volumes are small, although they are sold at more expensive prices, and as a result, such deals are very profitable. This is the reason that some exporters prefer air transportation.

Distribution of 2009-2010 exported fruits by their transportation types is presented below.

Table 20 - Export voumes of Armenian fruits by their transportation types, 2009-2010

2009

Fruits		Transportation types				Total	
		Transportation by trucks		Airlift by airplanes			
		ton	%	ton	%	ton	%
Grape		3,912.4	99.3%	26.4	0.7%	**3,938.8**	**18.8%**
Apricot		12,824.9	95.6%	593.0	4.4%	**13,417.9**	**64.1%**
Peach		850.7	85.7%	142.1	14.3%	**992.8**	**4.7%**
Plum		325.5	99.8%	0.7	0.2%	**326.2**	**1.6%**
Sweet cherry		344.5	53.9%	294.4	46.1%	**638.9**	**3.1%**
Berries		15.0	100.0%	-	0.0%	**15.0**	**0.1%**
Apple, pear		1,594.0	100.0%	-	0.0%	**1,594.0**	**7.6%**
Total	**ton**	**19,867.0**		**1,056.6**		**20,923.6**	
	%		**95.0%**		**5.0%**		**100.0%**

2010 (I-X)

Fruits		Transportation types				Total	
		Transportation by trucks		Airlift by airplanes			
		ton	%	ton	%	ton	%
Grape		4,268.9	99.6%	15.0	0.4%	**4,283.9**	**62.2%**
Apricot		1,745.4	88.6%	224.1	11.4%	**1,969.5**	**28.6%**
Peach		130.8	67.0%	64.4	33.0%	**195.2**	**2.8%**
Plum		149.2	96.9%	4.7	3.1%	**153.9**	**2.2%**
Sweet cherry		168.8	59.7%	113.9	40.3%	**282.7**	**4.1%**
Total	**ton**	**6,463.1**		**422.1**		**6,885.2**	
	%		**93.9%**		**6.1%**		**100.0%**

Source: State Inspectorate on Plant Quarantine

3.4 EXPORTERS

More than 30 companies are involved in the process of exports in Armenia. These export companies have a special structure. Based on the field analysis three types of export groups can be separated in Armenia.

GROUP 1	GROUP 2	GROUP 3
This group consists of about 20 exporters. These are **individuals** specialized in fruit and vegetable exports. They buy necessary volume of fruits and vegetables from farms during harvest season, organize their initial freezing, product delivery to the assigned place and sales. During the export process they work with their own or attracted recources, **undertake all the financial risks**, including the responsibilities of paying the farms, export costs, as well as undertaking possible losses. In spite of their direct or actual	This group consists of **legally registered 4-5 companies**. Besides of implementing all the functions of the first group (organize fruit and vegetable storing, freezing, transportation and sales), as well as do customs formulation of products and/or transportation services for the exporters of the first group.	This group consists of more than 10 **legally registered subjects.** They are specialized in customs formulation of products**.** In another words, they are intermediaries, which combine the functions of transportation and **customs clearance**. The subjects of this group do not have any participation in harvest, intital freezing/storing processes, as well as in selling the product. They only undertake financial responsibility for delivering the product to the assigned place safely and on time.

involvement, their names **legally do not appear anywhere**, customs clearance of their products is done not by their names.		

Real exporters are presented in the first and second groups. The members of the 3rd group assure the logistics of export. Although only the subjects of the 2nd and 3rd groups are mentioned as exports in the Armenian Customs Service.

From the first sight the fact of being in the center of export process and not appearing by names makes the 1st group members mysterious. However, there are no mysterious businessmen or exclusive export mechanisms in reality. This group consists of physical individuals who do fruit and vegetable wholesale. They all live in various villages of Ararat Valley, most of them are farms. Most of them are in fruit and vegetable export business for 15-20 years, have $100,000-150,000 in trade circulation and each of them exports 500-1,500 ton fruits and vegetables per year. According to various sources and to the data obtained by "snowball" method, the staff of the first group consists of the following operators.

GROUP 1

Name	Marz	Area	Community	Information about export volumes**
1. Chkalov Muradyan	Armavir	Armavir	vil. Arevik	2009→ ≈ 1,000 ton
2. Voskan Markosyan	Armavir	Armavir	vil. Arevik	2009 → > 450 ton 2010→ > 170 ton
3. Taron Yeremyan	Armavir	Armavir	vil. Arevik	2009 → > 500 ton
4. Jirayr* . . .	Armavir	Armavir	vil. Arevik	2009 → > 500 ton
5. Mahar (Sayid) Mhoyan	Armavir	Armavir	vil. Arevik	2009→ > 600 ton
6. Qyaram* . . .	Armavir	Armavir	vil. Arevik	
7. Qyaram* . . . (another person)	Armavir	Armavir	vil. Arevik	
8. Hamik * . . .	Armavir	Armavir	vil. Arevik	
9. Bagrat Mkrtchyan	Armavir	Armavir	vil. Arevik	2009→ ≈ 55 ton
10. Qajik Davtyan	Armavir	Armavir	vil. Arevik	
11. Armen Sargsyan	Armavir	Armavir	vil. Armavir	2009→ > 500 ton
12. Ruben Hovhannisyan	Armavir	Armavir	vil. Armavir	
13. Artush Sargsyan	Armavir	Armavir	vil. Mrgashat	2009→ ≈ 350 ton
14. Baghdasar Mnatsakanyan	Armavir	Baghramyan	vil. Karakert	
15. Spartak Eqizyan	Armavir	Armavir	vil. Aygevan	
16. Yura Hakobyan	Ararat	Artashat	vil. Qakhtsrashen	2009→ > 410 ton 2010→ > 330 ton
17. Ashot Avetyan	Ararat	Masis	vil. Marmarashen	

* - Research period coincided with fruit and vegetable exports season. It was not possible to meet all the exporters, as most of them were in Russia, busy with sales. That is why; data about them were obtained from their acquaintances, and often they were not of full value. The result of this problem is family name absence of the mentioned subjects.

** - Data were obtained directly from the exporters, and it is possible that they are reduced.They are just mentioned in order to give some idea about the exporters' work.

The first group is in the center of the export process and at the same time they are not registered as businesses and legally do not exist in the exports chain. They use a very simple mechanism. **Export process does not require any document circulation till the phase of customs formulation. Correspondingly, it is hard to tell who obtains whose product and in what volumes. The legal exporters make customs formulations via the 2nd and 3rd group of exporters. Export package is**

opened in the Armenian Customs Service by the name of the latters, which the legal exporter does not have. In order to export the product, the exporters must prove that they have bought it. The group of products is sold accountably with purchase act on behalf of a number of farmers to the company making customs formulations. At the same time special attention is paid to each farmer not to achieve the VAT threshold (58.35 mil AMD). Once the company, which does the customs formulation, becomes the product owner, it does the formulations and the product is exported. During these whole process real exporter's name is not mentioned anywhere. This exporter is not paying any taxes, since legally his name does not appear.

This mechanism works perfectly and is financially so attractive, that the members of the first group have no reason to change their operation style.

! From this viewpoint the most important question is to what extent the Free Economic Zone (FEZ) can attract the first group members. Currently, when FEZ does not operate, first group members' interest towards it is very low. Meantime, it is not at all obvious that this interest will appear once FEZ will become operational.

The 2nd group members are less in number and have their creation history. Formerly, one of them ("Spayka" company) has been providing only transportation, including transportation for the first group exporters. Starting from 2009 the company began to buy fruits and vegetables for exporting purposes. Along with this "Spayka" continues his customs formulation and transportation services for the first group members. That is why; they appeared in the second group. There are 2-3 other companies in this group, the owners of which were among the first group exporters a few years ago. They established their own companies, opened export package by their names in the Armenian Customs Service and began their own export at the same time offering services for the first group members. The second group exporters are presented in the following way.

GROUP 2

Name	Marz	Area	Community	Other information
1. "Spayka" LLC	Yerevan	Yerevan	Yerevan	
2. "Geghtam-Agro" LLC	Ararat	Artashat	Artashat	
3. "Armen-Fruit" PC				

The operation scales of the second group exporters are almost the same as those of the first group, except "Spayka". That is why; special attention is paid only to "Spayka", whose operation led to revolutionary changes and innovations in the sphere of Armenian fruit and vegetable exports. In order to understand the exclusiveness of "Spayka's" operation, its main activities should be presented.

Reference 1 - "Spayka" LLC

Foundation	► 2001	
Operation	► International transportations	
Location of forces	► Yerevan, Armenia	
Creation of new action way	► Decision on implementation of technical enforcement investment for fruit and vegetable export in 2009	
Main components of the investment project	► Project value	► 12.5 million USD
	► Investments' directions	► Mobilization of working capital in order to buy fruits and vegetables. Provide 50% deposit of product price to 600 farmers in 30 villages of Armavir, Ararat and Aragatsotn Marzes; ► Acquisition of fruit assortment line with 10 ton/hour capacity. Production: Ser.mac (Italy); ► Procurement of 60 Volvo and Iveco brand vehicles equipped with

fridge modes;
- Making boxes from polistirol and polipropillen and creating own business of wuropalletts. Machinary: Kurtz Group (Germany).
- Creation of rafregeration syatem for fruit meintenance. Equipment of Carrier Transicold (USA);
- Implementation of marketing events to promote their own “AraratFruit” brand in external markets (especially in Russia).

The investments of "Spayka" company are unprecedented in the sphere of Armenian fruit and vegetable exports. As a result, "Spayka" has become the biggest export company, moreover the most powerful company than all the other exporters together. Today "Spayka" is the only company in Armenia with its over-all technical equipment and is the biggest company in the area with its own trucks. "Spayka" has contributed automatic controlling systems for transportation, including product encoding systems, GPS navigation systems, etc.

Establishment of polystyrene and polypropylene boxes and Euro-pallet production is a good example of realizing innovative ideas. Until now Armenian producers have been transporting their products in wooden boxes. Unlike those, the boxes of "Spayka" are made of very light materials meant for food wrapping, and because of their light weight they allow to add the weight of products by 4-10%. Also, polystyrene and polypropylene boxes do not require special certificates for safe food transportation.

Unlike all the other exporters, "Spayka" directs its product sale to big supermarkets. For this purpose the company has made serious contributions towards product packing and branding.

The social effect of "Spayka" company’s contribution plan is described by creation of 450 permanent and 1,500 seasonal jobs.

According to the business plan of "Spayka", it was intended to procure 10,000 ton fruits and vegetables for exports during the first year of operation, but which was impossible to do because of harvest scarcity. "Spayka’s" procurements were less than half of it, although "Spayka" can export as much as all the exporters together.

"Spayka’s" **involvment in fruit and vegetable exports is a significant** stimulus for increasing export volumes. At the same time "Spayka’s" valuable contributions and high level of **technical equipment** will hardly **affect** the operation of the first group exporters. Their interests cross only in the case of fruit and vegetable procurement. The only problem is the availability of big working capital at "Spayka". This might eliminate first group of exporters from the market by artificial inflation of procurement prices. However, "Spayka" mainly implemented its investment project by receiving low-interest loans. Besides, in 2010 the company could not ensure turnover volumes they had planned, and consequently, lost part of its possible benefits. Moreover, in the beginning of 2010 the company gave deposits to the farmers for products, but for force-majeure reasons (product scarcity) it was impossible to procure enough quantity: the farmers kept the money, and "Spayka" didn’t demand it back. Consequently, the possibilities of new financial risks for "Spayka" do not seem to be high. Having this in mind the exporters of the first group feel safe for now.

The third group of exporters can be called **artificial exporters**. They are entities who do customs formulation and organize transportation and have only this connection with the main export process. That’s why; their operation in the field of fruit and vegetable exports is very technical. Their list is presented below.

GROUP 3	
1. "Solidarm" LLC	2. "Aram Gevorgyan" P/E
3. "Armen Avetisyan" P/E	4. "Taxi Nanavals" LLC
5. "Sofia Khurshudyan" P/E	6. "MadarMar" LLC
7. "Gohar Vlasyan" P/E	8. "Karlen-partner" LLC
9. "Aharon Khlghatyan" P/E	10. "Vardges Grigoryan"

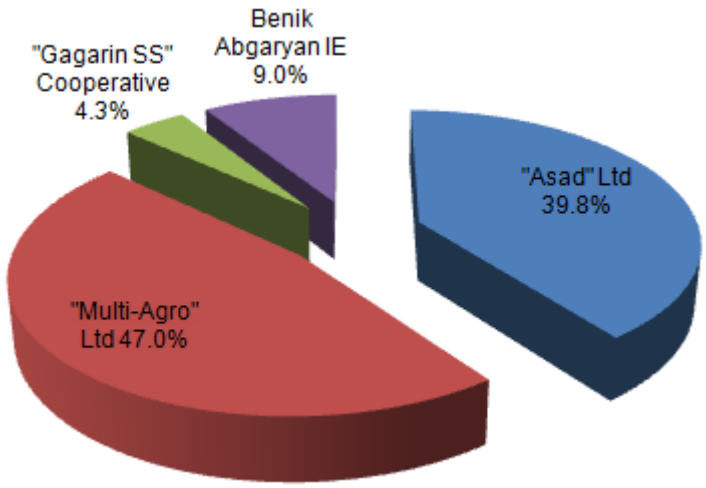
If the Armenian Customs Service ever publishes the list of fruit and vegetable exporters of Armenia, only these companies will be included (as well as the second group of exporters). However, it does not reflect the real situation. All these companies together serve the first group exporters, and are known by the latters as just "offices". The first group exporters can formulate different groups of their product at different offices, depending on which office will offer better conditions (cheaper costs for formulation and transportation). The importance of the third group exporters ends at this.

! Becoming familiar with the operation of the 2nd and 3rd groups exporters, we concluded that they are the most probable consumers of the FEZ. **Taxes appear only in the accounting of these entities during the process of fruit and vegetable exports**. **In order to make profit of tax advantages regime they will be interested to move their operation to the FEZ area**. However, we don't think that the FEZ is being created for defending the profits of the "artificial exporters". It should attract the second group exporters, to be more specific it should attract such companoes as "Spayka". Although, the situation is not **clear.** "Spayka" with its present refrigerator, packing and sorting capacities will be larger than the FEZ. This leads to the following questions. How will "Spayka" fit the FEZ; is it possible for that company to be registered in the FEZ but use not the capacities it has in the FEZ but those that it has in another place? These problems must be in the center of attention of those who are in charge of the FEZ establishment.

Potato is the only product in the export process which is operated by other exporters as well. For the past three years in this field famous companies of provisions and seed potato production are presented, like:

- "Multi-Agro" LLC (Kotayk Marz, v. Arinj)
- "Seed-grower" LLC (Lori Marz, v. Vardablur)
- "Benik Abgaryan" P/E (Kotayk Marz, c. Hrazdan)
- "Agroservice V and M" LLC (Shirak Marz, v. Beniamin)
- "Gagarin SS" consuming cooperative (Gegharkunik Marz, c. Gagarin)
- "Asad" LLC.

Chart 29 –Distribution of potato export by exporters, 2010



In 2010 4 companies have exported potato, which are presented in Chart 29.

4 FRUIT AND VEGETABLE IMPORT

4.1 IMPORT VOLUMES

Th balance of Armenian fruit and vegetable foreign trade is negative (export vs. import). Armenia imports more than exports. In both cases import is significantly greater than export. Separately taken fruit and vegetable foreign trades have different peculiarities, which are presented below.

4.1.1 Fruits import volumes

In the period of 2006-2009 the balance of fruits foreign trade was negative, comprising 14,000 ton among (see Chart 30), and $21 million (according to the customs value difference). However, these indicators do not give a real idea about the situation. The reality is that Armenia imports fruits that do not grow in the country. The imported fruits are meant to complete the variety of consumed fruits. 21,000 tons of fruits have been imported in 2006-2009, only 6% of which comprised the fruits that grow in Armenia (see Chart 31).

Chart 30 - The balance of Armenian fruit foreign trade for 2006-2009

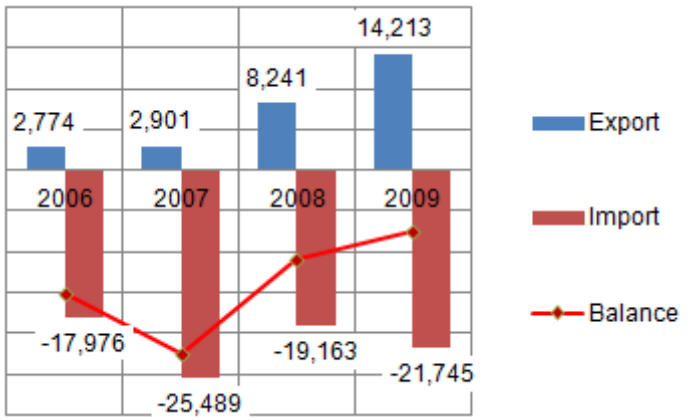
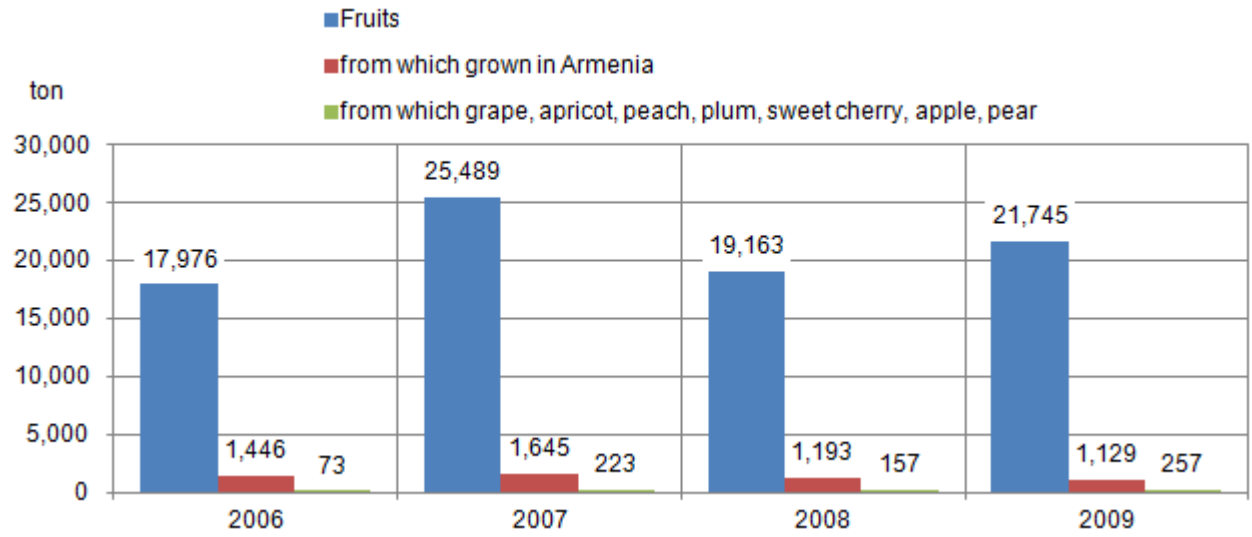


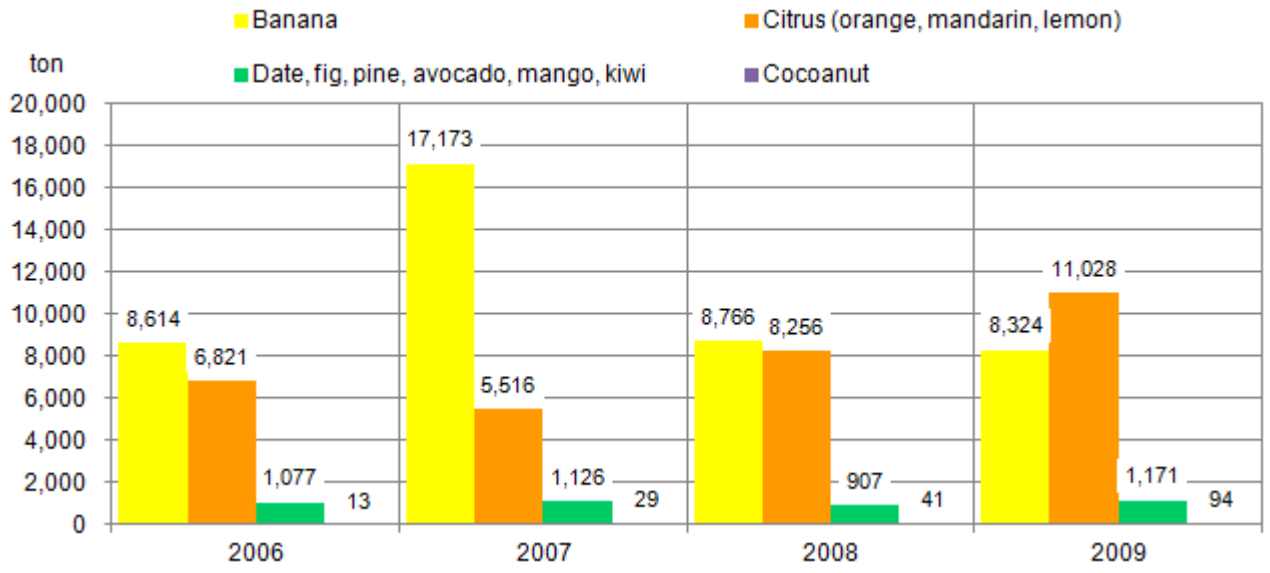
Chart 31 - The volumes of Armenian fruit import for 2006-2009



Source: "Foreign Trade of the Republic of Armenia", NSS, 2006-2009

The fruits that Armenia imports by large volumes are such types that do not grow in Armenia, i.e. banana, orange, mandarine, lemon, date, pineapple, avocado, guava, mango,kiwi (see Chart 32). Very small quantity of coconut is also imported.

Chart 32 - The volumes of imported fruits which do not grow in Armenia, 2006-2009



Source: "Foreign Trade of the Republic of Armenia", NSS, 2006-2009

Armenia is alike the other northern countries and those in the same zone (European countries and Russia), who also import large volumes of tropical and citrus fruits. The above mentioned fruits will be imported regardless the volumes of fruit production and their changes.

The analysis of fruit import variety shows that Armenia imports also those fruits growing in the country in small quatities. These are quince, nuts (walnut, hazelnut, almond), berries (strawberry, raspberry) and pomegranate. These fruits are meant to meet the local demand. While the fruits, which have large production volumes in Armenia, are demanded and are targeted as objects of this study. They have dominant positions in the market. That's why; their import volumes are very small. The figures of imported fruits as well as of those which grow in Armenia are presented below.

Table 21 - Volumes of imported fruits which grow in Armenia by their types, 2006-2010

Fruits	Indicator	2006	2007	2008	2009	2010 I-X
Grape	Volume, ton	32.7	10.0	1.9	26.1	4.8
	Price, $	55,383.0	11,001.0	5,901.0	23,336.0	1,700.0
Apricot	Volume, ton	-	0.9	0.6	0.1	0.4
	Price, $	-	694.0	1,792.0	152.0	400.0
Peach	Volume, ton	-	10.2	18.0	-	194.2
	Price, $	-	5,682.0	10,800.0	-	384,500.0
Plum	Volume, ton	-	4.5	3.8	1.2	20.8
	Price, $	-	3,391.0	11,360.0	4,452.0	31.7
Sweet cherry	Volume, ton	-	0.1	-	-	0.6
	Price, $	-	115.0	-	-	600.0
Apple	Volume, ton	37.0	169.9	83.5	148.6	192.3
	Price, $	19,938.0	158,047.0	152,070.0	199,381.0	194,600.0
Pear	Volume, ton	3.3	27.3	49.1	81.3	54.9
	Price, $	1,868.0	26,868.0	93,895.0	112,336.0	44,100.0
Sub-total 1 (for targeted fruits)	**Volume, ton**	**73.0**	**222.9**	**156.9**	**257.3**	**468.0**
	Price, $	**77,189.0**	**205,798.0**	**275,818.0**	**339,657.0**	**625,931.7**
Quince	Volume, ton	0.5	77.8	0.8	41.3	n/a
	Price, $	296.0	11,663.0	1,500.0	72,219.0	n/a
Nuts	Volume, ton	662.2	794.0	743.8	361.8	n/a

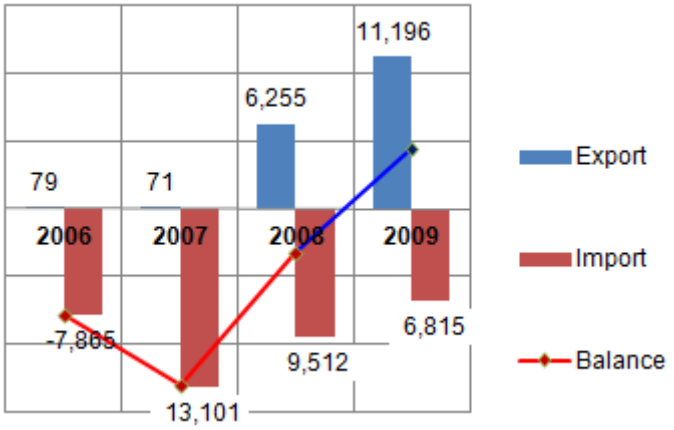
	Price, $	1,807,857.0	2,151,361.0	3,086,484.0	2,153,715.0	n/a
Berries, pomegranate	Volume, ton	710.3	550.0	291.1	468.3	n/a
	Price, $	709,206.0	1,084,753.0	549,461.0	943,970.0	n/a
Sub-total 2 (for other fruits growing in Armenia)	**Volume, ton**	**1,373.0**	**1,421.8**	**1,035.7**	**871.4**	**n/a**
	Price, $	**2,517,359.0**	**3,247,777.0**	**3,637,445.0**	**3,169,904.0**	**n/a**
ARMENIA	**Volume, ton**	**1,446.0**	**1,644.7**	**1,192.6**	**1,128.7**	**468.0**
	Price, $	**2,594,548.0**	**3,453,575.0**	**3,913,263.0**	**3,509,561.0**	**625,931.7**

Sources: 1. "Foreign Trade of the Republic of Armenia", NSS, 2006-2009
2. Armenian Customs Service (for 2010)

The import of the targeted products is done because of three main pre-conditions:

1) Before the ripening of local fruits and the start of their harvest season, some businessmen, taking into consideration consumers' expectations, import fruits that grow in Armenia, such as grape (mainly in July-August), apricot (in May), peach (in June-July), plum (in June). They are imported from such countries where these fruits are ripened at least 1 month earlier, mainly from Uzbekistan and Iran. This pre-condition will always be present and each year "pre-harvest" import of fruits will be done in Armenia. However, one thing is clear: these fruits are imported at higher price and are intended to be sold during a month, so their volumes will always be very small.
2) Fruits, that grow also in Armenia, are imported because of market deficit. During the years, when small volume of certain fruit type was produced, bigger volumes of import are recorded. Relatively bigger volumes of peach and apple imports of 2010 are particularly connected with this pre-condition. It should be mentioned that some fruit types such as grape and apricot, which are quite sensitive towards long distance transportation, even during bad harvest years are imported by small volumes. The same thing can not be said about peach, apple and pear.
3) Some fruits are imported in order to assure large variety for stores. This concerns mainly to peach, apple, pear. The initiators are largest stores of Armenia such as SAS, Yerevan-City, Star, Fresh. This pre-condition is not a satisfactory reason for large imports. In this case consumer preferences play their role, which are mainly for local fruits.

Chart 33 - Foreign trade balance of Armenian vegetables, 2006-2009*



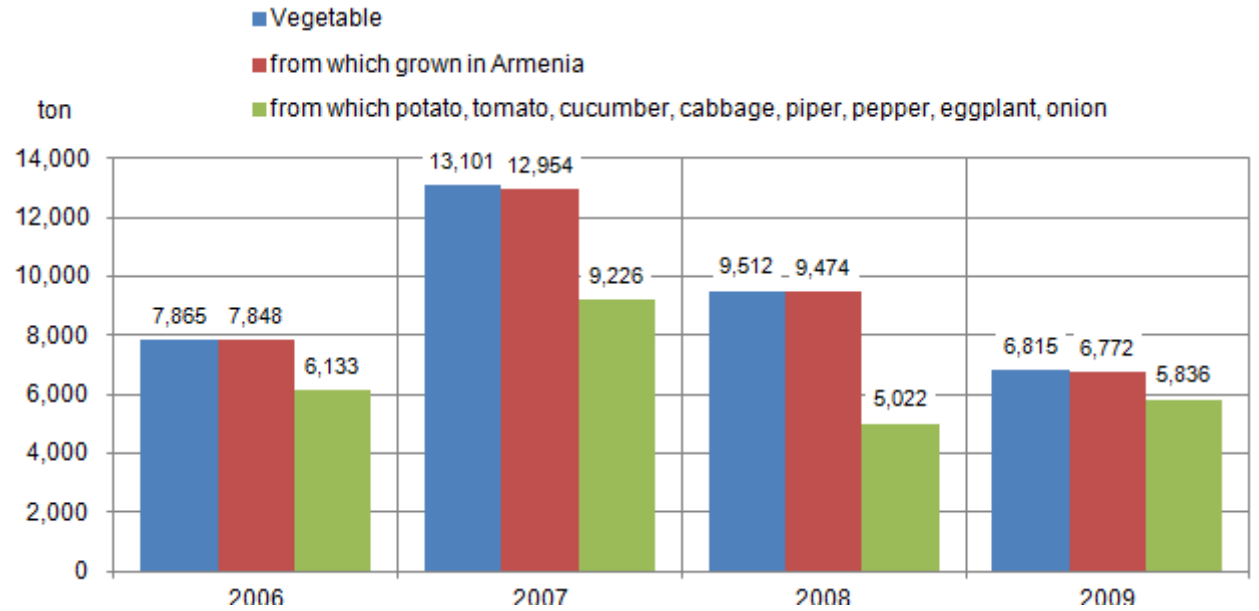
*** -** In the case of export, the numbers of State Inspectorate on Plant Quarantine were taken into consideration in order to make comparison

4.1.2 Vegetable import volumes

The figure is dual in the case of foreign trade balance of Armenian vegetables. According to NSS data, trade balance is negative, but the data of State Inspectorate on Plant Quarantine after 2008 is positive.

Unlike fruits, Armenia imports such vegetables which are produced in the country as well. The volumes of vegetable imports for the period of 2006-2009 are the following:

Chart 34 - Volumes of Armenian vegetable imports, 2006-2009



Source: "Foreign Trade of the Republic of Armenia", NSS, 2006-2009

Table 22 - Import volumes of vegetables growing in Armenia, 2006-2010

Vegetables	Indicator	2006	2007	2008	2009	2010
Provisions potato	Volume, ton	74	2,226	146	-	717
	Price, $	16,783	359,033	49,060	-	111,300
Tomato	Volume, ton	510	175	94	138	180
	Price, $	536,846	298,398	278,907	344,787	332,000
Cucumber	Volume, ton	163	377	161	129	-
	Price, $	164,826	843,896	508,446	332,237	-
Cabbage	Volume, ton	-	-	21	208	-
	Price, $	-	-	4,984	42,857	-
Pepper	Volume, ton	17	23	25	15	44
	Price, $	16,676	48,553	79,924	49,152	73,200
Eggplant	Volume, ton	16	22	20	7	125
	Price, $	17,990	36,178	50,557	13,443	127,200
Onion	Volume, ton	5,353	6,403	4,555	5,339	8,258
	Price, $	1,193,611	1,992,099	2,413,939	2,476,412	2,264,600
Sub-total 1 (for targeted vegetables)	**Volume, ton**	**6,133**	**9,226**	**5,022**	**5,836**	**9,323**
	Price, $	**1,946,732**	**3,578,157**	**3,385,817**	**3,258,888**	**2,908,300**
Potato plot	Volume, ton	1,631	3,577	4,122	801	n/a
	Price, $	1,326,597	3,269,529	4,593,226	744,347	n/a
Garlic	Volume, ton	84	152	327	107	130
	Price, $	53,425	164,757	438,549	114,545	154,100
Carrot	Volume, ton	0	0	3	28	n/a
	Price, $	0	0	1,325	13,803	n/a
Sub-total 2 (for other vegetables that grow in Armenia)	**Volume, ton**	**1,715**	**3,729**	**4,452**	**936**	**n/a**
	Price, $	**1,380,022**	**3,434,286**	**5,033,100**	**872,695**	**n/a**
ARMENIA	**Volume, ton**	**7,848**	**12,954**	**9,474**	**6,772**	**9,452**
	Price, $	**3,326,754**	**7,012,443**	**8,418,917**	**4,131,583**	**3,062,400**

Sources: 1. "Foreign Trade of the Republic of Armenia", NSS, 2006-2009
2. Armenian Customs Service (for 2010)

Bigger shares of import have onion and potato. The large quantity of onion imports is connected with 2 factors. According to the estimations of specialists, first of all it is connected with unsatisfactory local production and variation of supply. We have already mentioned that in case of vegetables (as they are annual plants) farmers can quickly change the variety of their products. If onion prices are high during a specific year because of small quantity, next year farmers start cultivating more onion. The result of it, as a rule, are overproduction and price decline. The next year some of the farmers stop cultivating onion, which becomes a reason of product reduction and price increase. It has been many years since this cycle regularly repeats and becomes a reason of unstable supply (this relates also tomato, pepper and eggplant). As a result, very often there is a lack of onion in the market, which leads to necessity of onion imports. There is another explanation for onion imports as well. Onion is imported from Turkey, and it tastes sweet unlike local sorts. Their defect is that their peel is thin and it is hard to keep them long, but it is very convenient for large quantity use (in restaurant cuisines). Besides, sweet onion has its own consumers.

As for potato plots, it has been many years since Armenia is importing high quality potato seeds. The seeds are imported from the Netherlands, France and Germany. Their volume varies between 1,000-1,400 tons. Those seeds are distributed among seed producing farms, who next year receive the first productive high quality seeds (about 100,000 - 120,000 tons), which are directed to meeting of seed demand among farmers engaged in potato cultivation.

The situation in the case of import volumes and structure of other vegetable types is similiar to the case of fruits. They are mainly imported by small volumes with the purpose to fill in the seasonal deficit.

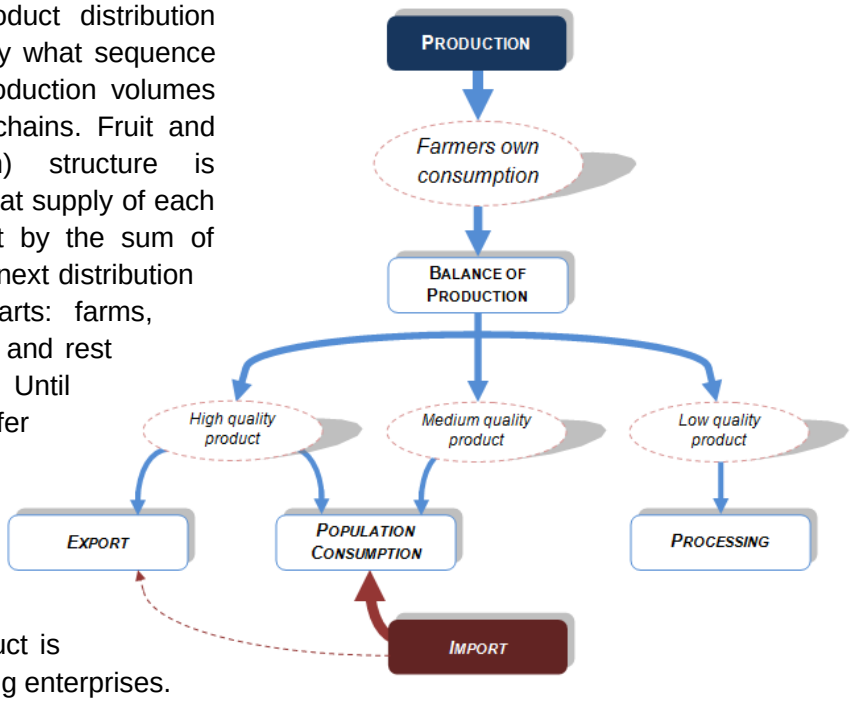
5 FRUIT AND VEGETABLE CONSUMPTION

5.1 FINAL DISTRIBUTION OF FRUITS AND VEGETABLES: POPULATION CONSUMPTION

5.1.1 Sales (consumption) structure

The last two chapters were about fruit and vegetable exports and imports. They are very important factors in the system of formation of supply. Although after taking out exports from fruit and vegetable production volumes and adding imports, we don't get the amount that is consumed by population. There are other factors as well in the system of product distribution that should be taken into consideration, i.e. own consumption of farms and procurements of processing enterprises. In order to understand the structure of product distribution system, it should be described by what sequence and logic fruit and vegetable production volumes are distributed among different chains. Fruit and vegetable sales (consumption) structure is presented in Chart 35. It shows that supply of each product is formed in the market by the sum of production and import. During its next distribution phases it is divided into 4 parts: farms, exporters, processing enterprises and rest of the people (excluding farms). Until now only two components of offer formation, i.e. export and import volumes, have been presented in this report, as well as one of the four chains, i.e. exports. For consumption done by people we must see which part of the product is consumed by farms and processing enterprises.

Chart 35 - Fruit and vegetable consumption structure in Armenia



5.1.2 Own consumption of farms

In the beginning of 1990, as a result of the privatization of agricultural assets, ten thousands of small farms were formed in Armenia. Today about 338,000 of such farms produce 97-98% of Armenia's agricultural products. The privatization of agricultural assets helped to recover from the provisional crisis which had began in the first years of independence, although the splitting of agricultural assets had its negative impacts on agricultural productivity. It is very difficult to conduct agricultural activities efficiently on small and splitted plot. As a result, thousands of farms don't have the opportunity to maintain minimum conditions of their own welfare at the expense of increased productivity. High poverty rate among rural people is the proof of this. Poor farms, as a rule, are mainly consuming their products, i.e. they use majority of their products for their own needs.

In such farms the structure of consumed products is distorted. They over-consume their own products, and underconsume the products that they don't produce. These important consequences significantly affect the real supply of products. Taking this into account, we will come back to the commercialization coefficient of rural husbandry products.

Organizing natural production, farms become their own providers of several products. Particularly, the farmers involved in fruit and vegetable production, set apart the quantity which is necessary for certain period of time to meet their own needs. Only after that the rest of the products is meant for sales (sell to the exporters, processing enterprises or people). The share of products which is sold in the market describes the commercialization level of farms. Consequently, the more products the producers sell, the higher will be the commercialization level. The indicators of targeted fruit commercialization are presented below by Marzes.

Table 23 - Fruit commercialization level in Armenia, 2006-2009

Marzes	Grape				Other Fruits*			
	2006	2007	2008	2009	2006	2007	2008	2009
Aragatsotn	69.5%	66.6%	76.3%	92.7%	56.7%	32.7%	23.2%	44.0%
Ararat	91.7%	89.3%	83.6%	79.9%	84.8%	79.9%	85.3%	83.9%
Armavir	91.7%	92.6%	91.5%	91.6%	83.4%	90.8%	82.2%	91.1%
Gegharquniq	-	-	-	-	51.0%	33.3%	13.2%	10.5%
Lori	0.0%	0.0%	3.9%	39.7%	23.4%	19.7%	19.4%	8.1%
Kotayq	51.9%	51.9%	21.3%	81.2%	58.4%	78.8%	52.7%	36.3%
Shirak	-	-	-	-	38.5%	18.7%	21.2%	13.8%
Syuniq	32.3%	28.8%	10.3%	51.6%	55.1%	54.3%	49.0%	46.4%
Vayots Dzor	62.9%	87.4%	86.6%	87.8%	34.7%	25.3%	49.5%	47.4%
Tavush	65.7%	58.0%	49.5%	58.4%	36.9%	14.6%	19.0%	39.4%
ARMENIA (weighed average)	**85.9%**	**85.3%**	**83.7%**	**83.9%**	**63.2%**	**48.7%**	**53.1%**	**58.0%**

* - Apricot, peach, plum, sweet cherry, apple, pear
Source: “Realization (Use) of Agricultural Product by Peasant Farms”, NSS, 2006-2009

The presented data have the following explanation and allow to do the following conclusions:

1. Grape has the highest commercialization rate among fruits. Generally, grape has leading positions with its rate among other horticultural products. The high commercialization is connected with the fact that technical sorts comprise 70% of total products, and processing enterprises express adequate demand for them. The quantity of table sort grape, which is procured by the exporters and sold in local market, is added to it and, as a result, grape commercialization comprises more than 83%. 15-17% of grape used in farms consists of:
   - Technical sorts, which are processed by the same producers: homemade grape processing for the wine or vodka is very common in Tavush, Vayots Dzor and Ararat Marzes;
   - Table sorts, which are used by producers to fulfil their consumption needs.
2. Grape commercialization is high especially in those Marzes, where processing enterprises or their collection points are located. They are Armavir, Ararat, Aragatsotn and Vayots Dzor Marzes. The producers of these Marzes have more opportunities from the viewpoint of selling their product. Tavush Marz makes an exception, where 75% of grapes are technical sorts, but commercialization comprises only 58% (2009).
3. Unlike grapes, the fruits commercialization is lower. The reason is that in case of other fruits there is no separation between "technical/table" sorts and consumption volumes are higher.
4. In case of fruits, higher commercialization indicators have those Marzes, where the main fruit plantations are located. They are Armavir and Ararat Marzes. The largest fruit producing farms are from these two Marzes. Fruit production is their main field of operation. They consider it as their private business, consequently the produced products (fruits) are particularly meant for sales. In other words, the larger enterprises are (by the volume of their production), the higher is the level of commercialization. Aragatsotn Marz will join these two in a few years.

Farms use three methods to sell fruits: a) direct sale, b) barter, c) natural payments made by products for services received (i.e. x kilos of fruits for cultivation of an orchard by a machine). In case of grape,

mainly direct sales take place (99%). Direct sale method dominates also in case of other fruits, although in 2009 barter comprised 6.4% of 58% sales. This practice is common mainly in Vayots Dzor (36%), Syunik (17%), and Ararat (9%) Marzes.

The indicators of targeted vegetable commercialization are presented below by Marzes.

Table 24 - Vegetable commercialization level in Armenia, 2006-2009

Marzes	Potato				Other Vegetables*			
	2006	2007	2008	2009	2006	2007	2008	2009
Aragatsotn	45.1%	45.9%	37.0%	29.5%	73.1%	72.0%	49.8%	45.4%
Ararat	71.6%	77.1%	73.4%	79.3%	82.3%	82.7%	78.2%	73.8%
Armavir	78.9%	84.1%	88.8%	91.0%	85.4%	90.5%	93.0%	91.9%
Gegharkunik	45.6%	46.7%	44.5%	42.7%	44.7%	31.5%	30.1%	46.6%
Lori	24.1%	26.3%	12.5%	12.4%	41.7%	52.3%	63.3%	35.0%
Kotayk	54.6%	52.4%	52.6%	38.0%	75.4%	71.9%	70.4%	43.2%
Shirak	32.1%	33.5%	31.7%	28.9%	42.2%	39.2%	36.9%	36.3%
Syunik	32.0%	37.9%	35.3%	27.8%	52.5%	52.4%	42.9%	33.5%
Vayots Dzor	14.9%	14.0%	6.1%	26.0%	11.4%	12.5%	13.4%	10.8%
Tavush	11.9%	14.7%	12.5%	10.7%	18.8%	18.8%	15.3%	16.3%
ARMENIA (weighed average)	**43.0%**	**45.5%**	**42.3%**	**38.4%**	**74.8%**	**76.9%**	**75.0%**	**74.1%**

* - Tomato, cucumber, cabbage, pepper, eggplant, onion
Source: “Realization (Use) of Agricultural Product by Peasant Farms”, NSS, 2006-2009

In case of vegetables the indicators of commercialization are also high in Armavir and Ararat Marzes. Besides, relatively large scale of operation (large areas of cultivation and large quantity of harvest) helps the producers of these Marzes, they also benefit from being close to the main consumption market, i.e. being close to Yerevan. These two marzes are the main providers of fresh fruits and vegetables in Armenia.

From Table 24 the indicators of potato commercialization are notable. The fact that commercialization comprises 43-47% in the largest potato production region (Gegharkunik) arises several questions. This phenomenon has two explanations:

- In Gegharkunik Marz, as well as in Armenia in general, a part of potato harvest is separated, in order to be used as seed for next year’s sowing. In the data of Table 24 that quantity is included in the quantity used by farms, consequently the commercialization turns out to be lower;
- Low commercialization level of potato is connected with its sales peculiarities. Potato is sold during the next 5-6 months after the harvest. This long period of sales suggests that after harvest only a part of potato harvest is sold until the end of certain year. The rest is sold during January-March of the next year. That’s why; those who are engaged in potato business end the year having significant stock of potato. In favorable harvest years this stock is even bigger. For instance, in 2009 34% of the harvest was not sold. It should be mentioned, that in 2010 3,000 tons of potato was sold at the beginning of the year from the stock of 2009. It should be concluded from this that actually the commercialization level of potato is higher.

Because of the above mentioned reasons it is hard to calculate the own consumption volumes of potato in farms. Another methodology will be applied in order to calculate potato consumption volumes among Armenian population. It is based on the research data done by the RA Ministry of Health for forming food basket. According to that, like most consumed products, potato has its place in the food basket, and according to the norms each person should consume 91.3 kg potato per year (data of 2010). Potato volumes consumed by population was calculated based on this indicator (see Section 5.1.4, "Consumption by population", page 92).

Thus, summing up fruit and vegetable commercialization indicators, it will be possible to calculate the quantity of product which is consumed among farms. Calculation formula is the following:

Own consumption quantity of farms (ton) = Product quantity (ton) x (100% - commercialization level)

Table 25 - Fruit and vegetable consumption quantity of farms in 2006-2009

Fruits and vegetables	Production volume, ton				Own consumption quantity of farms, ton			
	2006	2007	2008	2009	2006	2007	2008	2009
Grape	201,371	218,883	185,832	208,649	28,393	32,176	30,291	33,593
Apricot	72,017	15,681	83,089	80,686	26,502	8,044	38,969	33,888
Peach	61,477	63,868	41,651	57,883	22,624	32,764	19,534	24,311
Plum	7,591	11,226	12,077	10,344	2,794	5,759	5,664	4,345
Sweet cherry	6,763	3,901	6,598	7,682	2,489	2,001	3,094	3,227
Apple	96,268	111,836	117,199	120,844	35,427	57,372	54,966	50,754
Pear	22,566	27,105	29,322	28,247	8,304	13,905	13,752	11,864
Potato*								
Tomato	319,285	321,471	293,784	278,582	80,460	74,260	73,446	72,153
Cucumber	72,629	72,109	81,819	80,944	18,303	16,657	20,455	20,965
Cabbage	122,598	141,357	129,550	125,075	30,895	32,653	32,388	32,395
Pepper	49,000	60,000	63,000	71,000	12,348	13,860	15,750	18,389
Eggplant	43,600	56,000	63,000	71,000	10,987	12,936	15,750	18,389
Onion	62,235	56,847	61,449	50,416	15,683	13,132	15,362	13,058

* - There are no objective data to calculate the real consumption volumes of potato (product + seed) in producing husbadries

! It should be taken into consideration that average commercialization indicators applied for fruits and vegetables may have some deflections when it comes to specific products. Data presented in Table 25 should not be considered as absolute truth, but as aproximate indicators describing consumption volumes.

5.1.3 Procurements of processing enterprises

Armenian processing enterprises are another consumers of fresh fruits and vegetables. The processing enterprises of targeted products are divided into two groups:

1. **Grape processing enterprises** ▶ **Wine and brandy producers**
2. **Fruit and vegetable processing enterprises** ▶ **Canned and Dried products producers**

The whole quantity of produced fruits is divided between the above mentioned three enterprises for processing purpose.

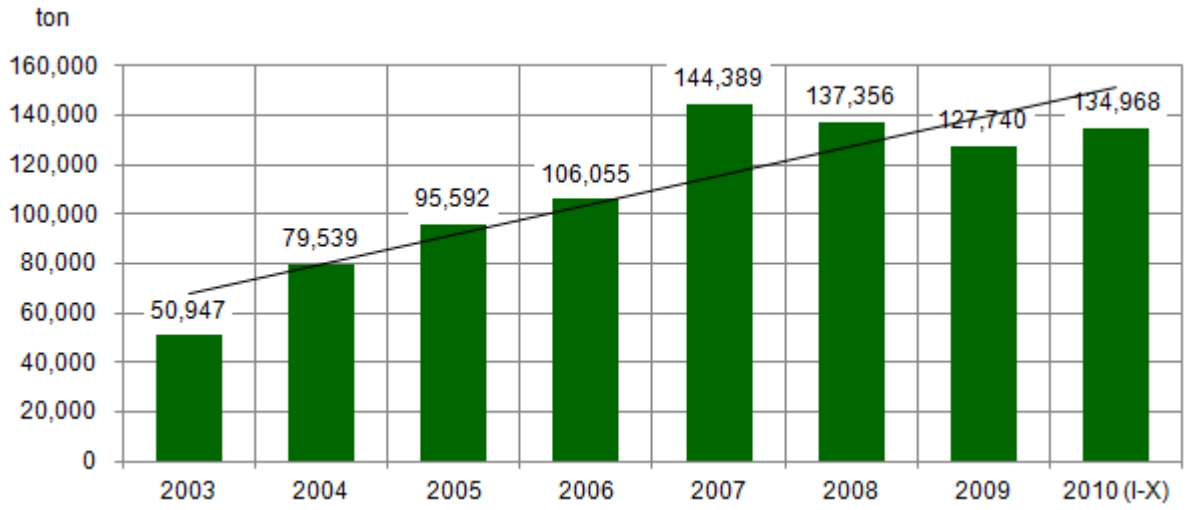
5.1.3.1 Grape processing quantities

Grape is procured by processing enterprises for wine and brandy production. Local production quantity of dried grape, i.e. raisin, is so small, that Armenia imports it almost fully[12]. Viticulture development in Armenia is based on the wine and brandy production development. For the past decade it had notable success (increase in wine and brady production and sales quantity, increase in

[12] Armenia has respectively imported 1100, 438, 433 and 930 tons of raisin during 2006-2009

export volumes and markets), which has significantly contributed to the grape production volumes (see Chart 10, page 23). The main stimulus was the constant increase of procurements by wine-brandy producers. The data presented at Chart 36 confirms that statement.

Chart 36 - Quantities of grape procurement by processing enterprises, 2003-2010



Source: RA Ministry of Agriculture

During the past decade the only decline in grape procurements for processing was recorded in 2008-2009 due to Global Crisis. **All the consequences of the crisis are not already fully overcome, yet**, but procurements of grape processors for January-October of 2010 exceeded the annual figure of 2009. This is a good stimulus for grape producers, although procurement prices are still problem.

About 40 enterprises engaged in wine and brandy production are located in 6 Marzes and procure grape from 5 Marzes of Armenia. Biggest share of procurements has the largest region in terms of growing grapes of technical sorts, i.e. Ararat Marz (see Table 26), where half of processing enterprises are located.

Table 26 - Grape procurements for processing by regions, 2006-2009, ton

Marzes	2006	2007	2008	2009
Yerevan	438	-	-	-
Aragatsotn	700	900	16	1,501
Ararat	71,212	89,350	89,486	75,563
Armavir	19,700	37,094	37,699	36,576
Kotayk	6,897	7,807	4,379	7,388
Vayots Dzor	1,630	1,645	1,789	1,688
Tavush	5,478	7,593	3,987	5,024
Total	**106,055**	**144,389**	**137,356**	**127,740**

Source: RA Ministry of Agriculture

Concentration in the market of wine and brandy is not very big. In 2006-2009 5 leading enterprises together have procured 55-65% of grape, while "Yerevan Brandy Company", the biggest brandy company in the country, usually procures 20-25% grape. Top 5 enterprises that procured grapes in 2006-2009 are presented below.

Table 27 – Top 5 grape procurers for 2006-2009

2006		2007	
Enterprises	**%***	**Enterprises**	**%**
❶ "Yerevan Brandy Company" CJSC	26.4%	❶ "Yerevan Brandy Company" CJSC	20.1%
❷ "Yerevan Brandy-Wine-Vodka Factory" OJSC	14.2%	❷ "Yerevan Brandy-Wine-Vodka Factory" OJSC	14.5%
❸ "Artashat Wincon" CJSC	7.6%	❸ "Proshyan Brandy Factory" LLC	7.6%
❹ "Shahumyan Win" LLC	6.8%	❹ "Artashat Wincon" CJSC	7.0%
❺ "Proshyan Brandy Factory" LLC	5.9%	❺ "Vagharshapat Wine-Brandy Factory" OJSC	6.5%

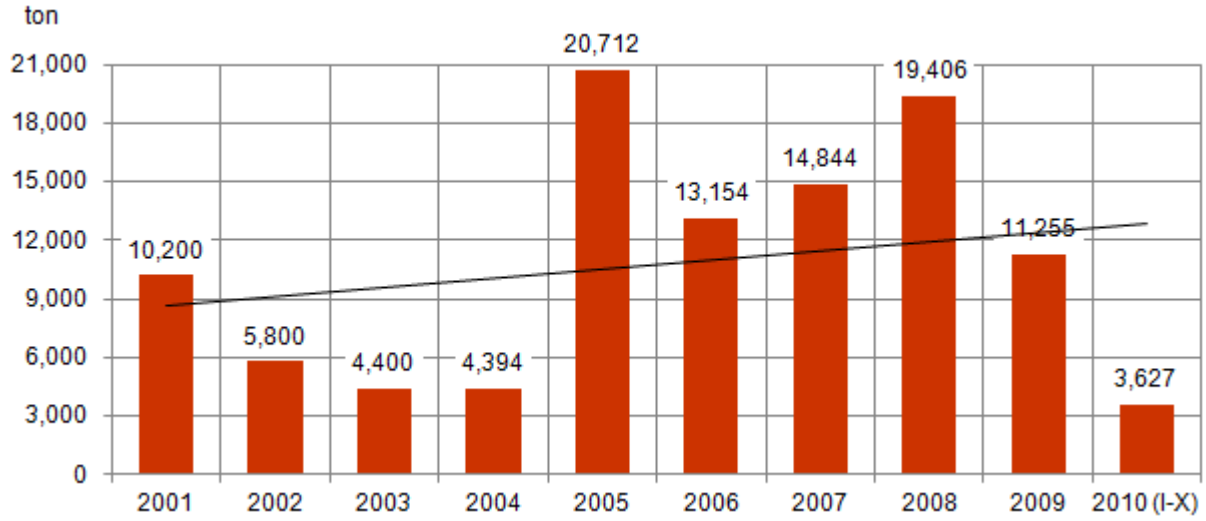
2008		2009	
Enterprises	**%**	**Enterprises**	**%**
❶ "Yerevan Brandy Company" CJSC	22.5%	❶ "Yerevan Brandy Company" CJSC	24.6%
❷ "Yerevan Brandy-Wine-Vodka Factory" OJSC	17.3%	❷ "Yerevan Brandy-Wine-Vodka Factory" OJSC	19.9%
❸ "Qakhtsrashen Wine Factory" LLC	6.4%	❸ "Proshyan Brandy Factory" LLC	11.1%
❹ "Vagharshapat Wine-Brandy Factory" OJSC	6.4%	❹ "Qakhtsrashen Wine Factory" LLC	4.3%
❺ "Shahumyan Win" LLC	6.1%	❺ "Shahumyan Win" LLC	4.3%

* - Share in total fruit storing volumes

5.1.3.2 Fruit and vegetable processing quantities

Enterprises, that are engaged in canning and drying, procure fruits and vegetables. The situation is not stable here. In spite of the fact that fruit processing quantities tend to be increasing for the past 10 years, quantities of procurements vary year by year, recording abrupt ups and downs (see Chart 7).

Chart 37 - Fruit procurement volumes by processing enterprises in 2003-2010



Source: RA Ministry of Agriculture

Comparison of dynamics of fruit production and processing quantities shows significant similarities. During low harvest years (2003, 2004, 2007, 2010) processing quantities were also reduced. This is logical, as during low harvest years product quantity is small, and the prices are high, which prevents processing enterprises from doing large-scale procurements. From this point of view the worst indicators of the past 10 years have been recorded in 2010, as the year was not favorable for three fruit types, i.e. apricot, peach and apple.

Generally fruit processing enterprises procure almost all kinds of fruits that grow in Armenia, except pear and oriental persimmon. However, the main demand is for apricot and peach.

Table 28 - Types and quantities of procured fruits for processing, 2006-2009, ton

Fruits	2006	2007	2008	2009
Apricot	3,850	337	7,514	4,641
Peach	1,493	4,766	6,953	1,928
Plum	500	525	579	550
Sweet cherry	372	220	450	502
Apple	4,605	4,208	2,646	2,107
Nut	139	193	133	151
Berries	830	190	348	423
Other fruits	1,365	4,405	783	953
Total	**15,160**	**16,851**	**21,414**	**13,264**

Source: RA Ministry of Agriculture

Top 5 out of 30 processing companies have 75% share of procured products (average indicator for 2006-2009). Most of the processing enterprises are located in Ararat valley (Ararat and Armavir Marz). "Artashat canned product" ("Artfood") company is the market leader (see Table 29).

Table 29 - 5 top fruit processing enterprises, 2006-2009

2006

Enterprises	%*
❶ "Proshyan Brandy Factory" LLC	23.6%
❷ "Artashat Can Factory" CJSC	17.2%
❸ "Borodino"Armenian Can Factory, LLC	15.3%
❹ "Euroterm" CJSC	10.9%
❺ "Yerevan Beer" CJSC	3.5%

2007

Enterprises	%
❶ "Proshyan Brandy Factory" LLC	35.6%
❷ "Artashat Can Factory" CJSC	27.5%
❸ "Euroterm" CJSC	12.0%
❹ "Borodino"Armenian Can Factory, LLC	7.7%
❺ "Yerevan Beer" CJSC	2.7%

2008

Enterprises	%
❶ "Artashat Can Factory" OJSC	35.8%
❷ "Borodino"Armenian Can Factory, LLC	18.8%
❸ "Euroterm" CJSC	13.5%
❹ "Proshyan Brandy Factory" LLC	6.1%
❺ "Ayrum Can Factory" OJSC	5.5%

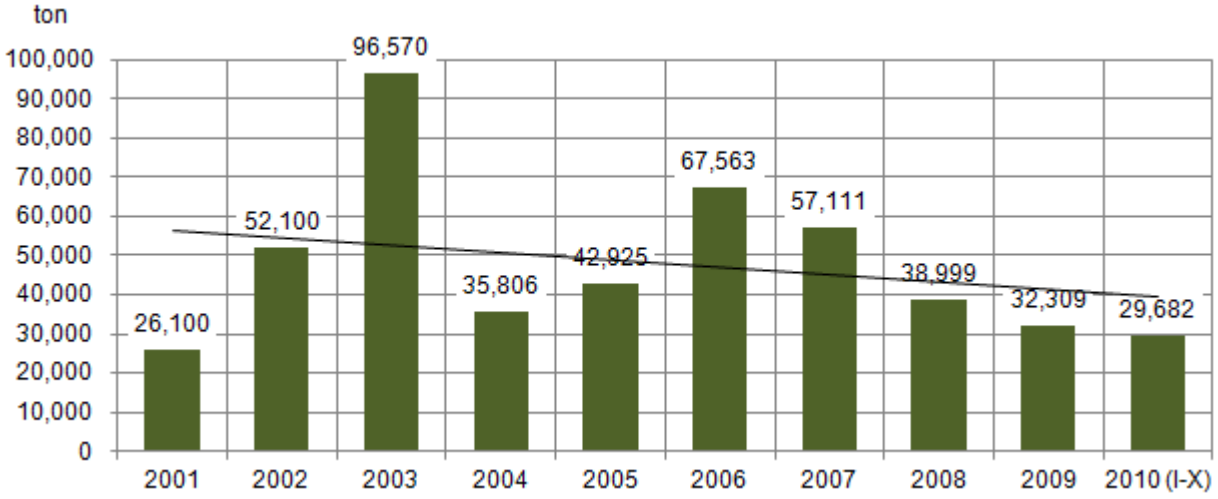
2009

Enterprises	%
❶ "Artashat Can Factory" OJSC	26.6%
❷ "Euroterm" CJSC	13.1%
❸ "Borodino"Armenian Can Factory, LLC	7.9%
❹ "Ayrum Can Factory" OJSC	7.5%
❺ "Proshyan Brandy Factory" LLC	7.3%

* - Share in total fruit storing volumes

The situation is not stable in the case of vegetable processing. For the past 10 years the quantity of procurements for processing reduced (see Chart 38).

Chart 38 - Quantities of stored vegetable by processing companies 2001-2010



Source: RA Ministry of Agriculture

90-95% of vegetable processing comprises tomato (see Table 30). Most of the processing enterprises produce and export tomato paste, which is implemented with difficulties. There is no positive stimulus from the supply side. Since 2006 there is a tendency to reduce plots of tomato. Some of the farms refuse to produce tomato, as procurement prices remain very low, especially on the background of last few years' high inflation indicators.

Table 30 - Types and quantities of procured vegetables for processing, 2006-2009, ton

Vegetables	2006	2007	2008	2009
Tomato	64,306	53,954	35,481	29,749
Cucumber	407	351	470	526
Pepper	740	481	649	257
Eggplant	1,261	1,255	1,305	745
Bean, pea	217	260	311	338
Other vegetables	632	810	783	693
Total	**67,563**	**57,111**	**38,999**	**32,309**

Source: RA Ministry of agriculture

Vegetable processing is known for its high level of concentration or low level of diversification. Top 5 companies have 96% share of vegetable procurements (see Table 31).

Table 31 - Top 5 companies procuring vegetables, 2006-2009

2006		2007	
Enterprises	**%***	**Enterprises**	**%**
❶ "Artashat Can Factory" OJSC	41.0%	❶ "Artashat Can Factory" OJSC	42.4%
❷ "Borodino"Armenian Can Factory LLC	37.6%	❷ "Borodino"Armenian Can Factory LLC	38.4%
❸ "MAP" CJSC	7.9%	❸ "MAP" CJSC	13.2%
❹ "Max Idea" LLC	6.0%	❹ "Euroterm" CJSC	1.1%
❺ "Artashes" LLC	2.4%	❺ "Artashes" LLC	1.0%

2008		2009	
Enterprises	**%**	**Enterprises**	**%**
❶ "Artashat Can Factory" OJSC	45.2%	❶ "Artashat Can Factory" OJSC	40.6%
❷ "Borodino"Armenian Can Factory LLC	37.3%	❷ "Borodino" Armenian Can Factory LLC	30.3%
❸ "MAP" CJSC	7.8%	❸ "MAP" CJSC	16.7%
❹ "Ejmiatsin Can Factory" OJSC	4.7%	❹ "Ejmiatsin Can Factory" OJSC	6.7%
❺ "Max Idea" LLC	1.3%	❺ "Konser" LLC	1.9%

* - Share in total fruit storing volumes

Besides those enterprises that produce canned products, there are about 100 small enterprises that produce dried products. These companies have 2-5% share in the procurements of fruit and vegetables for processing. Their main demand is for apricot, black plum, tomato and pepper. As an addition to already mentioned enterprises another 1,000 farms are irregularly involved in dried fruit production, too. During favorable harvest years, when prices for raw materials are relatively cheap, they produce dried products. Correspondingly, they may produce nothing during less favorable harvest years. 25% of involved farms operate in Ararat Marz, 45% in Armavir and 10% in Aragatsotn Marzes. In other Marzes the number of producing entities is small. 3-5% of total entities are in Vayots Dzor (Yeghegnadzor), Syunik Marz (Meghri), Lori Marz (Ayrum) and Tavush Marz.

In spite of the large number of entities that are engaged in dry fruit production, the quantity of products they produce is very small. Dry fruit production in Armenia comprises 200-300 tons per year (including dried rosehip), while consumption volumes are about 1,000 tons per average year, which means, that local producing enterprises ensure 20-30% of country's demand. Negative commercial balance conditioned by large volume of raisin import.

Concerning the export of dried fruits, it is less in volume and value.

Table 32 - Dried products export volumes by types, 2006-2010

Dried products	Indicator	2006	2007	2008	2009
Dried apricot	Quantity, ton	1.0	2.5	0.2	8.6
	Value, $	6,252	10,830	1,603	19,496
Dried black	Quantity, ton	0.1	0.1	0.0	0.5
	Value, $	651	997	440	4,450
Dried peach	Quantity, ton	0.4	0.4	0.2	0.4
	Value, $	3,006	4,149	2,156	5,199
Dried pear	Quantity, ton	-	-	9.9	-
	Value, $	-	-	9,541	-
Dried hip	Quantity, ton	0.4	13.9	13.5	15.1
	Value, $	8,885	16,991	21,290	16,995
Assortment of dried fruits	Quantity, ton	-	-	0.0	1.5
	Value, $	-	-	190	18,142
Dried tomato	Quantity, ton	18.7	0.1	14.2	-
	Value, $	66,372	679	65,262	-
Dried vegetables	Quantity, ton	0.3	0.0	0.3	0.3
	Value, $	1,022	31	1,495	629
ARMENIA	**Quantity, ton**	**20.9**	**17.0**	**38.3**	**26.4**
	Value, $	**86,188**	**33,677**	**101,977**	**64,911**

Source: "Foreign Trade of the Republic of Armenia", NSS, 2006-2009

5.1.4 Consumption by population

Having all components of fruit and vegetable supply, i.e. production and import indicators, as well as indicators of own consumption, processing and exports, it is possible to calculate the quantities of fruit and vegetable consumption by population. The calculation formula is the following (in tons).

Consumption by population	=	Product	-	Internal conumption by farms	-	Processing	-	Export	+	Import

Since the formula consists of 5 components, changes of consumption quantities depend on factors, which influence the change of each component. We should add to this the affect of macroeconomic indicators' development, as well as the influence of climate conditions. RA political relations with neighbor countries also play role, i.e. they have made serious correction in the usage of Armenan's external trade's potential. This last factor should be considered as stable.

Because of the diversity of factors that influence consumption quantities, the quantities of fruit and vegetable consumption by population always differ. Below the calculations of fruit and vegetable quantities consumed by population during 2006-2009 are presented.

Table 33 - Fruits consumed by population, 2006-2009, ton

Grape

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	201,371	28,393	106,055	219.0	32.7	66,736	**95,130**
2007	218,883	32,176	144,389	1,349.0	10.0	40,979	**73,155**
2008	185,832	30,291	137,356	2,182.0	1.9	16,005	**46,296**
2009	208,649	33,593	127,740	4,003.0	26.1	43,340	**76,933**

Apricot

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	72,017	26,502	3,850	1,929.2	0.0	39,736	**66,238**
2007	15,681	8,044	337	904.6	0.9	6,396	**14,441**
2008	83,089	38,969	7,514	5,280.1	0.6	31,326	**70,295**
2009	80,686	33,888	4,641	9,082.1	0.1	33,075	**66,963**

Peach

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	61,477	22,624	1,493	134.5	0.0	37,226	**59,850**
2007	63,868	32,764	4,766	314.5	10.2	26,034	**58,798**
2008	41,651	19,534	6,953	271.2	18.0	14,911	**34,445**
2009	57,883	24,311	1,928	654.2	0.0	30,989	**55,300**

Plum

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	7,591	2,794	500	90.7	0.0	4,207	**7,001**
2007	11,226	5,759	525	213.5	4.5	4,733	**10,492**
2008	12,077	5,664	579	269.8	3.8	5,567	**11,231**
2009	10,344	4,345	550	314.4	1.2	5,136	**9,481**

Sweet cherry

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	6,763	2,489	372	263.8	0.0	3,638	**6,127**
2007	3,901	2,001	220	95.5	0.1	1,585	**3,586**
2008	6,598	3,094	450	200.8	0.0	2,853	**5,947**
2009	7,682	3,227	502	599.3	0.0	3,355	**6,582**

Apple

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	96,268	35,427	4,605	0.0	37.0	56,273	**91,700**
2007	111,836	57,372	4,208	0.0	169.9	50,426	**107,798**
2008	117,199	54,966	2,646	34.0	83.5	59,636	**114,603**
2009	120,844	50,754	2,107	2.3	148.6	68,129	**118,883**

Pear

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	22,566	8,304		0.0	3.3	14,265	**22,569**
2007	27,105	13,905		0.0	27.3	13,228	**27,133**
2008	29,322	13,752		0.1	49.1	15,619	**29,371**
2009	28,247	11,864		0.6	81.3	16,464	**28,328**

Calculation of potato consumption volumes is difficult first of all because of the lack of data on consumption volumes in farms. Thus, in order to calculate the volumes of potato consumption, indicators of food basket were taken as basis. Respectively, each person normally consumes 91.3 kg potato per year (data of 2010, see Table 34). Potato quantities consumed by population were calculated based on this indicator (see Section 5.1.4 “Consumption by population”, page 77).

Table 34 - Potato quantities consumed by population, 2006-2009

Potato

Years	Total poulation of Armenia at the end of year	Potato consumption norm kg/person/year	Consumption by population, ton
2006	3,222,900	91.3	294,251
2007	3,230,100	91.3	294,908
2008	3,238,000	91.3	295,629
2009	3,250,500	91.3	296,771

Potato consumption norm per person (91.3 kg/person/year) is the smallest unit of consumption. The average consumption norm is higher by 25-30%. Other vegetable types consumed by population are presented below.

Table 35 - Vegetabe quantities consumed by population, 2006-2009, ton

Tomato

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	319,285	80,460	64,306	0.2	509.9	175,029	**255,489**
2007	321,471	74,260	53,954	0.0	175.4	193,433	**267,693**
2008	293,784	73,446	35,481	7.2	93.8	184,944	**258,390**
2009	278,582	72,153	29,749	8.4	138.3	176,810	**248,963**

Cucumber

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	72,629	18,303	407	0.1	162.7	54,082	**72,385**
2007	72,109	16,657	351	0.0	377.2	55,478	**72,135**
2008	81,819	20,455	470	7.4	161.2	61,048	**81,503**
2009	80,944	20,965	526	5.5	129.1	59,577	**80,541**

Cabbage

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	122,598	30,895		0.0	0.0	91,703	**122,598**
2007	141,357	32,653		0.0	0.0	108,703	**141,357**
2008	129,550	32,388		0.0	20.6	97,183	**129,571**
2009	125,075	32,395		0.0	208.0	92,889	**125,283**

Pepper

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	49,000	12,348	740	14.2	17.1	35,915	**48,263**
2007	60,000	13,860	481	15.9	22.6	45,666	**59,526**
2008	63,000	15,750	649	12.6	24.8	46,613	**62,363**
2009	71,000	18,389	257	15.5	15.0	52,354	**70,743**

Eggplant

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	43,600	10,987	1,261	0.0	16.2	31,368	**42,355**
2007	56,000	12,936	1,255	0.0	22.0	41,831	**54,767**
2008	63,000	15,750	1,305	0.0	20.3	45,965	**61,715**
2009	71,000	18,389	745	0.9	6.9	51,872	**70,261**

Onion

Years	Production	Own consumption by farms	Processing	Export	Import	Consumption by remaining part of population	Consumption by total/general population
2006	62,235	15,683		0.0	5,352.9	51,904	**67,587**
2007	56,847	13,132		0.0	6,402.5	50,118	**63,249**
2008	61,449	15,362		0.1	4,554.9	50,642	**66,004**
2009	50,416	13,058		20.2	5,338.7	42,677	**55,735**

In order to take into account the data of Table 33 to Table 35, we should consider the following:

! In order to compare equivalent data, the indicators of export are presented according to NSS data. It means that small quantities of export are not included in these numbers (which are seen in the numbers of the State Inspectorate on Plant Quarantine), and it is possible that they have not been registered by the Armenian Customs Service. However, these numbers are very small and don't play a significant role in the whole product distribution. The biggest difference is seen in the case of potato, because in 2009 NSS showed 614 ton exports, while SIPQ showed 7,039 tons. The difference comprises 1% of potato supply.

! The idea of *Consumption by total population* has a broad meaning in this case, than just a consumption of fruits and vegetables. The idea of *Consumption by total population* in Table 33 to Table 35 includes the following ways of fruit and vegetable distribution.
  - consumption of fresh products: as food product;
  - processing at home by population, i.e. canning, drying, freezing which extends the duration of fruit and vegetable consumption;
  - consumption of certain fruit types, i.e. grape, apricot, apple, pear, by farms for vodka and wine production;
  - inevitable loss during harvest;
  - possible loss of some parts of harvest in the case of long term storage of certain fruits and vegetables, i.e. grape, apple, potato, onion.

The data of Table 33 to Table 35 prompt us about a very important fact. The main component among the general system of fruit and vegetable supply and distribution are production quantities. Consumption quantities by population vary mainly at the expense of production quantity variation. Export, import and processing have a secondary role in the fruit and vegetable balance. It means that after fruit and vegetable production the largest part of the later distribution is done through consuming them fresh.

During certain years great variations of fruit and vegetable balance may cause product deficit or excess in the market. In such cases usually works one of the main rules of economics, i.e. the higher becomes the supply, the lower become prices and vice versa.

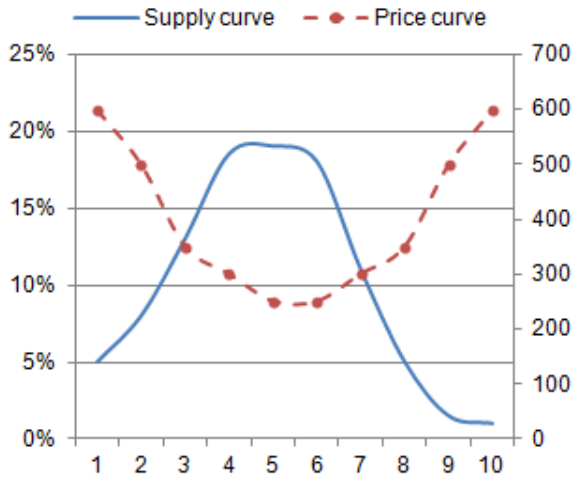
5.2 SALES PRICES

5.2.1 Main factors influencing sales prices

Thus, supply of fruits and vegetables is the main factor of forming sales prices. There are many other factors, which make a final correction in the sales prices of products, defining their highest and lowest lines. The major ones are: a) offer seasonality, b) products' quality features, and c) product procurement location, etc.

The factor of supply seasonality is the same in its nature as the above mentioned supply. At the beginning of harvest season the prices are high, and at the peak of harvest season they are low (as shown in Chart 39).

Chart 39 - Corelation of fruit and vegetable supply and level of prices



As we may remember from fruit and vegetable sale/consumption chart (see Chart 35), different consumers of products demand different quality products, i.e. high, average and low. At the same time, fruit and vegetable consumers differ from each other by the amount of their purchased products: some of them (exporters, processing enterprises) buy large quantity of products, some (population). As a result of mixed combination of product distribution different prices are formed for the same product. Below is presented the structure of fruit and vegetable sale prices according to product cost chain participants and quality features.

Table 36 - Structure of fruit and vegetable prices by security participants and quality features of products

Product cost chain participants			Nature of sale price	Quality features of sold product
Seller		Buyer/Customer		
Farms	➡	Exporter	Wholesale price	High quality product
Farms	➡	Processing enterprise	Wholesale price	Low quality product
Farms	➡	Intermediary-reseller	Wholesale price	High quality product Average quality product
Farms	➡	Population	Retail price	High quality product Average quality product
Intermediary-reseller	➡	Poulation	Retail price	High quality product Average quality product

Product procurement location is another factor influencing the prices. Some customers purchase the product at the producers place, others buy it in their own operation area. This creates price difference for the same product, which is dictated by transportation costs in the product cost price. Main product procurement locations are different in the case of fruit and vegetable cost chain participants.

Table 37 - Fruit and vegetable purchasing locations

Fruit and vegetable buyers/customers	Fruit and vegetable purchasing locations	
Exporter	Mainly at the seller's operating location	➡ At fruit/vegetable production location (garden, field) or from the seller's storage
Processing enterprise	Mainly in self-operating location	➡ At the processing enterprises' area or at the storing point
Intermediary-reseller	Partly in self-operating location	➡ At the wholesale market area of agricultural products
	Partly at the seller's operating location	➡ At the production area of fruits/vegetables (plantation, field) or from seller's storage
Population	Mainly in self-operating location	➡ At the closest market of residence or at other wholesale markets (supermarkets)

Taking into consideration the maltitude of factors that influence the prices of fruits and vegetables, the prices of the targeted products were presented by minimum and maximum limits. In order to show the trends, average price indicators were also shown.

Any intervention, including export promotion through operating the Free Economic Zone, can bring changes of prices. Such interventions can be favorable for the country but they may have the opposite effect for the consumers' of domestic market, especially when it comes to the possible increase of products' prices. From this point of view consumers are more interested in the level of retail prices. That is why; the analysis of fruit and vegetable prices is mainly based on the indicators of retail prices. Indicators of retail prices were presented based on the results of monitoring by Regional Centers of Agricultural Support, which includes the data of all markets of Yerevan and large cities of Marzes that sell agricultural products. In some cases, as an orienting information, prices of exporters and processing enterprises were presented, too.

5.2.2 Fruit and vegetable sales prices

Table sort grape has the longest period of sales comparing to other targeted products, such as apple, potato, cabbage, onion. It is sold in the markets from the beginning of its harvest, i.e. from August until May of the next year. As there is deficit of fruits in spring, and apple and grape are the main fruits that are sold, consequently until the ripening of first fruits of the next year the prices of grapes gradually go up, which is also connected with the deficit. Once sweet cherry and apricot start to ripen the grapes of *previous* year is being left out of the market (or the owners try to complete sales).

In the case of grapes the sales prices were presented only for table variety, as from the viewpoint of this survey the prices of technical varieties do not have significant importance. Their pricing will always depend on the relation of *exporter and processor* and won't be interfered by any third party or other marketing mechanisms (as can be the Free Economic Zone).

Below is presented the dynamics of retail prices of grapes for the period of 2007-2010 (see Chart 40). We can see that in 2008 grape prices were higher. In order to understand its reasons we should compare the quantity of grape supply with the average retail prices for the period of 2007-2009[13]

Table 38 - Corelation of grape demand and retail prices (as of 2007-2009)

Product sale season	Supply components, ton					Average retail price, AMD/kg
	Production	Processing	Export	Import	Consumption by population	
VIII 2007-V 2008	218,883	-144,389	-1,349.0	+10.0	**=73,155**	**494**
VIII 2008-V 2009	185,832	-137,356	-2,182.0	+1.9	**=46,296**	**635**
VIII 2009-V 2010	208,649	-127,740	-4,003.0	+26.1	**=76,933**	**353**

The connection of supply volume and prices of grapes' sale are obvious. During the past three years the highest price for grapes was recorded in 2008-2009, in the sale season due to small quantity (186,000 tons) of grape in 2008 and the decrease of consumption balance by population (46,000 ton).

Exporters' wholesale prices significantly differ from the average retail prices (see Table 39). It is connected with the fact that exporters start procuring during harvest season when prices are the lowest.

[13] The indicators of 2010 is impossibile to take into account, as the sale season of the year is not over yet. It is impossible to compare the average prices of incomplete season with the prices of whole season.

Chart 40 - Dynamics of average wholesale prices of grape, 2007-2010

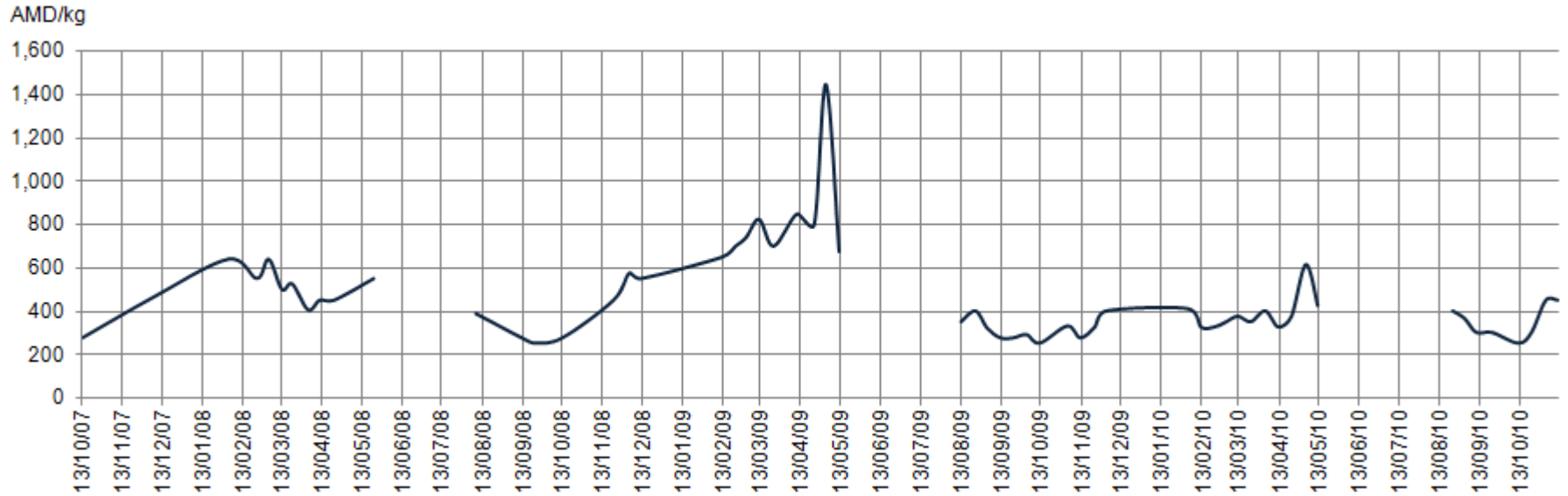


Table 39 - Exporters' prices of grape procurement by main varieties, 2008-2010

Grape sorts	2008	2009	2010
Red Kishmish	350-400	350-400	450-500
Black Kishmish	250-300	250-300	300-350
Itsaptuk	200-250	170-200	250-300
Shahumyan	200-250	180-250	200-300

Phases of changes in grape's prices

1. August	► First grape harvest is ripened in Ararat valley
2. September-October	► Grape harvest is on its peak. Because of the abrupt increase of offer there is a tendency of decreasing prices in Septmber-October. In the second half of October the prices of grape are on the lowest level.
3. November-December	► Prices of grape gradually increase. Consumption by the population reaches its peak on New Year's Eve.
4. January-May	► As grape is kept in refrigerators, the later it is sold (or the longer it is kept) its cost price increases. Because of it in this period the prices of grape continue increasing slowly.
5. May-June	► The harvest of "old" year's grape ends in the market.Newly ripened fruits take its place. If at that moment there is still grape (dried) left from last year, then abrupt decrease of prices is registered in order to quickly sell it.

Table 40 - Grape: index of consumption prices comaring with the same period of previous year.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	86.6	100.2	101.5	111.2	116.9	121.0	105.8	125.6	107.8	106.0	94.8	92.6
2008	90.9	87.7	77.1	72.5	76.3	71.5	104.1	84.5	94.0	109.9	122.3	123.2
2009	147.0	142.9	160.0	178.4	252.5	271.6	120.6	147.8	114.4	93.9	88.7	97.3
2010	74.7	57.8	55.7	52.9	44.4	40.7	91.6	102.1	125.3	151.2		

Table 41 - Grape: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	17.5	10.3	-2.6	2.1	11.9	0.9	8.9	-25.4	-42.3	-3.1	17.8	19.0
2008	15.4	6.4	-14.4	-4.0	17.7	-5.5	58.5	-39.5	-35.8	13.3	31.1	20.0
2009	37.6	3.4	-4.1	7.1	66.6	1.6	-29.6	-25.8	-50.3	-7.1	23.9	31.7
2010	5.6	-20.0	-7.6	1.8	39.8	-6.8	58.4	-17.4	-39.0	12.2		

! Here and after the changes of fruits' and vegetables'consuming prices are presented according to a periodical by NSS called *The index of consuming prices in Armenia*.

Apricot is exceptional among all other targeted fruits for its large variation of prices. In fact, the prices of apricot vary not only in separate years but also during separate months of the same year. By years large variatons of apricot prices are connected with the changes of harvest volume. As it has been already mentioned in the case of apricot the variations of harvest volume are very abrupt (5-10 times), which becomes a reason for equivalent variations of prices (see Table 42).

Table 42 - Correlation of apricot supply and consumption prices (as of 2006-2010)

Years	Supply components, ton					Sale prices, AMD/kg		
	Product	Processing	Export	Import	Consumption by population	Processors	Exporters	Average wholesale prices
2006	72,017	-3,850	-1,929.2	+0.0	**=66,238**		**250-400**	**230-520**
2007	15,681	-337	-904.6	+0.9	**=14,441**		**600-1,000**	**540-925**
2008	83,089	-7,514	-5,280.1	+0.6	**=70,295**	**35-50**	**220-400**	**230-340**
2009	80,686	-4,641	-9,082.1	+0.1	**=66,963**	**35-50**	**150-350**	**300-470**
2010	≈10,000	-very little	-4,626.9	+n/a	**=≈5,000**	**400**	**500-1,200**	**700-1,350**

Concerning the price variation of apricot during separate months of the same year, it is also connected with the volume of products available at the market in a certain month. Usually the prices are high at the very beginning of harvest (at the beginning of June when there is less product) and at the very end (in the middle of August, when product ends)[14]. Dependence of apricot prices on supply volumes is seen from the index of its prices. Below are presented the indices of apricot prices for 2007-2010.

Table 43 - Apricot: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	244.9	252.1	250.1	253.5	235.6	357.3	191.1	158.1	166.0	169.2	182.5	172.6
2008	159.3	159.1	155.6	151.2	147.8	46.5	34.1	41.6	56.2	58.0	51.9	53.4
2009	56.4	52.6	52.8	57.2	66.1	150.0	93.4	118.7	91.2	155.6	170.9	186.9
2010	173.8	176.1	181.7	178.2	156.2	107.1	432.7	372.6	301.9	184.1		

[14]First harvest of apricot ripens in Surenavan village of Ararat region at the beginning of June, and ends in submontane areas of Aragatsotn and Kotayk regions in the middle of August

Table 44 - Apricot: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	18.3	0.0	0.0	1.7	14.2	38.0	-48.4	24.0	5.8	3.3	17.8	10.5
2008	9.2	-0.1	-2.2	-1.2	11.6	-56.6	-62.2	51.3	42.9	6.5	5.4	13.7
2009	15.3	-6.9	-1.7	6.9	29.1	-1.4	-76.4	92.3	9.8	81.8	15.7	24.3
2010	7.2	-5.6	1.4	4.9	13.2	-32.4	-4.8	65.6	-11.1	10.9		

The seasonality of apricot's supply and sale is the shortest among all targeted products. Its prices decrease from [Max] to [Min] level in 20-25 days, stay in the same level for 10-15 days and again return to the previous level in one month (see Chart 41). The curve for exporters' prices is the same, only with less deflections towards the average prices (see Chart 42).

The dynamics of apricot's retail prices is presented in Table 45 by Marzes.

Table 45 - Dynamics of apricot's retail prices by Marzes for 2008-2010

Markets		2008						2009							2010				
		02.06.	11.06.	22.06.	02.07.	11.07.	22.07.	22.06.	02.07.	13.07.	22.07.	13.08.	24.08.	02.09.	22.06.	02.07.	13.07.	20.07.	02.08.
Yerevan	Min	1,000			140				160					600		450			1,200
	Max	1,620			310				330					780		1,240			2,560
Aragatsotn			600			100				100		500					700		
Ararat			500			150				100		200					700		
Armavir			500			150				70		250					700		
Gegharkunik			500			200				150		200					1,000		
Lori			500			200				100		250					600		
Kotayk				300			250	800			150		400		550			750	
Shirak				250			250	1,000			100		400		600			800	
Syunik				300			300	600			150		400		850			900	
Vayots Dzor				300				800			150				1,000			700	
Tavush				250			150	600			150				700			700	
ARMENIA	**Min**	**1,000**	**500**	**250**	**140**	**100**	**150**	**600**	**160**	**70**	**100**	**200**	**400**	**600**	**550**	**450**	**600**	**700**	**1,200**
	Max	**1,620**	**600**	**300**	**310**	**200**	**300**	**1,000**	**330**	**150**	**150**	**500**	**400**	**780**	**1,000**	**1,240**	**1,000**	**900**	**2,560**

Chart 41 –Correlation of apricot seasonality and retail prices (as of 2009)

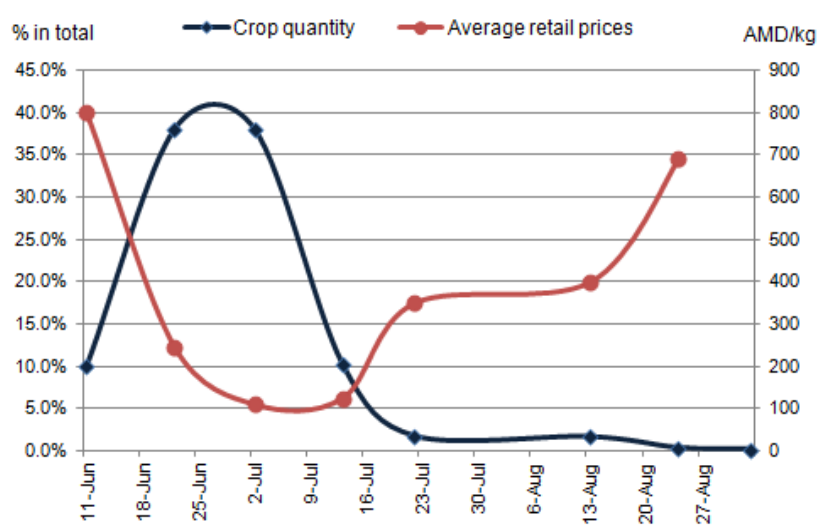
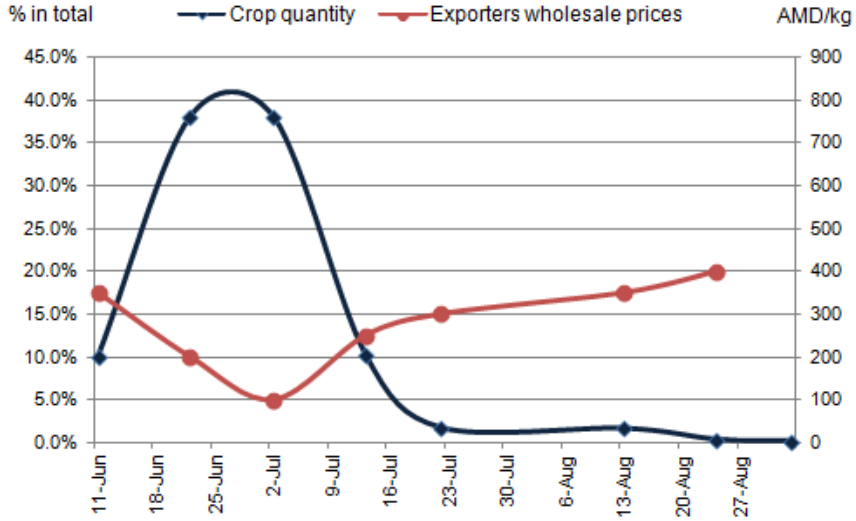


Chart 42 – Correlation of apricot supply seasonality and procurement prices (as of 2009)



Peach, plum, sweet cherry

Table 46 - Peach: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	281.1	287.5	284.8	289.2	271.8	193.1	185.9	136.4	91.0	92.4	78.6	77.6
2008	71.6	72.0	70.6	68.6	66.4	92.0	62.8	86.2	107.7	105.0	122.2	103.3
2009	109.1	102.2	102.8	110.3	129.1	94.5	118.6	95.5	97.7	99.5	169.2	186.3
2010	173.0	174.9	180.1	177.8	156.3	139.6	148.8	190.8	252.0	297.5		

Table 47 - Peach: index of consumption prices comparing with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	18.2	-0.6	-0.2	1.9	15.5	0.8	-11.6	-51.7	-36.4	24.4	24.6	32.6
2008	9.0	0.0	-2.2	-1.0	11.9	39.6	-39.7	-33.8	-20.5	21.3	44.9	12.1
2009	15.1	-6.2	-1.6	6.2	30.9	2.2	-24.3	-46.7	-18.6	23.5	146.5	23.5
2010	6.9	-5.2	1.4	4.8	15.1	-8.7	-19.3	-31.7	7.5	45.8		

Table 48 - Plum: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	236.3	242.3	240.6	245.1	230.6	135.4	124.0	92.3	119.2	127.1	162.9	156.7
2008	146.1	146.6	143.0	138.3	132.0	76.0	67.7	71.6	67.3	66.0	50.0	50.3
2009	52.8	49.6	50.0	53.7	63.7	141.0	98.3	102.1	98.9	99.3	105.0	113.2
2010	105.2	106.7	109.9	108.6	98.1	114.1	310.8	323.1	263.6	280.1		

Table 49 - Plum: index of consumption prices comparing with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	17.4	-0.4	0.1	2.2	15.6	0.8	-21.9	-32.3	10.6	23.3	40.3	11.2
2008	9.5	0.0	-2.4	-1.2	10.4	-41.9	-30.5	-28.4	4.0	20.8	6.3	11.8
2009	15.0	-6.1	-1.6	6.1	31.0	28.6	-51.5	-25.7	0.8	21.2	12.5	20.4
2010	6.9	-4.8	1.4	4.9	18.4	49.6	31.9	-22.7	-17.7	28.8		

Table 50 - Sweet cherry: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	96.9	99.1	98.5	100.3	96.0	170.5	198.4	190.0	156.4	157.8	170.7	163.6
2008	151.2	152.1	149.0	144.4	138.0	86.6	51.2	54.9	68.9	71.4	63.8	64.9
2009	68.4	64.3	64.5	69.0	79.4	144.9	118.6	110.9	114.7	107.0	114.1	122.2
2010	113.7	115.6	119.1	117.5	107.8	93.9	165.7	204.6	183.1	205.0		

Table 51 - Sweet cherry: index of consumption prices comparing with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	17.5	-0.6	0.1	2.3	17.6	18.9	-0.7	-3.4	-23.4	2.8	17.9	10.1
2008	8.7	0.0	-2.0	-0.9	12.4	-25.4	-41.3	3.6	-4.0	6.5	5.4	11.9
2009	14.6	-6.1	-1.6	6.1	29.3	36.0	-51.9	-3.1	-0.7	-0.7	12.5	19.8
2010	6.6	-4.5	1.3	4.7	18.6	18.4	-15.1	19.6	-11.2	11.3		

Table 52 - Correlation of peach supply and consumption prices (as of 2007-2010)

Years	Units of supply ton					Sales prices (AMD/kg) and their timeline										
	Production	Processing	Export	Import	Consumption by population	02.07.	13.07.	20.07.	02.08.	11.08.	23.08.	01.09.	10.09.	22.09.	12.10.	02.11.
2007	63,868	-4,766	-314.5	+10.2	**=58,798**			500-900					140-230			
2008	41,651	-6,953	-271.2	+18.0	**=34,445**	520-1,160	300-400	350-450		200-525			150-250	200-300	200-350	
2009	57,883	-1,928	-654.2	+0.0	**=55,300**	780-1,340		300-400		200-300	200-300	160-290	100-250	250-300	150-300	190-560
2010	≈20,000	- very little	-194.0	+n/a	**=≈20,000**	1,140-1,600			460-700	400-600	300-500	340-610	400-600	400-700	800-1,000	600-1,100

Table 53 - Correlation of plum supply and consumption prices (as of 2007-2010)

Years	Units of supply ton					Sales prices (AMD/kg) and their timeline										
	Production	Processing	Export	Import	Consumption by population	02.07.	13.07.	22.07.	02.08.	13.08.	24.08.	02.09.	12.09.	22.09.	02.10.	13.10.
2007	11,226	-525	-213.5	+4.5	**=10,492**											
2008	12,077	-579	-269.8	+3.8	**=11,231**	190-300	170-250	150-250					200-250	100-200		200-350
2009	10,344	-550	-314.4	+1.2	**=9,481**	280-390			150-250	150-250	200-300	170-300	120-200	200-400	220-300	
2010	n/a	- very little	-351.0	+n/a	**=n/a**	660-940			560-740	400-600	300-500	310-520	320-500	300-600		

Table 54 - Correlation of sweet cherry supply and consumption prices (as of 2007-2010)

Years	Units of supply ton					Sales prices (AMD/kg) and their timeline							
	Production	Processing	Export	Import	Consumption by population	22.05.	02.06.	11.06.	22.06.	02.07.	11.07.	22.07.	02.08
2007	3,901	-220	-95.5	+0.1	**=3,586**								
2008	6,598	-450	-200.8	+0.0	**=5,947**	1,000-1,500	660-1,280	450-500	400-600	280-540	250-400	250-350	
2009	7,682	-502	-599.3	+0.0	**=6,582**		560-920	470-900	500-600	310-470	200-450	200-400	
2010	n/a	- very little	-267.0	+n/a	**=n/a**		600-880	450-900	500-600	600-900	700-1,000	600-1,100	1,080-1,400

Apple, pear

Table 55 - Correlation of apple supply and retail prices (as of 2007-2009)

Years	Supply components, ton					Average retail price, AMD, kg
	Production	Processing	Export	Import	Consumption by population	
2007	111,836	-4,208	-0.0	+169.9	**=107,798**	**460**
2008	117,199	-2,646	-34.0	+83.5	**=114,603**	**373**
2009	120,844	-2,107	-2.3	+148.6	**=118,883**	**368**

Table 56 - Apple: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	112.0	114.0	113.3	117.6	135.0	144.6	119.0	107.7	101.7	101.8	99.2	98.6
2008	94.1	93.7	91.3	80.1	66.3	62.1	60.1	69.2	88.6	105.8	100.5	94.3
2009	95.0	85.6	83.0	98.0	116.6	122.5	108.5	108.2	97.2	87.2	90.2	97.7
2010	101.4	105.0	111.7	106.1	105.3	104.8	160.4	177.3	164.0	164.7		

Table 57 - Apple: index of consumption prices comparing with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	21.2	-0.8	-3.0	0.9	16.8	14.4	-14.3	-20.9	-20.8	-4.9	9.7	11.9
2008	15.7	-1.2	-5.5	-11.4	-3.4	7.2	-17.0	-8.9	1.4	13.6	4.1	5.0
2009	16.5	-11.0	-8.4	4.6	14.9	12.7	-26.5	-9.1	-8.9	1.8	7.8	13.7
2010	21.0	-7.9	-2.5	-0.6	14.0	12.1	12.6	0.4	-15.7	2.3		

Table 58 - Correlation of pear supply and retail prices (as of 2007-2009)

Years	Supply components, ton					Average retail price, AMD, kg
	Production	Processing	Export	Import	Consumption by population	
2007	27,105	-	0.0	+27.3	**=27,133**	**606**
2008	29,322	-	-0.1	+49.1	**=29,371**	**684**
2009	28,247	-	-0.6	+81.3	**=28,328**	**828**

Table 59 - Pear: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	132.1	132.7	126.9	133.6	142.3	141.0	122.1	125.7	80.6	95.5	86.7	87.9
2008	109.4	107.8	97.7	92.2	98.4	123.2	91.3	86.0	135.3	150.5	158.0	141.4
2009	120.9	123.5	138.9	141.9	168.7	131.9	150.4	113.6	83.2	69.8	72.8	86.1
2010	82.2	80.8	81.3	82.1	83.1	92.0	99.3	147.5	156.0	164.6		

Table 60 - Pear: index of consumption prices comparing with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	20.5	2.1	-4.3	5.5	10.1	2.2	5.2	-16.0	-38.1	-2.9	-0.9	19.4
2008	50.1	0.5	-13.2	-0.4	17.5	28.0	-22.0	-20.9	-2.7	8.1	4.1	6.8
2009	28.3	2.7	-2.4	1.7	39.6	0.1	-11.1	-40.2	-28.7	-9.4	8.5	26.4
2010	22.5	1.0	-1.8	2.8	41.4	10.7	-4.0	-11.2	-24.6	-4.4		

Chart 43 – Dynamics of apple average retail prices in 2006-2010

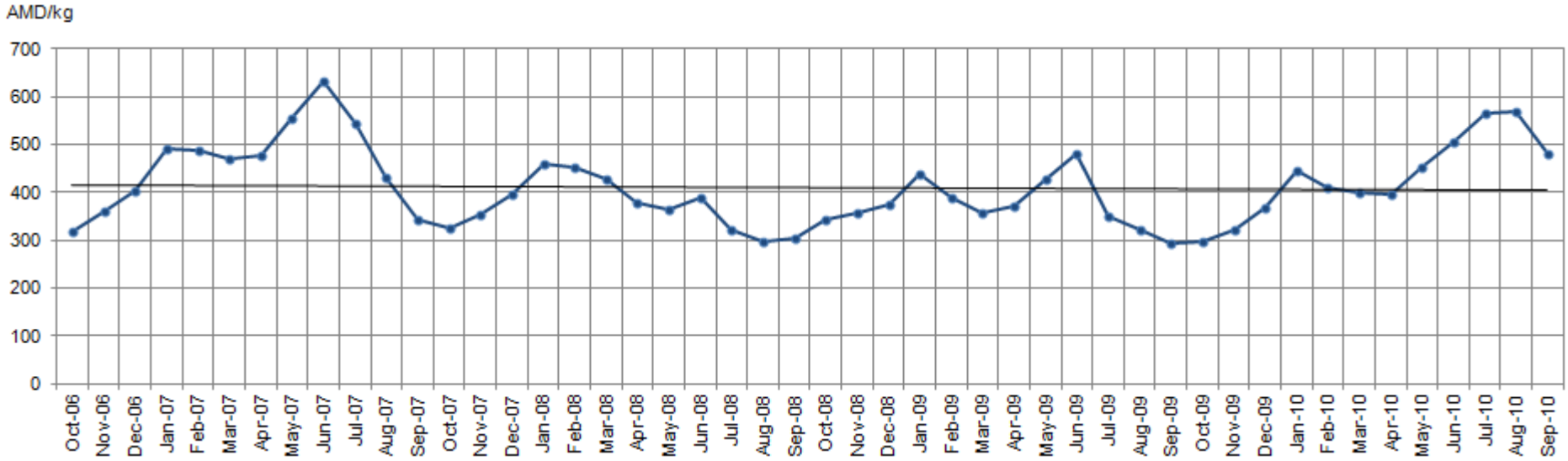
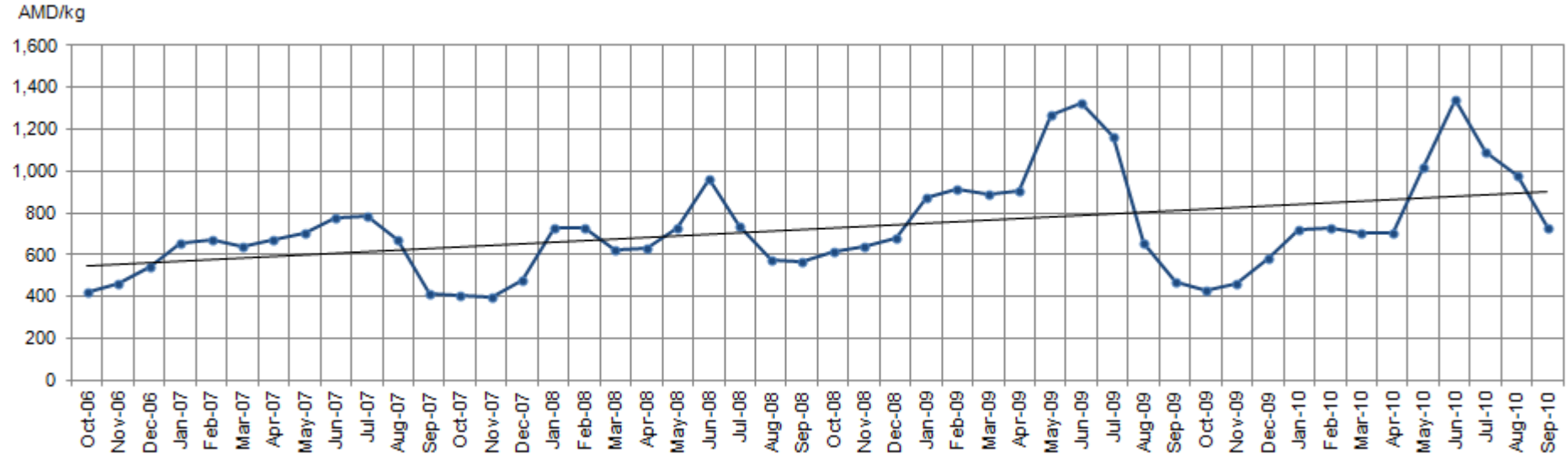


Chart 44 - Dynamics of pear average retail prices in 2006-2010



Potato

Chart 45 - Dynamics of average retail prices , 2006-2010

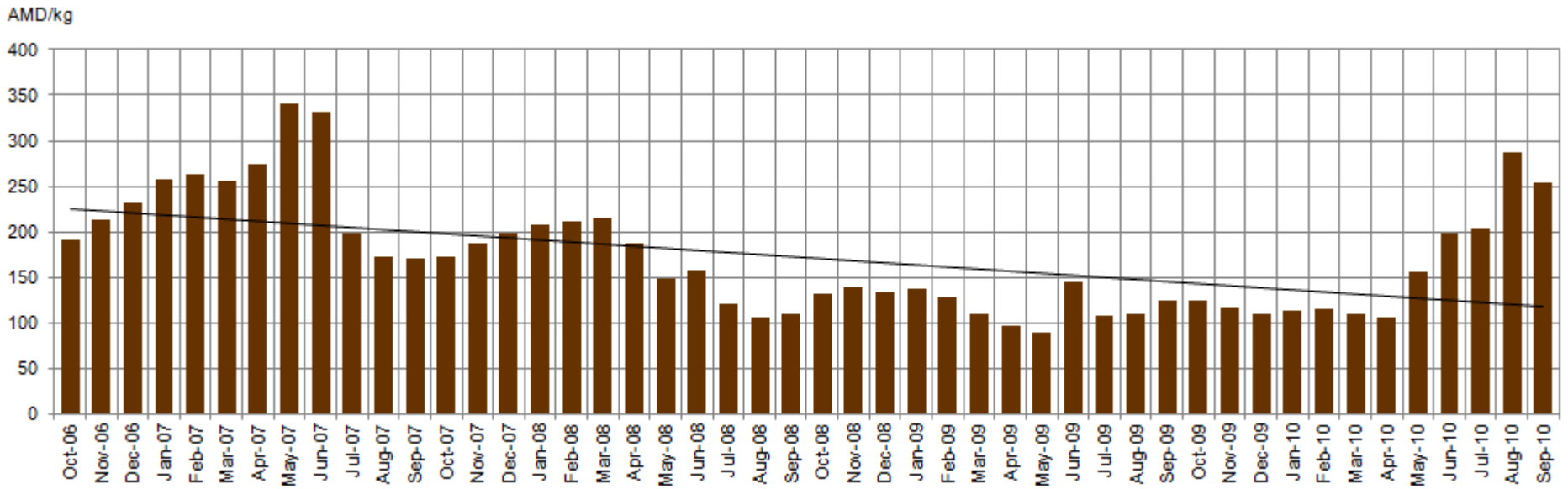


Table 61 - Potato: index of consumption prices comparing with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	160.6	145.0	140.7	161.1	158.9	140.7	103.1	85.5	87.4	91.3	87.8	86.2
2008	80.9	80.6	84.4	68.3	43.6	47.4	60.4	61.0	64.3	75.9	74.6	67.2
2009	66.3	60.3	51.2	51.6	61.0	92.4	90.0	104.9	113.6	94.1	83.7	82.4
2010	83.3	89.8	99.9	109.2	171.3	136.5	189.5	261.2	203.9	165.1		

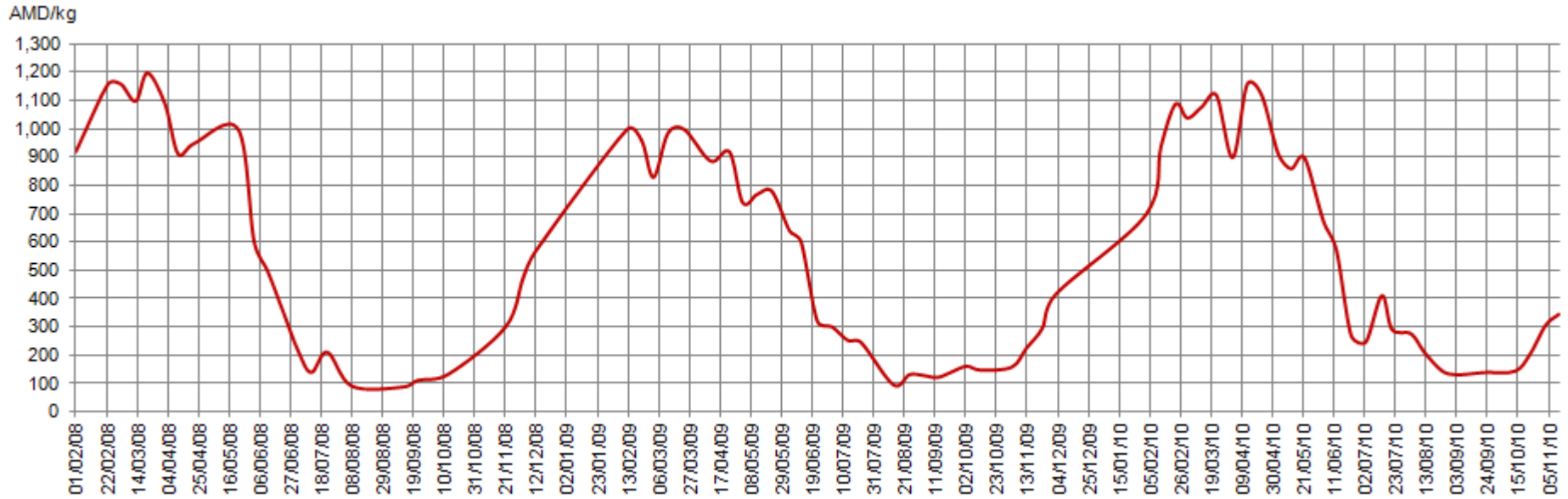
Table 62 - Potato: index of consumption prices comparing with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	10.8	2.6	-3.2	7.7	24.3	-2.4	-40.3	-13.2	-1.2	1.5	8.5	6.4
2008	4.0	2.2	1.3	-12.9	-20.6	6.0	-23.9	-12.5	4.3	19.8	6.6	-4.1
2009	2.6	-7.1	-13.9	-12.2	-6.2	60.6	-25.8	2.0	13.0	-0.7	-5.2	-5.7
2010	3.7	0.1	-4.2	-4.0	47.2	27.9	3.0	40.6	-11.8	-19.6		

Tomato

Tomato supply is ensured during the whole year. At the end of October, when open ground tomato is reduced and sold out, imported and covered ground tomato whose prices vary from 900 to 1,200 AMD/kg, enters the market. The imported tomato is substituted with covered ground tomato, which is ripened in Armenia. Local greenhouse tomato is sold in the markets by 800-1,000 AMD/kg, which gradually decreases and becomes 400-500 AMD/kg by the time open ground tomato ripens. Then open ground tomato enters the market which is incomparably cheap (see Chart 46). This cycle constantly repeats, and it is noteworthy that prices of tomato for the specified limits remain almost unchanged.

Chart 46 - Dynamics of tomato's average retail prices for 2008-2010



Prices offered by the processing enterprises also express surprising stability. It is almost one decade that they are between 25-35 AMD/kg. Such stability of prices is connected with several factors:

- Processing enterprises do not tend to pay higher price for tomato. Majority of tomato is being processed in processing enterprises and becomes not a finalized product but canned tomato paste, i.e. half-finished product. It is meant for such processing enterprises who in foreign countries produce various products from tomato. Although during the last few years the sale of those products has become difficult. In main cases processing enterprises end the year with large product supplies. This makes processing enterprises reduce the quantity of stored tomato, which helps to keep the level of low prices for processed tomato. Volumes of tomato which is being processed by processing enterprises had decreased by 45% during the period of 2007-2009.

- Difficulties connected with sales makes tomato producers reduce areas and give up cultivation of tomato. That is the reason why during the period of 2007-2009 volumes of tomato production had decreased by 13% (see Table 63). It happened mainly at the expense of processing enterprises' volumes. Tomato volumes meant for consumption by population had decreased a little (7%), as a result of which during the harvest season of open ground tomato (August-October) retail prices vary between 100-150 AMD/kg.

Table 63 - Correlation of open ground tomato supply and retail prices (as of 2007-2009)

Years	Offer components, ton					Average retail price during harvest season, AMD/kg
	Production	Processing	Export	Import	Consumption by population	
2007	321,471	-53,954	0.0	+175.4	**=267,693**	**89**
2008	293,784	-35,481	-7.2	+93.8	**=258,390**	**104**
2009	278,582	-29,749	-8.4	+138.3	**=248,963**	**131**

Table 64 - Tomato: index of consumption prices comaring with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	140.9	160.3	133.0	104.9	87.2	101.6	81.3	86.9	98.6	89.2	88.0	84.1
2008	100.4	93.3	102.9	109.6	106.8	104.3	93.2	129.9	133.6	151.4	104.3	99.2
2009	83.1	79.1	79.7	90.6	80.0	91.0	124.9	114.7	99.9	87.7	86.9	92.2
2010	99.2	100.6	114.5	112.1	109.0	93.8	113.4	157.9	118.9	103.3		

Table 65 - Tomato: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	74.9	1.1	-15.6	-17.1	0.7	-37.2	-60.5	-58.7	-4.8	49.4	130.8	100.8
2008	108.9	-6.1	-7.0	-11.7	-1.8	-38.7	-64.7	-42.4	-2.0	69.3	58.9	91.1
2009	74.9	-10.6	-6.2	0.3	-13.3	-30.3	-51.6	-47.1	-14.7	48.7	57.5	102.7
2010	88.1	-9.3	6.8	-1.8	-15.7	-40.0	-41.5	-26.3	-35.7	29.1		

Cucumber

The cycle of cucumber's retail prices are almost the same as tomato's. It is logical as cucumber grows both on open and covered ground. This makes it possible to ensure stable supply for the whole year. The dynamics of price variation is connected with the sequence of open ground cucumber-covered ground cucumber (see Chart 47). Consequently during that period, when market supply is ensured at the expense of covered ground cucumber, prices are high and the vice versa.

Chart 47 - Dynamics of cucumber's average retail prices, 2008-2010

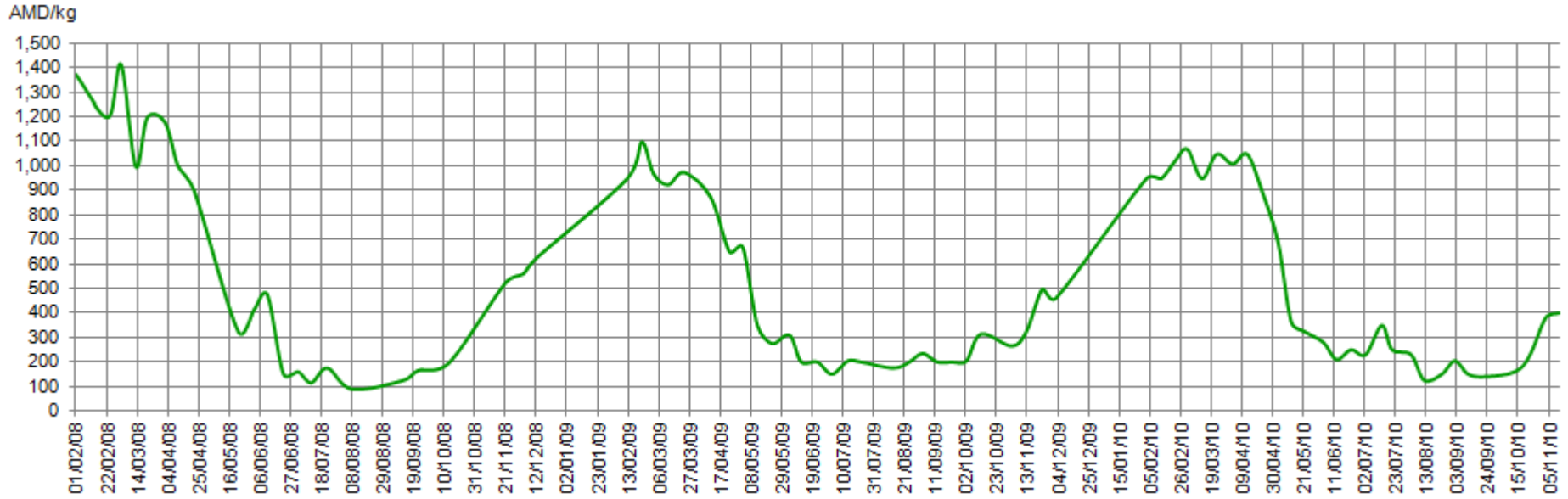


Table 66 - Cucumber: index of consumption prices comaring with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	91.3	124.5	115.5	103.9	92.3	102.6	81.5	106.0	131.1	117.2	128.9	128.1
2008	109.5	102.5	102.6	106.6	86.2	130.1	109.7	100.9	84.9	113.1	107.4	79.6
2009	84.2	75.0	86.2	94.4	108.3	92.6	131.9	164.5	139.2	112.1	106.2	133.0
2010	114.7	121.7	123.1	115.5	98.1	98.3	134.4	85.5	113.9	124.1		

Table 67 - Cucumber: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	75.9	-1.0	-14.3	-24.1	-51.4	-46.8	-23.3	18.3	20.7	22.3	71.2	91.0
2008	50.3	-7.3	-14.2	-21.2	-60.7	-19.7	-35.4	8.8	1.6	63.0	62.6	41.5
2009	58.9	-17.4	-1.4	-13.7	-55.0	-31.3	-7.9	35.6	-14.0	31.2	54.1	77.1
2010	37.1	-12.4	-0.2	-19.0	-61.7	-31.1	25.8	-13.7	14.6	43.0		

Cabbage

Chart 48 - Dynamics of average retail prices of cabbage for 2006-2010

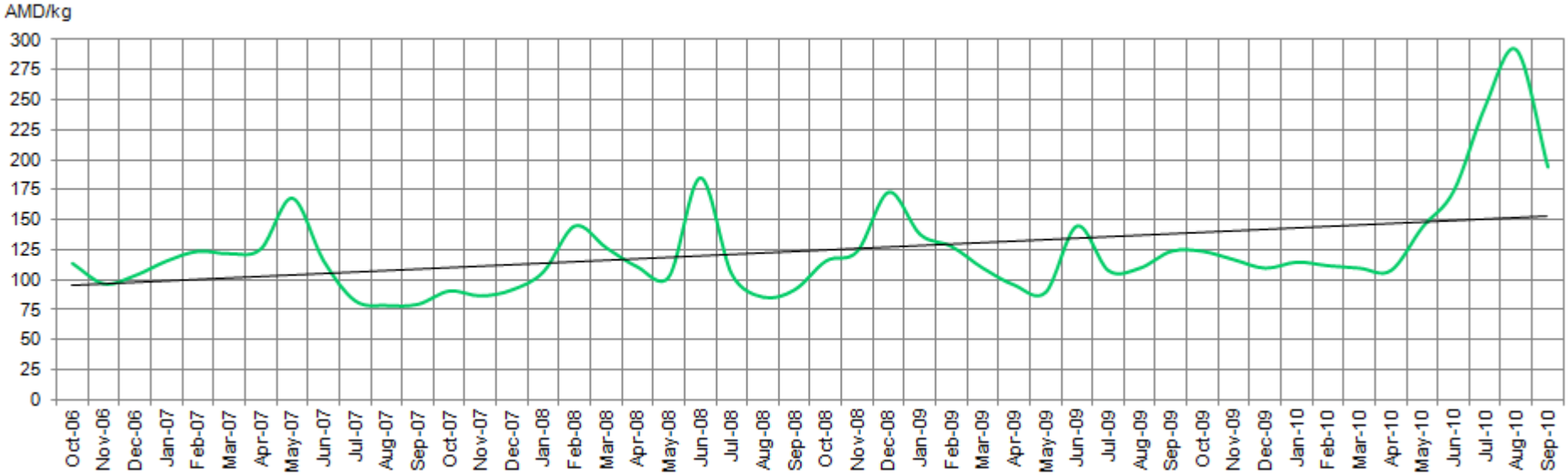


Table 68 - Cabbage: index of consumption prices comaring with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	116.6	96.1	108.7	128.3	98.9	71.6	40.1	41.8	60.3	80.6	90.0	88.6
2008	92.4	116.9	103.9	87.6	60.3	160.3	126.2	109.7	115.5	126.3	142.5	188.0
2009	216.8	140.0	159.0	191.6	243.5	76.8	71.3	92.1	101.9	105.4	96.2	64.8
2010	49.7	55.1	54.4	51.1	58.0	122.2	328.5	367.1	206.0	106.1		

Table 69 - Cabbage: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	11.6	6.6	-1.5	3.5	33.9	-31.6	-28.2	-5.5	2.1	14.2	-5.1	6.2
2008	16.4	34.8	-12.5	-12.7	-7.8	81.8	-43.4	-17.9	7.5	24.9	7.1	40.0
2009	34.2	-12.9	-0.6	5.2	17.2	-42.7	-47.4	6.0	19.0	29.2	-2.3	-5.7
2010	2.9	-3.4	-1.8	-1.3	33.2	20.7	41.3	18.4	-33.2	-33.5		

Pepper

Just like tomato and cucumber, pepper's supply is ensured for the whole year due to its ability to grow on closed gorund. Price variations have the same peculiarities: covered ground cucumber is more expensive than open ground cucumber. It is so expensive that it is common to sell it by piece. It is because of this peculiarity that dynamics of pepper's retail prices was presented taking into consideration the following units: a) one piece in the case of covered ground pepper, and b) one kg in the case of covered ground pepper (see Chart 49). For comparison we may consider that 4-5 pieces of covered ground pepper equals to 1 kg.

Chart 49 - Dynamics of pepper's average retail prices, 2008-2010

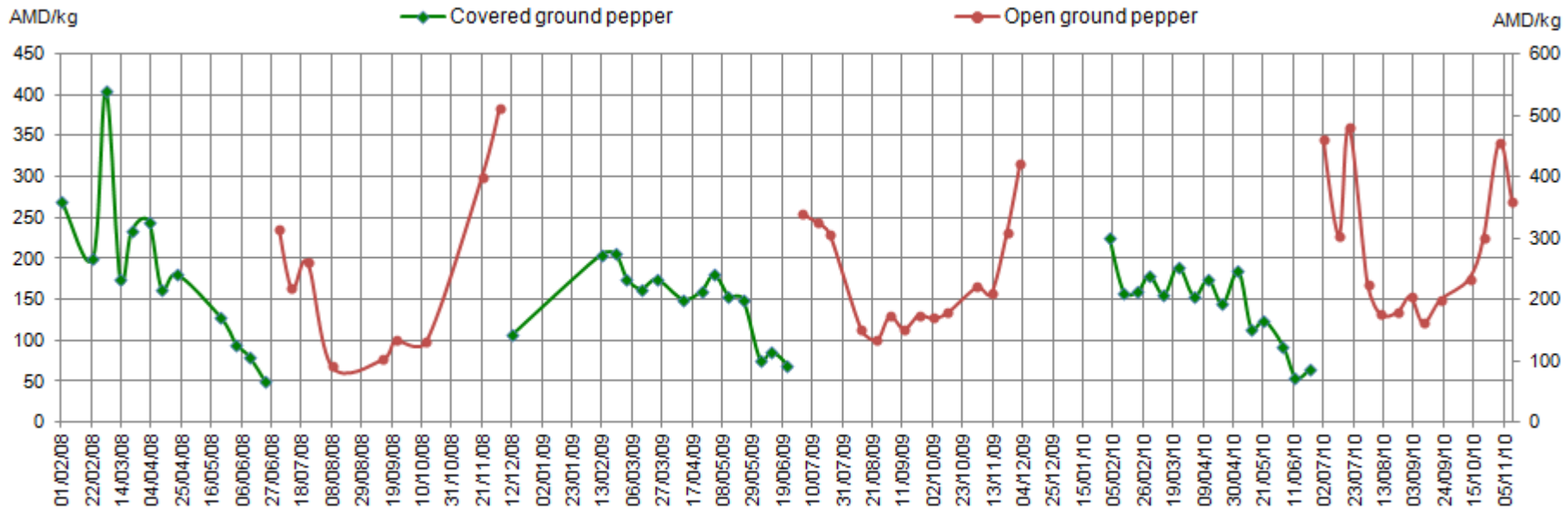


Table 70 - Pepper: index of consumption prices comaring with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	120.5	101.3	93.4	94.7	98.7	146.5	141.7	103.9	105.8	117.7	135.3	116.9
2008	115.5	136.7	143.4	130.0	116.9	96.4	75.0	90.0	88.3	86.3	81.4	102.6
2009	63.0	45.2	78.1	95.7	104.3	110.8	106.6	125.9	126.9	104.7	117.2	151.9
2010	207.1	230.8	132.0	115.3	109.0	110.2	119.7	112.0	108.9	137.7		

Table 71 - Pepper: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	114.1	8.6	-5.6	0.3	18.6	-35.5	-48.0	-65.9	-4.9	57.6	53.3	70.5
2008	111.6	28.5	-0.9	-9.0	6.6	-46.8	-59.5	-59.1	-6.7	54.1	44.5	114.9
2009	30.0	-7.9	71.4	11.4	16.2	-43.6	-61.0	-51.7	-6.0	27.2	61.7	178.6
2010	77.3	2.6	-1.9	-2.7	9.9	-43.0	-57.7	-54.9	-8.6	60.9		

Eggplant

Fresh eggplant's supply is seasonal in the Armenian market. It is intermitted during the period of December - May. The first eggplant sold in the market is an imported one. Sales of imported eggplant precede the ripening period of local eggplant and chronologically coincide with the period of May - June. During this period the prices of eggplant are the highest, i.e. about 1,200-1,300 AMD/kg. At the beginning of July, when local eggplant is sold, the prices go down abruptly. They again go up at the end of the harvest season, i.e. at the end of October. Processing enterprises store eggplant at the peak of harvest, i.e. in September, when prices are at the lowest level. Procurement prices vary between 60-70 AMD/kg.:

Chart 50 - Dynamics of average retail prices of eggplant for 2006-2010

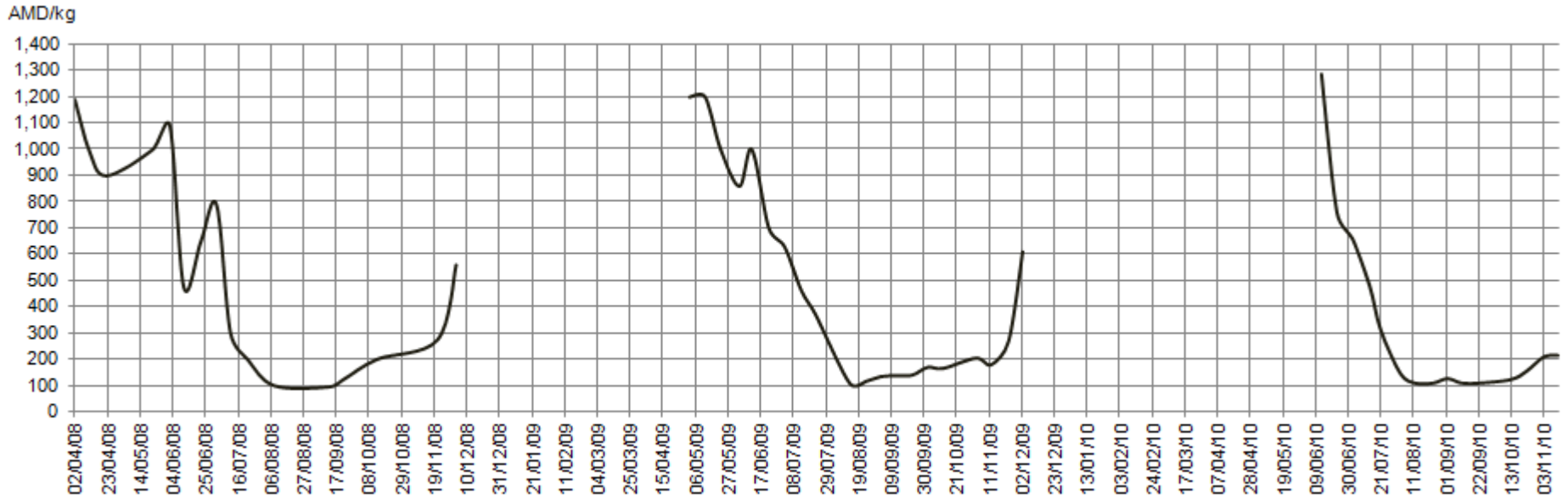


Table 72 - Eggplant: index of consumption prices comaring with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	90.2	102.8	93.1	89.8	88.8	95.4	123.9	95.2	90.4	86.9	93.6	84.9
2008	149.3	143.4	139.5	133.6	138.7	99.7	94.1	107.6	109.0	100.0	89.4	122.4
2009	88.4	72.9	124.9	132.1	84.1	100.6	106.9	117.1	131.4	134.2	136.4	163.3
2010	108.6	120.9	84.8	92.0	112.7	102.0	95.3	85.1	67.3	64.3		

Table 73 - Eggplant: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	43.4	16.5	-6.1	-0.3	25.2	4.4	-50.0	-75.9	-10.8	32.3	47.2	98.2
2008	152.2	12.0	-8.7	-4.6	30.0	-24.9	-52.8	-72.4	-9.6	21.4	31.6	171.5
2009	82.3	-7.7	56.5	0.9	-17.2	-10.3	-49.8	-69.8	1.4	23.9	33.8	225.1
2010	21.2	2.7	9.8	9.5	1.4	-18.8	-53.1	-73.1	-19.8	18.4		

Onion

Chart 51 - Dynamics of onion's average retail prices, 2006-2010

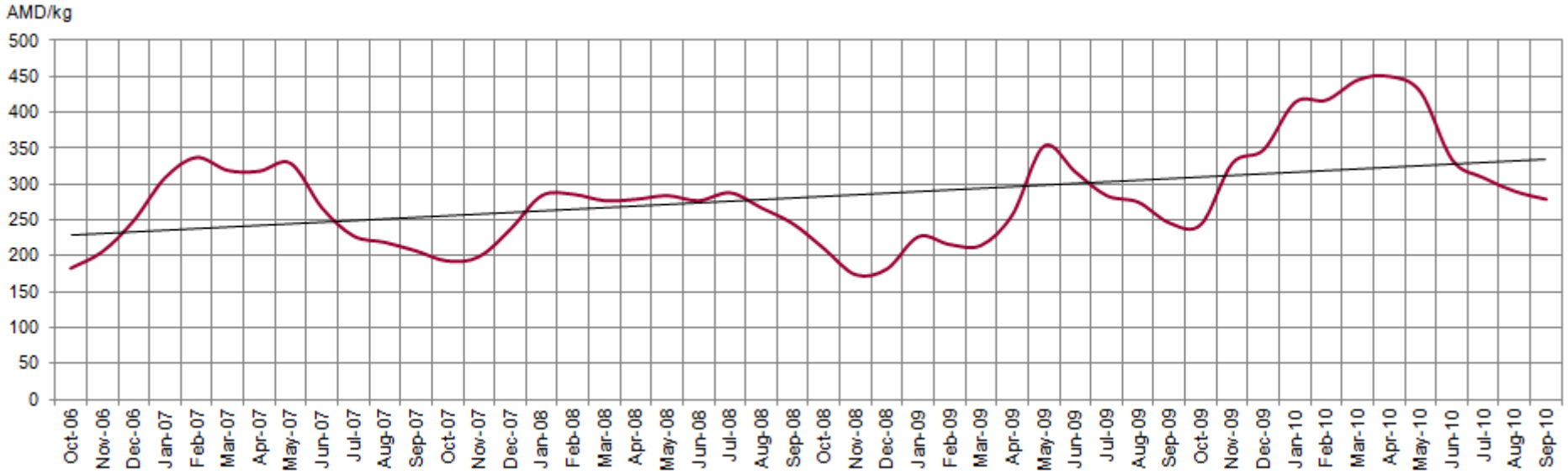


Table 74 - Onion: index of consumption prices comaring with the same period of previous year

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	90.5	103.5	101.9	106.6	109.4	90.9	88.0	91.1	105.5	105.6	96.1	95.1
2008	91.8	85.0	86.9	88.0	86.4	103.6	126.3	121.4	118.3	108.4	87.4	76.7
2009	80.1	75.7	77.7	92.2	124.4	114.6	98.5	103.1	100.4	116.7	189.4	191.4
2010	182.7	193.2	207.0	175.0	121.5	105.1	108.8	105.3	113.3	129.6		

Table 75 - Onion: index of consumption prices comaring with the previous month

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2007	23.7	9.0	-5.3	-0.3	3.4	-18.6	-14.6	-3.8	-5.8	-6.8	3.1	19.3
2008	19.4	0.9	-3.1	0.9	1.6	-2.3	4.0	-7.5	-8.2	-14.5	-16.9	4.7
2009	24.7	-4.8	-0.5	19.8	37.1	-10.0	-10.6	-3.1	-10.7	-0.6	34.9	5.8
2010	19.1	0.7	6.6	1.2	-4.8	-22.1	-7.5	-6.3	-3.9	13.7		

6 ESTIMATION OF FRUIT AND VEGETABLE EXPORTING VOLUMES

6.1 REASONS OF POSSIBLE MISTAKES OF EXPORT VOLUMES ESTIMATION

Estimation of fruit and vegetable export volumes is not a correct issue as practically it is impossible to mention certain statements and discourse. The reason is that many factors influence on fruit and vegetable export and part of them practically is not possible to foresee. Number of such factors and possible estimation scenarios are so many that we can not do other than figuring at assessments with certain scenario. Before going to export assessment, the supposed unpredictable factors should be defined.

- **Climate conditions**

Among all sectors of economy agriculture is the most sensitive to climatic conditions. It is more underlined in case of plant-growing. For the last 10-15 years climate cataclysms have great influence in Armenia especially on the quantities of fruit production. As fruit and vegetable growing is very centralized in Armenia, frostbites, high level precipitations, droughts can destroy about 80% of expected harvest. Apricot and peach are more sensitive to strict climate changes. Climate frostbtes of these fruits can reduce fruit exports from Armenia up to 3-4 times. In the last 10 years 3 such cases were recorded, once in 3 years. Though the specialist do not consider this phenomenon natural, there may be strict decline of particularly apricot production in upcoming years conditioned by unfavorable climatic conditions: according to precedent, for example in 2013. It was accepted like that in calculations. In case of other fruits we avoided making any climate predictions and considered the upcoming 3-4 years as favorable years.

- **Inflation level**

Inflation level has big and direct influence on fruit and vegetable prices. Increase of necessary inputs prices (fuel, auxiliary materials for care of orchards and plots) increases the cost price of fruits and vegetables and has negative influence on payable demand. Such phenomena inevitably increase also prices of fruits and vegetables. **Predictions for inflation level for upcoming years have been considered as impossible**. Development of international economy is not sustainable, especially in this post-crisis period. Thus, predictions of fruit and vegetable export can be based on the **inflation conventional number: 5% per annum**. This is an approximate avarage number for 2002-2010 period, but its daviation can be very big for the upcoming years.

- **Currency exchange rate**

From the product export viewpoint, the exchange rate is a very important factor. The money depreciation (inflation) can promote to the export quantities, and vice-versa, the money appreciation can have negative influence on exports. But considering the “unstable behaviour” of the exchange rate as well as that exchange rate is still used as deterrence tool for inflation (according to experts), it is very difficult to make stated predictions for money exchange rate. In export predictions of fruits and vegetables **we did not consider the possible variations of exchange rates, considering them conventionally constant.**

6.2 ESTIMATION OF FRUIT AND VEGETABLE EXPORT VOLUMES IN UPCOMING YEARS

To assess the export volumes of fruits and vegetables in upcoming years two approaches were applied: a) expert assessments, and b) econometric model’s results for export predictions. Each of the mentioned has certain disadvantages separately. The export assessments are based on subjective statements, that can differ from reality. This is confirmed also by the fact that for the same issue expert assessments differed from each other greatly. The main disadvantage of econometric models based

on historical data is the shortness of available data. It is not a secret that the figures of fruit production, i.e. plots, productivity, fruit quantity, were first published by fruit types by NSS in 2004. In predictions based on 6-7 years' history the standard deviation is quite big. Besides, analysis of historical data can not give the right insight as a new competitor has entered the market of fruit and vegetable exports in 2010, that will essentially change the volumes of exports. Though, expert assessements and results of econometric models in consideration of completion to one another give rather reliable estimates.

According to the specialists of agricultural and plant-growing fields the fruit and vegetable exports for upcoming yeras (2011-2014) will be presented mainly with fruits as for previous years. Moreover, the susteinable export will consist of 5 major fruits, i.e. grape, apricot, peach, plum, cherry. It is difficult to make any predicitons for apple as it has the most diversified consumption in domestic market (regarding the period) which does not create any big problems in apple comsumption. Besides, Aremenian apple is not so much popular in traditional markets of export (mostly Russia, as well as Ukraine, Belarus), as apricot and sometimes grapes are. Moreover, in the mentioned markets the competition for apple is bigger, than for apricot or grapes. This is the reason that in the last years apple has mostly been exported to Georgia in small quantities and by small traders.

Assessment of vegetables exports are even harder to do. Armenia does not have real experience in vegetable exports. Considering the volumes of previous years (see Table 17 - Volumes of Armenian vegetable exports by types, 2006-2010), certain vegetables had unstable export or they were exported in small quantities. Experts give a few reasons for this. The targeted vegetables can hardly sattisfy the domestic demand. There is not such excess to base the export policy on, i.e. ensure sustainability, stability and significant quantities. Only potato is produced in quantities exceeding the domestic demand, but the export difficulties actual for years have already stopped the increase in quantities of potato production. There was some progress only in 2010, when a number of producers managed to export their production to Iraq, Kazakhstan, Georgia. Here the most significant thing is that the potato producers did the export their production directly and not the entities specialized in export. According to them, the potato export has no perspectives in the markets they operate. In 2010 the all-time high quantity of tomato, cucumber and cabbage was exported from Armenia to Russia. It was conditioned by drought and lack of harvest in Russia as well as the stopping of vegetable supply from Turkey. Almost all the exporters agree that if in 2011 the import of Turkish products to Russia restarts, and if the year is favorable for Russia, we will have very little chances for vegetable exports to Russian market.

According to the experts, fruit exports in 2011-2014 will be conditioned by the following 3 factors:.

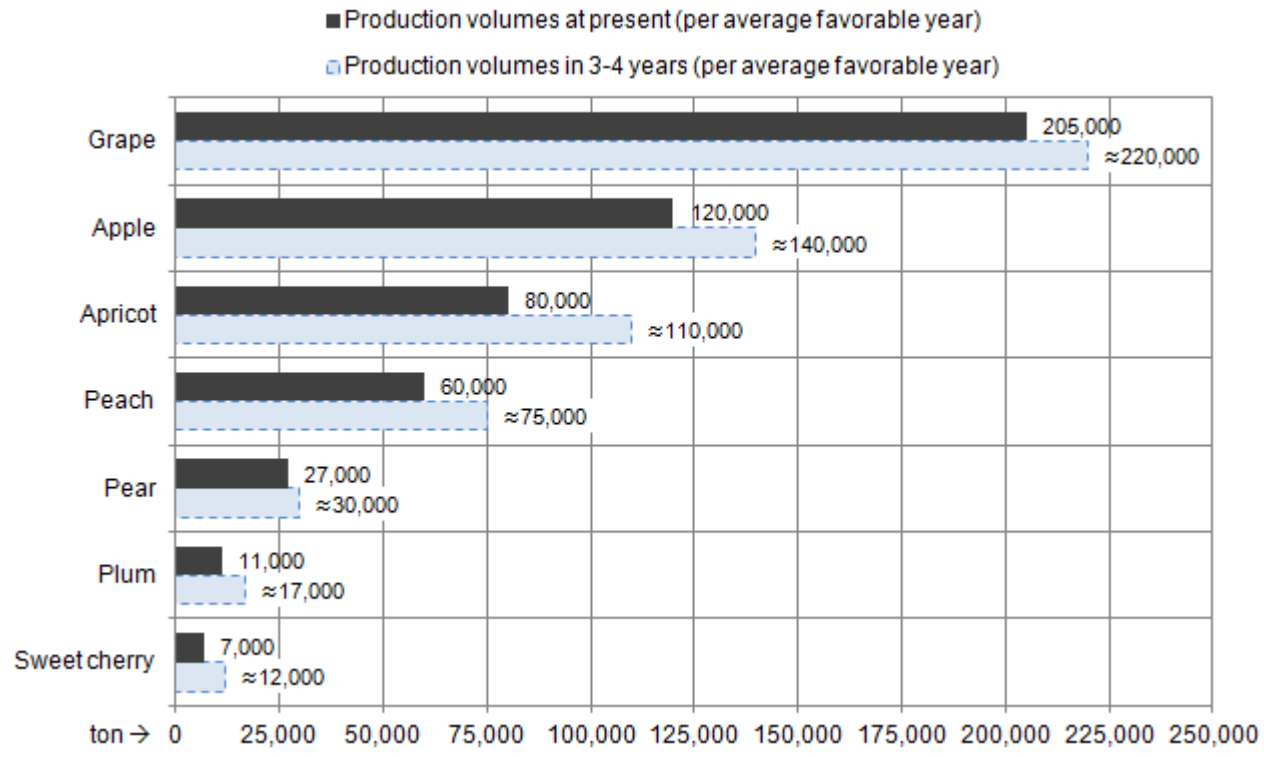
- Change of plots' and production quantity;
- Activities of "traditional" exporters;
- Implementation of the project of a new player in export market, i.e. "Spayka" company.

6.2.1 Factor of changes in plots' and production quanitiy

Major part of the exporters do agree that fruit exports are conditioned by their supply, i.e. production quantities. If the production quantities are small, export quantities will be small, too, as, for example, in case of peach, plum and cherry. In case of apricot, which has better export perspectives, during favorable years export quantities are big, during frostbite years they are small. This means that if **the fruit quantity is small, the exporters can not procure it in Armenia at the cost of domestic consumers' (population) share**.This is conditioned by the thing that both exporters and population aspire to the same product` high-qualitative fruits, and the part of population is also eager to pay high prices for fruits, as the exporters do. **Thus, exporters are not considered as unique conusmers for producers.** Thus, the experts think that **fruit export quantities can increase in unpcoming years only in case of increase in fruit production**.

What are the predicitions of experts regarding fruit production quantities in upcoming years? It is actual that plots of 5 fruits with export perspective, having demand in external market, are currently being expanded. And the major stimulus of their expansion is the export opportunity. This regards grape, apricot, peach, plum and cherry. Tendency of plot expansion of these fruits is notable for the last 10 years. But fruits have different tendencies. Plots of table sort grapes increase, but slower than those of apricot. Considering the dynamics of new created orchards and the demolition of the old ones or those with low productivity, actual but not registered orchards' big share, as well as avarage figures of productivity, the exporters think that fruit prodcution quantities in 2011-2014 will be as follows:

Chart 52 – Estimation of fruit and vegetable production volumes in upcoming 3-4 years



Source: Expert assessment

The data in Chart 52 is based on the opinion that 2011-2014 will be favorable years for harvest. This data shows that the actual and potential exported 5 fruits in 2011-2014 will record favorable years for harvest with about 71 thousand tones or with annual avarage of 17.7 thousand tones. This means that the most important factor for export increase, i.e. supply increase is ensured.

6.2.2 Factor of operation volumes of "traditional" exporters

In the upcoming years the operation volumes of the 1st group of exporters (actual exporters, that are not shown traditionally) or, so called, "traditional" exporters will continue to have important role in fruit export quantities. According to experts, "traditional" exporters can hardly record an intensive growth in exports. This means that if new exporters do not appear in the field, there will be no changes in export volumes by the actual exporters. This assessment of experts is based on the following statements:

- Activities of "traditional" exporters are limited according to their financial resources. They use certain amount of money for exports that is not being changed by years. Benefits of "traditional" exporters are directed to improvement of their own lifestyle and not to investments in business.

- Even the most experienced "traditional" exporters during 10-15 years of their activities have not created the minimum necessary basis for their activities, i.e. transport means, office, organizational appearance.
- The activities of "traditional" exporters are similar, directed most of all to Russian open-air markets. None of them works with trade networks. Moreover, they have very limited chances to do that as they have problems of quality assurance.

In conditions of actual activities of "traditional" exporters the export volumes can increase though very slowly, that in 3-4 years' dynamics can seem stable. This is confirmed by assessments of experts as well as the results of historical data (2002-2010) analysis (see Table 76 and Table 77; it is supposed that 2013 will be unfavorable year for apricot (there will be 80% of harvest loss), and for the other 4 fruits it will be avarage favorable year):

Table 76 - Expert assessment of fruit exports by "traditional" exporters

Fruits	2011	2012	2013	2014
Grape	**Fruits**	**Fruits**	2,888	2,951
Apricot	9,062	9,350	3,267	10,117
Peach	475	501	521	533
Plum	424	552	635	**Fruits**
Cherry	349	422	507	566
Total	**13,071**	**13,651**	**7,818**	**14,827**

Source: Expert assessment

Table 77 - Expert assessment of fruit exports by analysis of historical data

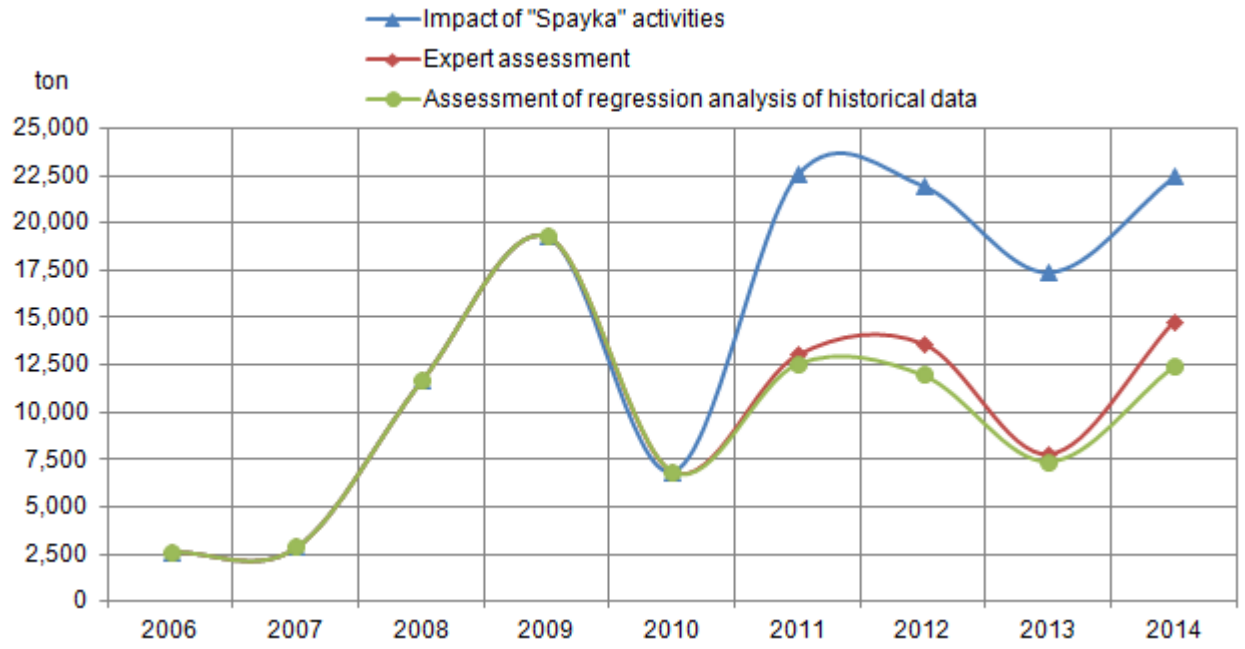
Fruits	2011	2012	2013	2014
Grape	3,596	2,827	2,890	2,953
Apricot	7,747	7,874	3,189	8,128
Peach	517	529	542	554
Plum	350	361	397	411
Cherry	379	392	406	418
Total	**12,589**	**11,983**	**7,424**	**12,464**

The presented data of fruit export can be used only in conclusions for "traditional" exporters. In case of Armenian fruit export this data is not complete as a new competitor has appeared in the market of fruits and vegetables since 2010, which tends to export alone as much as all other "traditional" exporters together.

6.2.3 Factor of "Spayka"

As it was already mentioned, in 2010 "Spayka" company has entered the market of fruit and vegetable exports. The latter is unique, since for the first time serious investments are being done in fruit and vegetable export infrastructures, creation of large park of trucks. Other than "traditional" exporters, "Spayka" is not concentrated only on open-air Russian markets, but it makes serious efforts to enter large trade cycles. Large investments and active marketing activities done allows hoping that "Spayka" will be able to achieve their expected export quantities. According to company's officers, "Spayka" intends to export at least 10 thousand tones of fruits and vegetables per annum. In 2010 the company had the same intention though it was not realized because of small quantities of harvest. If the upcoming years are favorable for harvest "Spayka" will certainly be able to assure that indicator, which will double the quantities of Armenian fruit and vegetable exports.

Chart 53 – Assessment of Armenian fruit and vegetable export quantities in 2011-2014



Source: Expert assessment

Thus, according to the developments in fruit and vegetable market it is predicted that in **2011-2014 fruit and vegetable export volumes will reach up to 22-23 thousand tones from those 10 thousand tones of recent years**. This is a significant growth for small this period and it is supposed that it should have its influence on fruit and vegetable prices in domestic market. In 2010 similar case was recorded in Armenia, when the price of mutton increased 2-2.5 times because of strict increase in sheep exports. The predictions on fruit and vegetable prices are presented in the next chapter.

6.3 Possible Impact of Export Volumes Increase on Local Market Prices

As it was already mentioned, many factors influence the fruit and vegetable prices, part of whcih is not easy to assess. If we exclude the influence of those factors or if we consider them constant for 2011-2014, the **main factor influencing fruit prices will be the change of market balance**. In this context we should understand that the “architects” of Free Exonomic Zone on behalf of the RA Ministry of Economy and other interested parties, are more anxious of the possible **increase of fruit retail sales prices** that will have its negative influence on consumption volumes by population, which, in its turn, will become serious problem in fruit production development. Such scenario directly faces to interests of thousands of farmers in charge with fruit production. By saying fruit market balance, we mean the quantitty of fruits that has to be consumed by population. This is calculated with the following formula:

Market balance = Product quantity - Export - Processing + Import

In the Section 5.1.4 (“Consumption by population”, page 77) we have already discussed the issue. The conclusion was that the main components of market balance formation are production and export quantities. The quantities of processing and import have almost no influence as:

- The processors’ demand of exported fruits is only for low quality (i.e. very cheap) products that is gathered from wastrel of harvest (scattered under the trees, not having good view of product, not having chances of consumption because of big excess). This is not very big quantity (for all fruits about 10 thousand tones per annum for the last 10 years) and it also depands on production volumes: if the productioon is large, the wastrel is also big and vice versa.

- The import quantities of products produced and exported from Armenia are very small and are intended only for consumption in pre-harvest period (it is used to be 1 month). Due to their small quantities and high prices they can not have positive influence on market balance.

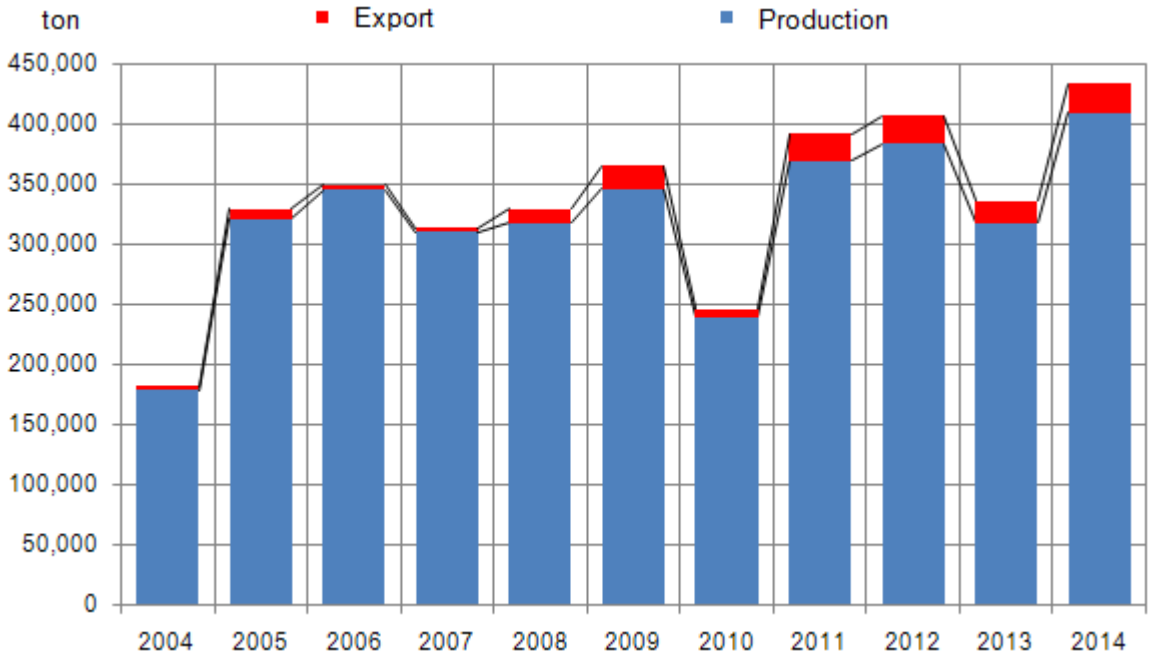
Thus, in upcoming years the main factors influencing retail prices of fruits will be the production volumes and export, including:

- The more the production quantities are, the bigger market balance will be that can result decrease in fruit prices;
- The more are the export quantities, the less market balance will be that can result increase in fruit prices.

This means that in order not to create preconditions of high prices in domestic market, the market balance should not be reduced, at least. This also means that in upcoming years the production quantities' increase should be equal or should exceed the export quantities' increase.

To make any conclusions a correlation should be done with fruit production and export quantities' assessments in 2011-2014. It is presented in Picture 54. The calculations were based on total volume of 5 exported fruits (grape, apricot, peach, plum, cherry), and it was supposed that 2013 will be unfavorable harvest year for apricot that has the most share in exports.

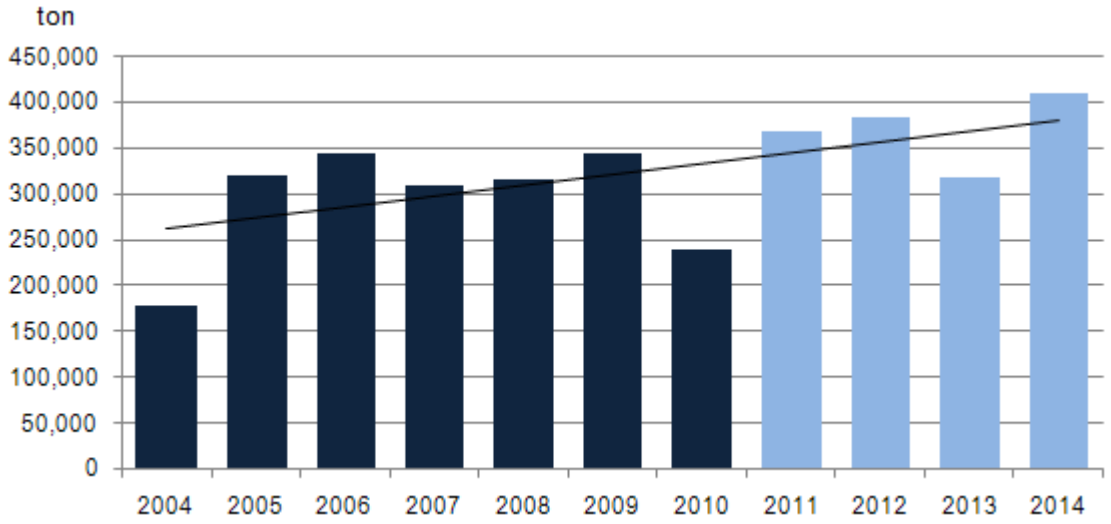
Chart 54 - Correlation of supposed fruit production and export quantities in Armenia in 2011-2014



Source: Expert evaluation

Picture 54 shows that export quantities will be doubled with entrance of "Spayka" company, that will result 5.7% of gross production of 5 fruits in 2011-2014 instead of 2.6% of previous years. But the market balance will not decrease in result, but will increase (see Picture 55), as the growth of production quantitiy with absolute number exceeds the export quantities' growth.

Chart 55 - Market balance dynamics of 5 exported fruits in 2004-2014



The data with absolute numbers in presented charts means that in 2011-2014 the volumes of 5 fruit types will increase by 71,000 tons, while export volumes will increase by 40,000 tons. Even if we consider that not all 71,000 tones will be due for export (high-qualitative or transportable), there will be more quantities qualified for exports than the demand of exporters is. The conclusion is **that in 2011-2014 there will not be preconditions of increase in fruit prices because of increase in export quantities**.

7 SUMMARY

7.1 CONCLUSIONS

The current study of possible exporting volumes of Armenian fruits and vegetable is comprehensive and allows to make conclusions which fully characterize the situation of Armenin fruits and vegetables for exports.

1. **The main factors** on which the volumes of Armenian fruit and vegetable exports depend are **production or supply volumes**. 14 fruit and vegetable types included in this study, which are produced in Armenia by larger volumes and all together comprise correspondingly 88% and 95% of fruits and vegetables produced in Armenia. Only 5 (grape, apricot, apple, potato, tomato) out of those 14 products are produced in quantities exceeding or satisfying the domestic consupmtion demand. Because of small production quantities Armenia can not have significant export quantities. This is confirmed by the fact that in the last 10 years the average fruit exports was only 2% and in the most favorable year 5% (in 2009). In case of vegetable these figures are far low.

2. **The major problems having negative influence on fruit and vegetable production quantities are the growing methods and technologies used by the producers**. This issue is rather urgent in case of apricot which is currently and in upcoming years will still be the most exported product. This regards tree sizes and methods of harvest. In Armenia the apricot trees grow up to 6-7 meters that makes it difficult the harvest. In result, about 10% of harvest becomes wastrel because of scattering or not being gathered.

3. Not having enough production quantities exceeding domestic demand, Armenia can not be considered a reliable supplyer in external market, yet. Currently, we are not in condition to ensure the demand of the consumers, i.e. sustainability of quantities, stability of supplies, quality assurance. Currently and in upcoming 3-4 years Armenia can be **only seasonal supplier** in external markets. This weakens essentially the competitiveness of our country.

4. Fruit and vegetable exports from Armenia are conducted by entities whose business culture can not be considered as exemplary (except “Spayka”). Their activities do not have organizational manner, they do not have offices and do not market their product. Activities of exporters are notable with **low level of diversification**: they all are concentrated on one market (Russia) and they realize their product in only one way (by their own means and into open-air wholesale markets). Consentraiting on the same country’s markets and not planning and supplying the products in common way, the Armenian exporters are their own competitors in external markets.

5. 5 fruits (grape, apricot, peach, plum, cherry) mainly represent more or less stable exports from Armenia. But the **exports are not diversified** as well. 85-90% of export volumes belong to grape and apricot. If the grape supply is relatively stable by years, in case of apricot it is not the same. It is very sensitive to climae changes that during the last 10 years 3 times it resulted about 80% of harvest loss. This was followed by strict decrease in exports. The only factor that protects position of Armenian fruits in Russian market is the unique reputation of apricot and partially grape among consumers. But this is not the merit of nowadays exporters, but the stereotypes coming from still Soviet Union times.

6. Compared with other countries exporting fruits and vegetables Armenia has one more problem: **limited opportunities of transportation**. The exporters have only one access to external market, i.e. Upper Lars checkpoint on Russian-Georgian border. This way can not be considered much supported because of Russain-Georgian strained relations. In 2010 summer, during the

most active export season, it was closed twice. Here it is important the role of RA Government that has to ensure the smooth operation of the checkpoint. Only stable operating road passage can ensure the sustainability and stability of exports.

7. Instead, the Armenian fruits and vegetables have stable position in domestic market. In an average favorable year there is sufficient supply for demand and accessible prices. Consumers' predilections are also for Armenian fruits and vegetables. Form this viewpoint, **import of fruits and vegetables growing also in Armenia does not have any perspectives as a business**. Importers of apricot, peach, apple, early-grown potato, tomato, cucumber, pepper and eggplant, are not engaged only in this. They are specialized in imports of large varieties of products and fruits and vegetables. Import is done in very small quantities only for period of one month before harvest in Armenia (cases of apricot, peach, potato, eggplant). Some products are imported to assure varieties (apple, peach, pepper), but their quantities are also small. So, import of products growing locally can not have any role in market development today and in near future.

8. Fruit and vegetable prices have been defined according to supply (production volumes) up to today. The exporters did not dictate their prices. The thing is that exporters are not exclusive consumers for producers. Certainly, they buy at higher prices, directly from producers and in wholesale quantities. But there is a whole army of intermediaries that are specialized in taking the products from producers to domestic market and reselling it to population. They also buy the same product and sometimes at higher prices. That is why; the producers prefer to consume their products in domestic markets. So, in upcoming years if new opportunities of fruit and vegetable export appear, the exporters can not procure necessary quantities due to high prices if there is not corresponding supply. 5 fruits that have export experience are supposed to be increased in production with about 71 thousand tones in 2011-2014. It is expected that at the same time export quantities will increase with about 40 thousand tones. These trends can not decrease domestic market consumption balance and cause increase in fruit and vegetable prices.

7.2 Recommendations Addressed to Exporting Volumes

The data presented in the previous chapters are in reality the summary of problems and challenges hindering the increase of Armenian fruit and vegetable export volumes. Thus, resolution of these problems will result first of all in increase of export opportunities and cause expansion of export volumes in future. We and sector experts see these resolutions in the following steps:

1. The exports should be predictable for producers (farmers) for a long-term period. Farmers will be directed to creation of new orchards and expansion of production volumes only if they are sure that fruit and vegetable production is countinuous, uninterrupted, developing and perspective process. For this, it should be evident for farmers the activities of the state (RA Government) and exporters to promote the growth of export volumes. From this viewpoint, it is very important highlighting in mass media the creation of Free Economic Zone (FEZ), implementation of "Spayka" investment project, new orchards' creation by "Tamara-Fruit" and other investors, as well as organizing study visits to FEZ territory and to storing and sorting locations of "Spayka".

2. Agriculture development projects should focus on (allocate resources) events directly relating to expansion of fruit and vegetable export volumes. These events include:
   - Improvement or creation of agricultural infrastructures, including irrigation system, with purpose of creating conditions for new lands' cultivation, expansion of anti-hail stations' network (cover) to struggle against hails.
   - Import of frost-hardy fruit sorts to struggle against early spring frosts.

- In order to increase productivity and to reduce wastrel during harvest, implementation of new technologies for fruit and vegetable growing, which is possible to realize in different geographical zones by realizing pilot projects on different fruits and vegetables. This can be realized by the RA Ministry of Agriculture, who has had success with similar projects, such as productivity growth of potato and other vegetables, currently a similar project is being realized for wheat.

3. Marketing activities should be implemented by the State to strengthen the frame of “Armenian” fruits in relatively achieved markets, i.e. Russia, Ukraine, Belarus. Recognitions like “Armenian apricot” and “Armenian grape” (recognition of Armenian grape is due to the brand of “Armenian cognac”) should be characteristic also for peach, plum and cherry.

4. The state should be in cotact with “traditional” exporters, recognize them, understand their methods of activities, and that is the most important, it should be done without making any inconvenience to them. The entry of “Spayka” in fruit and vegetable exports sector creates some challenges for “traditional” exporters. We understood that currently and in upcoming years the most important hindrance for export will be small quantities of supply. That is why it is predictable that there may be conflict of interests and competition between “traditional” exporters and “Spayka” for procurement of high-quality products for exports. It is not desirable that in this conflict “traditional” exporters lose and leave the market. The danger of “Spayka”’s monopolization in fruit and vegetabke sector will directly damage the welfare of thousands of farms and will create new social pressure. The state should already start to take measures for “traditional” exporters’ rights protection not to let creation of a new monopoly in Armenia.

5. Nowadays, in Armenia, creation of fruit and vegetable collectionpoints is being intensively realized. Leading role in this has “Millenium Challenge” Fund - Armenia. It is supposed that these collection points should be a link between fruit and vegetable producers and the market. Such concept has the RA Ministry of Economy, which aims at creating such points in the framework of fruit and vegetable export promotion project. Certainly, this is a very important infrastructure in Armenia that is distinguished with farms of small sizes. Though the face to face meetings and discussions with farmers give us the impression that there is misunderstanding for intermediary collection points especially among ”traditional” exporters. We encourage responsibles of the sector to pay attention to this issue and discuss it with exporters.

6. In its foreign policy the State should give much importance to ensure the smooth operation of transportation. Even short-term interruption of export passways has inverse influence on efficiency of export promotion projects.

8 APPENDIX

8.1 INFORMATIN SOURCES

8.1.1 Meetengs and Interviews

	Name	Position
1.	Karine Minasyan	▶ RA Ministry of Economy, Deputy Minister
2.	Hayk Mirzoyan	▶ RA Ministry of Economy, Head of Department of Industry Policy
3.	Vardan Sahakyan	▶ Free Economic Zone, Project Manager
4.	Jaap de Mol	▶ PUM Senior Expert (Netherlands)
5.	Lusine Tumyan	▶ ADA, Dirctor of Export Promotion Department
6.	Marcello Vende	▶ "Armenia International Airports" CJSC, General Manager
7.	Samvel Galstyan	▶ RA Minstry of Agriculture, Deputy Minister
8.	Tigran Petrosyan	▶ RA Minstry of Agriculture, Deputy Minister
9.	Gagik Manucharyan	▶ RA Minstry of Agriculture, Head of Plant Growing Department
10.	Karine Yesayan	▶ RA Minstry of Agriculture, Head of Horticulture Development Division
11.	Vram Gyulzadyan	▶ Head of State Inspectorate on Plant Quarantine
12.	Tigran Virabyan	▶ Ararat Regional Administration, Head of Agricultural Department
13.	Arthur Ayvazyan	▶ Armavir Regional Administration, Head of Agricultural Department
14.	Jura Azatyan	▶ Aragatsotn Regional Administration, Head of Agricultural Department
15.	Ara Karapetyan	▶ MCA-Armenia, Water to Market Component, Marketing and Food Safety Specialist
16.	Gayane Sargsyan	▶ "Scientific Center of vegetables and technical crops" SNCO, Director
17.	Karen Baghdasaryan	▶ "Spayka" LLC, Head of Project Management Division
18.	Pavel Maghakyan	▶ "Solidarm" LLC, Director
19.	Voskan Markosyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Arevik)
20.	Mahar (Sayid) Mhoyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Arevik)
21.	Vahram Sargsyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Mrgashat)
22.	Bagrat Mkrtchyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Arevik)
23.	Taron Yeremyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Arevik)
24.	Armen Sargsyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Armavir)
25.	Ruben Hovhannisyan	▶ Fruit/vegetable Exporter (Armavir Marz, v. Armavir)
26.	Yura Hakobyan	▶ Fruit/vegetable Exporter (Ararat Marz, v. Qaghtsrashen)
27.	Poghos Gevorgyan	▶ "Pak Grunt" NGO, Director
28.	Sandro Abovyan	▶ "Dried Fruit Producers' Association" NGO, President
29.	Onik Demirchyan	▶ "Yerevan City" Supermarkets, Procurement Responsible
30.	Artavazd Hakobyan	▶ "Star" Supermarkets, Procurement Responsible
31.	Anushavan Aghagulyan	▶ "Fresh" Supermarkets, Procurement Responsible

8.1.2 Publications

1. "Total Sum of 2010 Census of Area Under Crop", NSS, 2010
2. "Area Under Agricultural Crops and Gross Harvest", NSS, 2006-2009
3. "Foreign Trade of the Republic of Armenia", NSS, 2006-2009

4. "Armenian statistics yearbook", NSS, 2009
5. "Armenian socio-economic situation", NSS, 2006-2010
6. “Realization (Use) of Agricultural Product by Peasant Farms”, NSS, 2006-2009
7. “Food security and poverty”, NSS, 2006-2010
8. “Consumer price indexes (prices) in the Republic of Armenia”, NSS, 2007-2010
9. “Marzes of the Republic of Armenia in figures, 2000-2004”, NSS, 2005
10. “Agrolratu” Weekly