

Ministry of Agriculture and Agrarian Reform

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OUTLOOK NO 3

Agricultural Commodity Outlooks

TOMATO

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Syrian Tomato Outlook

Abstract

The Syrian Government gives due attention to the tomato sector along its whole commodity chain because of its substantial contribution to the generation of economic value added and income, its comparative advantage, the provision of the raw material for processing, the fulfillment of consumption needs of the population concerning tomato, and its potential export ability. Therefore, this outlook aims to provide useful information to inform the policy making process by reviewing the following aspects:

- The recent evolution and the current status of tomato production in Syria.
- The environmental conditions and their impact on tomato production.
- The main technical aspects of Syrian tomato production.
- The production costs and their evolution.
- The policies governing the tomato sector in Syria, including current prices and their evolution, the credit situation and trade policies.
- The evolution of the balance of trade.
- The prospects for future tomato production, based on the recent Mid Term Review of the Syrian Agricultural Strategy (SAS), related to production measures (area, yield and production), import, export, total supply, processing, marketing and distribution.

1. Background and objectives

Currently, tomato is considered one of the major vegetable crops in Syria because of its nutritional, consumption, processing and export value.

Tomato is produced by two major production systems namely: open field and green house tomatoes. The production of these systems is mainly irrigated. In 2004, the area of irrigated and rain-fed tomatoes amounted to 85% and 15% of the total cropped area under tomato, respectively.

The tomato production is notable for its high growth rate. In 2004, its value constituted 38.3% of the value of vegetable production; it amounted to 965 thousand tons constituting 31% of the total vegetable production; the cropped area of tomato was about 18 thousand hectares accounting for 10% of the total area under vegetables. These high percentages of growth of the tomato sector will lead both to the improvement of the economic value added and income of this sector and its labor force in particular and of the rural population in general, and to surplus production which either processed to a variety of products or exported (raw and processed).

Accordingly, the objective of this report is to provide a comprehensive preliminary picture of the economic, social and political aspects of the tomato sector, which will then form the

basis for an extended analysis of the future prospects of this crop in Syria. To this aim, the paper will touch on the following points:

- A description of the principal policies involving the tomato sector, which include pricing, marketing and trade policies.
- A brief description of the main technical aspects of tomato production, focusing on the use of natural resources, such as land and water, the impact of climatic conditions and the consequent uncertainty that characterize this production.
- The exploration of the recent trends in the major components of tomato's production costs, with a focus on the variability of the corresponding time series.
- An analysis of the recent evolution of tomato price at retail level.
- An Overview of the credit situation of tomato.
- Finally, the analysis of the evolution of the determinants of the tomato balance of trade.

2. Policies governing the tomato sector

The production of irrigated tomato sharply fluctuated in the past periods due to price instability, the insufficient store capacities and the bottlenecks in the supply chain. This led to a surplus production which enforced the tomato farmers to sell their product at very low prices. In spite of these constraints, an enormous progress in tomato production has been achieved due to the governmental policies supporting domestic production through improving the trade policies with the Arab countries and the European Union to increase the share of tomato exports.

The previous policies aimed at banning the imports of tomato to protect domestic production from competition of foreign tomato, which could have led to decrease both the prices and the production of local tomatoes. This policy, however, has been adjusted early 2005 after implementation the whole agreement of the Great Arab Free Trade Area (GAFTA) to allow the imports from the members of GAFTA and to eliminate of import fees. But, this procedure has been still restricted with the other countries because of the custom duties.

Accordingly, Syria has begun the economic reform considering everything from the farm to the whole marketing process. Therefore, the open field and green house tomatoes are planted according to the indicative Annual Agricultural Production Plan (AAPP) of the Ministry of Agriculture and Agrarian Reform (MAAR) to improve the performance of the agricultural sector. While in the past the planning of tomato production was central to maintain the stability of production and prices, to avoid the negative impacts on producers and consumers and to sustain the scarce water and land resources. These policies of direct governmental intervention in production have been substituted by indicative planning. Furthermore, the Government has encouraged high rates of growth in tomato production through area expansion, productivity boost by promoting the use of improved seeds and advanced irrigation technologies, and the provision of credits to provide sufficient tomato for domestic consumption, processing and export. The current policies are still enhancing the increase in production and export and restrict import through:

- Removing of export tax on agricultural products including tomato¹.
- Allowing the private sector to keep 100% of its export earning².

¹ Decree no. 15 dated 3.7.2001

- Allowing the import of grading, sorting and packaging machines their manufacturing period not exceeding 4 years.
- Issuing the decree no. 48 dated 4.8.1998 about Syrian joining the International Transport Agreement (TIR), which resulted in reducing the transportation costs for exporters.
- Issuing the Generalization no. 17854 dated 24.9.2001 by the Ministry of Transportation, which allows the Turkish transportation vehicles to enter Syria in order to ship the Syrian vegetables and fruits to Western Europe³.
- Imposing duties on tomato imports amounting to 50% for fresh, cooled, cooked tomato and tomato paste⁴. These fees were removed early 2005 for GAFTA members, which will increase the imports of GAFTA countries.

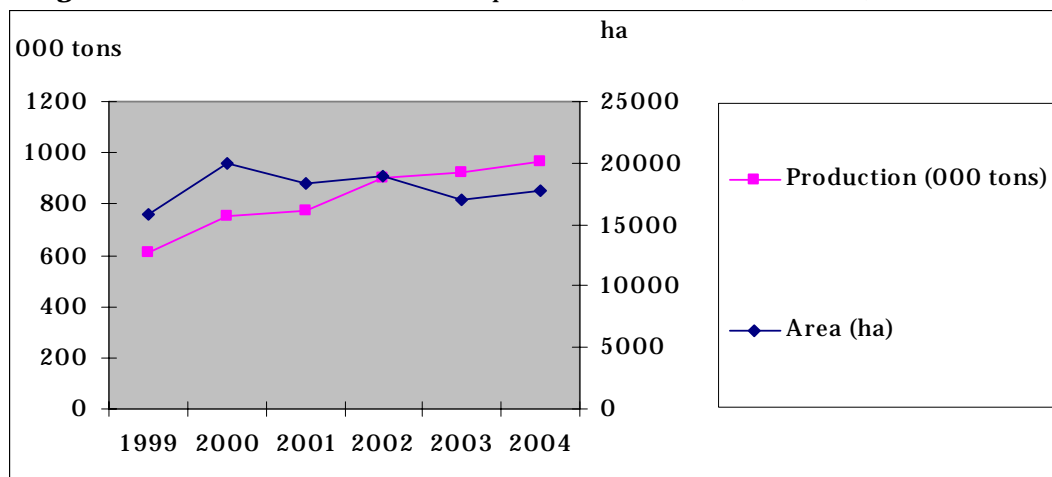
Finally, the prices of tomato are determined by the Government for the quantities delivered to the public tomato factories.

3. Production and climatic conditions

Syria is noteworthy for its natural environment, its resources of land and water and its diverse climate, which have substantial impact on the development and the productivity of agricultural products. This leads to diverse production regions, which allow the production throughout the year especially of vegetables which of course includes tomato.

The climatic condition⁵ such as rainfall and temperature impact the planted area, yield and the production of tomato⁶ causing variations in these measures as depicted in figures 1 and 2. Figure 1 indicates a huge horizontal expansion (area increase) after the drought year in 1999 and a shrink in the planted tomato area after 2000 due to the limited water resources and the vertical expansion (yield improvement due high yielding tomato seeds), which off set the reduction in the area through production increase as depicted in figure 2.

Figure 1. Evolution of the total area and production of tomato (1999-2004)



Source: Elaborated from MAAR Database

² Decision of the Ministry of Economy and Trade no. 1100 dated 15.7.2003

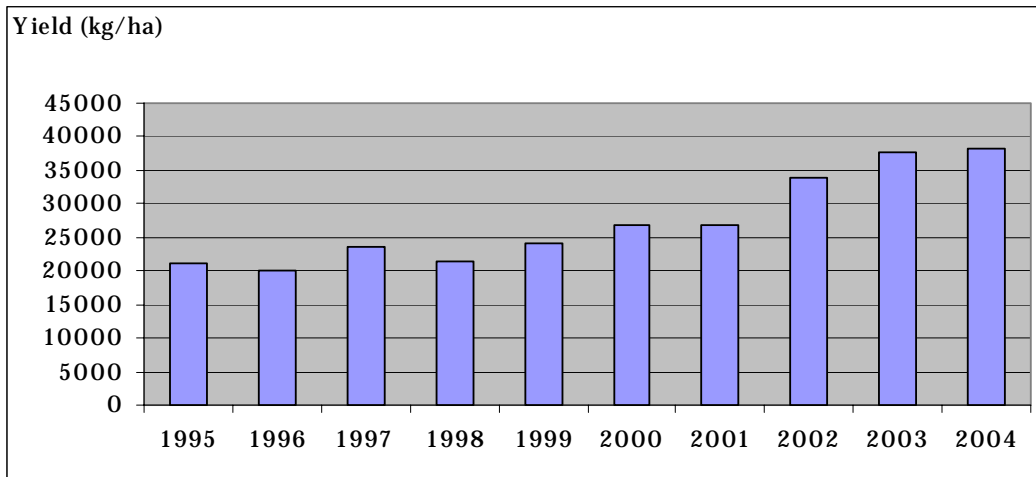
³ NAPC – Comparative Advantages of Orange 2005

⁴ NAPC – Over view about Syrian tomato

⁵ See, The Central Bureau of Statistics – The Statistical Annual Abstract – various issues

⁶ See item

Figure 2. Evolution of the yield of open field tomato (1999-2004)



Source: Elaborated from MAAR Database

The climatic conditions in 2004 were unstable causing some Governorates like Lattakia, Tartous and Homs to be affected by frost, which led to a damage in green houses and production loss. In Lattakia the number of affected green houses amounted to 3,207 (tomato, cucumber, beans and eggplant) with a percentage of damage of 10-100%. In Homs the number of negatively affected green houses was 1,578 with a percentage of damage of 30-100% leading to a loss in tomato production of 5,057 tons. In Tartous the number of negatively impacted green houses was 4,116 with a percentage of damage of 10-100%. Concerning open field tomato, Dar'a was affected by a temperature increase in July, which harmed 48 hectares resulting in a percentage of damage of 2-10% and a production loss of 25.7 tons.

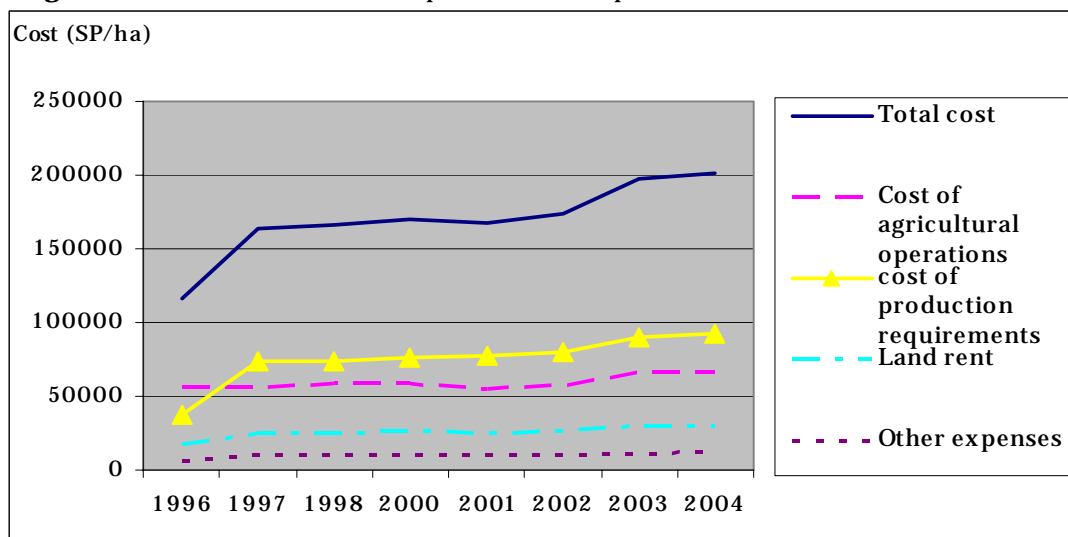
4. Economic outlook

4.1. Production costs

Production costs consist of fixed and variable costs. Fixed costs are paid independent of production volume, whereas variable costs follow the production size.

Figure 3 illustrates the evolution of the various costs per hectare for open field tomato from 1996 through 2004 including total cost, cost of agricultural operations, cost of production requirements (inputs), cost of land rent and other expenses. The figure shows an increasing trend for the mentioned costs, a cost jump between 1996 and 1997 as well as between 2003 and 2004 and cost stability between 1998 and 2002. The cost of production requirements is higher than that of agricultural operations.

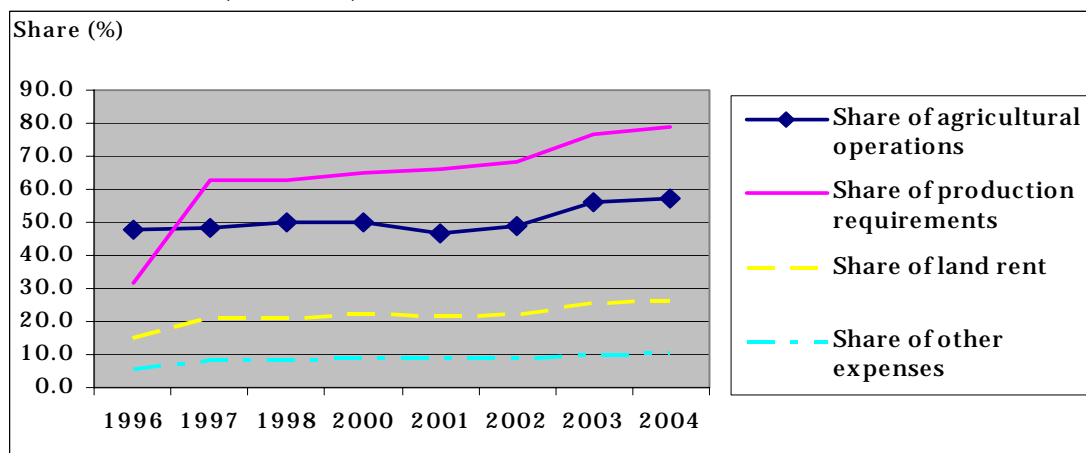
Figure 3. Evolution of the various open field tomato production costs (1996-2004)



Source: Elaborated from MAAR Database – The Annual Agricultural Statistical Abstract 2005

Figure 4 depicts the evolution of the share of the various cost items in total cost of production for open field tomato over the period 1996-2004. The figure indicates an increasing share for all cost items.

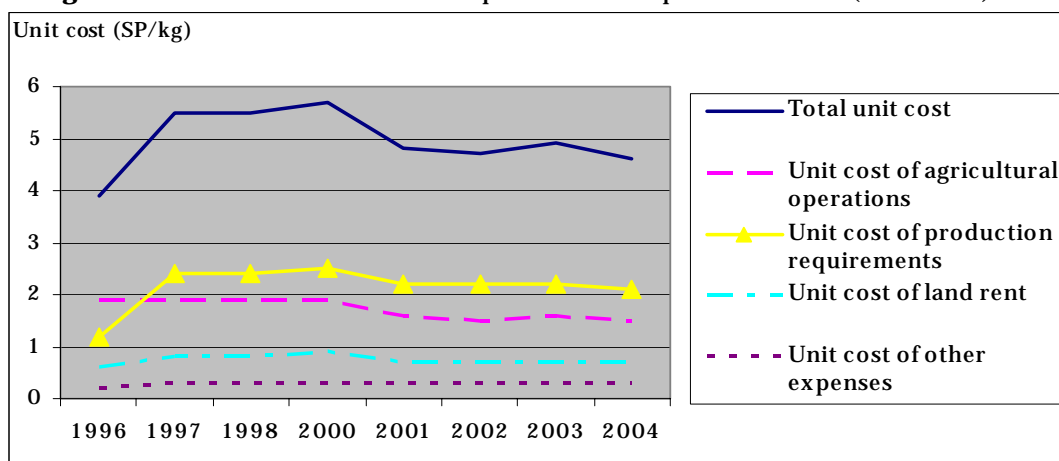
Figure 4. Evolution of the shares of the various cost items in total production cost of open field tomato (1996-2004)



Source: Elaborated from MAAR Database – The Annual Agricultural Statistical Abstract 2005

Figure 5 illustrates the evolution of the unit costs (SP/kg) of production for the different types of costs mentioned before over the period 1996-2004. The figure shows an increasing and a decreasing trend for both the total unit cost and the unit cost of production requirements, a decreasing trend for the unit cost of agricultural operations and stability for the unit cost of both land rent and other expenses. The cost decrease after 2000 is due to the termination of drought, technological advancements and improved services which lead to substantial improvement in yield.

Figure 5. Evolution of the unit costs of production for open field tomato (1996-2004)



Source: Elaborated from MAAR Database – The Annual Agricultural Statistical Abstract 2005

Table 1 represents the descriptive statistics of the time series over the period 1996-2004 for the various total and unit costs of open field tomato. The highest cost variations are present for both the total and unit costs of production requirements. But in general it can be concluded that the cost variations are moderate. The annual growth rate points out to an increasing trend for all cost items except for the unit cost of agricultural operations, which witnessed a diminishing one.

Table 1. Descriptive statistics of the various costs of open field tomato (1996-2004)

Item	Mean	Minimum	Maximum	CV (%)	AGR (%)
Total cost (SP/ha)	169,543	116,803	201,368	15	7
Cost of AP (SP/ha)	59,211	54,769	66,784	8	2
Cost of PR (SP/ha)	74,739	36,877	92,236	23	12
Cost of LR (SP/ha)	25,491	17,505	30,204	15	7
Cost of OE (SP/ha)	10,103	6,348	12,144	17	8
Total unit cost (SP/kg)	4.95	3.9	5.7	12	2
Unit cost of AP (SP/kg)	1.7	1.5	1.9	11	-3
Unit cost of PR (SP/kg)	2.2	1.2	2.5	19	7
Unit cost of LR (SP/kg)	0.7	0.6	0.9	12	2
Unit cost of OE (SP/kg)	0.29	0.2	0.3	12	5

Source: Elaborated from MAAR Database

CV: Coefficient of variation, AGR: Annual growth rate, AP: Agricultural operations

PR: Production requirements, LR: Land rent, OE: Other expenses

CV = Standard deviation/Mean*100

AGR = (power(Y1/Y0, 1/T)-1)*100

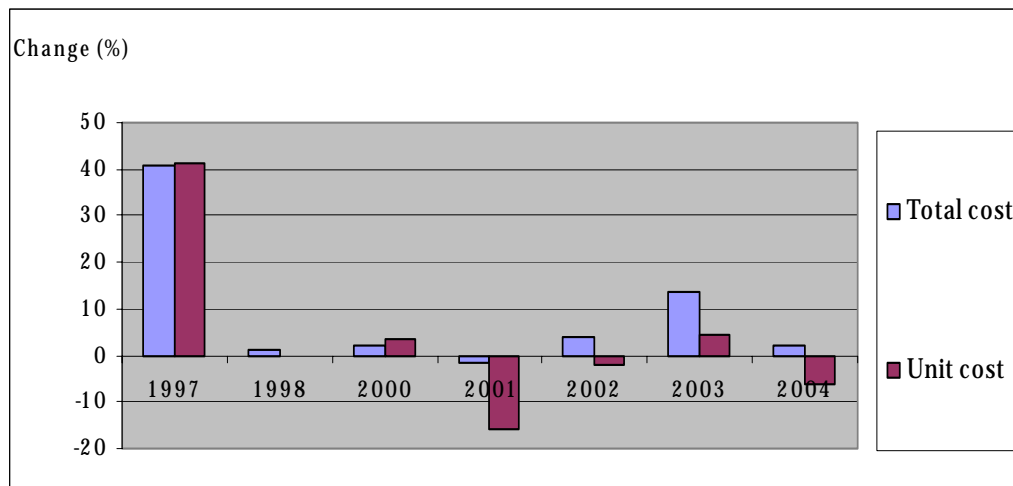
Y1- Target year, Y0 – Base year, T- Number of years minus one

4.1.1. Total costs

Here, it can be distinguished between total cost and unit cost of open field tomato. Figure 6 depicts the annual changes in total and unit cost from 1996-2004. The peak of change in both costs was from 1996 through 1997; thereafter the largest change was in 2001 in the unit cost and in 2003 in the total cost. The changes in total cost indicate a cost increase, while those in unit cost point out to a cost decline (yield increase).

Table 2 illustrates the changes in the aforementioned costs between 2000 and 2004. It can be noticed that there is an increase in total cost and a decrease in unit cost. Figure 7 depicts the evolution of both costs from 2000 through 2004.

Figure 6. Evolution of the annual changes of the total and unit costs of open field tomato (1996-2004)



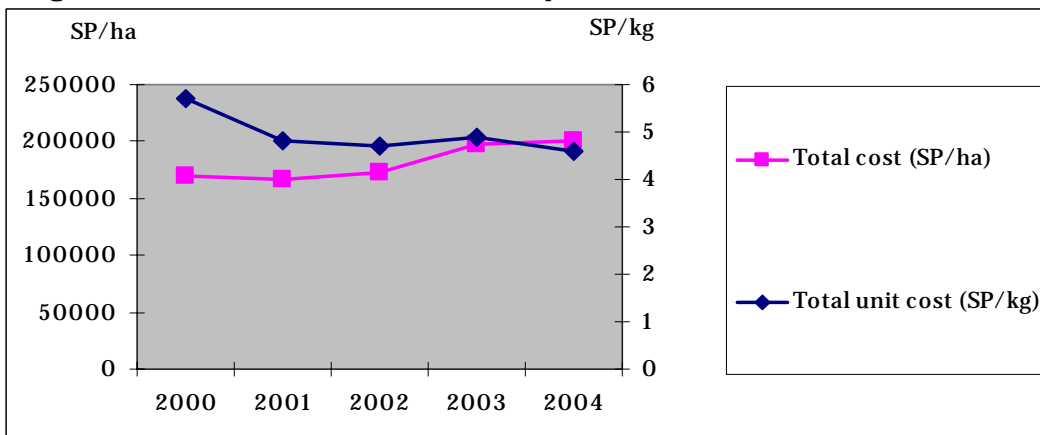
Source: Elaborated from MAAR Database

Table 2. Evolution of total cost and unit cost of open field tomato (2000-2004)

Item	2000	2004	AGR %
Total cost (SP/ha)	170,054	201,368	4.3
Unit cost (SP/kg)	5.7	4.6	-5.2

Source: Elaborated from MAAR Database

Figure 7. Evolution of total and unit costs of open field tomato (2000-2004)



Source: Elaborated from MAAR Database

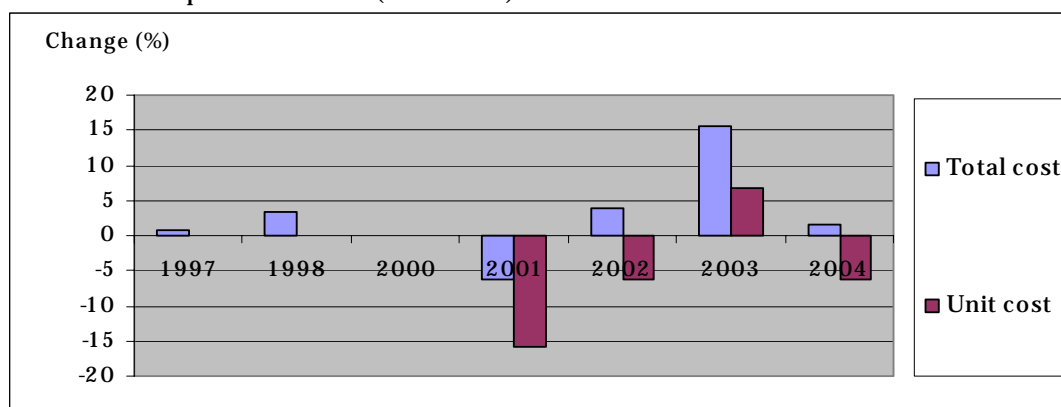
The major components of the total costs of open field tomato are the costs of agricultural operations and the costs of production requirements.

4.1.2. Costs of agricultural operations

Agricultural operations are separated into manual and mechanical activities. The wages of these operations differ due to the type of manual and mechanical work, kind of agricultural operation and the time of conduct. The worker wage varies from 200 to 300 SP for 8 hours according to gender. The average wage of mechanical operations amounts to 150 SP/dunum (one dunum equals 1000 square meter). The manual agricultural operations are executed throughout the year including land preparation, leveling, sowing, fertilization, chemical control, weeding, harvesting, etc. The mechanical operations are mostly limited to tilling and leveling.

Figure 8 traces the annual changes in the total and unit costs of agricultural operations for open field tomato from 1996 through 2004. The peak change was in 2001 for the unit cost and in 2003 for the total cost. Again, the changes in total cost indicate a cost increase, whereas those of unit cost show a cost decrease (yield improvement).

Figure 8. Evolution of the annual changes in total and unit costs of agricultural operations for open field tomato (1996-2004)



Source: Elaborated from MAAR Database

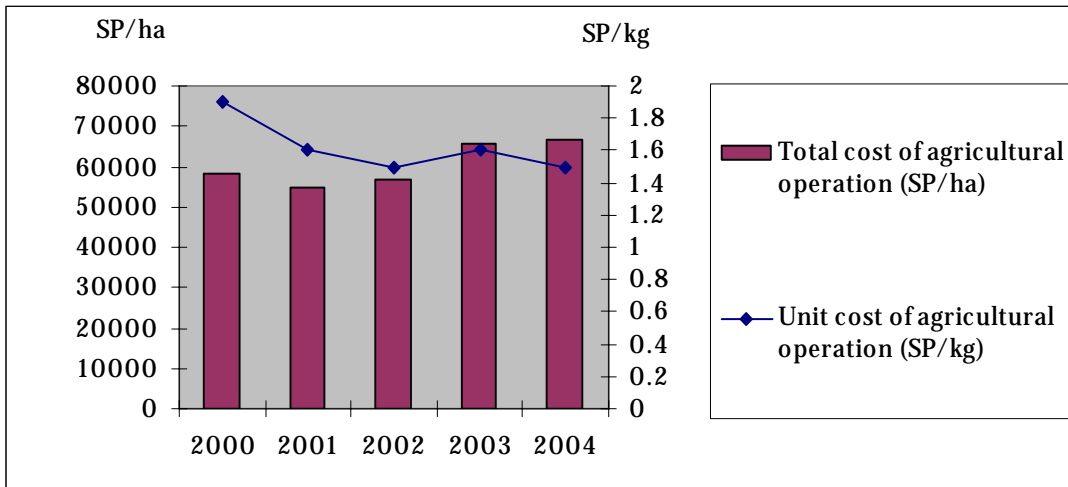
Table 3 traces the evolution of the total cost and unit cost of agricultural operations from 2000 through 2004. It indicates an increase of the total cost and a decline of the unit cost pointing out to a productivity improvement. Figure 9 illustrates the evolution of these costs over the period 2000-2004.

Table 3. Evolution of the costs of agricultural operations (2000-2004)

Item	2000	2004	AGR %
Total cost of agricultural operations (SP/ha)	58,442	66,784	3.4
Unit cost of agricultural operations (SP/kg)	1.9	1.5	-5.7

Source: Elaborated from MAAR Database

Figure 9. Evolution of the total and unit costs of agricultural operations for open field tomato (2000-2004)



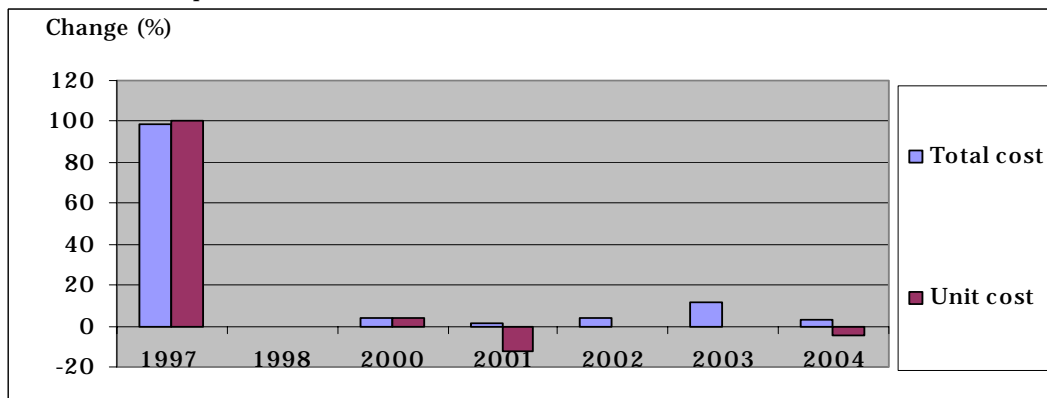
Source: Elaborated from MAAR Database

4.1.3. Costs of production requirements

Intermediate inputs (manure, chemical fertilizer, containers, seeds, water, and control materials) play a considerable role in the performance of the production process of tomato. Therefore, the Government has given due attention to their provision either through the governmental institution or the private sector. Imports are performed through both the public and the private sectors. The period 2000-2004 is characterized by the availability of intermediate inputs.

Figure 10 depicts the evolution of the total and unit costs of production requirements for open field tomato over the period 1996 through 2004. The figure specifies an increasing trend for total cost and a diminishing trend for unit cost. The peak of change between 1996 and 1997 is due the economic reform including price and exchange rate liberalization.

Figure 10. Evolution of the annual changes of total and unit costs of production requirements for open field tomato (1996-2004)



Source: Elaborated from MAAR Database

Table 4 is supplied with data about the evolution of the total and unit costs of production requirements of open field tomato from 2000 through 2004. The table indicates an improved performance because of the increase in total cost and the decrease in unit cost. Figure 11 traces this evolution in detail.

Table 4. Evolution of the total and unit costs of production requirements of open field tomato (2000-2004)

Item	2000	2004	AGR %
Total cost of production requirements (SP/ha)	75,797	92,236	5.0
Unit cost of production requirements (SP/kg)	2.5	2.1	-4.3

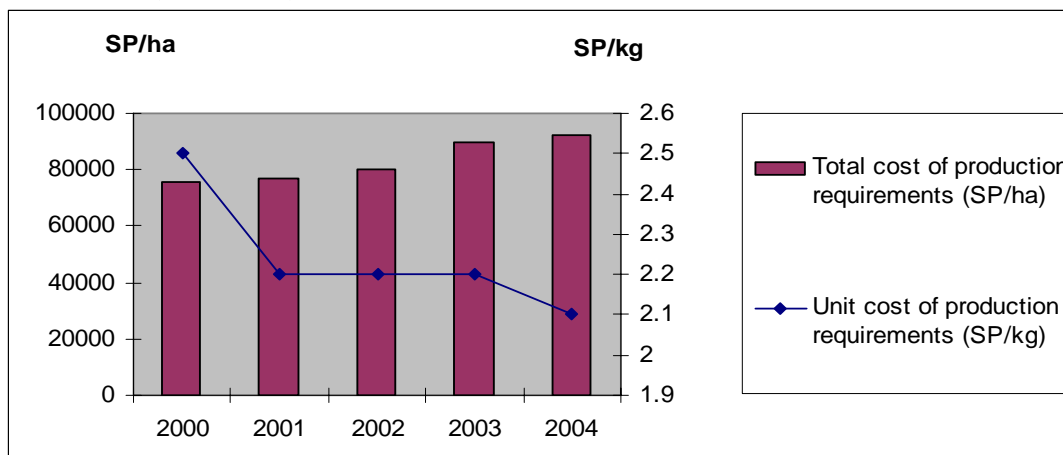
Source: Elaborated from MAAR Database

Table 5 traces the evolution of the components of the total cost of production requirements from 2000 through 2004 for one hectare of open field tomato. Accordingly, on average there is an increasing trend of the total cost of intermediate inputs; manure cost is fixed; the costs of chemical fertilizer, water and control materials are decreasing; the costs of containers (packaging) and seeds are increasing.

4.2. Prices

Because of the unavailability of the farm and wholesale prices of tomato, this section focuses on retail prices. Table 6 gives an idea about the evolution of the current and deflated retail prices of tomato from 2000 through 2004. During this period, the table indicates an increasing trend for all items included in the table except for the deflated retail price of tomato in relation to the retail price index of vegetables, which means that the tomato sector is exposed to a higher inflation rate than the average inflation rate of the economy leading to an income decrease of the sector in real term.

Figure 11. Evolution of the total and unit costs of production requirements for open field tomato (2000-2004)



Source: Elaborated from MAAR Database

Table 5. Evolution of the intermediate inputs of open field tomato 2000-2004 (SP/ha)

Item	2000	2001	2002	2003	2004	AGR %
Manure	5,000	5,000	5,000	5,000	5,000	0.00
Chemical fertilizer	8,393	8,393	7,921	8,172	8,347	-0.14
Containers	25,500	29,750	31,450	34,441	36,935	9.70
Seeds	12,500	12,500	12,500	18,750	18,750	10.67
Water	8,564	8,204	8,204	8,204	8,204	-1.35
Control	8,564	8,204	8,204	8,204	8,204	-1.07
Total	75,797	77,047	80,075	89,567	92,236	5.03

Source: Elaborated from MAAR- The Annual Statistical Abstract 2004

Table 6. Evolution of the retail prices of tomato and the price indexes (2000 – 2004)

Item	Unit	2000	2001	2002	2003	2004	AGR %
Retail price of tomato	SP/kg	9.80	12.40	13.80	13.20	11.60	4.18
Retail price index of veg.	%	100	122	110	118	126	5.95
General retail price index	%	100	103	104	109	114	3.33
Deflated price 1	SP/kg	9.83	12.06	13.22	12.08	10.16	0.82
Deflated price 2	SP/kg	9.83	10.18	12.50	11.16	9.19	-1.67

Source: Elaborated from Central Bureau of Statistics – The Annual Statistical Abstract, various issues

Veg. = vegetables

Deflated price 1 = Retail price of tomato/(general retail price index/100)

Deflated price 2 = Retail price of tomato/(retail price index of vegetables/100)

Table 7 shows the evolution of the retail prices of tomato by Governorates from 2000 to 2004. It indicates price variations among Governorates pointing out to marketing opportunities relying on the transportation and transaction costs.

Table 7. Evolution of tomato retail prices by Governorates over the period 2000-2004 (SP/kg)

Item	2000	2001	2002	2003	2004
Al-Sweida	9	13	14	13	11
Dar'a	8	11	13	13	12
Damascus	12	13	14	15	12
Homs	9	11	13	11	11
Hama	10	12	13	11	10
Lattakia	10	12	13	14	11
Tartous	10	15	16	15	11
Idleb	8	12	14	11	10
Aleppo	15	16	14	15	15
Al-Rakka	10	10	13	14	13
Dair-Ezzor	8	12	13	12	11
Al-Hassake	9	12	15	14	12

Source: Elaborated from Central Bureau of Statistics – The Annual Statistical Abstract- various issues

5. Credits

The Agricultural Cooperative Bank (ACB) provides in-cash and in-kind loans, which are distributed also through the cooperatives in villages. The in-kind loans are granted for the seasonal activities, whereas the in-cash loans for the mid-term and long-term investments. When the loans are short term (seasonal) and not exceeding 50 thousand SP, the interest rate is 4% for the public and cooperative sectors. These loans are provided in terms of seeds, fertilizers and control materials according to the loan list of the bank, which determines the quantities, quality, granting date and due date. The interest rate will be 6% for the public and cooperative sectors and 7.5% for the private sector when the loans exceed 50 thousand SP. These loans are granted in cash for irrigation wells and for the purchase of irrigation equipment in case of advanced irrigation technologies and technical assistance. The Recovery Period has been decided to be 10 years for cooperative projects and 7 years for individuals.

Table 8 illustrates the evolution of loans provided for vegetables including tomato from 2001 through 2004. The table indicates a decrease in both total and vegetable loans, but the decline in the loans provided for vegetables is substantially greater.

Table 8. Evolution of loans provided for vegetables 2001-2004 (million SP)

Item	2001	2002	2003	2004	Growth rate %
Total loans	7,527	6,759	6,948	6,361	-5.5
Vegetable loans	12	6	6	8	-12.6
Share %	0.16	0.09	0.09	0.13	-7.6

Source: Elaborated from MAAR – The Annual Agricultural Statistical Abstract 2005

Table 9 gives an idea about the loans granted for irrigation projects including tomatoes. Accordingly, the greater the area is the smaller the rate per dunum, but the inverse is relevant for drip irrigation to promote advanced technologies and loan upper bound.

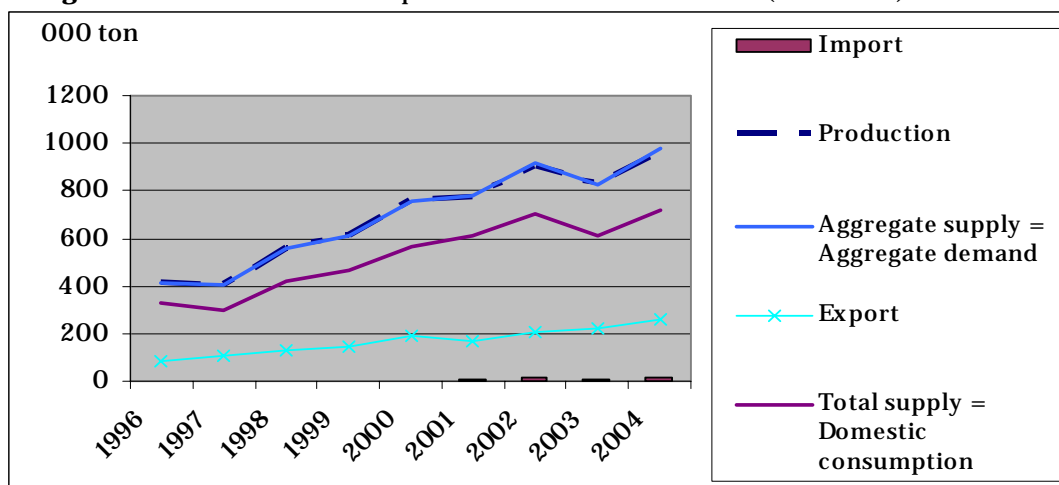
Table 9. Loans granted for irrigation projects

Area (Dunum)	Loan (SP/dunum)	Loan for drip (SP/dunum)	Loan upper bound (SP/dunum)
< 21	10,000	20,000	180,000
21-50	9,000	30,000	425,000
> 50	8,500	40,000	1,000,000

Source: Elaborated from NAPC- Tomato Comparative Advantages 2005

6. Export, import and balance of trade

Tomato balance sheet comprises production, import, export and total supply (domestic consumption). Aggregate supply results from adding domestic production to import. Total supply (domestic consumption) is assessed by subtracting export from aggregate supply. Aggregate demand is estimated by adding export to total supply. Aggregate supply is equal to aggregate demand. These equations don't take into consideration stocks, stock changes, wastage and losses. Figure 12 traces the evolution of these measures over the period 1996 through 2004. It indicates an increasing trend for all items. For the same period, Table 10 illustrates the descriptive statistics of the time series of the components of tomato balance sheet in addition to the per capita demand of tomato. The table indicates substantial progress in all measures due to the technological advances in production and trade liberalization, which in turn explains the high values of the coefficient of variation (high fluctuation).

Figure 12. Evolution of the components of tomato balance sheet (1996-2004)

Source: Elaborated from MAAR Database

Table 10. Descriptive statistics of the components of tomato balance sheet (1996-2004)

Item	Unit	Mean	Minimum	Maximum	CV %
Production	000 ton	688	407	965	30
Import	000 ton	9	4	15	61
Export	000 ton	168	83	260	34
Total supply	000 ton	524	299	720	29
Per capita demand	Kg/person	32	20	41	25

Source: Elaborated from MAAR Database

6.1. Production

6.1.1. Production systems

There are two production systems namely: open field tomato and green house tomato. Both kinds of tomato are planted according to the indicative AAP of the MAAR taking into account the crop rotation of each region.

Open field tomato

Open field tomatoes are grown all the year round and referred to the season in which they are planted namely: spring, summer and fall tomatoes. The planting occurs irrigated and rain-fed from February until June. The harvest is conducted mid June through late October. There are various varieties differing due to the growth period, ripe period, processing ability, kind of fruit and resistance. The method of planting differs due variety. The prevailing method is to plant the seeds in the nursery and thereafter to move the seedlings to the field when they mature. This method helps to save seeds, water and land and to provide better services for the seedlings. The most of planted tomato is irrigated (line irrigation). Sprinklers are used by seedlings but seldom by matured plants to prevent diseases. Drip irrigation is increasingly used because it saves both water and services and helps to conduct a good harvest. The ACB encourages the implementation of drip irrigation by providing loans. The use of early or late varieties assists the farmers to improve their profitability because of the high prices. This kind of farming spreads out from the South of Yermouk Basins to the North of Aleppo.

Green house tomato

It's considered as an early crop (October-June), therefore it receives high prices. The number of green houses is increasing due to the increasing demand for this crop from neighboring and foreign markets. This kind of farming is irrigated.

6.1.2. Production measures

Production measures comprise area, yield and production.

Area

Table 11 illustrates the evolution of the area of open field and green house tomatoes from 1999 through 2005. In 2005 the cropped area of open field tomato amounted to 13 thousand hectares and that of green house tomato 3 thousand hectares.

Table 11. Evolution of the area of open field and green house tomatoes 1999-2004 (ha)

Item	1999	2000	2001	2002	2003	2004	2005
Irrigated summer tomato	5,716	8,132	6,412	6,555	6,733	6,746	7,167
Irrigated spring tomato	2,677	2,416	1,979	2,797	1,452	1,721	2,306
Irrigated fall tomato	1,358	2,790	1,575	3,028	2,741	3,513	3,141
Total irrigated open field t.	9,751	13,338	9,966	12,380	10,926	11,980	10,483
Total rain-fed open field t.	3,845	4,319	5,854	4,221	3,406	2,676	2,131
Total open field tomato	13,596	17,657	15,820	16,601	14,332	14,656	12,614
Green house tomato	2,175	2,266	2,543	2,398	2,719	3,050	3,169
Total irrigated tomato	11,926	15,604	12,509	14,778	13,645	15,050	13,652

Source: Elaborated from MAAR Database

Table 12 shows the descriptive statistics for the time series mentioned above from 1999 through 2004. The Table indicates an enormous improvement in fall tomato and a decrease in spring tomato, which resulted in high coefficient of variations. The Table shows also an increase in open field, green house and irrigated tomatoes. The advancement of green house tomato, however, is faster than that of open field tomato.

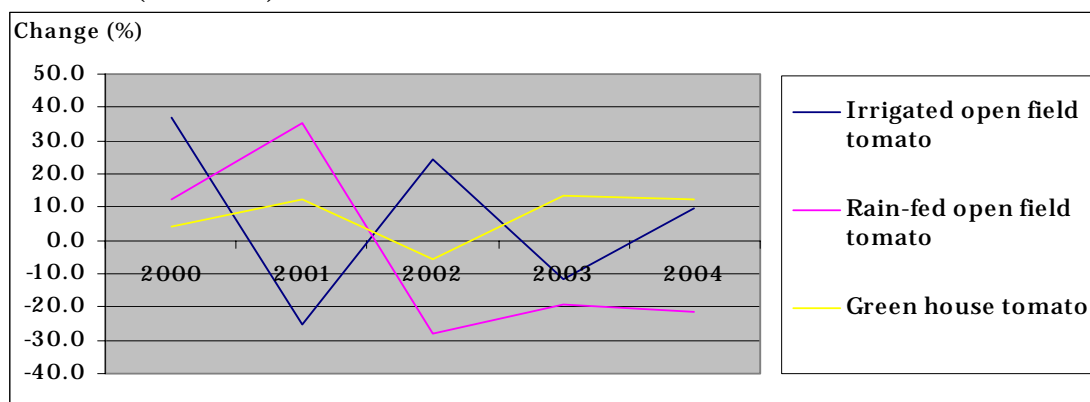
Table 12. Summary statistics of the area time series for tomato 1999-2004 (ha)

Item	Mean	Min	Max	CV %	AGR %
Irrigated summer tomato	6,716	5,716	8,132	12	3.4
Irrigated spring tomato	2,174	1,452	2,797	25	-8.5
Irrigated fall tomato	2,501	1,358	3,513	34	20.9
Total irrigated open field tom.	11,390	9,751	13,338	12	4.2
Total rain-fed open field tom.	4,054	2,676	5,854	26	-7.0
Total open field tomato	15,444	13,596	17,657	10	1.5
Green house tomato	2,525	2,175	3,050	13	7.0
Total irrigated tomato	13,915	11,926	15,604	11	4.7

Source: Elaborated from MAAR Database, Min = Minimum, Max = Maximum

Figure 13 illustrates the annual changes in the area of open field and green house tomato over the period 1999 through 2004. The Figure shows substantial annual changes which indicate instability.

Figure 13. Evolution of the annual changes of the area of open field and green house tomatoes (1999-2004)

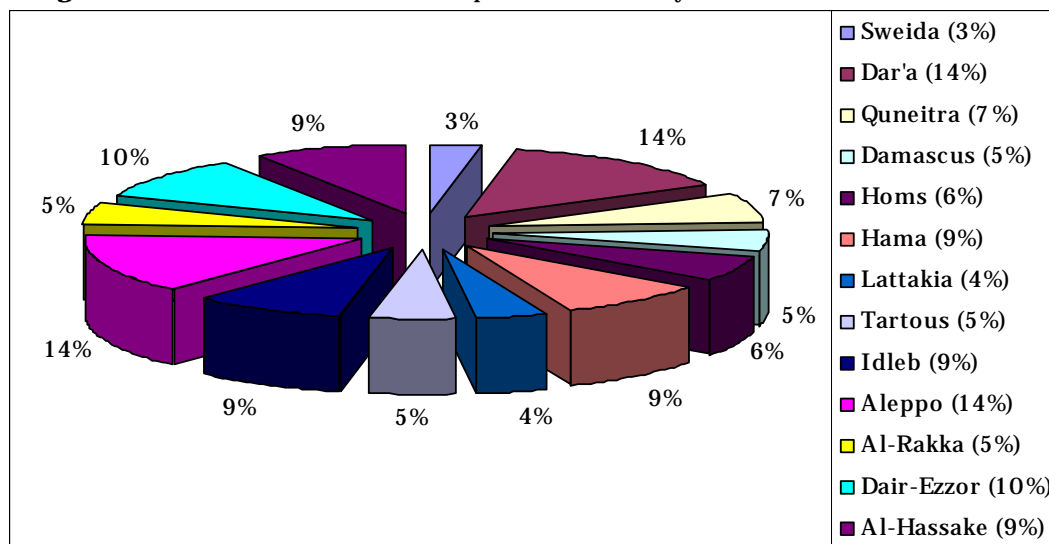


Source: Elaborated from MAAR Database

Land price varies between 50-300 thousand SP/dunum relying on the irrigation source and land quality in the southern region, where tomato farming mostly concentrates. The land rent amounts to 2500-3500 SP/dunum/year for lands irrigated from nets and 4000-5000 SP/dunum for lands irrigated from wells. It is noteworthy that there is a strong competition on a limited area of land. Therefore, it is expected that the rent will increase from 120 to 200 thousand SP/well/year (a well irrigates 40 dunums).

Tomato planting of open field tomato is mostly performed in Dar'a (14%) and Aleppo (14%) as depicted in Figure 14. Green house tomato, however, is located mostly in Tartous and Lattakia, which produce about 98% of this product.

Figure 14. Distribution of the area of open field tomato by Governorates in 2004 (%)



Source: Elaborated from MAAR database

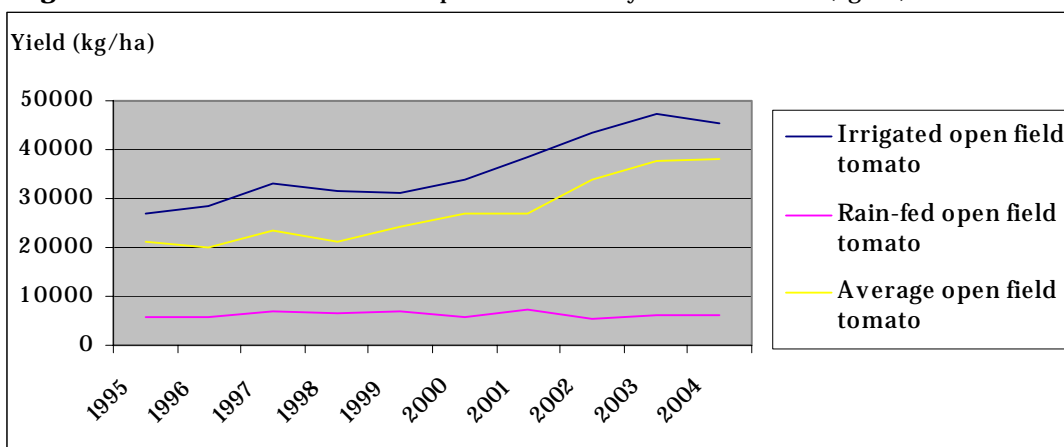
Yield

There are substantial differences in productivity between irrigated and rain-fed open field tomato as well as among Governorates due to the variations in Agro-Ecological Zones.

The average yield of open field tomato substantially increased from 21 tonnes/ha in 1995 to 38 tonnes/ha in 2004. In 2005 the average yield of open field tomato amounted to about 42 ton/ha. For the period 1995-2004, the yield of irrigated open field tomato

increased by 68%, whereas the yield of rain-fed tomato increased by 21%. In 2005 the yield was about 50 ton/ha for irrigated tomato and 6 ton/ha for rain-fed tomato. The yield of green house tomato increased from 5424 kg/house in 1995 to 6000 kg/house in 2004 (and in 2005 also) realizing an increase of 10.6%. Figure 15 traces the evolution of the various open field tomato yields from 1995 through 2004. The figure shows that huge differences in the performance of irrigated and rain-fed farming are there and the improvement in the yield of rain-fed tomato is miniscule compared to that of irrigated tomato.

Figure 15. Evolution of the various open field tomato yields 1995-2004 (kg/ha)



Source: Elaborated from MAAR Database

Table 13 illustrates the descriptive statistics of the various yields of open field tomato. The Table indicates enormous growth and fluctuations by irrigated and average yields compared to rain-fed yields. Yield improvements are due to:

- Intensification and diversification strategies.
- The use of improved seeds and advanced irrigation technologies.

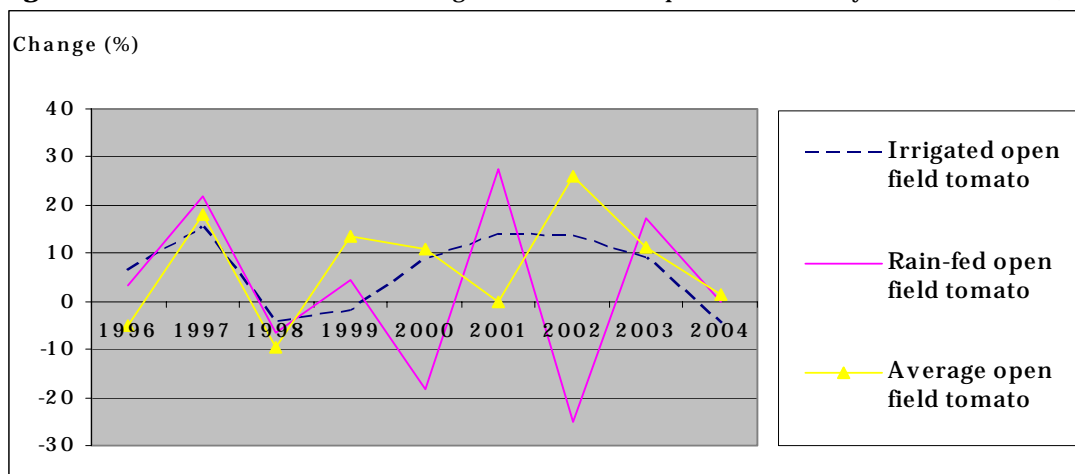
Table 13. Summary statistics of the various open field tomato yields 1995-2004 (kg/ha)

Item	Mean	Min	Max	CV %	AGR %
Irrigated tomato	35,966	26,951	47,396	20	5.9
Rain-fed tomato	6,271	5,361	7,166	10	1.3
Average yield	27,348	19,990	38,128	25	6.8

Source: Elaborated from MAAR Database

Figure 16 depicts the annual changes in the various yields of open field tomato from 1995 through 2004. The Figure indicates high variations in yields, but the highest oscillations are by rain-fed tomato due to weather conditions.

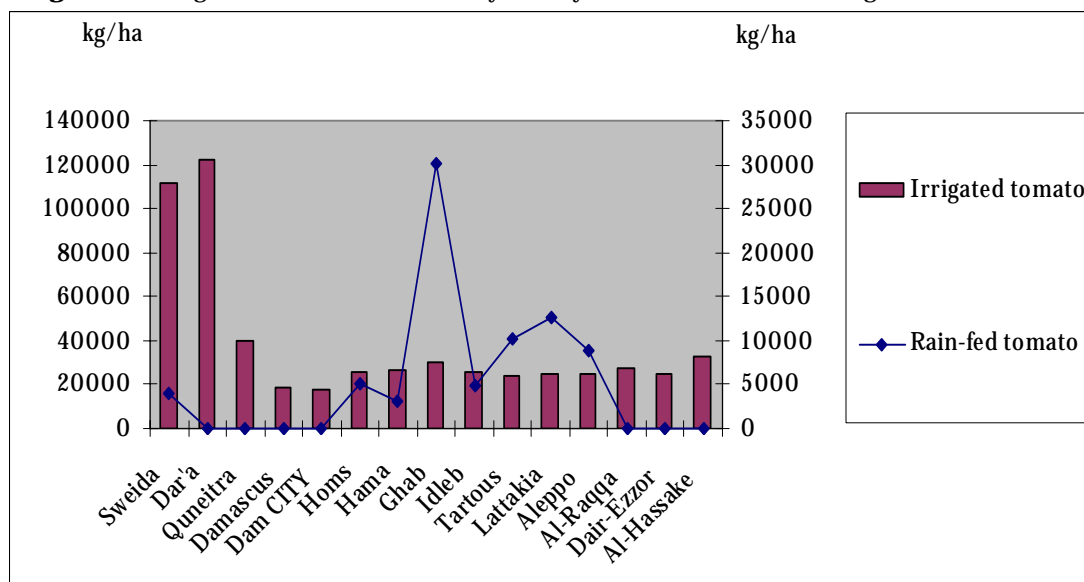
Figure 16. Evolution of the annual changes of the various open field tomato yields 1995-2004 (%)



Source: Elaborated from MAAR Database

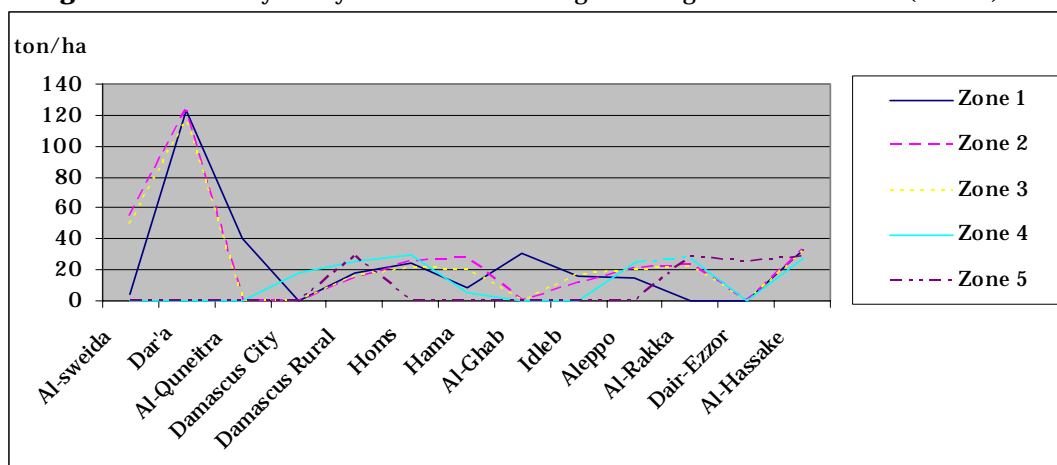
Figure 17 illustrates the various tomato yields of open field tomato by Governorates in 2004. Dar'a Governorate recorded the highest yield (122 ton/ha). It is clear that irrigated tomato is grown in all Governorates and rain-fed tomato concentrates in some Governorates of which Al-Ghab Governorates has the highest yield (30 ton/ha). Figure 18 shows the average yield of open field tomato by Governorates and Agro-Ecological Zones and the impact of the variations in climatic conditions.

Figure 17. Irrigated and rain-fed tomato yields by Governorates in 2004 (kg/ha)



Source: MAAR- The Annual Agricultural Statistical Abstract

Figure 18. Tomato yield by Governorates and Agro-Ecological Zones in 2004 (ton/ha)

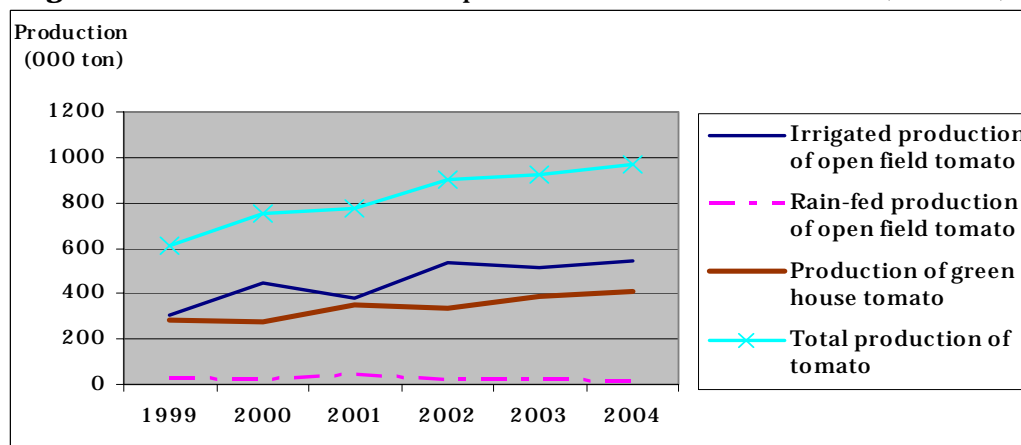


Source: NAPC-Database

Production

Tomato production is characterized by its high growth compared to other crops. The production of tomato increased from 610 thousand tons in 1999 to 965 thousand tons in 2004 achieving a percentage increase by 58%. In 2005 the production of this crop amounted to 958 thousand tons. The projected production of this crop in 2010 is 1207 thousand tons⁷. For the period 1999-2004 the production of open field tomato and green house tomato grew by 230 and 126 thousand tons (70% and 45%) respectively. In 2005 the production of open field and green house tomatoes was respectively 535 and 423 thousand tons. Figure 19 traces the evolution of the various productions of tomato over the period 1999-2004. It shows increasing trends except for rain-fed tomato, which is decreasing.

Figure 19. Evolution of the various productions of tomato 1999-2004 (000 tons)



Source: Elaborated from MAAR Database

Table 14 is supplied with data about the descriptive statistics of tomato production time series over the period 1999-2004. The Table indicates a substantial progress in tomato production, except for rain-fed production, and high fluctuations of this production due to price variations and to difficulties by entering international markets. Figure 20 shows the variations in tomato production over the period 1999-2004.

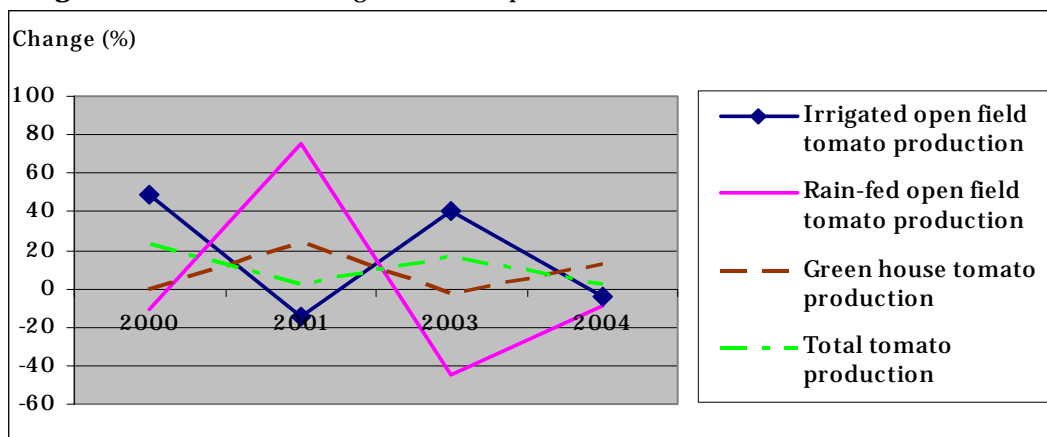
⁷ Ten Five Year Plan

Table 14. Summary statistics of tomato production time series 1999-2004 (000 ton)

Item	Mean	Min	Max	CV %	AGR %
Irrigated open field tomato	456	303	542	21	12
Rain-fed open field tomato	26	17	42	34	-9
Green house tomato	390	279	707	41	20
Total production of tomato	821	611	966	16	10

Source: Elaborated from MAAR Database

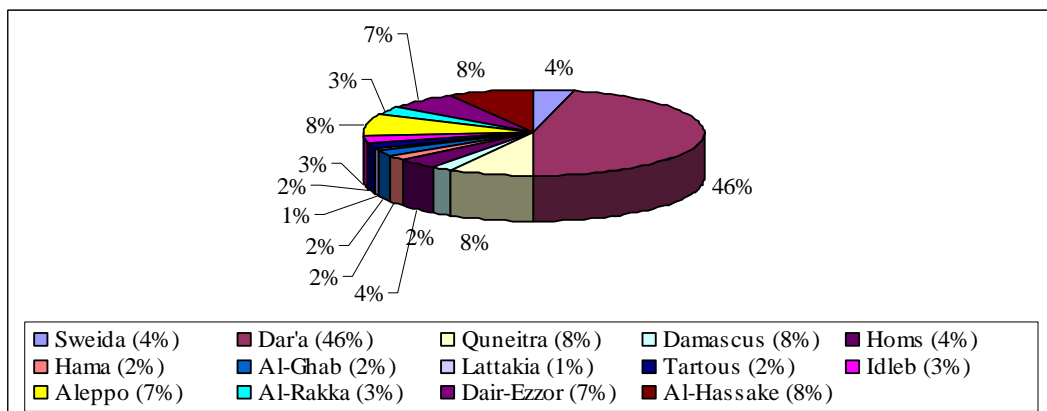
Figure 20. The annual changes in tomato production 1999-2004 (%)



Source: Elaborated from MAAR Database

Figure 21 illustrates the distribution of the production of irrigated open field tomato by Governorates in 2004. The production concentrates in Southern Region especially Dar'a which has a production of 251 thousand tons (46%). The improvement in tomato production in Dar'a is due to the use of advanced irrigation technologies, the good expertise of farmers, the suitable climatic conditions and the use of improved high yielding varieties. Green house tomato production concentrates in Lattakia (12%) and Tartous (86%).

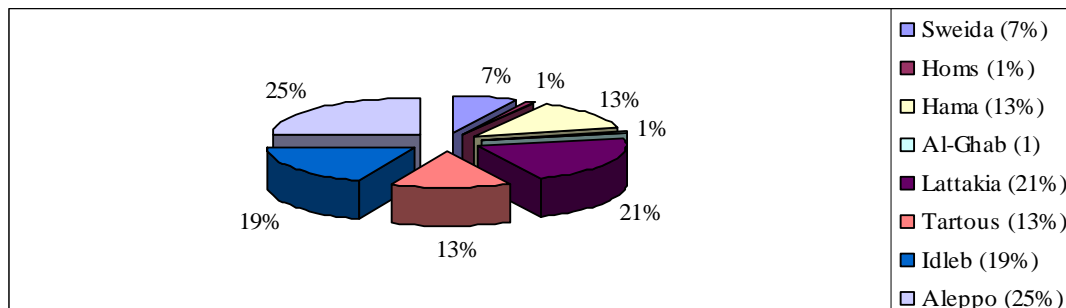
Figure 21. Distribution of the production of irrigated open field tomato by Governorates in 2004 (%)



Source: Elaborated from MAAR Database

Figure 22 shows the distribution of the production of rain-fed open field tomato by Governorates in 2004. Accordingly, rain-fed tomato production is located in Aleppo, Lattakia, Tartous, Idleb, Hama, Homs and Sweida.

Figure 22. Distribution of the production of rain-fed open field tomato by Governorates in 2004 (%)



Source: Elaborated from MAAR Database

6.1.3. Processing

Both the public and private sectors contribute to the processing activities of tomato in Syria with an annual production capacity of 180-200 thousand tons of tomato paste because the demand for processed food like tomato paste is constantly and dramatically increasing due to the population and income growth, the changing consumption pattern and increasing entry of women in the labor force.

The public firms concerned with vegetable and fruit processing including tomato are distributed in the following Governorates namely: Dar'a, Damascus, Al-Hassake, Lattakia, Idleb and Dair-Ezzor. Five of these firms have a daily production capacity of 100-120 tons of tomato; one firm has a daily production capacity of 180 tons (Mzairieb Firm in Dar'a). These firms are multi purpose (Economy of Scope) because in addition to tomato paste they produce canned peas, canned legumes (broad beans and green beans), marmalade and jam and various canned vegetables. The technology is considered advanced in these firms.

The private firms mostly concentrate in the Southern Region. The daily production capacity of these firms varies between 40 and 250 tons of tomato. There are more than 80 firms to produce tomato paste and tomato juice with semi advanced to very advanced technologies.

Both public and private firms purchase the raw material from both the wholesale markets and farmers. Some private firms produce tomato to avoid the fluctuations in tomato prices. The by-product of sorting and grading (public and private) of tomato either for local market or export can be considered as input for these processing firms.

6.2. Trade

6.2.1. Import

Syria imports the improved varieties of tomato seeds to enhance domestic production. In addition, Syria imports tomato, which is considered marginal compared to the domestic consumption. Import of tomato amounted to 13.6 thousand tons valued 47.5 million SP in 2002 and 14.7 thousand tons valued 53.6 million SP in 2004. The most of tomato imports are from GAFTA Countries especially Jordan and Egypt. In 2004, the imported quantity was about 12 thousand tons valued 40 million SP from Jordan and 3 thousand tons valued 11 million SP from Egypt. The imports of tomato paste are negligible because the locally produced tomato paste suffices with domestic consumption.

6.2.2. Export

Table 15 is supplied with export data about the averages of 1995-1997 and 2002-2004 as well as for the period 2000 through 2004 including quantity of export, value of export, unit value and export destinations. The Table shows a substantial improvement in the performance concerning quantity of export, value of export, unit value and export diversification comparing the average of 2002-2004 with that of 1995-1997. Comparing 2004 with 2000, however, indicates substantial progress in the quantity of export and export diversification and an enormous short fall in the value of export and unit value. The Table specifies also that Saudi Arabia is the major export destination.

Tomato is considered a crop with an increasing export potential. Tomato export constitutes about 27% of local production. Recently, the increase in production has enhanced the tomato exports because of the relative decline in production costs. The availability of the product all the year round due the green house tomato has constantly enabled a surplus to be exported. This surplus can be increased through the utilization of the availability of the product and the competitive prices to be exported abroad especially to Arab countries. The increase in the exports of fresh tomato is due to the bilateral

agreements with other countries, the GAFTA agreement and the agreement with the European Union.

Table 15. Quantity, value and share of exported tomato (1995-2004)

Item	Exported Quantity (000 ton)	Value of Export (million SP)	Unit Value (SP/ton)	Export Destination (%)
Average 1995-1997	88	555	6,304	Saudi Arabia (74.4), Katar (14.6), Kuwait (3.4), Jordan (2.8), Lebanon (2.8)
Average 2002-2004	232	2,193	9,443	Saudi Arabia (67.2), European Union (6), Kuwait (5.9), United Arab Emirates (5.6), Romania (2.9), Russia (2.2), Katar (2)
2000	190	3,593	18,947	Saudi Arabia (69.4), Kuwait (4.9), United Arab Emirates (7.3), Russia (10.2)
2001	168	3,184	18,936	Saudi Arabia (82.2), Kuwait (4.5), United Arab Emirates (5), Russia (3.5)
2002	218	2,870	13,143	Saudi Arabia (71.5), European Union (8.7), Kuwait (5.3), United Arab Emirates (6.6), Russia (2.6)
2003	218	2,384	10,935	Saudi Arabia (69.3), Kuwait (6.5), United Arab Emirates (6), Romania (6.8), Russia (3.1), Katar (2)
2004	260	1,328	5,102	Saudi Arabia (54.1), European Union (9.6), Kuwait (6), United Arab Emirates (2.9), Ukraine (8.8), Lebanon(7.7), Katar (1.9), Turkey (2.5), Iraq (2.3)

Source: NAPC- SAT 2005

6.3. Domestic demand

Tomato is consumed in relatively high quantities domestically. The increase in consumption relies on several factors such as the price of the commodity, the prices of the substitute products, income and population growth. The per capita consumption of tomato amounted to 40.2 kg annually in 2004 against 24.7 kg annually in 1995 achieving a percentage increase of 63%. Table 16 illustrates the average monthly consumption of tomato for the urban and rural population compared to other vegetables relying on census data. The Table shows that the trend of vegetable consumption is increasing for both urban and rural population between the two periods and the per capita consumption of tomato is substantially higher than the other vegetables. The projected aggregate demand for tomato is 607 thousand tons in 2010 pointing out to an enormous surplus production.

Table 16. Per capita monthly consumption of major vegetables 1996-2004 (kg)

Item	1996-1997		2003-2004	
	Urban	Rural	Urban	Rural
Tomato	3.69	4.24	4.03	4.62
Potato	1.61	2.13	2.20	3.03
Eggplant	1.46	1.33	1.58	1.83
Cucumber	1.31	1.19	1.94	2.13
Dry onion	0.61	0.78	0.71	0.79

Source: NAPC 2005- Comparative Advantages of Tomato

6.4. Marketing

Most of the open field tomato production is marketed and consumed locally in the form of fresh tomato or tomato paste. Whereas, the entire production of green house tomato is market to be consumed fresh or exported to neighboring or foreign markets. The domestic market for tomato in Syria is considered a free market relying on market forces (Supply and demand). Farmers move their production to the wholesale markets to be sold by auction. Retailers purchase the tomato either from wholesale market or from middle men. The open field tomato sold in the local market is sorted and graded by the traders, whereas the exported tomato is prepared by sorting and grading companies.

Concerning tomato paste, the processors (public and private) purchase the tomato of three sources relying on the prices and the availability of the product namely: farmers (the major source), wholesale markets and middle men. The purchased tomato is processed by both the public and the private firms. The public tomato paste is sold either in the local market (the major part) or to the private firms to be treated again, packed and labeled. The private sector has the major share in both internal and external markets. Therefore, improving this sector and making it export oriented will improve both its performance and the income of its labor force.

7. Concluding remarks

Syria is notable for its both natural environment and geographical location, which allow diverse production regions produce vegetables in general and tomato in particular all round the year. The low wages and high employment rate, suitable climatic conditions, good quality of Syrian tomato and surplus production are factors giving tomato comparative advantage to acquire foreign currency.

There are several factors which improve the performance of the tomato sector. The most important factors are:

- Enhancing of investment opportunities in the food industry to improve quality complying with the international standards, the needs of local and foreign markets and organic farming.
- Adopting of early tomato varieties.
- Developing the technology of agricultural production.
- Diversifying of tomato packaging to induce more demand.
- Improving the processing properties of the product to expand marketing opportunities.
- Improving the market information to comply with international advancement and to enhance the flexibility and marketing performance.
- Promoting international cooperation to reduce duties and to boost the movement of tomato products.

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