

## SOME CONSIDERATIONS REGARDING THE ROMANIAN VEGETABLE SECTOR AFTER ACCESSION TO THE EUROPEAN UNION

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### **Abstract**

*Vegetable growing as an important branch of horticulture ensure agricultural food products with relatively low content in calories, nutrient rich and contain fibre in order to promote health and well-being. The aim of this paper is to provide for the scientists, researchers, and farmers a detailed picture for Romanian vegetables sector in order to increase the performance of vegetables holdings. In order to improve vegetable yield and quality, and the competitiveness of vegetables farms, investments in farms and attraction of funds represent important measures for management of vegetable production. Romania has a strong tradition of family farms. In Romania is an important potential for the production of vegetables in the field, and organic vegetables production, due mainly to the high natural fertility of soils, traditions for vegetables growing, and the diversity of the climate. In the field of agriculture, new institutions have been set up and many financial instruments have been introduced for the development of the agricultural sector and for the improvement of the conditions in the rural areas. Currently, agriculture is supported by payment instruments from the national budget and European funds. In recent years, the amount of vegetables and the value of exports have an upward trend, while the quantity and value of vegetable imports has a downward trend.*

*Keywords: agricultural policies, Common Agricultural Policy, European funds, Romania, vegetable sector.*

### **1. INTRODUCTION**

Vegetable production is one of the most important horticultural industries in worldwide. Numerous studies reported the medical and nutritional benefits from consuming vegetables. Such of research studies have been reported as beneficial to prevent cardiovascular risk, type II diabetes, obesity and others diseases. Vegetables are good sources of vitamins, minerals, fiber, and antioxidants.

Romania has a strong tradition of family farms. This is one of the reasons for too many small vegetables farms. Romania's accession to the European Union has overcome many transformations in Romanian society. The adoption of European legislation has contributed to major changes in the socio-economic and institutional environment. Romania's agricultural policy is aligned with European standards through the adoption of Community legislation and the implementation of the requirements of the Common Agricultural Policy (CAP).

The agricultural policy and strategies are mainly carried out by the Ministry of Agriculture and Rural Development of Romania. The institutional framework for agriculture is generally provided by the Romanian Agency for Payments and Intervention in Agriculture, the County Directions of Agriculture and Agency for Rural Investment Financing. Agency for Payments and Intervention in Agriculture ensure the payment of agricultural subsidies and the implementation of some measures

for the agricultural market through European Agricultural Fund for Guarantee (EAFG) and European Agricultural Fund for Rural Development (EAFRD). Agency for Payments and Intervention in Agriculture finance projects for vegetables sectors and a better life in rural areas through EAFRD.

The main financing instrument and strategy for agriculture and rural development is representing by Common Agricultural Policy of European Union. Currently, the CAP 2014 - 2020 is organized by a new European regulation, Regulation (EU) No 1307/2013. Funds assigned by this policy come out in part from the central European budget and in part from National or Regional budgets (Falavigna et al., 2013).

Some authors investigate how the Common Agricultural Policy and various types of subsidies affected the technical efficiency and productivity change of farms in the European Union (Latruffe and Desjeux, 2016; Blomquist and Nordin, 2017). Minviel and De Witte (2017) assess the influence of public subsidies on farm technical efficiency. They found that public subsidies influence negatively the conditional technical efficiency of French farms and these financial instruments tend to reduce farm production due mainly decoupled and coupled payments. However, in most developed countries, public subsidies constitute the main agricultural policy instrument and represent a large part of farmers' income. For instance, almost whole budget of the Common Agricultural Policy, which is about 50 billion euros, is used by agricultural companies and other beneficiaries. In addition, about one-half of the net value added of farms in the EU countries is due to public subsidies European Commission (Minviel and De Witte, 2017). Blomquist and Nordin (2017) evaluate the impact of agricultural subsidies (CAP) on employment outside the agricultural sector. Besides the direct impact on agriculture, the subsidies may stimulate the rural economy in general, and increase employment in sectors other than agriculture.

Sustainable development of protected crops is considered a real alternative to farming for Romania. In Romania can be used for crop protection the following systems: mulch, temporary protection, low tunnels, solarium sand greenhouses (Scurtu et al., 2016). Scurtu et al. (2016) reported that policy for vegetables sector must take into account the following aspect: climate change globally and regionally, the actual situation of irrigation systems and methods, the current organization and economic particularities of vegetables farmers. The aim of this paper is to provide for the scientists, researchers, and farmers a detailed picture for Romanian vegetables sector in order to increase the performance of vegetables holdings.

## 2. MATERIALS AND METHODS

In this paper, we involved a documentary synthesis, analysis and interpretation of statistical data collected from TEMPO-online database from Romanian National Institute of Statistics (RNIS), EUROSTAT, FAOSTAT, IFOAM, and the official data from Ministry of Agriculture and Rural Development (Romania). Available information come from institutional sources for agricultural statistics and allowed authors to create a detailed picture for the vegetable sector, mainly after accession to European Union. Information is analyzed mainly by graphical presentation for the vegetables area under cultivation (expressed in hectares), the quantity harvested (expressed in thousands tonnes), the yield (expressed in tonnes per hectare), export and quantity, export and import value, in 2007 – 2016, period when Romania became a member of the European Union (EU).

### 3. RESULTS AND DISCUSSIONS

In recent years, consumption of vegetables has rapidly increased due to their high nutritional value and positive health effects. The World Health Organization recommends a minimum consumption of 400 g of fruit and vegetables per day, excluding potatoes and other starchy tubers, to help prevent chronic disease and nutritional deficiencies. However, vegetable consumption in Europe, the US, and across the world remains below World Health Organization recommendations. In Europe, consumption is around only 220 g per person per day for adults, which is half the daily recommended quantity (Rekhy and McConchie, 2014).

The statistical data show an upward trend of the Romanian vegetable sector, together with an increase in consumption, which is expected to reach 190 kg / capita / year in 2020. It is estimated that this consumption of vegetables will be ensured in a very big percent from Romanian vegetable production.

The European Union supports the vegetables sector through the Common Market Organisation (CMO) for Fruit and Vegetable. In 2008, only one producer organization and 4 producer groups were accredited in accordance with European criteria. Currently, according to the date of Ministry of Agriculture and Rural Development from Romania, there are 24 producer organizations recognized under the Common Market Organisation Regulation (*Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007*). These associative forms in the fruit and vegetable sector were set up at the initiative of producers to take advantage of the CMO. Producer organizations in the fruit and vegetables sector are important players in the food supply chain.

According with data presented by Romanian Agency for Payments and Intervention in Agriculture, the financial support for financing the operational programs of the producer organizations in the fruit and vegetable sector was EUR 0.87 million in 2016. The financial support to producer groups in the fruit and vegetable sector was EUR 1.11 million in 2016.

The vegetable sector is a key sector in EU agriculture, weighting 13.6 % of EU agricultural output. The Netherlands (17.8 %), Spain (16.7 %) and Italy (16.5 %) were the most important producers, in terms of economic value, accounting for over 50 % of vegetable output in 2015 (EUROSTAT - Agriculture, forestry and fishery statistics, 2016).

According to the EUROSTAT data (2013) farm structure survey, almost 920 000 holdings grew fresh vegetables, which was 12.4 % of all European farms with an arable area. In Romania are 22.1 % of these vegetable holdings. Nearly half (49.4 %) of those holdings were in just three countries: Romania (22.1 %), Poland (15.4 %) and Spain (11.9 %) (figure 1).

The average area in the EU devoted to fresh vegetables per holding was 1.7 ha. According to the most recent data, Romania is much below the EU average with 0.3 ha fresh vegetables per holding, one of the smallest average in the European Union (EUROSTAT, 2013). 7.2 % of all European fresh vegetables were grown on land given over to cultivation under glass or other high accessible cover. In Romania, in last ten years the protected cultivation area of vegetables is increasing from 2170 ha in 2007 to 4155 ha in 2016 (figure 2).

In Romania, the production of greenhouse vegetables has fallen dramatically over the past 30 years (1843 hectares in 1990, 1403 hectares in 2000). In 2007, greenhouse surfaces occupied 536 hectares, while after ten years the vegetables production in greenhouse decreased to 316 hectares in 2016 (figure 3). One of the causes of the decline in vegetable crops in greenhouses is due to higher utilities and construction costs.

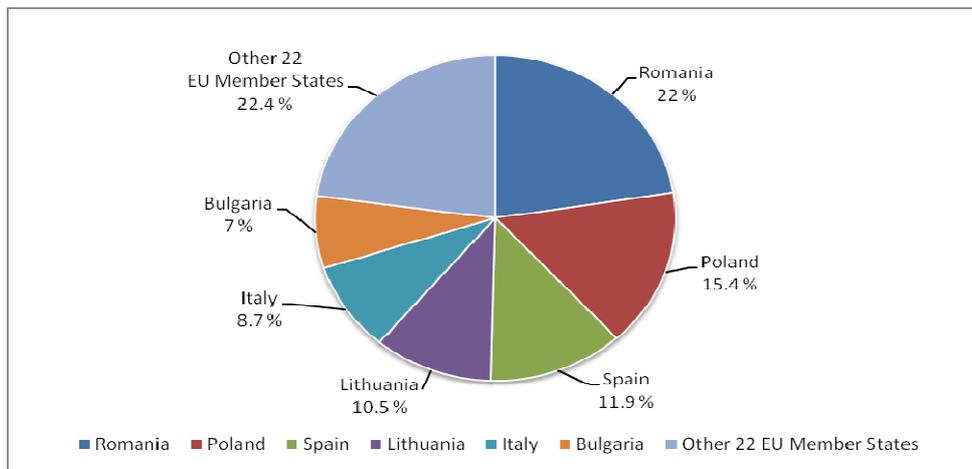


Figure 1. Fresh vegetable holdings by EU Member States, 2013 (EUROSTAT, 2016)

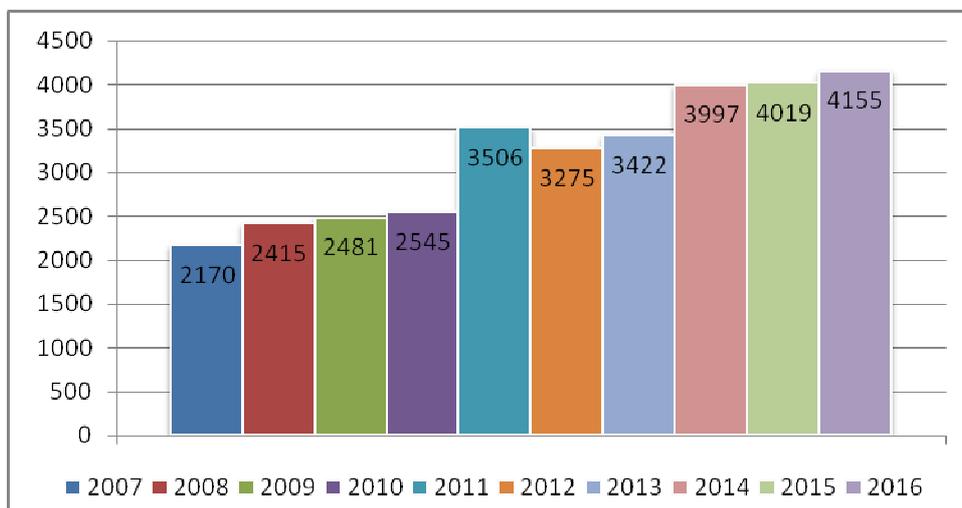


Figure 2. Protected cultivation of vegetables (ha). Source: RNIS, TEMPO Online Database

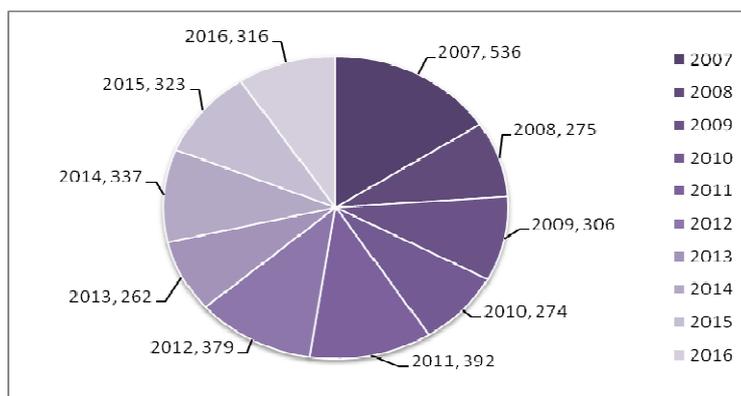


Figure 3. Greenhouse vegetables area, 2007 - 2016 (ha). Source: RNIS, TEMPO Online Database

In 2015, almost 2.2 million hectares of land in the EU was used to produce vegetables for fresh consumption and for processing. This amounts to 1.9 % of all EU arable land. Almost 7.1% of the vegetable area was located in Romania (figure 4). In Romania, total vegetable area in 1990 occupied 216 009 hectares and in 2000 occupied 234 019 ha. The total vegetables area increased

after 2000 years and in period after accession to the EU registered the maximum level in 2008. In recent years the vegetable area has decreased slightly in Romania (figure 5). In Romania the total agricultural area is 14 630 072 hectares and at the level of 2016 year the vegetable area occupied only 1.55%. This area is not enough to ensure the vegetable consumption for a country with 19.7 million inhabitants.

According to the data presented by RNIS (TEMPO Online Database), in 1990 the total production of vegetables was 2 357 461 tonnes and in 2000 the vegetables production registered 2 527 776 tonnes. It can be seen both the vegetable surface and the vegetable production had an ascending trend. In the period of Romanian integration into the European Union, 2011 was the most productive for vegetable crops, registering 4.17 million tons (figure 6).

In the last 10 years, in Romania, the production of vegetables in protected areas had an upward trend (figure 7). In fact, the protected surface of vegetable crops has increased in recent years. Romanian producers are interested in selling fresh vegetables on the market as early as possible.

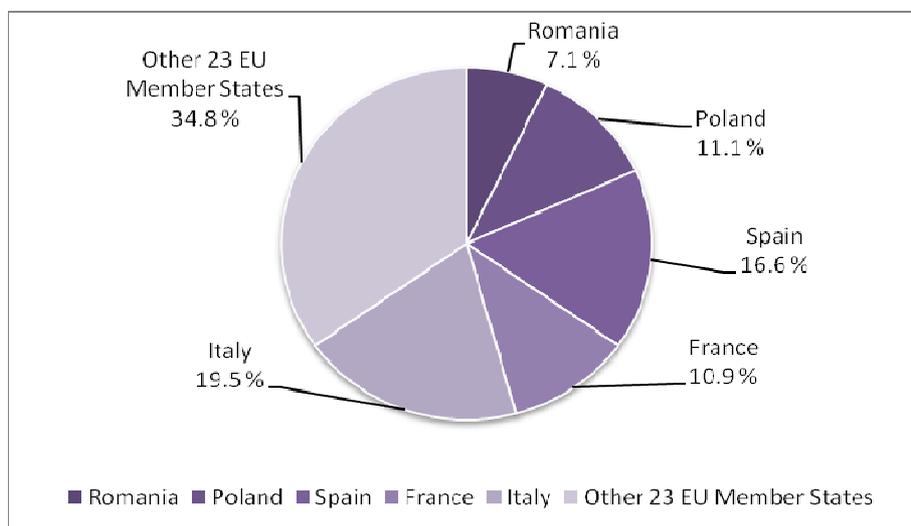


Figure 4. Fresh vegetable area by EU Member States, 2015 (EUROSTAT, 2016)

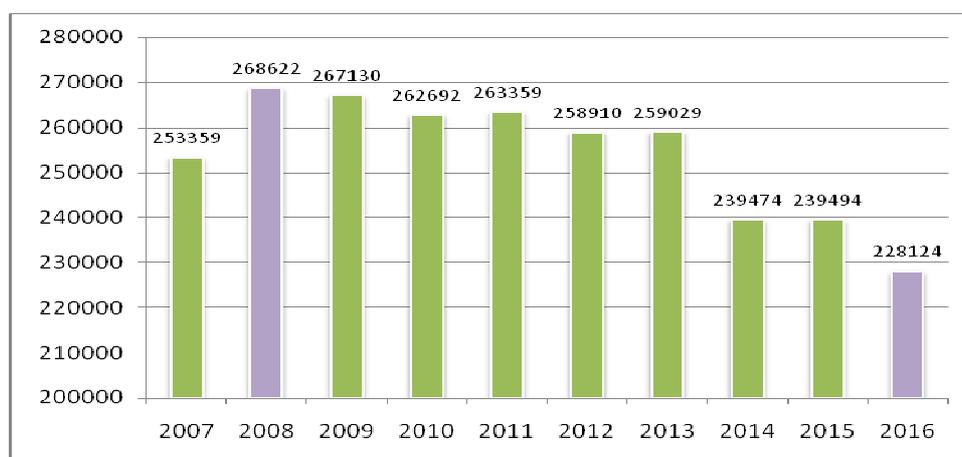


Figure 5. Evolution of total vegetable area (ha), 2007 – 2016. Source: (RNIS, TEMPO Online Database)

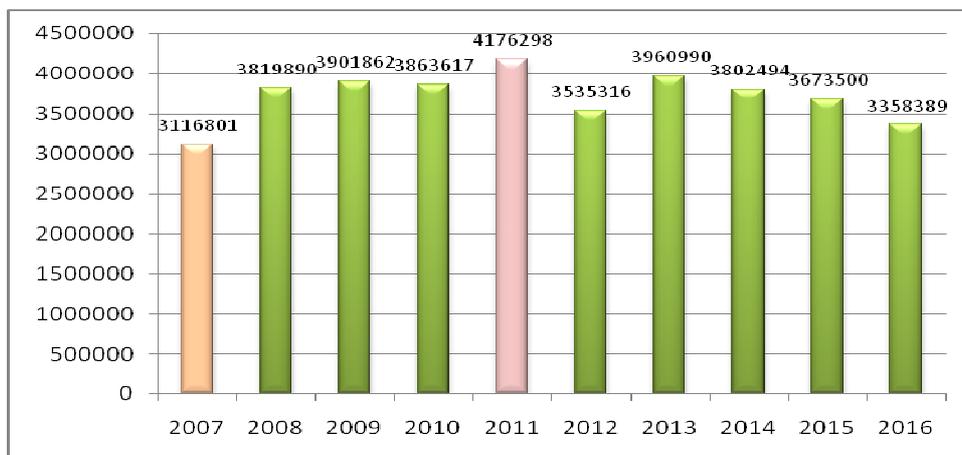


Figure 6. Vegetables production in Romania (tonnes), 2007 – 2016. Source: (RNIS, TEMPO Online Database)

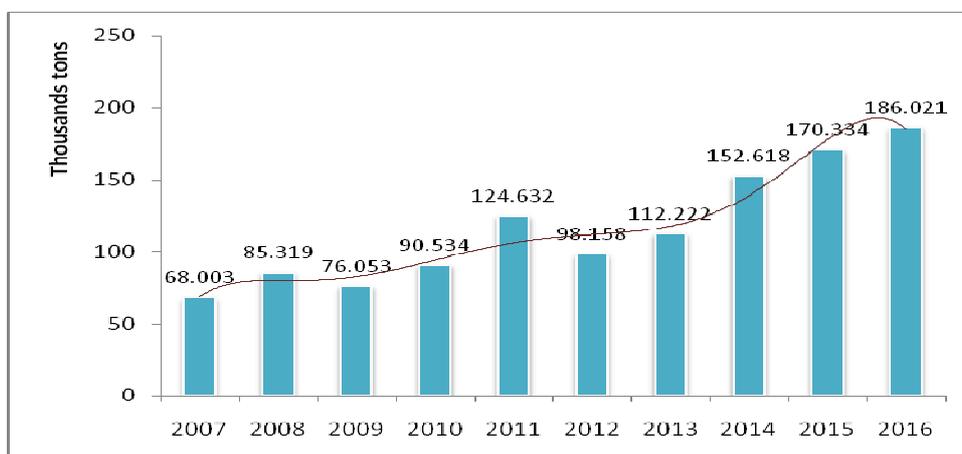


Figure 7. Protected cultivation of vegetables. 2007 – 2016. Source: (RNIS, TEMPO Online Database)

The main vegetables species grown in EU were: tomatoes, peppers, eggplants, courgettes, cucumbers, carrots, radishes, onions, garlic, lettuce, fresh pulses (mainly peas and beans) and brassicas (cabbages, cauliflowers and broccoli). In EU, among individual vegetable crops, tomatoes occupied the largest area, the same trend can be seen in Romania (9.5 % from total area of tomatoes). By contrast, in Romania, tomato production accounted for just 2.6 % of all European tomato production. The main vegetables species grown in EU are: tomatoes, cabbages, onions, peppers, and eggplants (table 1, table 2). The surfaces for cabbages and peppers crops seem to be constant, while a surface of eggplants crops is increasing during 2007 – 2016. The main vegetables species in Romania represented by tomatoes, cabbage, onions, peppers and eggplants occupied 63.3% from total vegetables area and 67.3% from total vegetables production (RNIS, 2016). Tomato production per hectare ranged between 13.76 tones for 2012 and 16.10 tones for 2014. The best yields for cabbage crops were registered in 2014 and for eggplants in 2009 (table 3). According with the date of National Institute for Statistics, the most important vegetable regions in Romania are the South-Muntenia Region, the South-East Region and the North-East Region.

**Table 1. Vegetables area for main species in Romania (ha), 2007 – 2016. Source: RNIS, TEMPO Online Database**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Tomatoes	46045	51498	49080	49767	51754	49655	48369	43857	44258	41000
Cabbage	46124	49015	48346	47043	47016	49089	54907	47837	48718	46248
Onions	34117	35026	35180	33842	33125	33050	32245	30305	31204	30309
Peppers	18622	20187	19980	21005	20002	19947	19491	18241	18415	17987
Eggplants	5469	10535	9978	10315	10020	9577	9359	9209	9200	8787

**Table 2. Vegetables production for main species in Romania (thousands tonnes, 2007 – 2016)***Source: RNIS, TEMPO Online Database*

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Tomatoes	640.7	814.3	755.5	768.5	910.9	683.2	749.1	706.2	701.8	627.1
Cabbage	893.1	964.6	1001.9	981.2	1025.2	987.9	1156.4	1123.1	1077.9	992.3
Onions	324.9	395.5	378.1	369.1	394.3	345.3	391.8	386.9	360.7	325
Peppers	184.9	238.6	245.6	243.4	253.5	207	227.6	228.5	226.3	201
Eggplants	63.7	153.6	168.5	144.3	160	126	123.2	127.5	128.4	116.2

**Table 3. Yields for main species in Romania (tonnes per hectare, 2007 – 2016). Source: Author own calculations based on RNIS, TEMPO Online Database**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Tomatoes	13.92	15.81	15.40	15.44	17.60	13.76	15.49	16.10	15.86	15.30
Cabbage	19.36	19.68	20.72	20.86	21.81	20.12	21.06	23.48	22.13	21.46
Onions	9.53	11.29	10.75	10.91	11.90	10.45	12.15	12.77	11.56	10.73
Peppers	9.93	11.82	12.30	11.59	12.67	10.38	11.68	12.53	12.29	11.22
Eggplants	11.65	14.59	16.90	14.00	15.97	13.16	13.17	13.85	13.96	13.23

Organic production is an important objective for Common Agricultural Policy of European Union. Common Agricultural Policy and Rural Development Programmes stimulate and finance the organic production. Vegetables continue to be highly popular purchases among European organic consumers. The total area under organic vegetables production is 0.5 percent of the total area of vegetables grown in the world (57 million hectares in 2013, according to FAOSTAT). The positive trend in organic vegetables production and the global organic market seen in the past years continues to grow worldwide. Based on information from private sector, certifiers, and governments, IFOAM (2016) noted that in 2015, 2.4 million organic producers were reported. According with the data regarding land use and crops categories in organic agriculture worldwide, vegetables occupied 304 479 ha (fully converted and in-conversion areas) in 2014. The vegetables worldwide in-conversion areas occupied 4.7 % in 2014 (14 342 ha). Europe occupied first place in the world for organic vegetables production with 131 882 ha in 2014, increasing with 9.4 % compared with the organic area cultivated in 2013 (IFOAM, 2016). According with the data for Romania in 2014, the total vegetables organic area occupied 1 913 hectares (0.7% organic share) with 1391 hectares area fully converted and 522 hectares area under conversion (Willer and Lernoud, 2016). In EU is 23210 holdings producing organic fresh vegetables (2013). In Romania the organic fresh vegetables occupied 110 ha in 2013 (0.1 % share of EU-28 under organic fresh vegetables) and there are located 70 organic vegetables farms. Organic vegetable farming was practised on 2.5 % of EU holdings cultivating fresh vegetables and on 5.3 % of the area dedicated to these crops. 12.6 % of all certified organic farms grew organic fresh vegetables. However, the area devoted to organic fresh vegetables made up just 1.3 % of all certified organically managed hectares.

At EU level, the total value of output for vegetables was 45 % higher than that for fruit: EUR 30.7 billion for vegetables vs. EUR 21.1 billion for fruit (EUROSTAT). The most recent data from the European Health Interview Survey (EHIS) show that daily consumption of fruit and vegetables in 2014 was widespread across all Member States. In the EU-28, on average a third (34.4 %) of the population aged 15 or over did not consume any fruit or vegetables in a day; half (51.4 %) the population ate daily from 1 to 4 portions of fruit and vegetables, while the residual 14.1 % consumed more than 5 portions a day. Almost two thirds (65.1 %) of the Romanian population did not consume any fruit or vegetables daily. In Romania 3.5 % of the population, ate more than 5 portions of fruit and vegetables in a day and 31.4 % ate 1 to 4 portions of fruit and vegetables in a day.

According with database of National Inspection for Seed Quality (2016) 5032 economical agents in vegetables sector were registered, of which 1073 were vegetables seed producers. In 2012, the storage capacity for fruit vegetables in Romania was 278 thousand tons, the national food policy objective for 2020 being 400 thousand tons and for 2030 by 2030.

According with data of Food and Agriculture Organization of the United Nations (FAO) imported quantity for tomatoes decreased from 71060 tonnes in 2007 to 45 033 tones in 2013. The imported quantity for tomatoes in 2013 represent 6 % from domestic production. For the other species there is a slight fluctuation of the quantities imported during the period 2007 – 2013 (figure 8). For selected vegetables in 2013 Romania imported more than 70 000 tones.

As far as the export of vegetables is concerned, only the quantity of exported cucumbers is much higher than the imported one. In 2013 exported quantity of tomatoes was 6.2 % from the imported quantity. The most exported culture is cucumbers with more 20 000 tons in 2013. The quantities exported are significantly higher in recent years than in 2007. The quantity of exported tomatoes has increased in recent years by more than 10 times the quantity in 2007 (table 4).

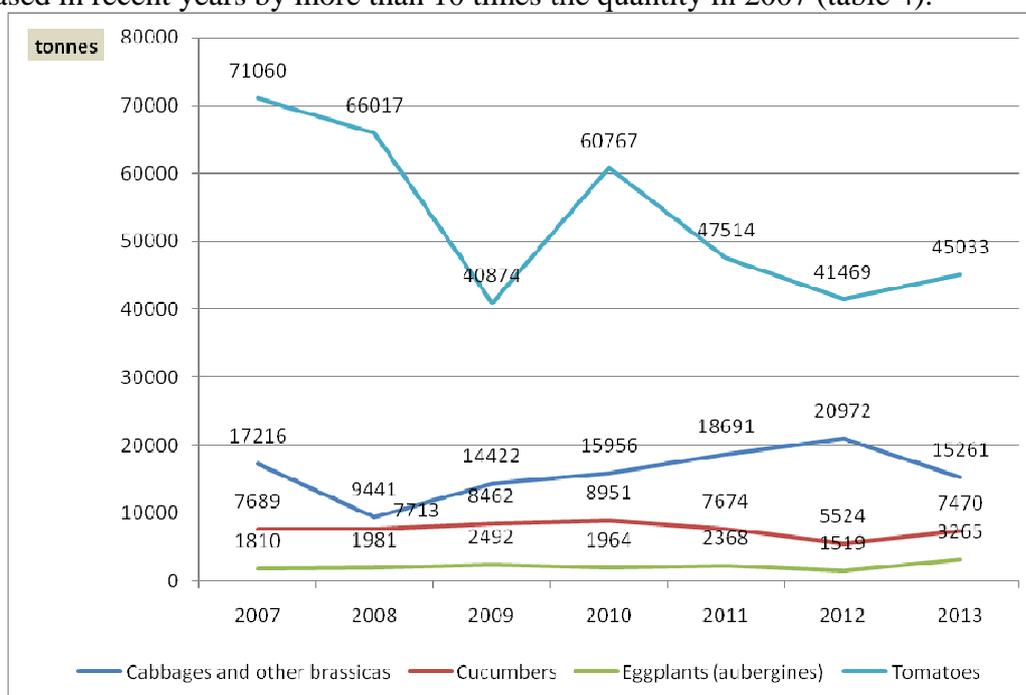
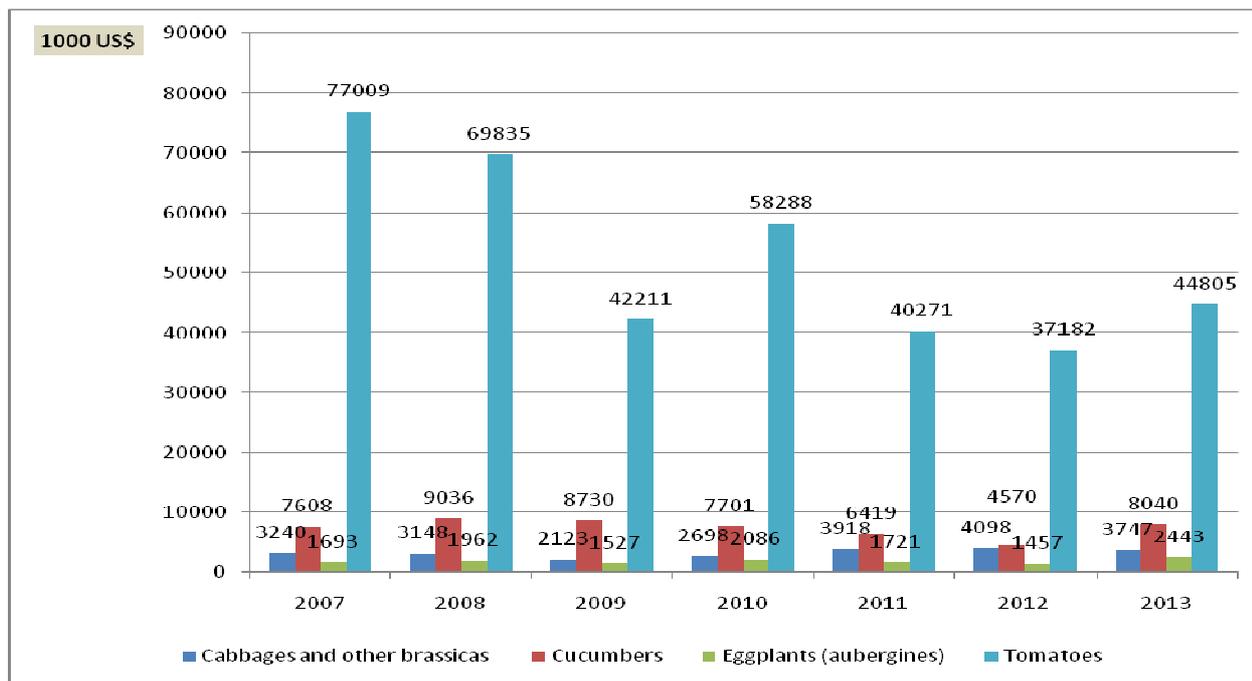


Figure 8. Import Quantity for main vegetables in Romania (FAOSTAT, 2017)

**Table 4. Export Quantity for main vegetables in Romania (FAOSTAT, 2017)**

	Cabbages and other brassicas	Cucumbers	Eggplants (aubergines)	Tomatoes
2007	277	7659	77	202
2008	60	7381	21	694
2009	190	10335	38	1334
2010	482	12522	472	1367
2011	587	16985	308	1719
2012	276	13867	232	2990
2013	361	20479	175	2793

The value of imports for tomatoes, cabbage, eggplant and cucumber was about \$ 60 million in 2013, while the export value was \$ 17.5 million. The value of vegetable exports has an upward trend. It seems that the value of vegetable imports decreased from year to year. It was found that the value of vegetable imports decreased from \$ 90 million in 2007 to about \$ 60 million in 2013 (figure 9). The value of tomato, cucumber, cabbage and eggplant exports was about \$ 5 million (2013). The value of tomato, cucumber, cabbage and eggplant exports increased annually to \$ 17 million in 2013 (figure 10).



**Figure 9. Import Value for main vegetables in Romania (FAOSTAT, 2017)**

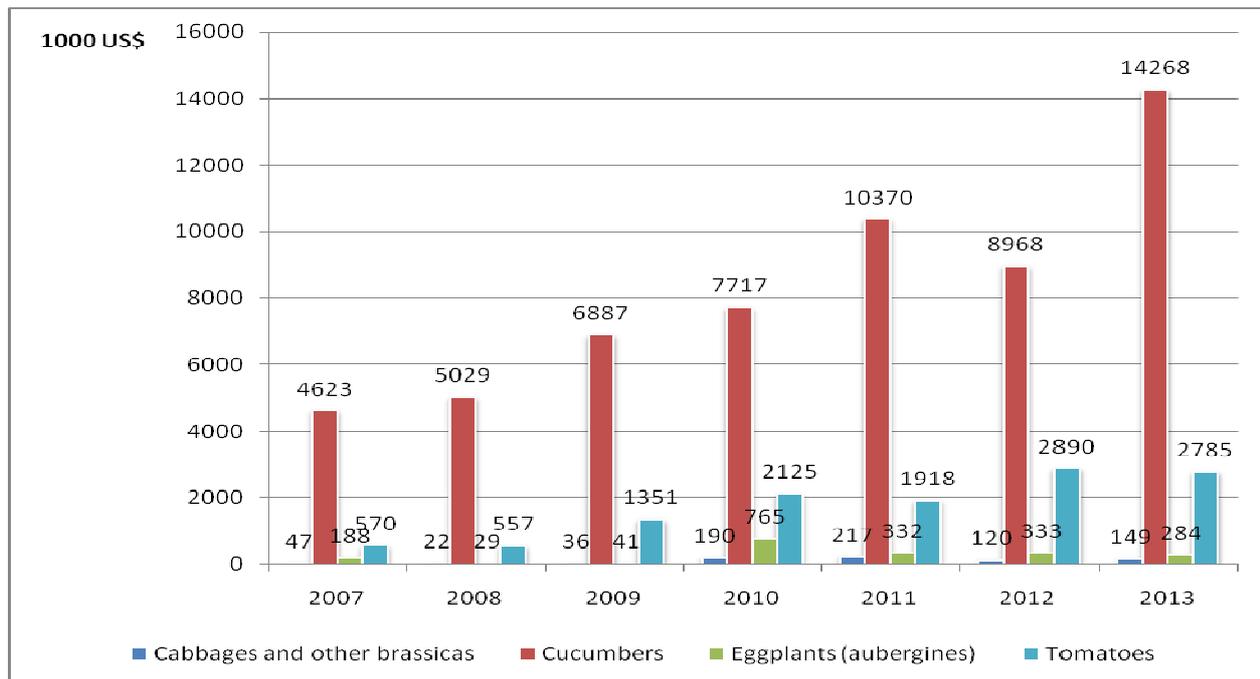


Figure 10. Export Value for main vegetables in Romania (FAOSTAT, 2017)

In general, the value of vegetable exports per ton is higher than the value of vegetable imports per ton of product. Tomatoes were exported in 2013 with 997 \$ per ton and imported with 994 \$ per ton (table 5).

Table 5. Price of imported and exported vegetables (\$ / ton) (Author own calculations based on FAOSTAT, 2013)

	Cabbages and other brassicas	Cucumbers	Eggplants (aubergines)	Tomatoes
Import value	227	1076	748	994
Export value	412	697	1622	997

Romania became a member of the European Union (EU) on 1 January 2007. Through the current reform of the Common Agricultural Policy and through the national budget, the vegetable sector benefits from the following financial instruments: single payment scheme, Redistributive payment, 'Greening' payment, Payment for young farmers, Transitional National Aid for crops located on arable land, payment for fuel used in agriculture, subsidies for climatic accidents, voluntary coupled support, payment for maintenance of organic farming practices, conversion to organic farming methods and financing for projects in the field of vegetable growing. Almost two thirds (65.1 %) of the Romanian population did not consume any fruit or vegetables daily.

The Romanian Government adopted in 2017 a special program for tomato growers. This program is designed for vegetables producers in greenhouse and solarium in order to ensure the national consumption needs from domestic production. According to the Government Decision no. 39/2017 the financial support for beneficiaries is 3.000 euro / beneficiary / year, for an area of minimum 1000 m<sup>2</sup>. This horticultural program financed by national budget is designed for 8 years. Beneficiaries must achieve a minimum production of 2 kg of tomatoes per square meter and demonstrate that they have sold the tomatoes production during January-May inclusive, and November-December 20 inclusive.

#### 4. CONCLUSIONS

Romania has the potential to be a country with performances in the field of vegetable growing, especially for organic vegetables. In Romania organic fresh vegetables occupied only 0.1 % of EU-28. Family vegetable farms are a tradition in Romania, which is why our country currently owns the most vegetable holdings in European Union. However, a very large part of them have a very small size and are not competitive, but they contribute to the vitality of the Romanian village, and maintaining the traditions and culture in rural areas. Before 2000, the greenhouse area was thousands of hectares, and now exceeds 300 hectares. This greenhouse area is too small to ensure the need for vegetables in the cold season. In this regard, a special program for the cultivation of vegetables in protected areas and the provision of consumer products during the winter period is useful. Almost two thirds (65.1 %) of the Romanian population did not consume any fruit or vegetables daily. There is necessary to elaborate special program for daily consumption of vegetables and fruit. The main vegetables species in Romania are represented by tomatoes, cabbage, onions, peppers and eggplants, but still is enough space for vegetables diversification. European funds and Common Agricultural Policy are important tools to sustain the vegetables sector.

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