

WORKING PAPER No 49

**Assessment of the Competitiveness of the Syrian
Agriculture: an application to selected
representative value chains.
“Durum Wheat”**

Prepared

By

Mouzad Karkout

With assistance from

Fredric Lancon

International Cooperation Center of
Agricultural Research for Development-Montpellier- France

Damascus, March 2011

Table of Contents

1. Introduction	1
1.1 Food security and trade liberalization.	1
2. The Wheat Market.....	3
2.1 Type of wheat	3
2.2 Wheat demand in Syria	3
2.2.1 <i>Evolution of wheat consumption.</i>	3
2.2.2 <i>The commodity balance of wheat: increasing surplus</i>	4
2.3 The world wheat economy	5
2.3.1 <i>Wheat supply and area</i>	5
2.3.2 <i>World's wheat exports and imports</i>	6
2.4 The durum wheat economy	7
2.4.1 <i>Major suppliers of durum wheat</i>	7
2.4.2 <i>Major users of durum wheat</i>	9
2.5. Syria position in the world trade of wheat	10
2.5.1. <i>Increasing participation to the world wheat trade</i>	10
2.5.1.1 <i>Wheat import policy</i>	10
2.5.1.2 <i>Syrian wheat export trends</i>	10
2.6. Syrian durum wheat exports and rewards to quality	12
2.6.1 <i>Specificity of Syrian Durum</i>	12
2.6.3 <i>Durum Export and world prices and price differential</i>	14
3. The Syrian wheat value chain	19
3.1 The wheat value chain arrangement: a “public” value chain	19
3.2 Value chain structure	19
3.2.1 <i>Producers</i>	19
3.2.1.1 <i>Production inputs</i>	20
3.2.1.1 <i>Production cost structure of wheat</i>	22
3.2.2. <i>Public trading and processing companies</i>	24
3.2.2.1 <i>The General Establishment of Cereal Processing and Trade</i>	25
3.2.2.2. <i>GCM and GCB</i>	26
3.2.3 <i>An emerging private sector</i>	26
3.2.4. <i>The wheat value chain configuration</i>	27

3.3 Agro-ecological and local implication of soft and durum wheat production	29
3.3.1 <i>General trends of soft and durum wheat production in Syria.....</i>	29
3.3.1.1 <i>Area</i>	29
3.3.1.2 <i>Production.....</i>	30
3.3.1.3 <i>Yield</i>	32
3.3.2. <i>Geographical specialization: distribution of soft and durum wheat production.....</i>	34
3.3.2.1 <i>Share of governorates in wheat area</i>	35
3.3.2.2 <i>Durum wheat area</i>	36
3.3.2.3 <i>Share of governorates in wheat production.....</i>	36
3.3.2.4 <i>Durum wheat production</i>	37
4. The financial analysis of durum wheat competitiveness.	39
4.1 Financial impact of alternative trends in durum export price.	39
4.2 Issue, cost and price reference	40
4.2.1. <i>Minimizing the food security cost through durum added value maximization</i>	41
4.2.2. <i>Wheat production, marketing cost and price mechanism.....</i>	41
4.2.3 <i>Mechanism and estimation of subsidy</i>	42
4.2.4 <i>Estimation of subsidy reduction magnitude.....</i>	42
4.2.4.1 <i>GECPT, internal and external subsidy analysis</i>	42
4.2.4.2 <i>GECPT, cost and income analysis</i>	43
4.3 Rainfed durum export for reducing pressure on irrigated land	49
5. Conclusions and perspective.....	50
5.1 Possible changes of durum status in the Syrian agriculture	50
5.2 Enhancing durum production in some regions	51

1. Introduction

1.1 Food security and trade liberalization.

The Syrian agriculture is deeply transformed by the successive waves of macro-economic reforms that have been implemented by the Syrian government during the past years, In line with the signature of trade agreements with the Arab countries (the Great Arab Free Trade Agreement) and Turkey, the on-going negotiation with the WTO. Although, Syrian agriculture is increasing opening, but food security remains a crucial objective, and agricultural trade remains under government control for selected strategic commodities like wheat.

Wheat is the backbone of the Syrian food security strategy, but it is not a homogenous food value chain. It entails various ways of producing and different type of product. Wheat production has been encouraged on both rainfed and irrigated areas. So, it considered the dominant irrigated crop in Syria, which covered in average for 2006-2008 more than 50% of total irrigated area and 63% of irrigated crops, in addition to 35% of rainfed crops. Moreover, it occupied roughly 49% of total area under winter crops. Syria became self-sufficient in wheat in the mid-1990s. In particular Syria traditionally produce an important share of durum wheat (60% durum to 40% soft), but in the recent years the ratio shifted to the benefit of soft wheat that is increasingly consumed locally.

The reason behind choosing this product is: How to make compatible the opportunities offered by the trade liberalization and the necessity to keep food security. Simultaneously the wheat promotion program has succeeded beyond the expected volume making Syria a recurrent next exporter of wheat surplus in the recent years.

This study aims to investigate: to what extent the increasing “tradability” of the Syrian wheat could be a vehicle for improving and optimizing the social cost of the food security strategy through a better valorization of its export? Until now wheat policy focuses on food security: Increasing wheat production. But changes in the demand: diet transition, slowing down of the per capita bread consumption, and changes in composition of the bread to 75% of soft wheat flour to 25% durum wheat flour against 50% before. The result is; decreasing of durum wheat production against soft wheat, and then increasing likeliness of recurrent surplus of soft wheat to be exported. But, this report would address the question: why not focusing on export durum wheat with high price rather than soft wheat? The study shows and makes profitability analysis for the options under various settings:

- Within the given position of Syrian durum wheat on the world market
- With an improved position of the Syrian durum wheat on the world market through focusing on a good quality of the origin Syrian durum wheat with stability in production and exports. If reinforcing competitiveness; how to achieve it on both:
 - International level: ensuring that there is clear market for high quality durum wheat.
 - Internal level: what are the implications for developing a specific high quality durum value chain? Private versus public. Issue of profitability, quality management under a price system with governmental subsidy.

2. Wheat Market.

2.1 Type of wheat

World produces mainly three species of wheat which are dependent to their containing of humidity, protein, Hectoliter Weight, weight of 1000 grain, color and some other specifications as follows:

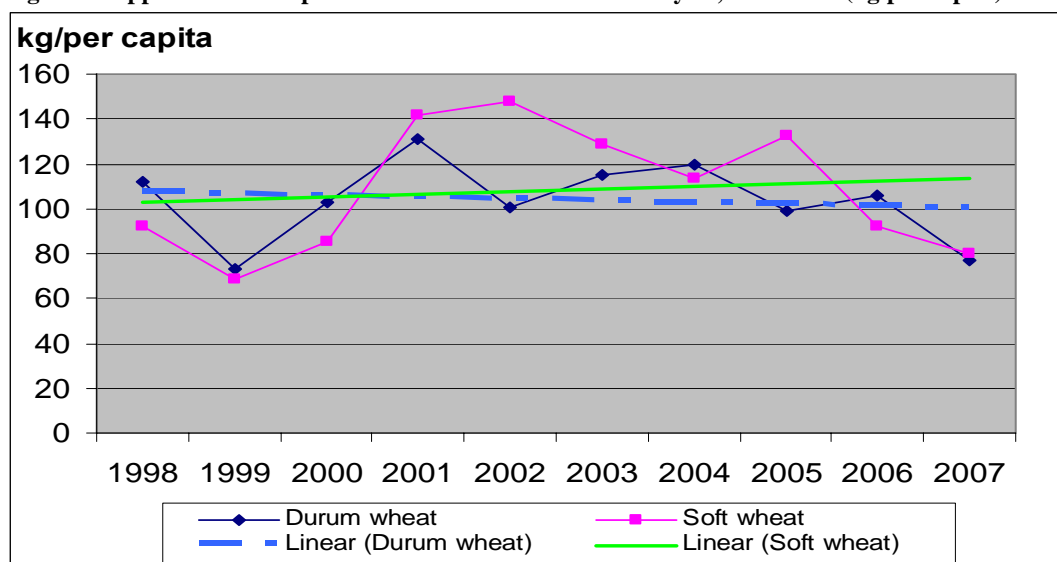
1. Soft wheat that the percentage of its humidity exceeds 14%, which uses mainly for producing kinds of white bread.
2. Common hard wheat with humidity between 11-14%, uses individually or mixture with soft wheat which its flour uses to produce brown bread and kinds of sweets and macaroni or spaghetti in addition to produce bran for food or fodder.
3. Durum wheat; which characterizes by lower humidity that is less than 11% and has relatively high percentage of protein which reaches to 14%. So, it easy to carry out, to store, and to processing. Durum is a high quality wheat variety mainly used in pasta and semolina production, but also in bread production in Middle East countries and turkey.

2.2 Wheat demand in Syria

2.2.1 Evolution of wheat consumption.

In Syria, Soft and durum wheat are mostly used for making bread. The integrated flour; which produced by the public sector mills, for many years ago, consists of 50% soft and 50% hard wheat flour. In addition, durum wheat uses mainly in the private sector for producing several kinds of semolina flour for making pasta and cuscus and other utilizations. Moreover, it is widely uses in form called “bulgur” which is cooked like rice because of its component of protein and carbohydrates. Also, some food processing firms use durum wheat to produce yellow or brown flour and bran for food or fodder. And they extract its component of protein, carbohydrates, and wheat embryo mainly for export. But, the traditional consumption of durum wheat byproduct in Syria has slightly declined during the period 1998-2007. Then the public integrated flour has been modified in 2008 to be consisted of 75% of soft wheat flour to 25% of durum wheat flour. So, the surplus of durum wheat has increased during the same period, and the available quantity for export has risen. However, the domestic consumption of soft wheat flour has increased associated with the emergency of the private processing companies that produce white flour for making vary kinds of white bread, cakes, biscuits, and so on, In addition to the growing of soft wheat flour in the new ingredient of public flour. Figure1 depict the general trends and the apparent consumption of durum and soft wheat in Syria during the period 1998-2007.

Figure 1: Apparent consumption of durum and soft wheat in Syria, 1998-2007 (kg/per capita)



Source: NAPC database, the GECPT data, Author elaboration

The trend lines, in figure 1, Shows a slight decline in per capita consumption of the durum wheat with less fluctuations, conversely, soft wheat per capita consumption shows a growing but more unstable trend until 2005. The apparent per capita consumption of both, durum and soft wheat has been declined by -4% and -2% respectively during the study period especially in 2007.

2.2.2 The commodity balance of wheat: increasing surplus

In general, the ratio of self sufficiency exceeded 100% in all years for durum wheat and most years for soft wheat, during the study period, reaching the highest (155%) in 1998 for durum and 156% in 2006 for soft wheat. So, the domestic production was higher than the internal demand, in spite of the high populating rate in Syria. This situation refers to existing of trade surplus of wheat in normal years to compete in internal and external markets. The export rate of total yearly production ranged of 3% to 35% for durum wheat and of 0% to 36% for soft wheat during the period study.

The growth rate in table 1 illustrates that the exported quantities of durum wheat has been declined by -11% during the period 1998-2007, due to the reduction in durum wheat production and effects of drought seasons, then the available quantity and self sufficiency has been slightly declined also by -2% and -3% respectively. But, the production of durum wheat is still sufficient to meet the domestic demand with surplus to be exported, as it shown in table 1.

Table 1: Durum wheat commodity balance, 1998-2007 (000 tonnes)

Durum wheat	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Growth rate (%)
Production (000 tons)	2,685	1,608	1,728	2,429	2,320	2,456	2,225	2,067	2,230	1,816	-4
imports (000 tons)	0	0	0	0	0	0	0	0	0	0	0
Exports (000 tons)	950	450	50	235	595	434	79	261	255	338	-11
Available (000 tons)	1,735	1,158	1,678	2,194	1,725	2,022	2,146	1,807	1,976	1,478	-2
Self sufficiency (%)	155	139	103	111	134	121	104	114	113	123	-3

Source: NAPC database, the GECPT data, author elaboration.

For soft wheat; Syrian government carefully deal with this strategic commodity for food security issue. So, the export began only when the production exceeds the domestic requirement in addition to strategic storage, as table 2 shows.

Table 2: Soft wheat commodity balance, 1998-2007 (000 tonnes)

Soft wheat	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Growth rate
Production (000 tons)	1,427	1,084	1,377	2,316	2,455	2,457	2,312	2,602	2,702	2,225	5
imports (000 tons)	0	0	17	49	74	265	143	192	8	45	15
Exports (000 tons)	0	0	0	0	0	457	416	375	980	739	13
Available (000 tons)	1,427	1,084	1,394	2,365	2,529	2,265	2,039	2,419	1,730	1,531	1
Self sufficiency (%)	100	100	99	98	97	108	113	108	156	145	4

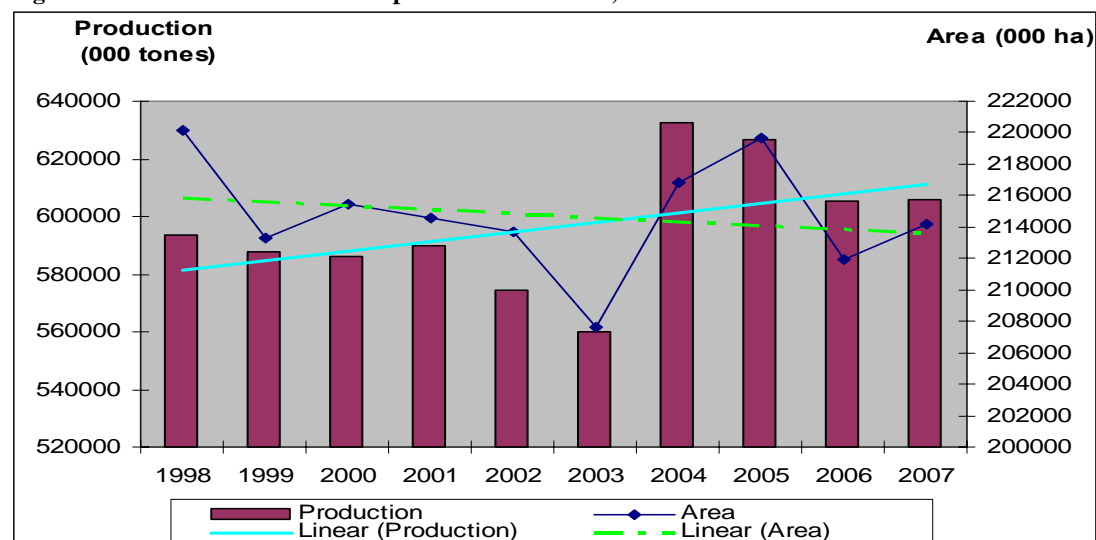
Source: NACP database, the GECPT data, author elaboration.

2.3 The world wheat economy

2.3.1 Wheat supply and area

World wheat production accounted to about 605,995 thousand tons in 2007, and has been quite variable over the period 1998-2007. Nevertheless, the trend line and the growth rate which is 0.2% in figure2 refer in general to slight increase in global production. Wheat production has been declined since 1998 to 2003, reached to lowermost quantity 559,829 thousand tons because of drought that affected several producer countries, and then it jumped to the largest quantity 632,458 thousand tones in 2004. Also, world wheat area has been fluctuated during the study period, the annual growth rate was negative -0.3%, the highest area was 220,114 thousand hectare in 1998, while the lowest one was 207,592 thousand hectare in 2003. Figure2 illustrates development of world wheat production and area.

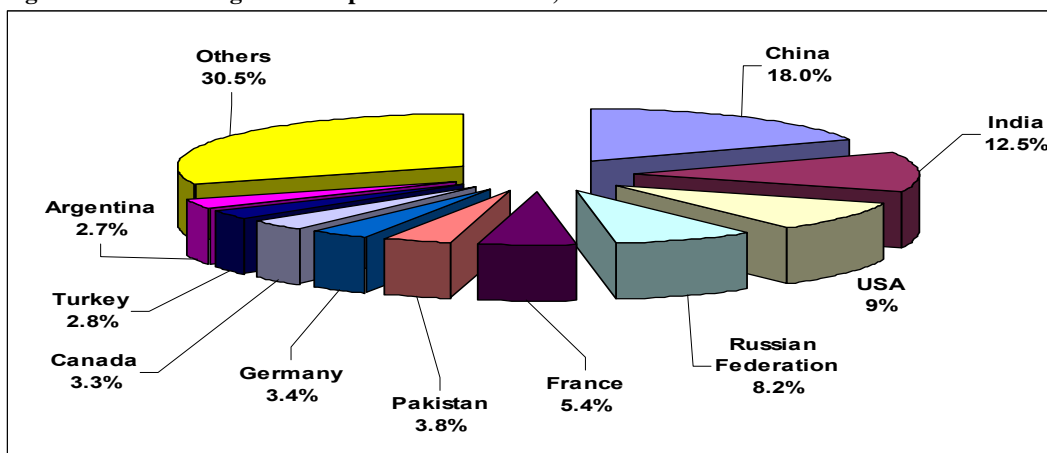
Figure 2: Evolution of world wheat production and area, 1998-2007



Source: FAOSTAT

The world's largest wheat producer countries are: China 18%, India 12.5%, the USA 9.2%, Russian Federation 8.2%, and France 5.4% of total world wheat production, as it illustrated in figure3.

Figure 3: Word's largest wheat producer countries, 2007



Source: FAOSTAT

2.3.2 World's wheat exports and imports

World wheat exported quantity in 2007 reached to about 127,775 thousand tons. The USA came at the top of the wheat exporter group; its share was about 26% of the world wheat exports. While Syria occupied the 13 order to 20 world wheat exporter countries by 0.8% of total world wheat exports (FAOSTAT). Table 3 illustrates some of the world's largest wheat exporter countries in addition to Syria, in 2007.

Table 3: Share of countries in global wheat exported quantity (%), 2007

USA	Canada	Australia	Russian Federation	France	Argentina	Kazakhstan	Germany	China	UK	Syrian
25.8	13.7	11.5	11.3	11.3	7.5	4.8	3.6	1.8	1.5	0.8

Source: FAOSTAT.

Table 4 shows order of the highest value of one ton exported wheat by counties in 2007. Syria came at the 17 order of 20 world's wheat exporter countries (FAOSTAT). But this value was average resulted of composed value of soft, hard, and durum wheat.

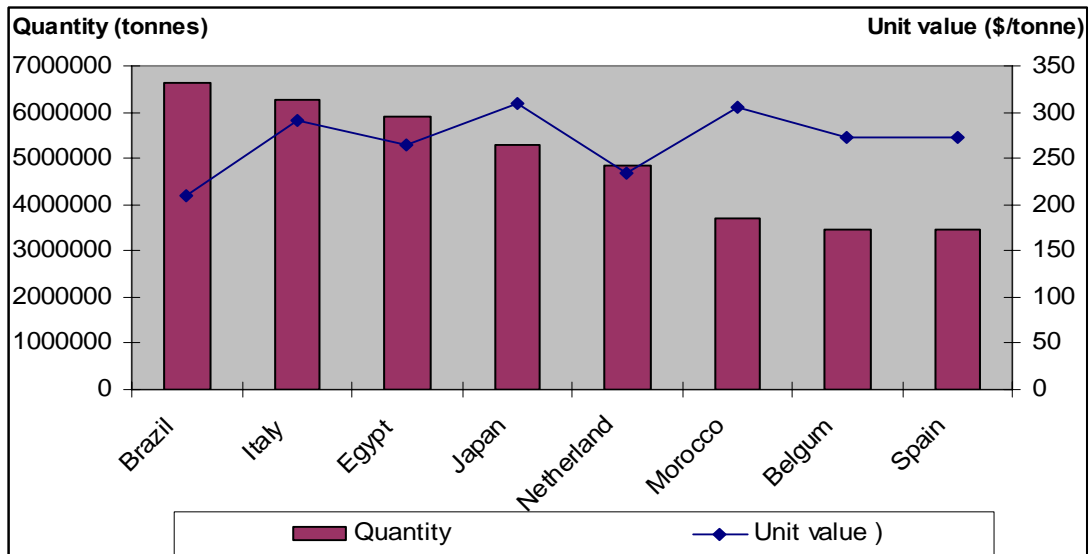
Table 4: Order of countries by value of exported wheat (\$US/tonne), 2007

Spain	Austria	Belgium	Netherlands	Czech Republic	Australia	Denmark	Mexico	USA	Syria
352	311	292	279	273	265	264	262	253	215

Source: FAOSTAT

The top world's wheat importer countries in 2007 ranges between Brazil (6,638,019 tonne) and Spain (3,440,542 tonne), and the highest unit value was for Japan (309 US\$/tonne) while the lowest unit value for Brazil (210 US\$/tonne), as figure 4 shows.

Figure 4: Top wheat importer countries, 2007



Source: FAOSTAT.

2.4 The durum wheat economy

2.4.1 Major suppliers of durum wheat

In terms of agronomics attributes¹ the best quality of durum wheat is produced in regions which have a relatively dry climate, with hot days and cool nights during the growing season. Durum wheat also yields relatively well under dry conditions. Durum production and consumption was historically concentrated in the hot dry regions around the Mediterranean Sea; North Africa, southern Europe, Turkey, and Syria remain major durum producing regions, in addition to some regions which have the same climate conditions in Canada, USA, and some other countries. Accordingly, Syria has comparative advantage with its good climate conditions, in terms of quality in producing durum wheat in several regions at south and northeast of Syria.

Until now there is no available world's database on durum wheat. But FAO began to build specialized database on durum wheat at countries within local regions level. Refers to some studies and reports were done by the European union (CEHIAM establishments), USDA, International Grain Council, and Canadian Grain Council, the world durum wheat production was calculated at 26.2 million tones in 2005 . In 2006, the production reached nearly 33 million tones, and then declined to 26 million tons in 2007 due to drought that affected the European Union and North Africa which represented about half of the world durum wheat production. .

The EU- 27 countries produce in average about 9 million tones of durum wheat which is planted in rainfed areas. This quantity represents roughly 8% of total EU wheat production that concentrated in Italy, Spain, France, and Greece, while Austria and Portuguese produce about 1.7% of total EU durum wheat production. Canada produces in average about 4.5 Mt of durum wheat and it is considered with the USA; which produce in average approximately 2.4 Mt, second producer of durum wheat after the EU in the world. Durum production in Mexico was estimated 1.3 Mt annually, and it exports annually almost 0.6 Mt of durum wheat. Turkey is the third largest durum producer in the world, next to the EU and

¹ 1. Wheat farming guide, extension division, ministry of agriculture, Syria.

2. DURUM WHEAT: 2007-2008 SITUATION AND OUTLOOK, December 5, 2007.

CGC (Canadian Grain Commission), study of RVA Technology (14/09/09), available at: THE HORSE'S MOUTH website. USDA report, (15/09/09)

Canada, with average production 3 Mt. Syria comes at fifth order after the USA, it produces in average more than 2.2 Mt of durum wheat in good years which Exceeds 40% of total wheat production, and then it has become a significant durum wheat exporter. Durum production in India was accounted to 1.4 Mt in 2007 and it is only used domestically. The Russian federation durum production uses to meet the domestic demand. While Australia exports most of its durum wheat production (0.3 Mt) due to low domestic uses. North Africa's countries (Algeria, Morocco, and Tunisia) produce in average 3.5 Mt of durum wheat which has been quite variable over the past ten years because it is largely dependent on yearly rainfall. Table 5 detailed most of estimated quantities of world durum wheat production, export, and import.

Table 5: Main world durum wheat producers, exporters. 2007 (Value 000 tons)

Country	Production			Export		Import		Indicators	
	Value	Share	Cumulated	Value	Share	Value	share	Export/ Production	Import/ Import+ production- Export
EU	8933	25%	25%	1023	14%	1527	21%	11%	16%
Canada	4445	13%	37%	3587	49%	-	-	81%	-
Turkey	3110	9%	46%	172	2%	24	0%	6%	1%
Kazakhstan	2560	7%	53%	-	-	-	-	-	-
United States	2367	7%	60%	1083	15%	497	7%	46%	28%
Syria*	1816	5%	66%	338	5%	-	-	19%	-
India	1420	4%	70%	-	-	-	-	-	-
Russia	1395	4%	74%	-	-	50	1%	-	3%
Algeria	1347	4%	78%	-	-	1994	28%	-	60%
Mexico	1327	4%	82%	615	8%			46%	
Morocco	1167	3%	85%	-	-	618	9%	-	35%
Tunisia	1085	3%	88%	-	-	386	5%	-	26%
China	960	3%	91%	-	-			-	
Libya	100	0%	91%	-	-	135	2%	-	57%
Peru	0	0%	-	-	-	107	1%	-	-
Venezuela	0	0%	-	-	-	388	5%	-	-
Australia	500	1%	92%	270	4%			54%	-
Middle East	795	2%	95%			194	3%	-	20%
Other	1892	5%	100%	241	3%	1323	18%	-	-
Total	35219	100%		7329	100%	7243	100%	20%	-

Source: Canadian Wheat Board Annual report statistics, 2007.

* National official data, 2007.

According to the previous information, the world production of durum wheat is limited and it corresponds to about 7% of total wheat production. Highly concentrated production: 6 top producers represent 66% of the total world durum production; EU, Canada, Turkey, Kazakhstan, USA, In addition to Syria. In other words, Northern America (Canada + US), Europe and southern Mediterranean countries (northern Africa and Middle East) are the 4 durum pole. Therefore, annually world supply of durum wheat in global market ranges of 6-7 MT. There is very concentrated trade on the export side; Canada, US and EU represent more than 75% of the world durum export. It is notable that the high level of exchange operates between major producing exporting and using countries (US-Canada, and US, Canada export to Europe). And major importing countries beyond producing countries are the northern African countries (especially Algeria and morocco) (table6).

Table 6: Major trade destination of major exporter and share of targeted countries imports (ooo tonnes)

importer	Exporter destination		Total import of importer	Share
	Canada	USA		
USA	422	0	497	85%
Venezuela	327	0	388	84%
Japan	207	0	214	97%
Algeria	761	223	2000	49%
Morocco	494	0	600	82%
Tunisia	137	176	386	81%
EU	759	0	1500	51%
Italy	421	319		

Source: Canadian Wheat Board, 2007.

Also table6 shows that most of imported durum wheat quantities of USA, Venezuela, Japan, and Morocco, come from Canada, while Tunisia imports more than 80% of its need from USA and Canada, but Algeria imports only about 50% of its requirement from USA and Canada, while Canada exports to EU about 50% of total imported durum of the EU.

2.4.2 Major users of durum wheat

However it is likely that the utilization of the durum is not the same in the various durum hubs; In EU, USA, and south America it mainly uses for pasta, while in north Africa it is for semolina and bread, then in Turkey, Syria and other Middle East countries durum is mainly uses for bread. It means that durum wheat is not necessarily a substitute or complementary good for soft wheat but more likely to be a segmented market for pasta and semolina making.

Durum wheat has limited and unique characteristics which make it especial wheat in world wheat markets. Good quality durum has a very hard vitreous kernel, with an amber yellow endosperm, while common wheat, even hard red spring wheat, is less vitreous and has a white endosperm. The substitutability of common wheat for durum wheat is therefore limited. The good quality of pasta and other products are connected to the characterizations of durum wheat. Durum flour is called semolina and is used to produce pasta and couscous; a staple food in North Africa. Couscous consists of small grain-like balls of semolina steamed and prepared in a manner similar to rice, in addition to bread that traditionally is produced from flour of durum wheat in North Africa. Pasta products (spaghetti, macaroni, etc.) are generally produced exclusively from durum semolina in Europe and North America, while Asian pasta is produced from flour of common wheat.

As a result of these unique characteristics, the demand for durum tends to be quite inelastic, meaning that a small shortage of durum can result in a large increase in durum prices over non-durum wheat. Even if global supplies of common wheat are abundant, a shortage of durum can result in high durum prices, as most end-users are unwilling to switch to common wheat. Conversely, because the market beyond traditional pasta and couscous production is limited, a relatively small increase in durum production can result in large durum price declines.

The demand of durum wheat will increase associated with increasing the consumption of its products. It is worth to note that durum wheat byproducts are also used in some medical and beautification industry. The four Arab countries in North Africa; Morocco, Algeria, Tunisia, and Libya are considered the largest importer countries. As a result, they have the biggest market to this commodity, because the durum wheat considers the natural food stable for habitants in addition to bread production from durum wheat, as it mentioned above, traditionally bread are also made with durum flour. Domestic production in those countries is insufficient to meet requirements, and imports have averaged 3 Mt over the past 5 years, representing nearly 40% of annual consumption to these countries.

The other major durum wheat demanding countries are Japan, Venezuela, Peru, and Chile. The South American countries have been a consistent market for Canadian common wheat and durum wheat which is estimated at 0.5 Mt in 2007, so Canada is dominated in this market. Japan yearly imports in average over the past ten years about 0.2 Mt of durum wheat and Canada also supplies the bulk of the durum imported by Japan.

2.5. Syria position in the world trade of wheat

2.5.1. Increasing participation to the world wheat trade

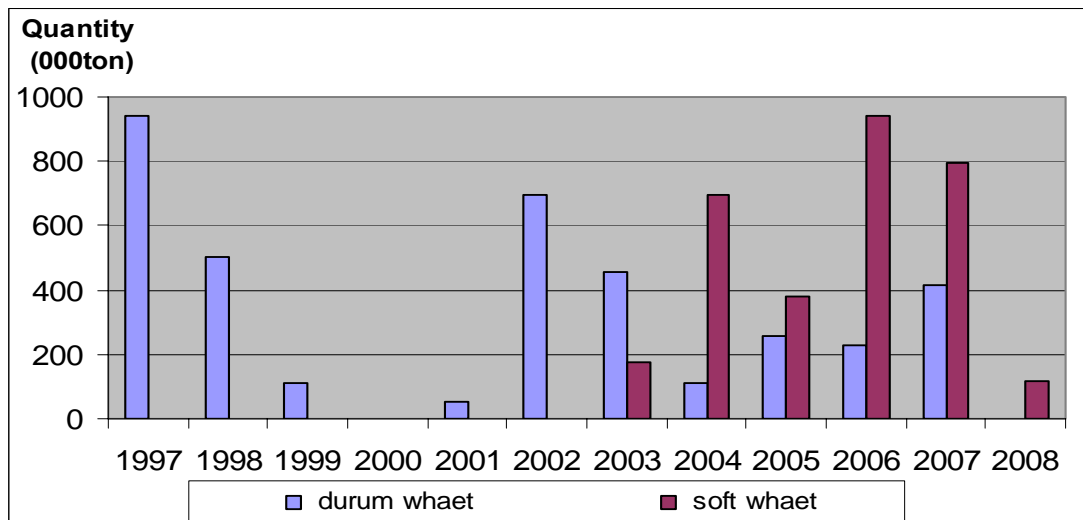
2.5.1.1 Wheat import policy

The private sector can import wheat under conditions; for domestic use or re-exporting, according to the instructions NO 9 in 9.10.2002 that was made by the ministry of economic and trade. The imported wheat should have the same specification that is adopted in the GECPT. The government usually stops the imports of wheat yearly during the harvest and marketing season from May1 to September1. The importer have to pay an amount, as insurance, to the Central Bank equal to the imported wheat value in Syrian Pound at the exchange price of SP46.5/US\$, in order to ensure that the imported wheat is made for domestic consumption or re-exported. The importer can retrieve his insurance amount after the operation is completed.

2.5.1.2 Syrian wheat export trends

From mid of 1990s, after Syria has become self-sufficient in wheat and had tradable surplus of wheat production, specially durum wheat, Syria converted from importer country of wheat in some dry years to exporter of durum and soft wheat. In general, It mostly exports durum wheat, while retains strategic storage of soft wheat for producing bread then for food security. Nevertheless, Syria began to export its surplus of soft wheat since 2003 which then exceeded exports of durum wheat, as shown in figure 5. Data of the GECPT; which is the only side that has an authority for exporting Syrian wheat, illustrates that the rate of Syrian exports of durum and soft wheat consists 31.4% and 68.6% respectively of total wheat exports in 2007.

Figure 5: Evaluation of Syrian durum and soft wheat exports, 1997-2007

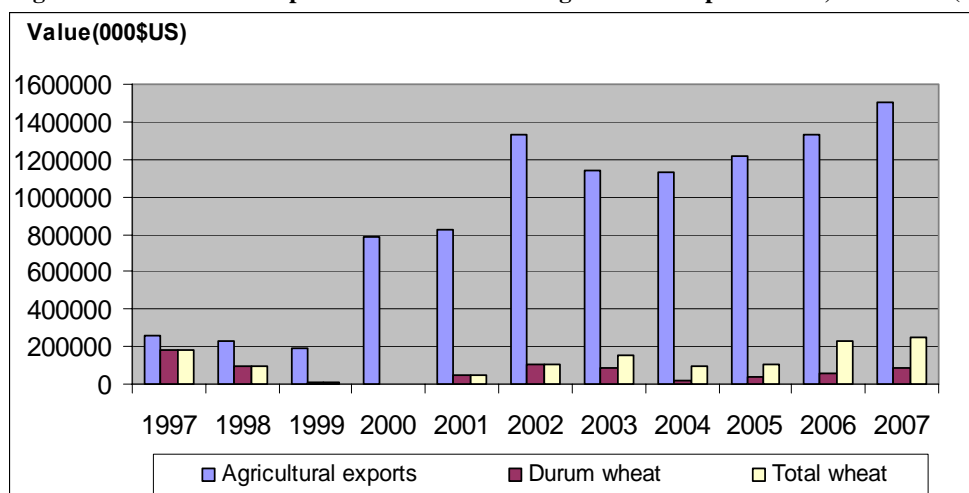


Source: Data of the GECPT.

Figure 5 shows the exported quantities of wheat were unstable during the period 1998-2007 due to drought, and the exported quantity of soft wheat was larger than durum wheat when there was appropriate

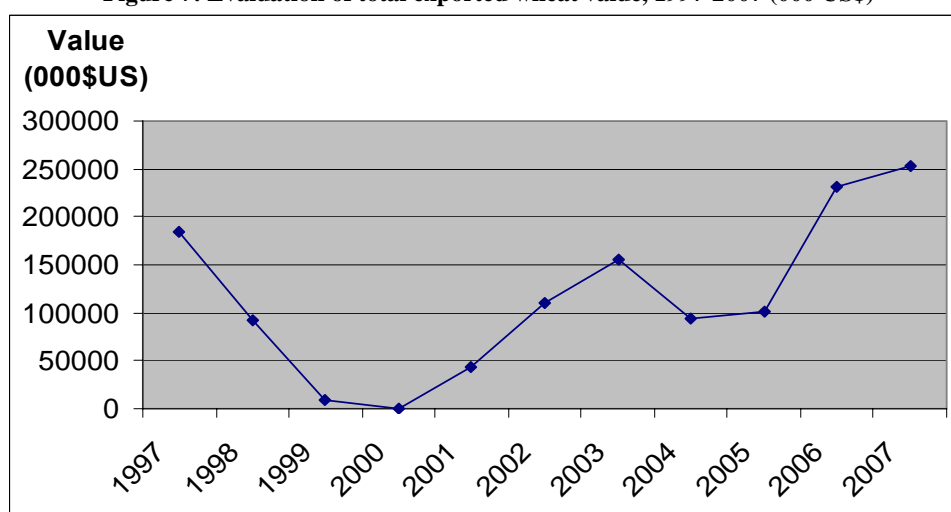
surplus for export. Value of agricultural exports substantially developed from 2001 during the period 1997-2007, while the value of exported wheat did not develop at the same rate and it fluctuated during the same period, as figure 6 and figure 7 shows.

Figure 6: Evaluation of exported wheat value and agricultural exports value, 1997-2008 (000 US\$)



Source: NAPC database. The GECPT data.

Figure 7: Evaluation of total exported wheat value, 1997-2007 (000 US\$)



Source: NAPC database. The GECPT data

The share of exported wheat value was diverse in the same period due to unstable of exported wheat because of drought, as it shown in the following table:

Table 7: Evaluation of portion of exported wheat in agricultural exports value, 1997-2007 (000 US\$)

Item	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Share of wheat exports in agricultural exports (Value %)	72	41	5	0	5	8	14	8	8	17	17
Share of durum wheat exports in agricultural exports (Value%)	72	41	5	0	5	8	7	1	3	4	6

Source: NAPC database. The GECPT data

Table 7 illustrated that Syrian exported wheat was merely durum wheat until 2003, and then the proportion of exported durum wheat has declined adverse increasing of exported soft wheat especially in 2006 and 2007, as shown in figure6.

2.6. Syrian durum wheat exports and rewards to quality

2.6.1 Specificity of Syrian Durum²

Definition: The origin Syrian durum wheat means; the wheat that is historical planted in Syria under common name "hard wheat", which has unique specifications that has been identified as a result of cellular test of chromosomes of Syrian wheat kinds. These tests clarified that the pure genealogy of Syrian wheat kinds such as: Sham1, sham3, sham5, buhouth5, and horany wheat follows to the global durum wheat kind which has 28 chromosomes, and gains high prices due to its industrial efficiency and global production limitation (5-7% of world wheat production), while soft wheat kinds have 42 chromosomes (Agricultural Science Research Commotion). Table8 illustrates the characteristics of Syrian durum wheat comparison with Canadian and USA durum wheat.

Table8: Characteristics of Syrian durum wheat, comparison with Canadian and USA durum.

Characteristics	Syrian durum wheat	Canadian & USA durum wheat
Humidity %	8 – 9 %	13-14% some 17%
Protein %	12 - 14 %	12-14%
Grain color	Ambry	red
Hectoliter Weight/kg	75 - 85	75-79
Crystallization %	90 -95 %	40 -75 %
Weight of grain /1000/g	35-50	20-32

Source: Brief memorandum, General Committee of Agricultural Science Research. Study about wheat breed prepared by MAAR, 1995-1996.

Table8 shows that Characteristics of Syrian durum wheat superior to Canadian and USA durum wheat, spicily for Humidity, color, Crystallization, and Weight. By these unique characteristics, the Syrian durum wheat can strongly compete in world markets and gain relatively high prices according to the demand aim and structure. But, why it didn't get this price premium, or not as high as expected? Is agro-food industry so sensitive to the quality of durum, or a middle quality is OK? Is the world market or the Syrian wheat export value chain able to make the distinction? What is the proportion of Syrian durum that meets the highest standard? Maybe there are other issues; Logistics aspects, homogeneity, stability in delivering the same quality might be also important for durum agro-industrial users. It is difficult to answer to all the questions in this report, but the report will show the real situation in these aspects.

The experience of Syria in exporting wheat at regional and global level considered new specially in durum wheat, Syria began to export wheat in the middle of 1990s. Nevertheless, Syrian durum wheat, which is currently middle in quality, has had prices nearly equal to world prices at the contract time. But, some high qualities of Canadian and Italian durum wheat, that have the same characterization of Syrian durum, gain the highest prices in world markets. The taintless Syrian durum wheat affected by the time during planting, storing, and marketing actions and modified to mixer product which may compose of several kinds of common wheat, although the GECPT applies severe procedures in order to separate kinds of wheat during storing or marketing time. And it makes classification for wheat kinds when it receives the product from farmers. The challenge that faces Syrian trade of durum wheat is represents by the actions that ensure producing pure and high quality of breeds to meet the world demand on this product,

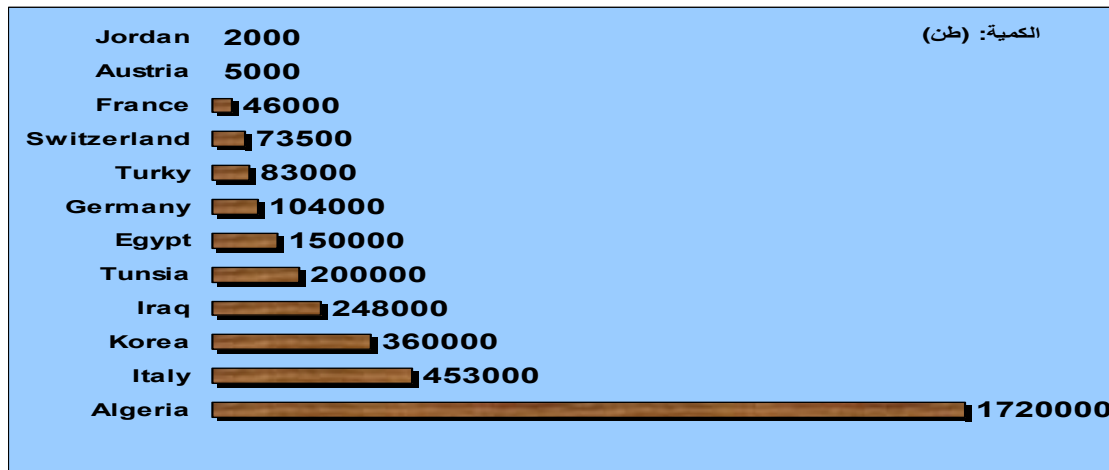
². For more information about kinds and characterization of Syrian durum, see: Wheat farming guide, extension division, ministry of agriculture, Syria.

and enhance the marketing and exporting capacity. In addition to develop adequate infrastructures to achieve the trade activities by effectiveness way which meets the world measures in this area. So, Syria can improve competitiveness of its durum wheat in regional and global markets, and obtains satisfactory prices.

2.6.2 Syrian durum wheat destination

Figure8 traces the destination of Syrian durum wheat exports and total exported quantities by countries in the whole period 1997-2007.

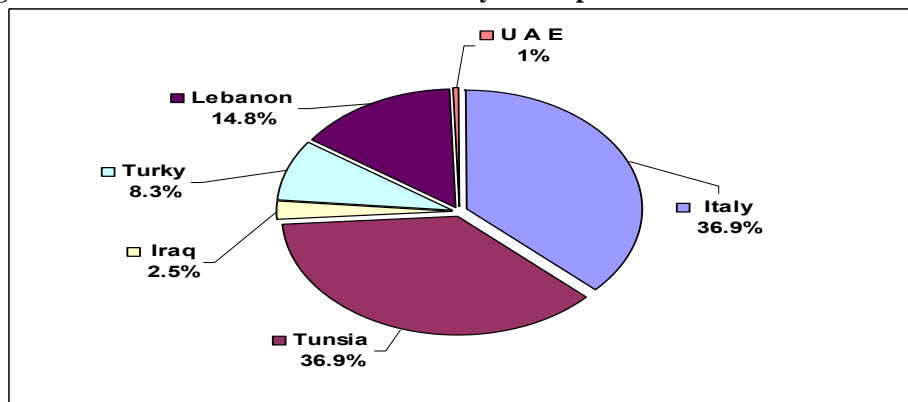
Figure 8: Destination of Syrian durum wheat exports and total exported quantities by countries in the whole period 1997-2007.



Source: GECPT data

As figure8 shows, Algeria was the largest imported country of Syrian durum wheat; as a result it is considered the most important market for Syrian, although Algerian market continued to 2003, and then cam Italia, North Korea, Iraq, Tunisia, and Egypt. It is notable that Italian market was more steady during the study period (7 years of 10 export years), but with different quantities according to yearly production situation, and ranged yearly between 10 to 150 thousand tons during the same period. North Korea imported among 4 years at stable quantities, and France also imported Syrian durum wheat for 4 years but in small quantities, the biggest one was 16 thousand tones. Figure9 shows the destinations and distribution of Syrian exported durum wheat in 2007.

Figure 9: Destinations and distribution of Syrian exported durum wheat in 2007



Source: GECPT data.

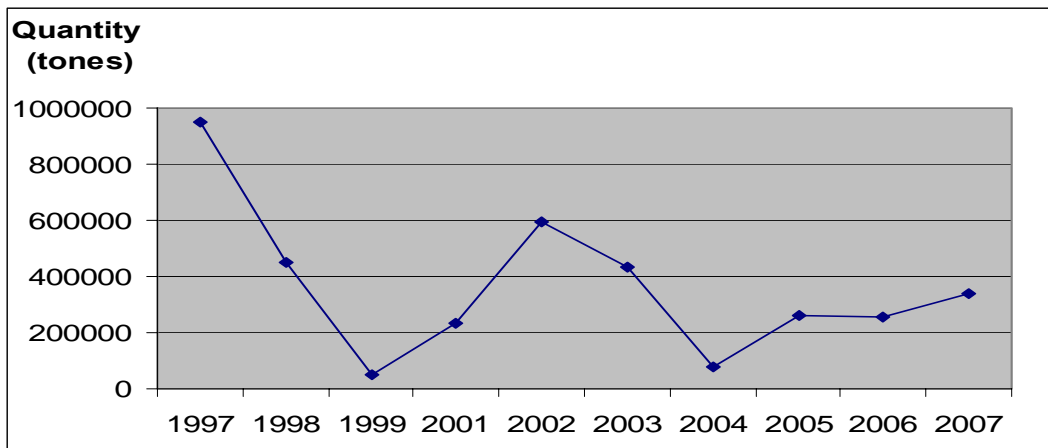
As mentioned before, the most stable world markets for Syria to export durum wheat are, dependent on demand aim and structure, the EU and northern Africa countries due to insufficient of domestic production to meet the increasing demand on this product . Even though, the Syrian exporter which is represented by the GECPT prefers exporting to regional neighbors or countries because of the easiest of

overland exporting regarding to limitation in procedures, transition costs, rapidity of payment, etc. Nevertheless, the neighboring countries such as Iraq, Jordan, Lebanon, and Egypt import limited quantities of Syrian durum wheat due to lowering in domestic demand. Moreover, the Turkey market is considered closed because of availability surplus in domestic production. So, the Syrian exporter would be in a better position by targeting more stable markets associated with increasing demand on durum wheat. As a result, Syrian exports should meet the conditions and development of world demand.

2.6.3 Durum Export and world prices and price differential

Syria began to export durum wheat since the mid-1990s. But these exports were unstable, and there were annually fluctuations. Durum wheat exports reached about 950 thousand tonnes in 1997 then declined to minimum of 50 thousand tones due to drought in 1999/2000, and in 2007/2008 seasons. Figure10 represented development of Syrian exports of durum wheat during the period 1997-2007.

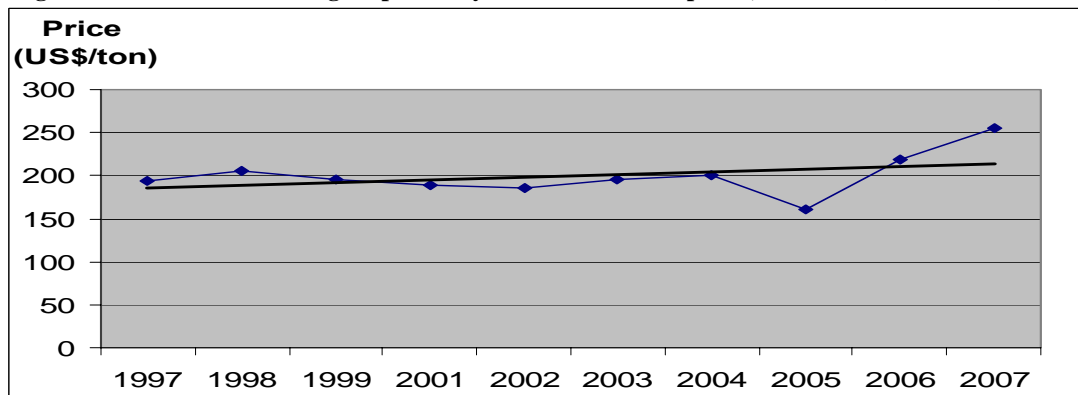
Figure 10: Exported quantities of Syrian durum wheat, 1997-2007 (tonnes)



Source: GECPT data

The weighted prices of exported durum wheat averaged to about 258 US\$/ton in 2007, while the price of exported soft wheat amounted to 225 US\$/ton at the same time (the GECPT data). Figure11 traces the development of exported durum wheat prices during the period 1997-2007. The trend line illustrates increases in Syrian export prices of durum wheat especially in 2006/2007 as a result of increasing in world demand on wheat.

Figure 11: Evolution of average exported Syrian durum wheat prices, 1997-2007 (US\$/tonne)



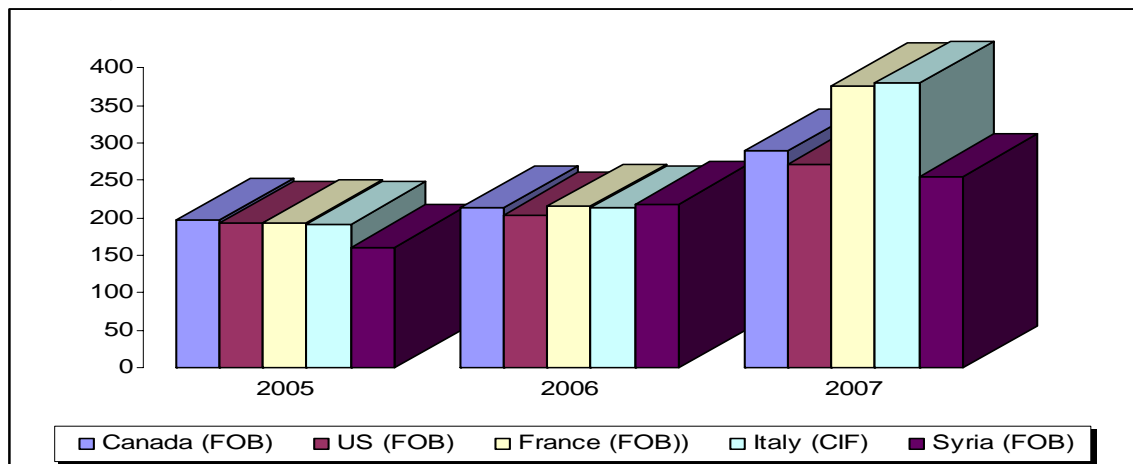
Source: GECPT data

Note: Syria did not make any export contracts in 2007/2008 because of drought.

The drought that affected Syria, especially in 2008, stopped exports of wheat since middle of 2007, and prevented it from gaining high prices of durum wheat which doubled twice or three times to some kinds according to their origin. In addition, drought obligated Syria to import soft wheat among the GECPT for completing its need of wheat to produce integrated bread.

The disparity of world durum wheat prices reflects differs in quality and content of the raw product (protein, crystallization, humidity, and weight, etc), which affects the quality of the last product. The importers pay more currently for high quality of some kinds of Canadian and Italian durum in comparison to Syrian durum wheat prices. Therefore, Syria can obtain higher prices for its durum wheat when it can improve the purity and quality of this product. Figure12 represents comparison show between average of world durum wheat prices and average of real exported Syrian durum wheat prices during the period 2005-2007; according to the largest export countries of durum wheat.

Figure 12: Average of exported durum wheat prices according to the largest export countries, 2005-2007 (US\$/tonne)



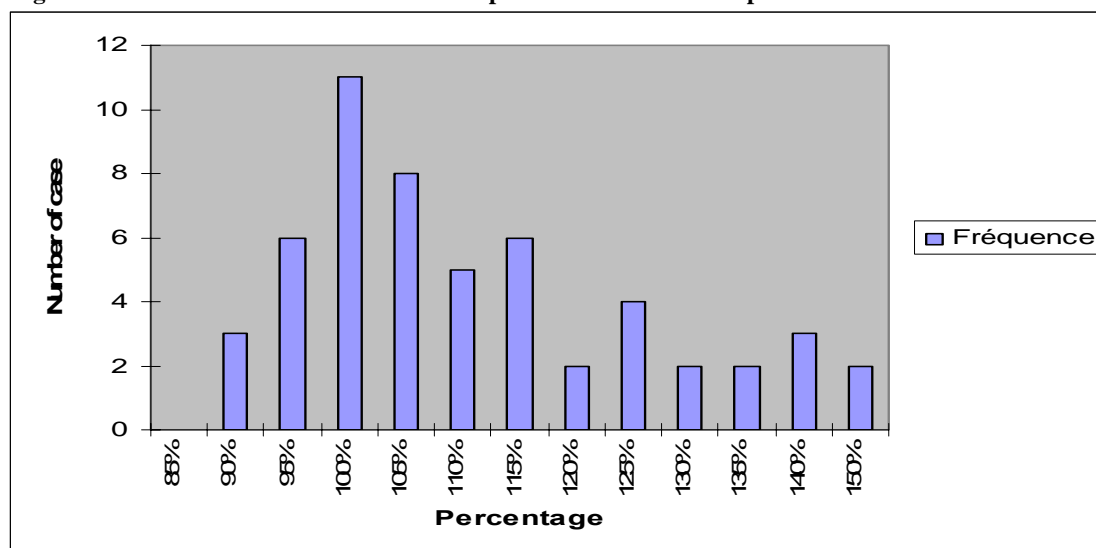
Source: Reuter's agency, daily and monthly sample of world wheat prices and GECPT data.

Figure 12 shows that the Syrian durum wheat was competitive in terms of price level in regional and world markets with its actual specifications, due to increasing of demand on it and gained prices nearly equivalent to world prices in 2005, while its prices was higher from 2006 to middle of 2007, when Syrian wheat exports stopped, in comparison with Canadian and USA durum wheat. Prices of Italian and France wheat, spicily durum wheat, raised in 2007 and 2008 beneficial of increasing of world demand due to drought that affected several producer and exporter countries like Syria and some producer and importer countries such north Africa countries (Tunisia, Algeria, and morocco).

At world level, usually durum wheat gains higher prices than soft wheat due to limited world production of durum, but these differences range from year to another, for instance:

1. if we look at long time series for soft/durum differential in the case of the Minneapolis market in US we found that the ratio of durum price to wheat varies from 85% up to 150%, however between 1956 and 2008 in 75% of the years the price differential is below 115% and In 34 of 52 years the price of durum wheat superior to the soft wheat price (figure 13).

Figure 13: Distribution of durum/soft wheat price on the USA Mineapolis market



Source: Computed from USDA sources.

2. When we look at the Canadian market (table 9) the highest prices difference are 131 and 136% that was recorded only for two years 1997 and 2008 respectively. Otherwise the price differential ranges between 87% and 118%.

Table 9: Canadian domestic price for soft and durum wheat (US\$)

Year	Soft wheat	Durum wheat	Differences(durum/soft)
1996-97	225	250	11%
1997-98	212	278	31%
1998-99	208	201	-3%
1999-2000	192	207	7%
2000-01	203	234	16%
2001-02	217	257	18%
2002-03	250	267	7%
2003-04	211	222	5%
2004-05	205	192	-6%
2005-06	195	170	-13%
2006-07	213	216	1%
2007-08	372	505	36%
2008-09	311	367	18%

Source: Canadian Wheat Board Statistics.

Syria has been exported soft wheat only during 2003-2007, and then it has obtained a significant differentiation between real export prices of durum and soft wheat in some years, as the following table shows.

Table 10: Real export prices of Syrian durum and soft wheat 1997-2007 (US\$)

Years	1997	1998	1999	2001	2002	2003	2004	2005	2006	2007
Av Durum wheat price (US\$)	194	205	195	188	185	195	200	161	218	255
Av soft wheat price (US\$)	0	0	0	0	0	155	187	157	180	225
price differential durum /soft wheat	0	0	0	0	0	26%	7%	3%	21%	13%

Source: The GECPT data.

It is difficult to consider that the differentials are similar to the previous of the US and Canadian cases, because there is no evidence that the durum market is integrated and that price variation in the US and Canadian market would be fully transmitted to the Syrian FOB price because of quality differences and condition of the transactions (requirement of the purchaser of the Syrian durum may differ from the one of the Canadian and US durum).

The perspective offered by these differentials shows that even though the durum has on average a premium over the soft, the current differential is rather limited 10 to 15%, then the potential gain of reducing the cost of soft wheat supply to the Syrian population through export of durum is also restrained. One issue is to further identify to what extent the specificity of the Syrian durum may deserve a higher premium. But, the challenge is the limited capacity of the GECPT to supply durum of high quality on a regular basis to the most demanding market (pasta industry in Europe and North America and Japan...). Also, the impact of quality on the competitiveness has to be assessed cautiously; one paper³ analyzes the factors that explain why the US agro-food industry may or may not prefer Canadian durum versus US durum wheat. It concludes that logistical factors (system for supplying the product) may have more impact on durum purchaser decision than the quality.

³ Mimi Lee, Mel Lerohl*, James Unterschultz,, 2001, Buyer preferences for durum wheat: a stated preference approach , *International Food and Agribusiness Management Review* 3 (2000) 353–366

3. The Syrian wheat value chain

3.1 The wheat value chain arrangement: a “public” value chain.

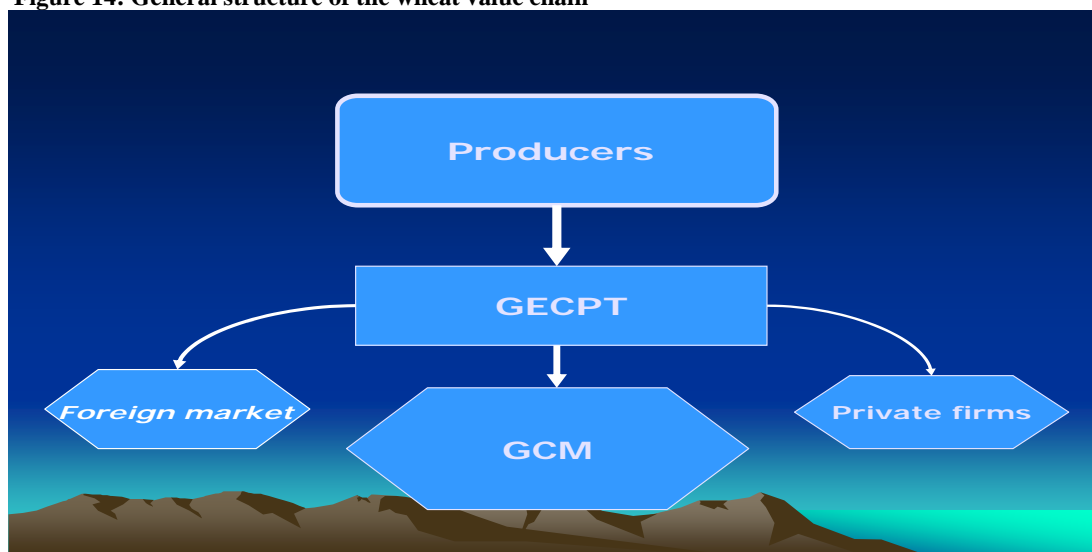
Internal and external trade: Wheat is considered one of the most important strategic crops in Syria, and has paramount importance for human consumption and food security of the country. So, wheat commodity is almost totally operated by hand of the government. The major objective of the Government is to ensure that the country has annually strategic storage of wheat, because more than 60% of it consumed in form of bread. The government sets the official prices for purchasing wheat from the producers through the General Establishment for Cereal Processing and Trade (GECPT). Moreover, it identifies prices along the marketing and processing series. These prices are annually reviewed and it is adopted according to the production cost study of one area unit which contains a marginal profit.

Before Syria has become self-sufficient in wheat, the government has been taken extreme procedures to prevent producers from selling their production to the private sector, and to prohibit transmission wheat between regions within each governorate or among governorates. Then the government has been attenuated these barriers especially in good years, but in dry years there were sharp commercial barriers on wheat, as it happened lately during dry seasons in 2007/2008 with resolution no 1,186 which prevented the private sector of carrying wheat among governorates without permission from the GECPT.

3.2 Value chain structure

Wheat value chain comprises of two main agents: producer and The GECPT as a trader, an exporter, and as processor, in addition to small role of trader as a middleman between producer and the GECPT.

Figure 14: General structure of the wheat value chain



Source: author elaborated

3.2.1 Producers

In Syria the small and middle properties of land are prevalent due to the splitting of properties throughout the time as a result of heritage customs. The small and middle farms mostly operated by households, specifically manual operations. But these farms pay wages for mechanized operations such as; cultivation, machinery sowing of seeds and fertilizer, pesticides, and harvesting. While mechanization prevails in large farms, and they mostly own machines and equipment, in addition these farms use more wage labor in their manual operations. As a result, the farmers who own middle or large farms have more

practices and efficiency role among the production, marketing and value chain. In the irrigated regions, farmers (producers) follow the following agricultural rotations:

- Potato, wheat, and summer vegetables (the southern region of Syria).
- Potato or sugarbeet, wheat, and vegetables (the northern and middle regions of Syria including Al-Ghab region)
- Cotton, wheat, and vegetables (Al-Hassakhe and the northeast regions of Syria)

Often, wheat is planted after sugarbeet or potato or cotton crop to benefit from remains of fertilizers in land especially the organic fertilizers.

For producing wheat in rainfed areas, farmers follow an agricultural rotation according to annual rainfall:

- Legumes, wheat, and winter or summer rainfed vegetables (it prevails in the middle and northeast regions of Syria).
- Legumes, wheat, slumber (it prevails in the southern regions of Syria).

3.2.1.1 Production inputs

▪ Seeds: Farmers use between 250-300 kg of wheat seeds per hectare in the irrigated land and between 150–250 kg per hectare in the rainfed land which differ according to ecological-zones. They can book and get what They preferred of improved and sterilized seeds by two ways:

A. From the Agricultural cooperation Bank (ACB), if it available, at the official prices by paying directly total seeds value or by seasonal credit with official interest rate. This seeds originally distributed from the General Establishment of multiply Seeds (GEMS) according to the agricultural plan and the rates that adopted in the ACB.

B. Directly from the GEMS at the official price after making contract which states; that farmer obligated to deliver his production to it under condition that product should equivalent to the specifications that stated in the GEMS. The GEMS adds 20% marginal profit (or a prize) to the official wheat price in the same year; as encouraging policy for farmers to use all required inputs and operations in order to get good quality of product. In addition, some other farmers get improved and sterilized seeds at higher price among intermediary traders that may gathered it from surplus of some farmers or unused seeds stored from previous years. Moreover, Many farmers use common seeds of own retention production from previous years or they purchase seeds from other farmers.

▪ Fertilizers and fuel: Syrian government liberalized prices of chemical fertilizers in 2008/2009 season. Before that it has adjusted the price of diesel in 2007 from about 7 SP per liter to 25 SP per liter then decreased tom 20 SP per liter. Chemical fertilizers were distributed by the ACB according to the yearly agricultural plan and the adopted use rates at official prices included government subsidies; by paying directly the Chemical fertilizers value or by seasonal credit with official interest rate. Also, the ACB has adjusted the Requirement Tables of crops in 2008. The following table illustrates the requirement of wheat crop of seeds and chemical fertilizers in addition to the available cash credit per dunum before and after the adjustment.

Table 11: requirements of wheat crop of seeds and cash credit per dunum and fertilizer prices.

Crop	Seeds before 2008 (kg/dunum)	Seed after 2008 (kg/dunum)	Cash credit (SP/dunum) before 2008	Cash credit (SP/dunum) after 2008	Chemical fertilizer	Prices before liberalization (Sp/kg)	Prices after liberalization (Sp/kg)	Increasing prices (%)
Irrigated wheat on wells	25	30	450	1000	Super phosphate 46%	8.16	23.90	193%
Irrigated wheat (Flowed)	25	30	450	1000	Urea 46%	8.90	18.00	102
Rainfed wheat in ecological zone 1*	20	22	165	250	Nitrate ammonium 30%	5.80	15.40	166
Rainfed wheat in ecological zone 2**	15	15	140	210	sulfate potassium 50%	12.50	57.10	357

Source: ACB data, 2009.

* Rainfall more than 550 ml/year

** Rainfall more than 350 ml/year

Note: 1 hectare = 10 dunum

Table 9 Shows that the increasing rate of base chemical fertilizers prices ranged between 102% to 457% and it equivalent to the governmental Subsidy that was applied before. Then the ACB raised the advanced credit rates that delivered to the farmers at the same time with seeds and fertilizers in order to covering the increasing in fertilizer and diesel prices.

According to interviews with sample of farmers covering most of the Syrian governorates that produce wheat; the increase in fertilizer and diesel prices has been created heavy increasing in production cost specially in irrigated wheat, as a result it caused a reduction in numbers of irrigations which depends on pumps operated by diesel. Consequently, this situation led to reduction in yield and in marginal profit of farmers then caused increasing in farmer indebtedness and deficit in return of the previous debt especially in succession of drought years. Therefore, the position of the producers in the value chain has been negatively affected by these evolutions. Moreover, because of food security issue, this situation has added more burdens on government by raising farmer credits and dispensation of some interest rats with postponed of previous credits. Also, the government was obligated, due the new cost and drought, to raise the official prices of delivered wheat in 2007/2008 season and 2008/2009 season by about 45% and 20% respectively over last years. So the gap between national wheat prices and world wheat pieces has increased.

- Pesticides and herbicides: Farmers mostly use the herbicides yearly especially in irrigated wheat and they get them mainly from the private sector with liberalized prices, while operates of controlling epidemic pests implemented only by government consideration of limited wages from farmers.

- The irrigation water: There are several sources of irrigation water in Syria: rivers and springs, private wells, public webs on rivers and dams and public wells as the following table:

Table 12: irrigated areas according to sources of water, 2007 (ha)

Item	Total irrigated area (ha)	From private wells (ha)	Public irrigation projects (ha)	Rivers and springs (flow) (ha)
2007	1,396,340	812,921	358,563	224,856
% of total irrigated area	100	58	26	16

Source: MAR, the annual agricultural statistical abstract, 2007.

Table 12 illustrates that the public irrigation network cover only 26% of total irrigated areas while private wells cover 58%. When farmers use the public irrigation web they are obligated to pay about 3,500 SP per hectare as fees in complete season, but when they get water from private wells they mostly use pumps which operate on diesel with irrigation cost higher than public irrigation web cost by more than 5 times. Small percentage of farmers uses electricity instead of diesel, so they could reduce the irrigation cost by about 75%. As mentioned before, the raise in diesel prices has reflected in production cost and has caused negative effects on yield. This disproportion in production costs led to inequality in net profit between farmers, then as a result reduces the effectiveness of farmers in the value chain of wheat.

- Labor: Most wheat in Syria is mechanized in most agricultural operations. The labour needs for wheat vary between rainfed and irrigated land and among agro-ecological zones. Labor requirements for rainfed wheat are mostly used for planting, fertilization, and weeding, and labor cost comprised about 6% of total production cost, while in irrigated wheat; which reaches to about 14% of total production cost, are used for land preparation, planting, fertilization, weeding, controlling and irrigation.

- Capital: The agricultural cooperation bank (ACB) is the only permanent formal source of credit for wheat producers. The ACB offers in-kind and in-cash loans. In addition, there is an informal market for credit. The main source relevant to wheat production is the informal traders of cereals and store or companies that sell the agricultural production inputs.

3.2.1.1 Production cost structure of wheat

Wheat costs of production differ from one area to the other and from farm to farm in the same area. The most important factor that causes the variation of wheat production costs structure is the planting type whether rainfed or irrigated, but there is no big difference in the average value of production cost during the period 1999-2008, and there is a small difference in production cost between irrigated soft and durum wheat related to the seed cost and the productivity, as table13 shows.

Table 13: The official production cost of wheat, 1999-2008 (SP/tonne)

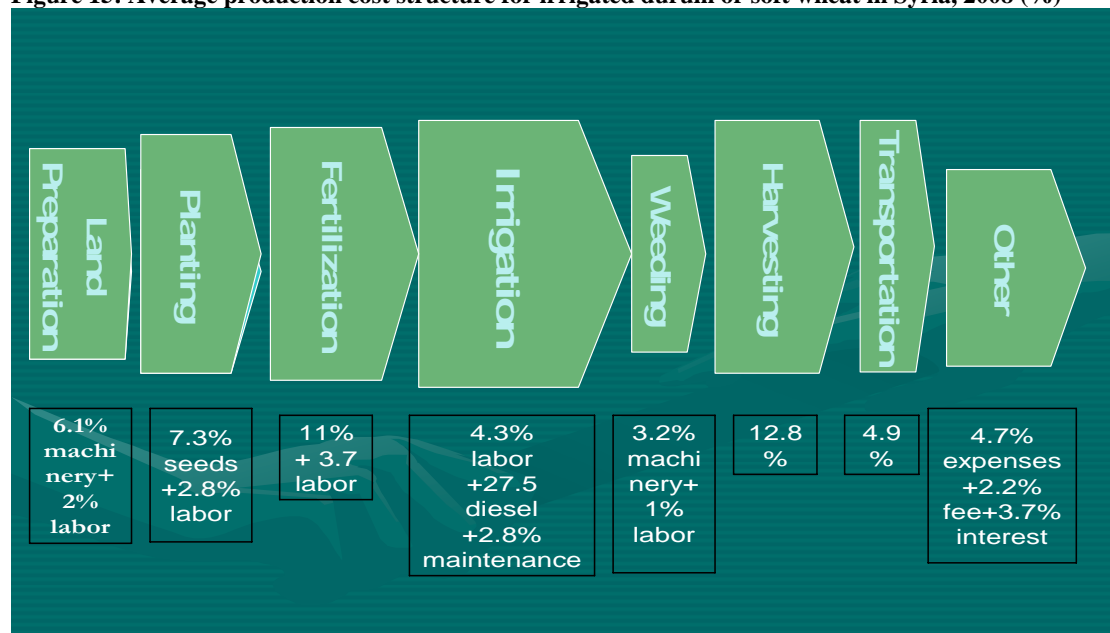
Item	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Av
official irrigated soft wheat cost (SP/tonne)	9,990	11,480	11,500	10,919	10,271	10,729	9,990	9,500	9,360	9,530	10,327
official irrigated durum wheat cost (SP/tonne)	10,710	12,260	12,280	11,026	10,641	11,040	10,240	9,850	9,790	9,870	10,771
official rainfed durum wheat cost (SP/tonne)	10,910	15,170	15,180	11,521	9,233	9,281	8,690	8,810	8,340	8,860	10,600

Source: The annual statistical abstract, 2008.

A. Irrigated durum wheat

The largest component of production cost is the irrigation operation, which equivalent to about 35% of total cost due to diesel use that comprises 27% of this operation, and labor requirement for irrigation; which depends on ways and performance of irrigation operation, was estimated in average to 4.3% of this operation cost. The second large component is cost of fertilization reaches to about 14% of total cost that contains about 3.4% of labor cost. Third large component is the harvesting operation which mostly machinery performed; comprises about 12.8% of total cost. Then comes the planting operation with seeds value, and several operations related to land preparation and weeding with partial use of labor. The cost of transportation depends on the distance of a GECPT centers and the time for marketing operation. The last component involves of incident expenses and limited administration fee in addition to interest on capital use for inputs. Figure 15 briefly shows the proportions and structure of production costs of irrigated wheat.

Figure 15: Average production cost structure for irrigated durum or soft wheat in Syria, 2008 (%)

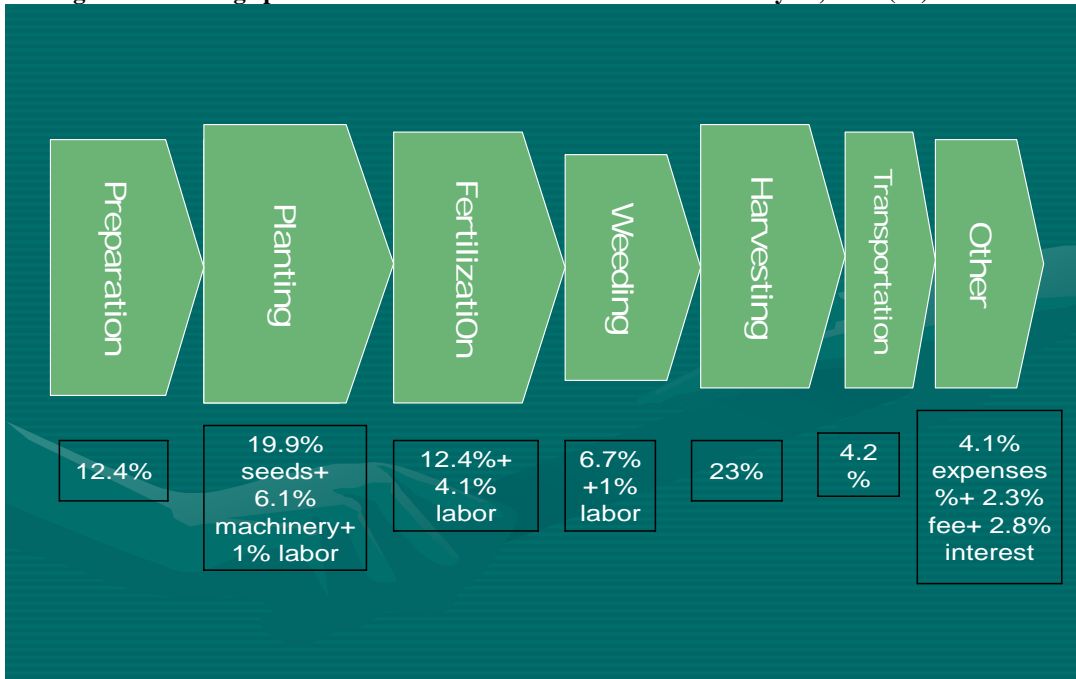


Source: Survey by Author.

B. Rainfed wheat

The production cost of 1 kg for rainfed wheat, which is differs from year to year according to the yield, less than the production cost for irrigated wheat by about 1 to 2 SP per kg at the national level. But, after adjusting prices of diesel with liberated of fertilizer prices the difference in production cost will increase due to the amount of fertilizers and diesel use. The major component of production cost for rainfed wheat is cost of planting operation which reaches to about 27% of total cost with small percentage of labor cost and large cost of seeds, Then the harvesting operation that equivalent to about 23%, which mostly machinery implemented. The fertilization comprises of 16.5% of total cost with 4.1% of labor cost, and land preparation that totally machinery applied, form about 12.4% of total cost. Weeding reaches to 7.7% with small use of labor, while transportation cost nearly the same proportion for production cost of irrigated wheat and the same details for other costs, as shown in figure 16. It is notable to refer that cost of land in both irrigated and rainfed wheat production is usually considered as rent land; which equivalent to 15% of production.

Figure 16: Average production cost structure for rainfed wheat in Syria, 2008 (%)



Source: Survey by Author

3.2.2. Public trading and processing companies

Wheat in Syria is basically under responsibility of General Establishment for Cereal Processing and Trade (GECPT), which is followed to ministry of economic and trade. There are two public processing companies under the GECPT; the General Company for Mills and the General Company for Bakeries, as shown in the following figure:

Figure 17: The administration form of public trading and processing companies



Source: Elaborated by author.

This study will not focus on wheat processing. But it will briefly refer to public processing companies, other than the GECPT, related to wheat trade issue, so it will stop at the GECPT level as main agency in the wheat trade issue and value chain.

3.2.2.1 The General Establishment of Cereal Processing and Trade

Total estimation storage capacity of the public sector included the GECPT, GCM, and the General Company of Silos (GCS) for wheat is about 5,712 thousand tons as follows:

Table 14: Wheat storage capacity of the public sector

Owner	Kind of store	Storage capacity (000 tons)
GECPT	Warehouses	1,105
	Metal bins	1,237
GCM	Silos or (cement sells)	620
GCS	Silos or (cement sells)	2,750

Source: the GECPT data.

A. the GECPT as a trader

The GECPT has the authority to purchase, storage, and marketing wheat. It has 139 marketing centers for receiving wheat from producers at the official prices, which are distributed all over the country and not so far from production regions. The GECPT adopts and executes instructions and the resolutions that come from the ministry of economic and trade in this scope. Most of wheat (more than 65%), that received by the GECPT, is sold to the General Company of Milling (GCM) at the cost prices. Also, the GECPT sells wheat directly at world prices by Syrian pounds to private mills only for milling then exporting, and to industrial institutions (plants of macaroni, noodles, and biscuits) by virtue of the instruction Number 7 in 15.9.2002.

The new cost of wheat in GECPT through several operations and adding value involves the following items:

Table 15: Storage cost at GECPT (trader cost), (SP/ton)

Operations								
Storage rental	Sterilization	Put in	Put out	Garble	Airing	Packing	Sample test	transportation (Moving between centers and storage inside GECPT)
23	28	7	7	21	5	23	50	36

Source: GECPT data. Author elaborated.

B. the GECPT as an exporter

Currently the GECPT operates under operation regulation No 629 in 5.3.2006, which is group of instructions that arranges sale operations within GECPT, and according to contract arrangement under Law No 51 in 9.12.2004.

Under this arrangement the GECPT can sell wheat by the following methods:

1. Direct contract.
2. Committed contract
3. Deferred contract and installment. While the rest of methods such as; direct method, bidding, selling by agents, and straight or soft selling are done according to Law No 51 in 9.12.2004.

Until now the GECPT sells outside the country (export) by direct contracts without Agents. Also, the operation regulation states that the export prices of Syrian wheat must be equal or higher than world prices at the same time (no less than world prices). And the GECPT sells wheat by virtue of resolution NO 312 in 5.4.2003, which contains the Cereal Trade Regulation. Accordingly, the export operation achieves as the following steps: the directorate of Internal trade and storage make a proposal about the quantity and the quality of wheat that ready to export, then the GECPT Administration Council make the

decision on this issue. And the export operation is completed by the Sale Committee that is formed for that. The Sale Committee makes advertisements, and sends samples of wheat for those who willing to import. Then, after studying and accepting the prices, the contract can be made for export. The total value of the commodity is bayed by check or any official documents according to the state of the contract. It is worth to note that the export decision of the GECPT are not currently based on the demand, but firstly by the level of surplus stored by the GECPT.

The additional cost for exporting wheat at port stage consists of the following items:

Table 16: Export cost at the port (FOB), (SP/ton)

Item	Transportation	Port authority fees	Av storage rental	Other fees	Total
Value (SP/ton)	800	200	10	90	1100

Source: The GECPT data. Author elaborated.

3.2.2.2. GCM and GCB

The General Company for Milling (GCM) concedes the main agency of wheat processing in Syria. It has the responsibility to ensure the needs of wheat flour for producing integrated flour. The GCM buy more than 65% of wheat production in Syria from the GECPT at the cost price. As instance; in 2008 the total needs of wheat for processing integrated flour in Syria was about 2.7 million tonnes, consists of 75% soft wheat and 25% durum wheat which means approximately 675,000 tons of durum wheat, equivalent to 31% of average yearly production of durum wheat during the period 1998-2007, so Syria has currently about 69% of its durum wheat production available for trading, with respect to food security issue (If Syria now has already strategic storage of durum wheat).

The GCM sells the integrated wheat flour to the General Company for Bakeries (GCB) at the fixed official price (about 8 Sp) which has governmental subsidies. The difference between cost price of the GECPT (or value of wheat) and the value of flour at official price, in addition to value of byproduct of flour (like bran), form the deficit at the GCM level, then the government pays this deficit to the GECPT as a subsidies, in order to cover the total value of wheat that has been sold to the GCM. In addition, there is a governmental subsidy at the GCB level for fixed official price of integrated bread (of SP 9 per kg)⁴. These prices were last changed in 2002.

The public factories of biscuit and pasta, which have limited processing capacity, obtain their own requirements of flour from the private mills. The GCM does not sell the integrated flour, which is only used for making integrated bread, for other uses since it is subsidized. In addition, the biscuit and pasta industry require different types of flour (zero flour for biscuit and semolina for pasta) that differ from the integrated flour produced by the GCM. Moreover, semolina flour is a mixture of flour that is domestically produced and imported flour.

3.2.3 An emerging private sector

The Syrian government attempt to enhance the food industry in the context of reforming foreign trade especially in the fields of GAFTA, European partnership and joining the WTO. The private agro-food sector consists mainly of companies established under investment law No. 10 of 1991 and its amendment by Decree No. 7 of 2000, and by the decree No8 of 2007 that requires a minimum level of investment equal to 10 million SP. Some of these companies operate on processing macaroni and noodles using flour of durum wheat (semolina flour). These companies also obtain their requirement of flour from the private mills or they use imported flour. So, private companies do not consider until now as important agencies involved in marketing and processing the domestic durum wheat. Nevertheless, the following table 17 refers to the development of processing quantities of macaroni and noodles in the private sector with high yearly growth rate which associated with small growth rate in the public sector.

⁴. The price of private white bread about 35 SP/kg.

Table 17: Evaluation of public and private industry for processing macaroni and noodles 1998-2006, (000 tons)

Item	Macaroni and noodles										
Years	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Growth rate
Public industry	0.9	0.7	1.4	0.9	1.1	1.2	1.2	1.2	1.2	1.3	3.6
Private industry	5.4	6.3	6.8	7.0	7.1	7.2	11.0	12.9	19.1	14.7	11.8
total	6.3	7.0	8.2	8.0	8.2	8.4	12.2	14.0	20.3	16.0	10.9

Source: Elaborated from CBS, The ASA, Various issues.

In addition to the industrial companies that produce varieties of macaroni, there is a new and development private sector operates on cereal marketing and industry. There are 52 private mills with total daily capacity more than 6358 tons, about 30 mills of them have daily capacity above 100 tons, most of these mills (75%) exist in Aleppo governorate while the rest distributed all over the country. The mills obtain their requirement of wheat directly from farmers, through middleman with marginal profit, or by making contract with the GECPT. however, they mainly import what they need of wheat.

According to some interviews with firm owners, the private mills may cover about 30% of total needs of flour requirement for private sector in Syria.

Some of these mills consider as a processing firms, in addition to making common and semolina flour from soft and durum wheat respectively for domestically uses and for export, also produce yellow or brown flour and bran for food or fodder. In addition, they produce some byproduct of durum wheat called "bulgur" which is cooked like rice and broadly used in Syria. Moreover, some of them extract its (especially durum wheat) component of protein, carbohydrates, and wheat embryo in exportable quantities, for healthy and medical uses.

The owners of cereal processing firms often complain about weak cooperation with the GECPT side. And they troubled of difficulties and unstable policies for exporting or importing operations of processing cereals. On the other hand, there is untrusting environment between exporters and importers with public employed especially at custom area. Moreover, for more than two years they have asked the government for permission to establish a union of processing cereals, without respond. In addition, the owners of private mills suffered from smuggling operations of public integrated flour to the domestic markets (that maybe ranged between 300-500 tons daily); which significantly cheaper than flour produced by private sector, whether it imported or domestically processed, because of the governmental subsidies that applied on public integrated flour. The cereal processors also request for making adjustments on the Syrian measures of wheat industry that are not appropriate, according to them, with Syrian wheat, or they need permanent permission to work on the domestic wheat (because of wheat imported quality differ of domestic wheat, and the Syrian measures set for Syrian wheat only before private sector has been able to import wheat).

3.2.4. The wheat value chain configuration

As mentioned before, the largest quantity of wheat (more than 65%) is delivered directly or indirectly to the GECPT as follows:

1. Big farmers and the majority of middle farmers sell their production, including production costs and transportation costs, at yearly official prices directly to the GECPT.
2. Part of middle farmers and most of small farmers sell their production at prices lower than official prices to small traders (as middleman) or to processors included production costs only without transportation cost. Then the middleman traders sell most of gathered wheat to the GECPT at official prices and the rest may sold to processors or to wholesale traders of cereals at local markets which distribute it to retail traders or small processors included marginal profit.

Less than 5% of production is delivered to the General Establishment for Multiply Seeds (GEMS); which is followed to the Ministry of Agriculture, through previous contracts with farmers at official yearly prices plus 20% as incentive to ensure good quality of seeds. About 25% of total wheat production is retention for food and seeds and other uses in local markets, and the rest is maybe delivered to private mills and processing companies.

The GECPT pays the value of delivered wheat only through the Agricultural Cooperation Bank (ACB), so the ACB can cut farmer's credits in advance. Farmers who prefer to sell their production of wheat to traders or to processors at lower prices than official prices, may to avoid pay back the credit of the ACB, the long procedure of the GECPT which include; receiving, tasting, classification, etc. or to be given value of his wheat immediately. It is notable to refer that, those long and complicated procedures of the ACB at credit stage or at marketing stage may compel farmers to be as a hostage in hands of traders or middlemen, and then effects negatively the position of farmers in the wheat value chain.

The most important agent in wheat value chain is the GECPT which receive the largest quantity of soft and durum wheat. It controls the majority of trade activities by adopting official prices, since it considers the biggest trader and biggest exporter and importer in drought seasons; it works on both levels of marketing; internal and external market.

From 2008 on, the GECPT delivers to the GCM what it needed of wheat for producing public integrated flour, consists of 25% durum and 75% soft wheat. The rest is retention for strategic storage and the surplus for marketing mostly for export and small part may be delivered to private processing companies under a contractual arrangements.

The flow chart of wheat differs according to the official prices and to yearly rainfall. The GECPT has been received different percentage of total yearly wheat production during the period 1999-2008, as it shown in the following table.

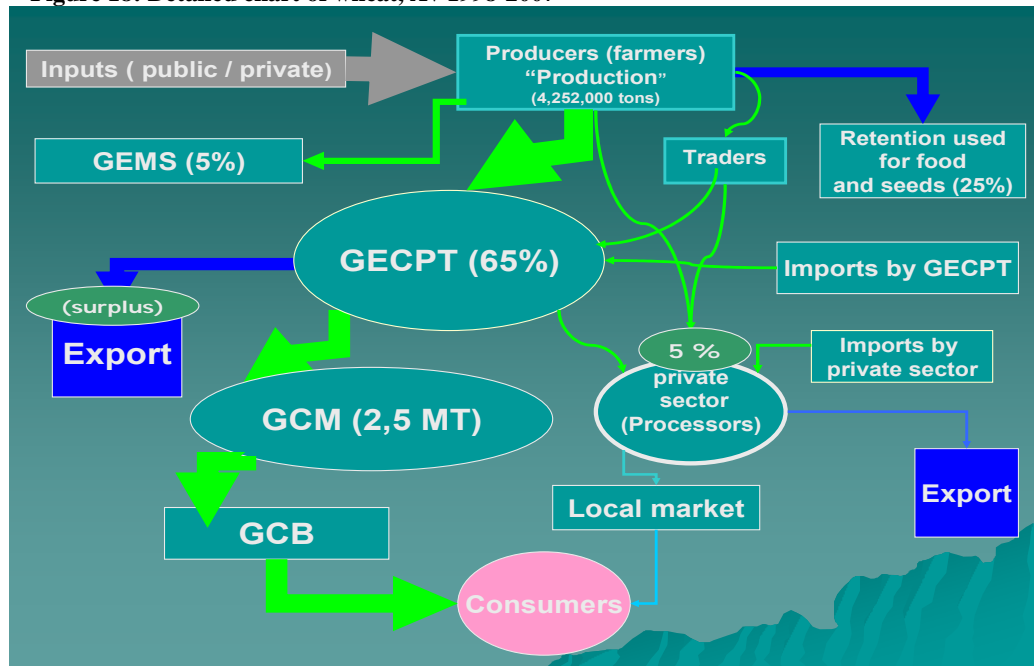
Table 18: The yearly percentages of delivered wheat to the GECPT of yearly production, 1999-2008 (% of total production)

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
58%	63%	76%	77%	73%	72%	68%	66%	39%	46%

Source: THE GECPT data.

And then the imported quantities also fluctuate depended on self sufficient ratio of wheat. For example; the private sector could import wheat only since 2002 and has been foreclosed yearly during harvest and marketing the domestic wheat (wheat import by private sector stops (prohibit) only for about three months each year throughout the harvesting season). And soft wheat that imported by public sector only happened during last drought season in 2007/2008. Also, the export quantity differs according to the availability of wheat surplus; soft wheat exported by public sector only happened during 2003 to mid of 2007. Moreover wheat requirement for the private processing companies develop through the time, as well as the consumption habits change also (diet diversification), especially for bread consumption.

Figure 18: Detailed chart of wheat, Av 1998-2007



Source: The GECPT and GCM data. Author elaborated.

3.3 Agro-ecological and local implication of soft and durum wheat production

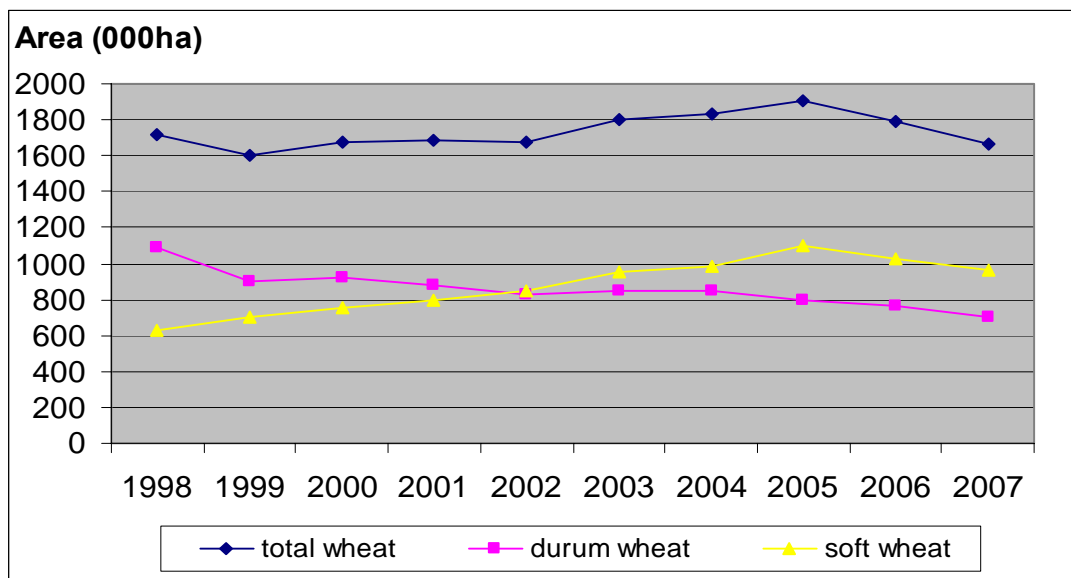
3.3.1 General trends of soft and durum wheat production in Syria

Wheat is planted in all governorates and regions on irrigated and rainfed land during the winter season. The area of wheat represented about 55% of total cereals area in the average during the period 1998-2007, 50% of total irrigated land, and 70% of land irrigated for strategic crops. Wheat value comprises about 83% of cereal production value, 21% of plant production value, and it represented in average 13% of total agricultural production value during the period 1998-2007 at the fixed prices of 2000. The production of soft wheat is concentrated in the northern and eastern governorates with fewer ratios in the governorates that located in the middle of the country, while durum wheat is produced in all regions with different ratio but it is dominated in the middle and southern governorates comparison with soft wheat.

3.3.1.1 Area

Wheat area was stable during the period 1998-2007, the annual growth rate near zero or tends to be bit negative -0.4%. But the disproportion in the area due to climate conditions and varied of the rainfall. The government concentrated its efforts at vertical extension (Increase of yield per area) in wheat production because of limitation in the cultivated area in Syria. The lower area was about 1603 thousand hectares in 1999 due to drought while the highest one was 1904 thousand hectares in 2005, as shown in figure 19.

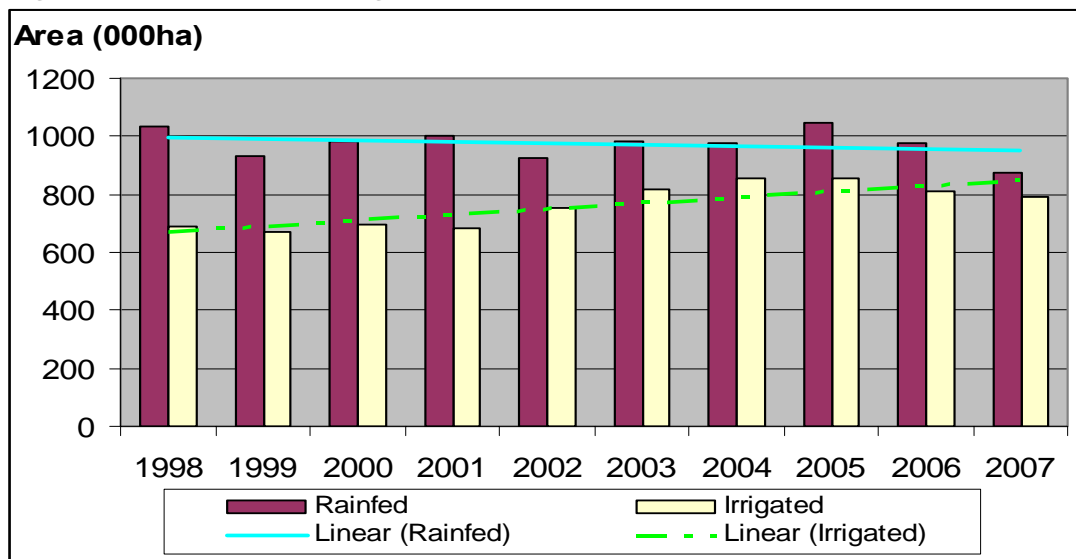
Figure 19: Syrian wheat area, 1998-2007



Source: NAPC Database

Figure 19 illustrated that area cultivated by durum wheat was bigger than soft wheat area until 2002, and then the area under soft wheat increased till the end of the study period by the same amount. Also, the irrigated area under wheat has annually risen by 1.5%, while the rainfed area has declined annually by about -1.8% at the same time, as the trend lines show in figure 20.

Figure 20: Evolution of wheat irrigated and rainfed area, 1998-2007



Source: NAPC Database

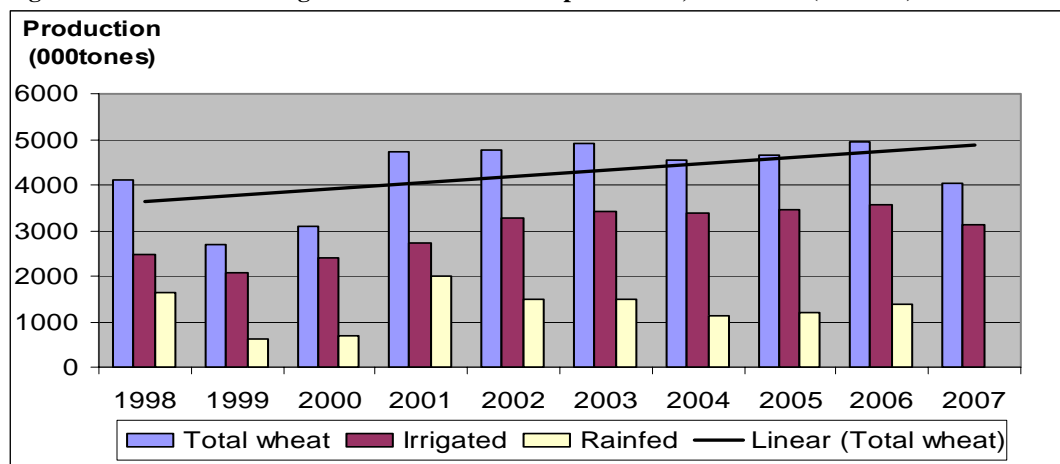
Figure 20 illustrated that irrigated area was more stable than rainfed area in the same period.

3.3.1.2 Production

Wheat production in Syria dependent extremely to climate conditions, so the production has been fluctuated specifically in rainfed land during the period 1998-2007 due to differs in rainfall and

drought that affected the country during the period 1999-2000 and 2007-2008, where the wheat production was in the minimum. Although the trend line refers to increases in production during the study period, but the annual growth rate between the beginning and the end of that period was near zero. Wheat that produced in rainfed land has decreased annually by -6% during the same period, at the same time the irrigated wheat has increased due to the vertical expansion policy in wheat production, as depicted in figure 21.

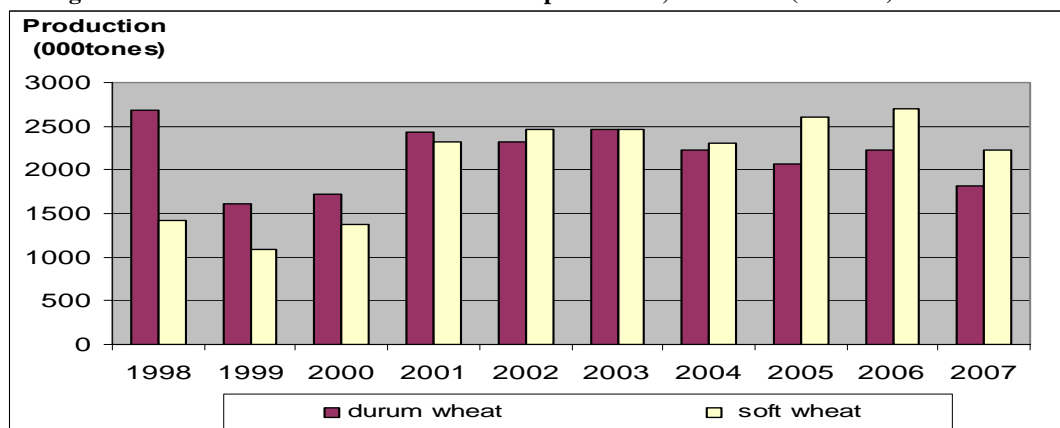
Figure 21: Evolution of irrigated and rainfed wheat production, 1998-2007 (000 tons)



Source: NAPC database.

Figure 22 illustrates development of durum and soft wheat production during the period 1998-2007.

Figure 22: Evolution of durum and soft wheat production, 1998-2007 (000 tons)



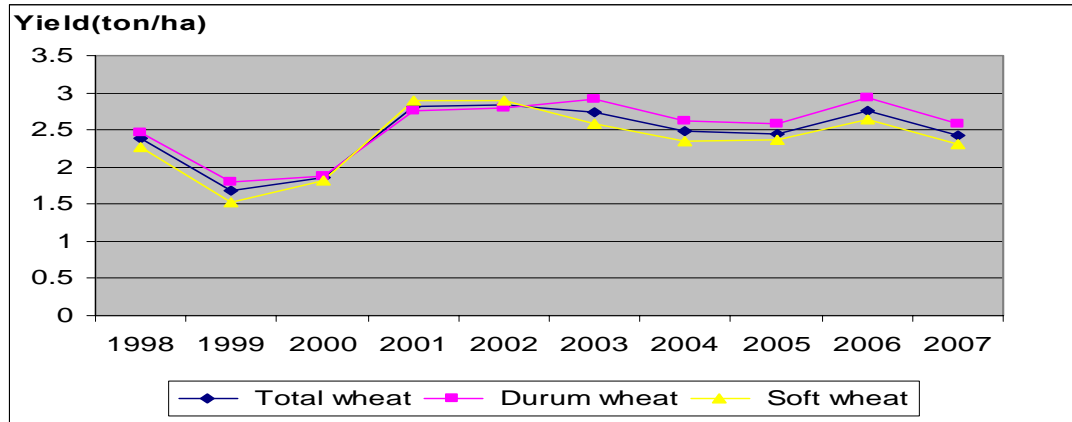
Source: NAPC database.

It can be noticed from figure 21 that there was significant increasing in soft wheat production by annual growth rate 5% during the study period, while durum wheat production decline annually by -4.2% in the same period, due to the government policy in some services, such as seed distribution. In addition, the official durum wheat price has been reduced by 0.5 SP/kg in 2007/2008 season. These procedures aim to meet the new flour mixture for integrated bread production that is lately consisted of 75% soft wheat flour and 25% durum wheat flour, instead of the last one which was consisted of 50% of each kind. It is notable that the annual need of wheat flour to produce local integrated bread all over the country requires about 65% of annual wheat production in normal years, in Addition to retention of 250 thousand tons for seeds to the next year.

3.3.1.3 Yield

Yield dependent on the rainfall, available technologies, and the level of available services. During the 1990s of last century; yield wheat in unit area has been promoted by entrance of a new and high productivity of wheat seeds breed and the efficiency use of production factors. But wheat yield in rainfed land differs according to rainfall, and it ranges between 0.5 ton/ha in a dry year to 1.7 ton/ha in good years with high rainfall, While yield in irrigated land ranges between 3-4 ton/ha. Figure 23 shows comparison of soft, durum, and average wheat yield.

Figure 23: Evolution of wheat yield in Syria, 1998-2007 (ton/ha)



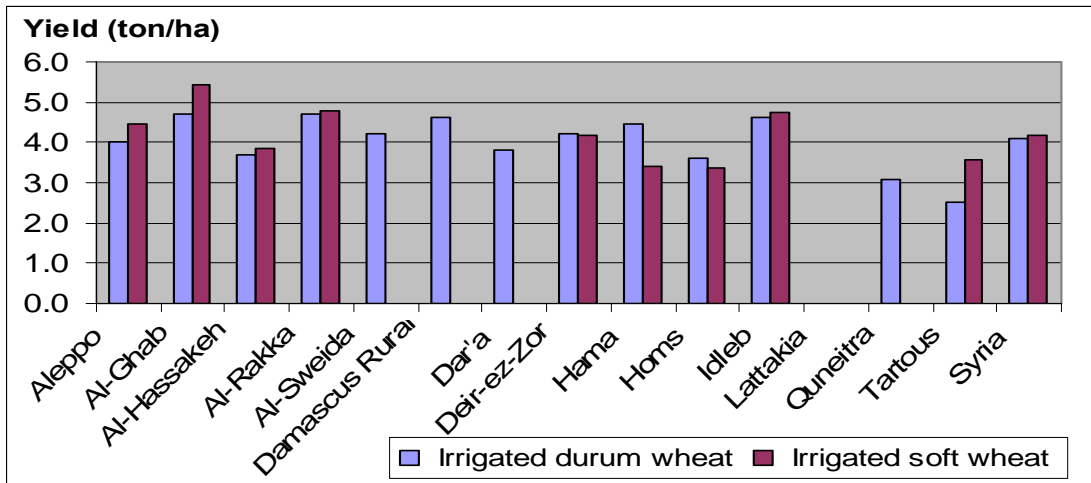
Source: NAPC database.

According to figure22 there are small differences between soft wheat and durum wheat yield with excellence of durum wheat yield especially in the last years.

There are substantial differences in the productivity of land among governorates. In 2007 the productivity of irrigated land was highest in Damascus Rural (4.88 tons/ha) and lowest in Tartous (2.89 tons/ha), While the productivity of rainfed land was the highest in Al-Ghab (3.31 tons/ha) and the lowest in Tartous (0.92 tons/ha). The differences in productivity are due to the differences in agro-ecological zones (rainfall), soil type and the performance of agricultural operations.

In general, yield of irrigated soft wheat was bit higher than yield of irrigated durum wheat in most governorates, and then in average for Syria, as it shown in figure 24.

Figure 24: Yield by governorates for irrigated durum and soft wheat, average 2002-2007 (ton/ha)

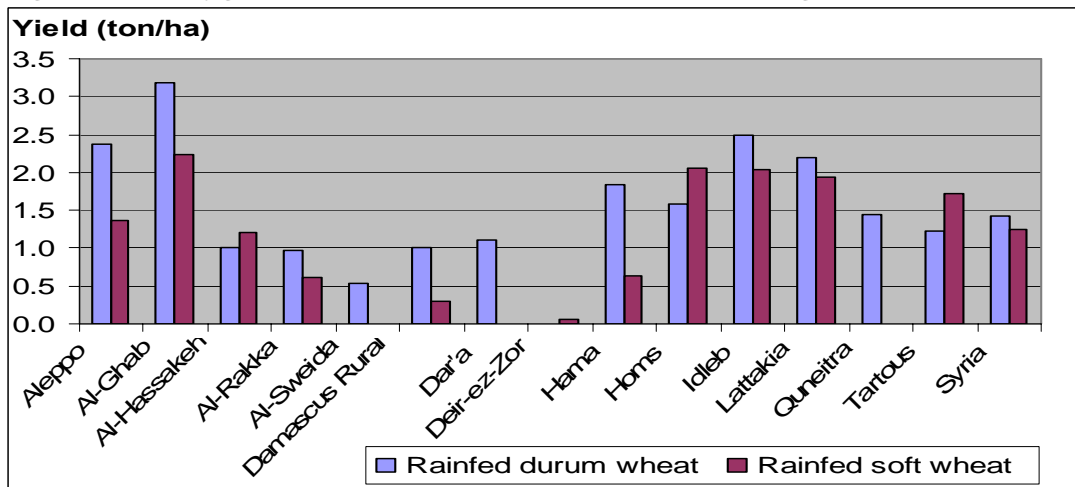


Source: NAPC database.

Also, Figure 24 illustrates that yield of irrigated durum wheat is raised in some governorates and regions than others such as Al-Ghab, Al-Rakka, Damascus rural, Hama, and Idleb.

For rainfed durum and soft wheat; yield of rainfed durum wheat was higher than the yield of rainfed soft wheat in most producer governorates, and then in average for Syria. However, yield of rainfed durum wheat in Al-Gab, Aleppo, Idleb, and Lattakia was significantly raised than other governorates. As figure 25 shows.

Figure 25: Yield by governorates for rainfed durum and soft wheat, average 2002-2007 (ton/ha)



Source: NAPC database.

And it is notable that some governorates were specialized by planting only durum wheat (Damascus rural, Dar'a, Quneitra, and Al-Sweida). These governorates represent about 21% of total rainfed durum wheat area and about 14% of total durum wheat area.

The Government supports the provision of improved seeds through the General Establishment for Seed Multiplication (GESM). Improved seeds are expression of technology. Therefore, the Syrian Government enhances the use of advanced technologies to increase production and decrease costs in cooperation with the General Commission for Agricultural Scientific Research (GCSR), which submits the new varieties to GESM, and then the GESM provides wheat seeds to farmers. This goal is stated in the Syrian Agricultural Strategy 2001-2010 and the Tenth Five Year Plan 2006-2010. The GCSR has improved the

productivity in its research stations to 7 tons/ha for irrigated and 4 tons/ha for rainfed wheat in the first ecological zone and 3 tons/ha for rainfed wheat in the second ecological zone. Table 19 traces average soft and durum wheat yield in Syria and in ecological zone 1 and zone 2.

Table 19: Average soft and durum wheat yield for Syria and by ecological zones, (ton/ha)

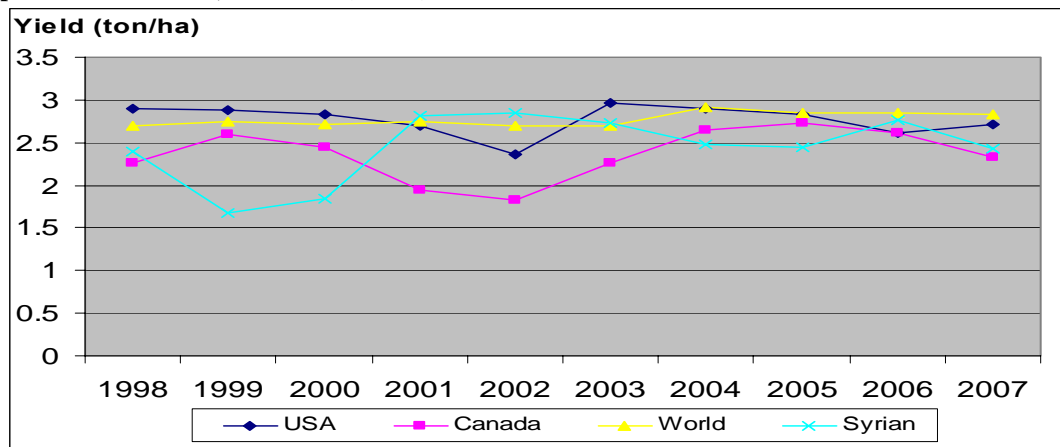
Agro-Climatic Zones ⁵	Item	Yield Av 2002-2007
Syria	Irrigated durum wheat	4.1
Syria	Irrigated soft wheat	4.2
Syria	Rainfed durum wheat	1.4
Syria	Rainfed soft wheat	1.2
Zone 1	Rainfed durum wheat	1.8
Zone 2	Rainfed durum wheat	1.1
Zone 1	Rainfed soft wheat	1.8
Zone 2	Rainfed soft wheat	1.2

Source: NAPC database.

As table 19 briefly shows; the average yield of irrigated soft wheat for Syria was higher than irrigated durum wheat yield by about 0.1 ton/ha. But, the average yield of rainfed durum wheat for Syria higher than rainfed soft wheat yield by about 0.2 ton/ha. So, durum wheat, in general performs better in rainfed areas than soft wheat. And in Zone 1; durum wheat performs as well as soft wheat, while soft wheat yield in average for Syria in Zoon2 was higher than durum wheat yield.

The comparison between wheat yield in Syria with average of world wheat yield and some large producer countries shows; that there were clear annually variations among the time series which reflects the affects of climatic conditions on the wheat production and productivity in Syria. Nevertheless, there were significant increases in Syrian wheat yield during the period 1998-2007 especially in 2001, and it was correspondent to the average world wheat yield in some years and the average of wheat yield in the USA, while it was higher than wheat yield in Canada in several years (FAOSTAT). As Figure 26 shows.

Figure 26: Evolution of Syrian wheat yield in comparison with average yield of world and some large producer countries, 1998-2007 (ton/ha)



Source: FAOSTAT. NAPC database.

3.3.2. Geographical specialization: distribution of soft and durum wheat production

As mentioned above, durum wheat is performs better in rainfed areas. And historically the famous Horany brand of Syrian durum wheat is originally planted in rainfed areas within southern Syria (Horan region or Dar'a governorate). Then the southern four governorates of Syria (Damascus rural, Dar'a, Quneitra, and Al-Sweida governorate) specialized in planting only durum wheat, mostly in rainfed

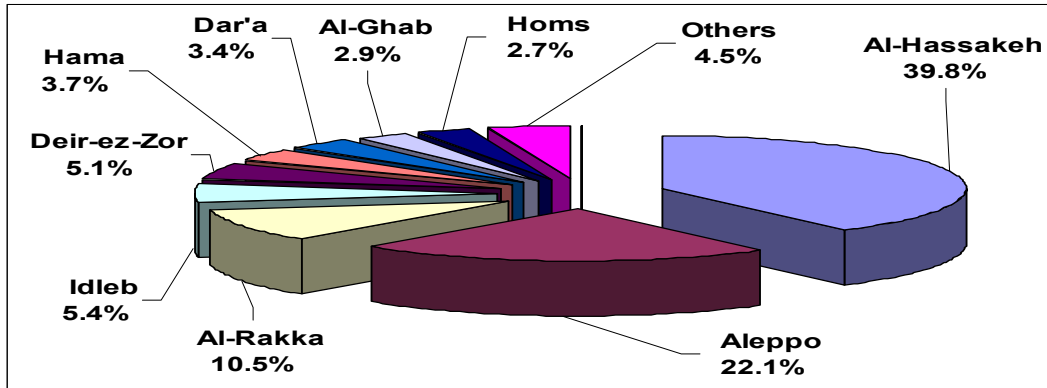
⁵. The yearly rainfall in agro-climatic zone1 is more than 350 mm, and in zone 2 between 250-350 mm.

system. Moreover, in Al-Gab, Aleppo, Hama, Idlib, Lattakia, and in Alrakka; the yield of rainfed durum wheat significantly higher than rainfed soft wheat yield (figure 23). So, durum wheat in these regions in addition to southern governorates of Syria, within rainfed areas, consider more important than soft wheat. And their rainfed durum wheat production represents about 62% of total rainfed durum wheat production and 17% of total durum wheat production in Syria. Then their total rainfed durum wheat areas represent about 51% of total rainfed durum wheat areas, and 26% of total durum wheat areas in Syria. However, Al-Hassakeh governorate considers the most important governorate for wheat production in Syria; its rainfed durum wheat area equivalent to about 39% and 20% of total rainfed wheat areas and total durum wheat areas in Syria respectively. Also, its rainfed durum wheat production, correspondent to about 27% of total rainfed durum wheat production, and 7% of total durum wheat production in Syria(irrigated and rainfed) respectively (see figures 26, 27, 28, and 29).

3.3.2.1 Share of governorates in wheat area

Area that is planted by wheat concentrates in eastern and northern governorates, the biggest share is in Al-Hassakeh then in Aleppo governorate. In general more than 77% of wheat area located in four governorates: Al-Hassakeh, Aleppo, Al-Rakka, and Deir-Ezzor governorate. Then the rest of wheat area is distributed over other governorates at small ratios, as figure 27 reflects.

Figure 27: Share of governorates in wheat area, 2007

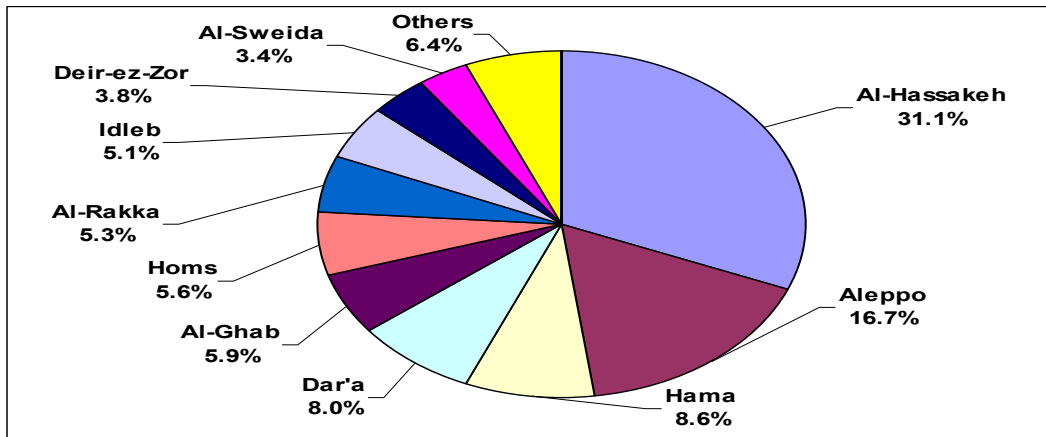


Source: NAPC database.

3.3.2.2 Durum wheat area

The share of durum wheat area in total wheat area has been declined, as mentioned before, during the period 1998-2007 from 63% at the beginning of the period to 42% in the year 2007, adverse increasing soft wheat area to raise the share of soft wheat in the flour's mixture that prepared to produce national integrated bread from 50% to 75%. The durum wheat area is distributed over the governorates as the following figure:

Figure 28: Share of governorates in durum wheat area, 2007 (%)



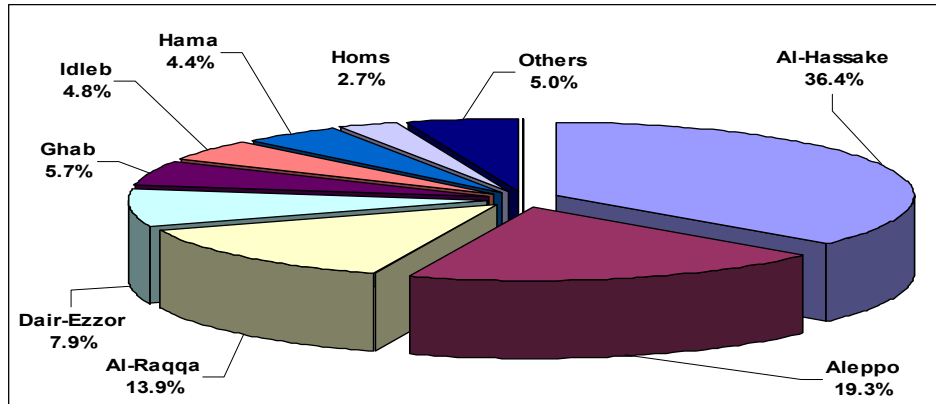
Source: NAPC database.

Figure 28 shows that the biggest area concentrated in Al-Hssakeh and Aleppo governorate, because they are primarily the largest wheat producers in Syria, nevertheless the middle and southern governorates in addition to Algab region are sharing also by good area relatively in total durum wheat area. Moreover, all the southern governorates (Damascus rural, Al-koneitera, Dar'a, and Alsweida), as mentioned before, plant only durum wheat.

3.3.2.3 Share of governorates in wheat production

Wheat production was distributed among governorates in 2007 as follows:

Figure 29: Share of governorates in wheat production, 2007 (%)



Source: NAPC database.

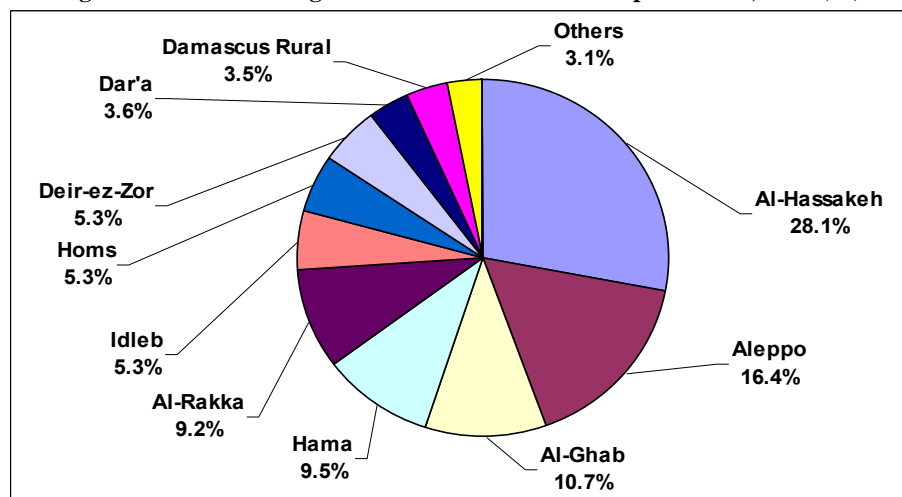
Figure 29 refers to that wheat production, like wheat area, concentrates in four of eastern and northern governorates which produce more than 77% of total wheat production in the country: Al-Hassakeh, Aleppo, Al-Rakka, and Deir-Ezzor governorate. And the middle region with Idleb governorate in addition to Al-ghab region produce about 18% of total production, while most of the rest is produced in the southern region in addition to less than 1% in the western region of the country. It is notable that the share of governorates differs from year to another due to climate conditions and the yearly rainfall, also it dependent to the ratio between rainfed and irrigated production.

3.3.2.4 Durum wheat production

Syrian durum wheat production averaged to about 2 million tones annually during the period 1998-2007, and amounted to 45% of total wheat production in Syria in the last three years, while it was represents about 65% at the beginning of the study period. The production of durum wheat is distributed to 77% irrigated and 23% rainfed wheat.

As it mentioned above, durum wheat is planted in all regions with different ratio, but it is dominated; in relatively with soft wheat, in middle and southern governorates. Durum production was distributed over governorates in 2007 according to figure30.

Figure 30: Share of the governorates in durum wheat production, 2007 (%)



Source: NAPC database.

Figure 30 illustrated that durum wheat production distributes over all governorates. The northern and eastern governorates, which are the largest wheat producer in Syria, share nearly by 64% of total, while share of the middle region was about 26% and the south region that is planted only durum wheat shares only by 9%, then the coastal region (western governorates) shares only by 1%. It is notable that some governorates nearly produce rainfed durum wheat only such as Sweida and Al-Koneitera governorate, which didn't have relevant source of irrigated water. While irrigated durum wheat in Dar'a governorate represents about 54% of its total durum wheat production, and some other governorates produce only irrigated durum wheat beside soft wheat such as AL-Rakka and Deir-Ezzor governorate.

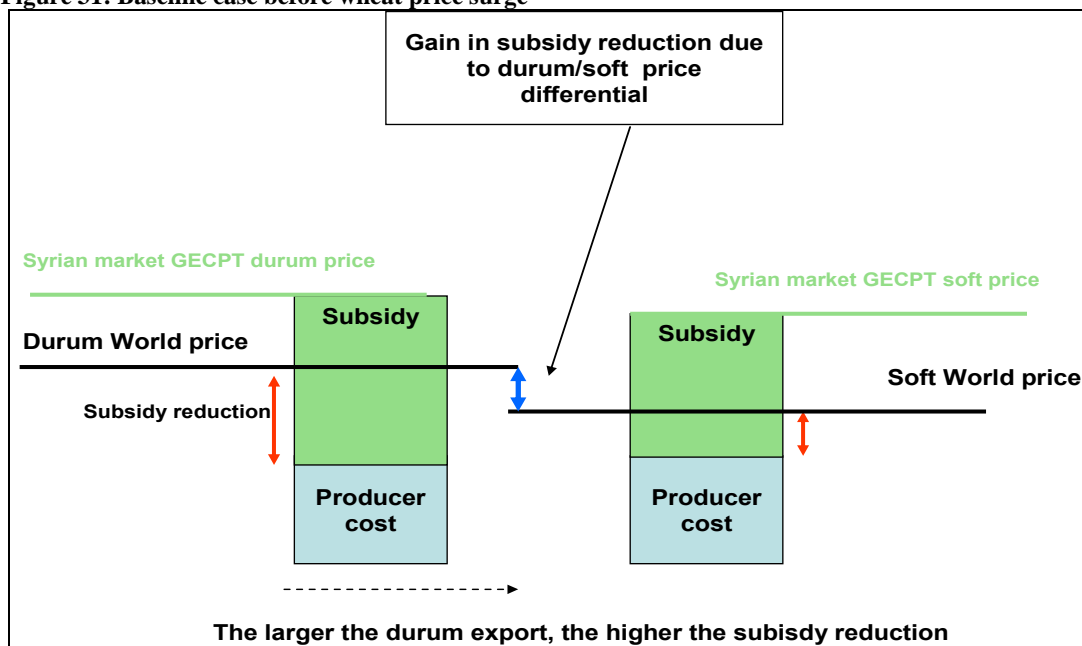
4. The financial analysis of durum wheat competitiveness.

4.1 Financial impact of alternative trends in durum export price.

Syria can benefit of export durum wheat and optimize the social cost of the food security strategy, when the GECPT export cost price (FOB) is lower than world price (which realize the estimated scenario2 in 2007 with doubled price reward of durum wheat, but without tax on farmers “page 48”). So, it can recognize this case with significant reduction in producer cost then in export cost.

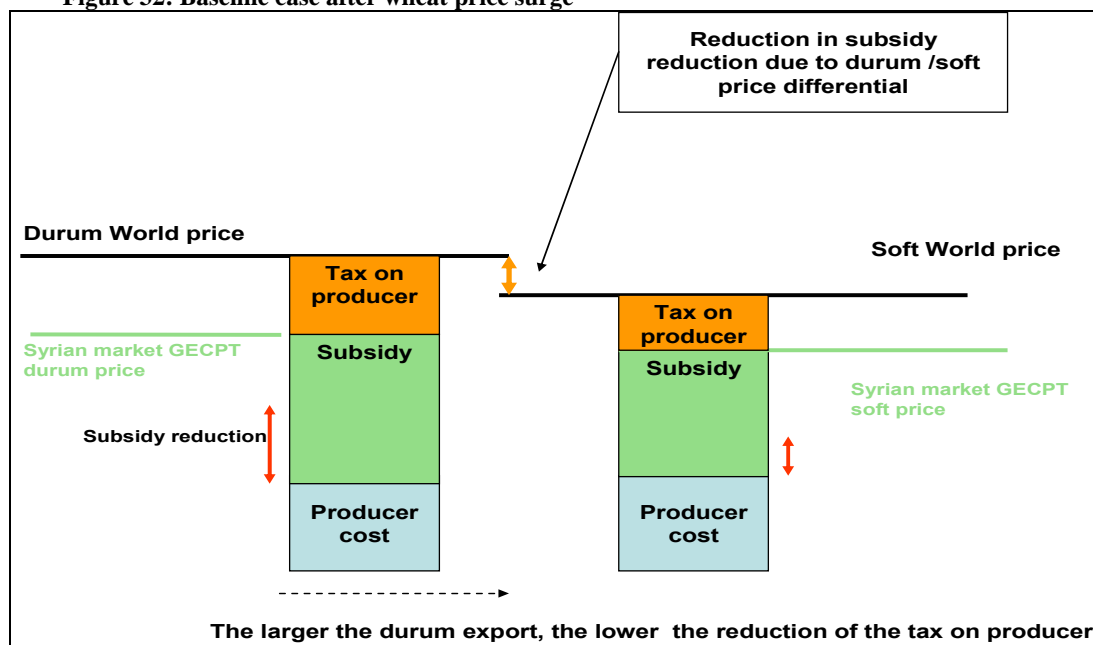
In general, the global idea is that given the higher level of price for durum compare to soft wheat, the export of durum will decrease the cost of the subsidy level when the FOB price is closer to the price given by the GECPT price to farmer. Since the durum international price is higher than the soft wheat international price, the “decrease” in subsidy cost will be higher when Syria exports durum rather than soft. This rationale is illustrated in Figure 31.

Figure 31: Baseline case before wheat price surge



If world market price is higher than the GECPT official price, then the difference between the GECPT price and the world market is a tax on producer, or a negative subsidy, unless a part of the price increase on the world market is transmitted to the farmer through an increase of the GECPT farmer price. In any case, the price differential in favors of the durum on the world market still represent an opportunity to reduce the cost of the subsidy for the GECPT.

Figure 32: Baseline case after wheat price surge



4.2 Issue, cost and price reference

The government sets official prices for purchasing durum and soft wheat from the producers through the GECPT. Moreover, it identifies prices along the public marketing and processing series. These prices are adopted after taking into consideration the official production cost as a pointer. The yearly official wheat production cost study is done by the Ministry of Agriculture and Agrarian Reform (MAAR). This cost represents the average wheat production cost of Syrian governorates for rainfed in different agro-ecological zones, and for irrigated wheat per area unit, usually per hectare, using the average of estimated yearly yield of wheat at national level to calculate the production cost of one kilogram of wheat. It is notable to refer that wheat production costs consider almost the same for durum and soft wheat, and there are no big differences for yield also.

The official price involves cost and a marginal profit which always includes governmental subsidy. The official price for durum wheat until 2007 was higher than the official prices of soft wheat by 1 SP per kg, and then the difference has reduced to 0.5 SP per kg. Although official prices are yearly reviewed, nevertheless they were fixed till 2007 because of no big changes in the main input prices, before the government has raised diesel prices, as it shown in table 20.

Table 20: Evaluation of the official prices of durum and soft wheat, 1998-2008 (SP/kg)

Item	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Durum wheat	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	17
Soft wheat	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	16.5

Source: Elaborated from, CBS, The Annual Agricultural Statistical Abstract, Various issues

However, this study will adopt the average official durum and soft wheat production cost per tonne for 1998-2007 period and the average official price in the same period for compute the level of subsidy during this period. Then the study considered the year 2007 data as a normal year in Syria for financial analyses due to consideration of 2008 as a drought year and there is no export in it, in addition to unstable cost especially for increasing price of diesel and price liberalization of fertilizer.

4.2.1. Minimizing the food security cost through durum added value maximization

The main objective of this report is to look into the way that may improve and optimize the social cost of the food security strategy, and reduce food security cost through a better valorization, and then maximize the durum added value, by focusing on export durum wheat with high prices rather than soft wheat under different settings:

- Within the given position on the world market
- With an improved position of the Syrian durum wheat on the world market, through focusing on a good quality and management of the origin Syrian durum wheat with stability in production and exports.

4.2.2. Wheat production, marketing cost and price mechanism

For producer, until 2007 season, there is no big difference in average production cost per tonne between rainfed and irrigated system (table13), so the study will consider one weighted average cost.

The official durum wheat production cost per tonne for 1998-2007 period in average was about/10,800 Sp/tonne / included transportation cost (for rainfed and irrigated durum wheat). The fixed official price⁶ for delivered quantities at the same period was 11,300 Sp/ton /. So, the estimated marginal profit in average for the producer equivalent to /500 Sp/tonne /.

The durum wheat official price considers the input price at the GECPT level as a main trader of wheat in Syria. The estimated cost price of the GECPT for domestic marketing consists of the input price during the period 1998-2007 in average (11,300 Sp/tonne) and the varied cost storage which corresponding to about /200 Sp/ton/becomes /11,500 SP/tonne.

The GECPT sells durum wheat to the private processing companies at world price. But, it sells to the public sector (GCM) at the cost price. In any case, the difference between world price and official price represent the governmental subsidy.

The estimated cost price for exporter involves of the estimated cost price for domestic marketing and the export cost (FOB) which equivalent to about /1,100 SP/ton/ . So, the total cost price of durum wheat for GECPT as an exporter for the period 1998-2007 in average is /12600 SP/ton/ (11,500 +1,100).

The same steps can be applied for soft wheat with consideration of lower official price by 1000 Sp/ton for average official prices of 1998-2007 period. The following tables briefly show prices of durum and soft wheat at deferent stage.

Table 21: Prices of durum wheat for domestic and export marketing (SP/tonne)

Item	Farmer price	GECPT selling price on domestic	GECPT selling price for export
Prices (SP/ton)	11,300	11,500	12,600

Source: Elaborated by author.

Table 22: Prices of soft wheat for domestic and export marketing (SP/tonne)

Item	Farmer price	GECPT selling price on domestic	GECPT selling price for export
Prices (SP/ton)	10,300	10,500	11,600

Source: Elaborated by author.

⁶ The official fixed price was 11,800 SP/Tonne for the first degree of wheat, but the report considered the average fixed price for average quality of wheat.

4.2.3 Mechanism and estimation of subsidy

As mentioned above, the difference between world price, for imported wheat, at Syrian port in addition to insurance cost with customs fees plus inside cost to reach the equivalent point, and the official fixed price of wheat plus the storage procedure cost represents the amount of governmental subsidy, if there is!. The official fixed price for purchased durum and soft wheat during 1998-2007 period included storage cost is 11,500 Sp/ton for durum and 10,500 Sp/ton for soft wheat.

In general, the average percentage of purchased wheat, for the period study (1997-2007), that GECPT maybe received subsidy for, is about 60% of total wheat production (In addition to applying subsidy on integrated flour and bread). And the subsidy rate is the ratio between the amount of subsidy and the domestic marketing official cost price. But, in 2007 and 2008 the GECPT only received 39 and 46% respectively of total wheat production. Nevertheless, the export quantity not limited to what the GECPT received wheat, it related to the volume of strategic storage of durum or soft wheat in previous years.

4.2.4 Estimation of subsidy reduction magnitude

4.2.4.1 GECPT, internal and external subsidy analysis

1. The initial situation scenario (baseline scenario):

The baseline scenario is build in reference to a “normal” year on the international grain market, i.e. before the wheat price surge of 2008.

In 2007, the GECPT purchased 39% of soft and durum wheat production at the official prices by total value included the storage cost about 17,257 million SP for both soft and durum wheat. But the value of soft and durum wheat at world price at the same point was about 24,704 million SP. Accordingly, there was a negative Subsidy or tax on farmers for domestic trade (for purchased quantity by GECPT) by - 7,447 million SP for total wheat, due to the price surge of wheat at global level, as the following table.

Table 23: Domestic market subsidy (Mill SP)

Item	Soft wheat	Durum wheat	Total
Total purchased value at GECPT stage	9,110	8,147	17,257
Total purchased value at world price	13,600	11,104	24,704
Subsidy/tax for domestic trade (for purchased quantity by GECPT)	-4,490	-2,957	-7,447

Source: Elaborated by author.

And the GECPT exported in 2007 by about 11,727 million SP for soft and durum wheat (the real world prices for Syrian wheat was 225 US\$/tonne in Average for soft and 255 US\$/tonne for durum wheat), but the export cost of total wheat was 12,826 million Sp. So, there was positive subsidy at the export level by 10% for soft and 6% for durum wheat or 9% in average for total exported wheat, as follows:

Table 24: Export subsidy (Mill SP)

Item	Soft wheat	Durum wheat	Total
GECPT total cost for FOB	8,620	4,206	12,826
World export value	7,763	3,964	11,727
Subsidy/tax to export	857	242	1,099
Share of subsidy	10%	6%	9%

Source: Elaborated by author.

2. Scenario1, reducing soft wheat export:

The estimation scenario1 is limit soft export to 0% and total quantity of wheat in baseline scenario estimated to be durum wheat: The negative subsidy (tax) at domestic level remains as in the baseline scenario, but the positive subsidy at export level reduced from 9% to 6%, as follows:

Table 25: Export subsidy (Mill SP)

Item	Soft	Durum	Total
GECPT total cost for FOB (SP)	0	13,569	13,569
World export value SP	0	12,787	12,787
Subsidy/tax to export SP	0	782	782
Share of subsidy	0%	6%	6%

Source: Elaborated by author.

3. Scenario2, increasing durum quality to get the best price reward:

The estimation scenario2 is limit soft wheat export to 0 and increase in price rewards for durum wheat (doubled) from 13% to 26% above world soft wheat price (as a result of the best quality). The negative subsidy (tax) at domestic level remains as in scenario1, but the export subsidy share converted from +6% to -4% (no subsidy but tax or profit for GECPT) as follows:

Table 26: Export subsidy (Mill SP)

Export subsidy(mill SP)	Soft	Durum	Total
GECPT total cost for FOB (SP)	0	13,569	13,569
World export value SP	0	14,176	14,176
Subsidy/tax to export SP	0	-607	-607
Share of subsidy	0%	-4%	-4%

Source: Elaborated by author.

More recently, for 2008 and 2009:

A. The official prices of wheat in 2008 adjusted to 16,500 Sp/tonne for soft and 17,000 Sp/tonne for durum wheat. The result is a positive subsidy at domestic trade by 3.6% for soft and 6.5% for durum wheat; in average subsidy share by 5% on total wheat for domestic trade level at the same world wheat prices, but there is no export in 2008.

B. The official prices of wheat in 2009 adjusted also to about 20,000 SP/tonne due to rising in input prices (diesel and fertilizers) and the differential between rainfed and irrigated wheat cost became bigger than before. The result is higher subsidy at domestic trade level and also higher subsidy on export level when it happens, with nearly the same level of world wheat prices.

4.2.4.2 GECPT, cost and income analysis

This way analyzes the affect of the substitution of durum export to soft export by adopting the same cost of domestic marketing for 2007 in addition to cost of wheat milling at the GMC stage, and export cost that applied in the previous scenarios. Then it makes comparison between the GECPT total income that correspond to the value of the flour that results from milling one tone of wheat, taking into account the conversion factor of wheat/flour which equivalent to 0.80 (comprises of 75% soft and 25% durum wheat) which received by the GECPT as a result of selling wheat to the GMC in addition to the value of the byproduct (bran) which estimated about 20% of the flour value, and the GECPT income which represents the value that results from export on tone of wheat, and the level of net subsidy above total income of the system through each scenario. The analysis defines 4 scenarios as follows:

1. The baseline scenario is without export

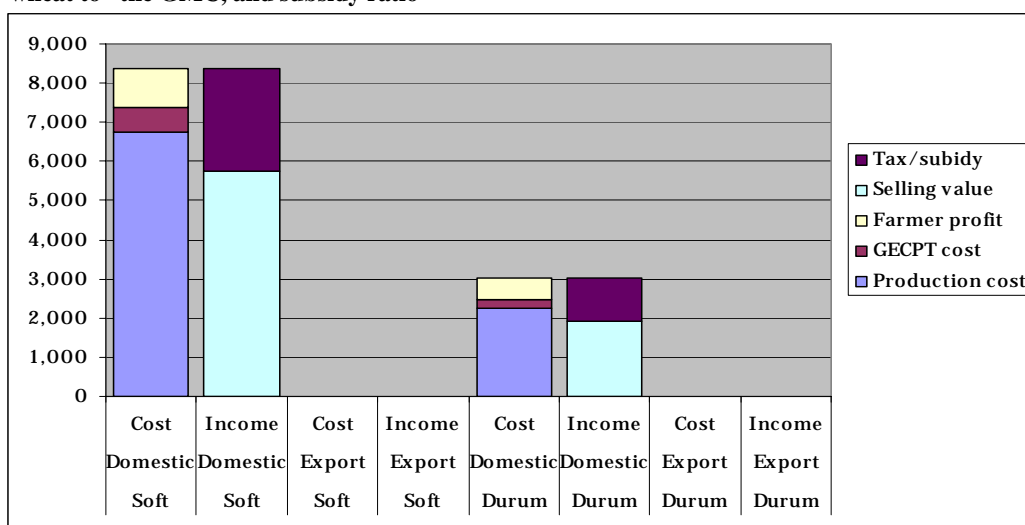
This scenario illustrates the real situation of the GECPT cost/income without export and the GECPT profit/loss at the domestic market as a result of selling one tonne of wheat to the GMC for making flour and the subsidy level of the system. The total cost represents the GECPT purchasing value at official wheat prices (75% soft and 25% durum wheat) in addition to domestic market and milling flour cost at the GMC, and the total selling value comprises of the flour value (0.80 of wheat value) and the value of byproduct (bran). The difference between total cost and selling value at the GECPT level considered as a subsidy paid by the government and the ratio of net subsidy (the subsidy minus the tax if there is) above total income of the system reaches to 33%. The following table 23 detailed the GECPT domestic operation and the figure 33 shows the share of farmer profit, GECPT domestic cost and income, production cost, and the subsidy ratio of the system (all computed according to the new ratio of soft/durum wheat in the integrated public flour).

Table 27: GECPT domestic operation for one tonne of wheat (SP)

Type of wheat	Soft (75%)	Soft	Durum (25%)	Durum	Total value
Market destination	Domestic	Export	Domestic	Export	
Purchasing value	7,725	0	2,825	0	10,550
Marketing	150	0	50	0	200
Milling cost	480	0	160	0	640
Total cost	8,355	0	3,035	0	11,390
Selling value of flour	4,800	0	1,600	0	6,400
Selling value by product	960	0	320	0	1,280
GECPT total selling value	5,760	0	1,920	0	7,680
GECPT profit / loss	-2,595	0	-1,115	0	-3,710
Subsidy value	2,595	0	1,115	0	3,710
Tax level	0	0	0	0	0
GECPT income	8,355	0	3,035	0	11,390
level of net subsidy above total income of the system					33%

Source: Summarized Data from spreadsheet.

Figure 33: Farmer profit, GECPT; domestic cost and income from selling one tone of soft and durum wheat to the GMC, and subsidy ratio



2. Scenario 1 is with only soft wheat export

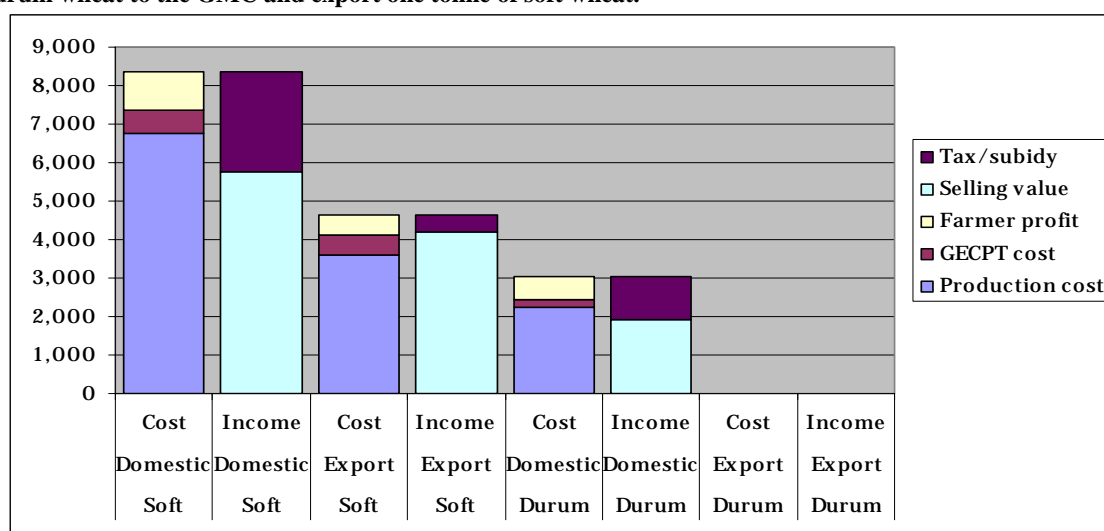
In addition to the same domestic operation, this scenario detailed the export operation of the soft wheat only by the GECPT and the total selling value and income with subsidy ratio of the system that correspondent to about 26%. Table 24 summarizes the scenario1 and figure 34 makes the picture of the different shares of items and agents through the system.

Table 28: GECPT, Domestic and export operation for one tonne of soft wheat (SP)

Type of wheat	Soft (75%)	Soft	Durum (25%)	Durum	Total value
Market destination	Domestic	Export	Domestic	Export	
Purchasing value		4,120		0	
Marketing domestic		80		0	
Cost for FOB		440		0	
Total cost	8,355	4,640	3,035	0	16,030
Selling value export		4,185		0	
GECPT profit/loss		-455		0	
Total selling value	5,760	4,185	1,920	0	11,865
Subsidy level	2,595	455	1,115	0	4,165
Tax level	0	0	0	0	0
GECPT total income	8,355	4,640	3,035	0	16,030
level of net subsidy above total income of the system					26%

Source: Summarized Data from spreadsheet.

Figure 34: Farmer profit, GECPT domestic and export cost and income from selling one tone of soft and durum wheat to the GMC and export one tonne of soft wheat.



3. Scenario 2 is with substitution of the durum to soft wheat export

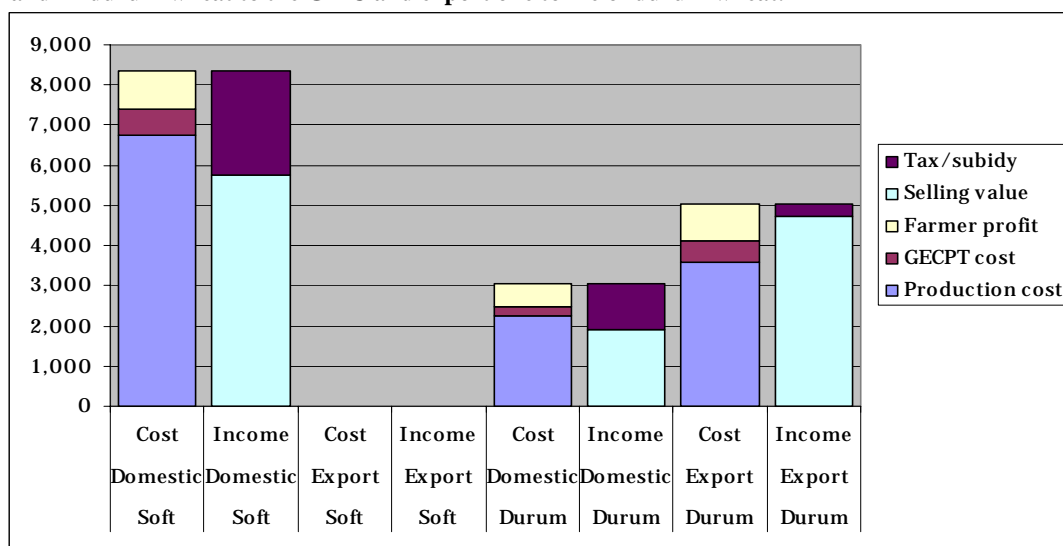
In this scenario the domestic operation remains as in the previous scenarios, but in export operation durum wheat substitution to soft wheat export. The subsidy ratio of the system declined from 26 to 24% as a result of higher GECPT total income by replacing soft wheat export by durum with higher world price. The new effective is illustrated by the following table 25 and figure 35.

Table 29: GECPT, Domestic and export operation for one tonne of durum wheat (SP)

Type of wheat	Soft (75%)	Soft	Durum (25%)	Durum	Total value
Market destination	Domestic	Export	Domestic	Export	
Purchasing value		0		4,520	
Marketing domestic		0		80	
Cost for FOB		0		440	
Total cost	8,355	0	3,035	5,040	16,430
Selling value export		0		4,743	
GECPT profit/loss		0		-297	
Total selling value	5,760	0	1,920	4,743	12,423
Subsidy level	2,595	0	1,115	297	4,007
Tax level	0	0	0	0	0
GECPT income	8,355	0	3,035	5,040	16,430
level of net subsidy above total income of the system					24%

Source: Summarized Data from spreadsheet.

Figure 35: Farmer profit, GECPT; domestic and export cost and income from selling one tone of soft and durum wheat to the GMC and export one tonne of durum wheat.



4. Scenario 3 is with higher price reward for durum on the world market

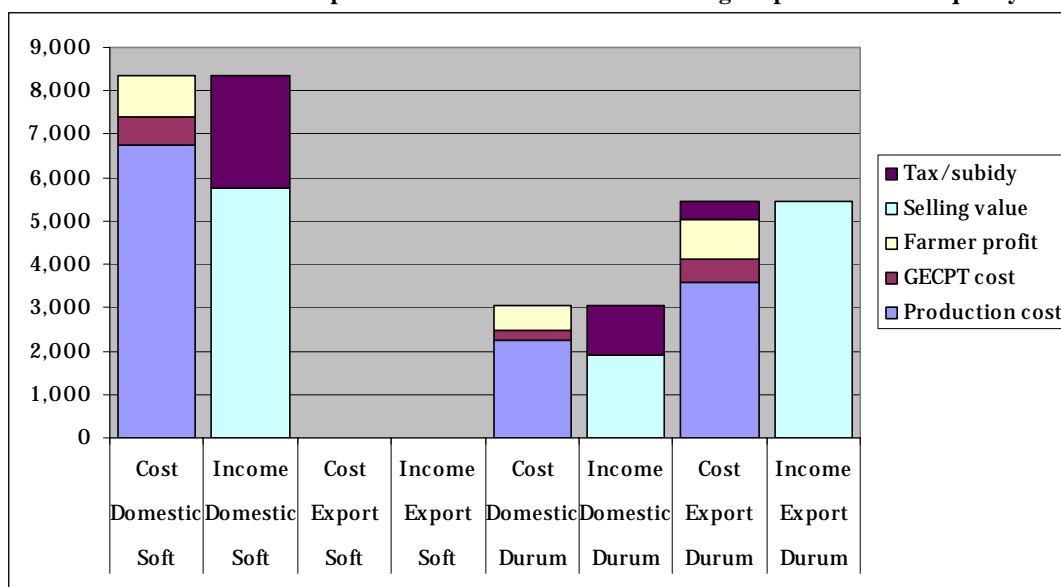
The positive effective of an estimated higher price reward to quality for durum wheat export (double) in this scenario reflected in total selling value and total GECPT income, and the subsidy converted to the tax at export level then the level of net subsidy above total income of the system declined from 24% in scenario 2 to 19.7%. Table 26 detailed the export operation and shows the tax instead of the subsidy at GECPT export stage, and figure 36 depict the new scenario particularly at the income and export durum wheat level.

Table 30: GECPT, Domestic and export operation for one tonne of durum wheat at higher price (SP)

Type of wheat	Soft (75%)	Soft	Durum (25%)	Durum	Total value
Market destination	Domestic	Export	Domestic	Export	
Purchasing value		0		4,520	
Marketing domestic		0		80	
Cost for FOB		0		440	
Total cost	8,355	0	3,035	5,040	16,831
Selling value export		0		5,441	
GECPT profit/loss		0		401	
Total selling value	5,760	0	1,920	5,441	13,121
Subsidy level	2,595	0	1,115	0	3,710
Tax level	0	0	0	401	401
GECPT income	8,355	0	3,035	5,040	16,831
level of net subsidy above total income of the system					19.7%

Source: Summarized Data from spreadsheet.

Figure 36: Farmer profit, GECPT; domestic and export cost and income from selling one tone of soft and durum wheat to the GMC and export one tonne of durum wheat at higher price reward to quality.



5. The following table summarize the level of net subsidy above total income of the system by aggregating and compute the ratio of the net subsidy (total subsidy– total tax) on the total income of the GECPT. This is the ratio which is an indicator of the potential cost reduction of the changes in the GECPT marketing policy.

Scenario	net ratio of subsidy
Baseline - no export of wheat	33%
Scenario 1 - export of soft wheat	26%
Scenario 2 - export of durum only	24%
Scenario 3- export of durum only with high price reward to durum	20%

It can be concluding from the previous scenarios, that export reduces the subsidy ratio as the value of export is higher than the value of wheat sale to GBC. But substituting durum to soft does not bring significant changes under the current price reward; only a high price reward would justify a specialization of GECPT in durum export.

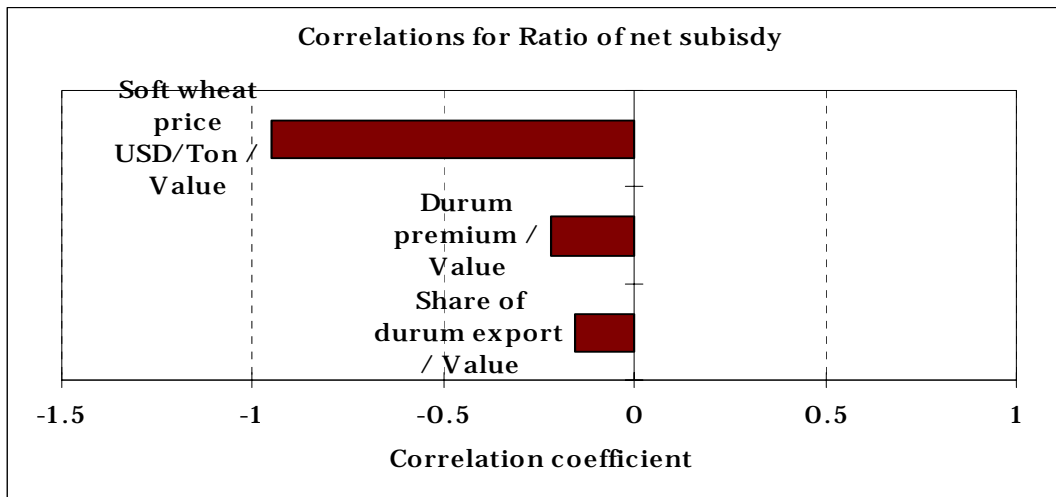
6. Sensibility analysis

The sensibility analysis, using @risk software, illustrates that the net ratio of subsidy is inversely correlated to the price of wheat, then to the durum premium and then to the share of durum in wheat export. In other words, if the price of exported wheat increased the net ratio of subsidy significantly decreased, but if the durum premium or the share of durum in wheat export increased the net ratio of subsidy is bit decreased, as it shown in the following table and figure.

Correlations for Ratio of net subsidy / Value

Input	Correlations Coefficient ⁷
Share of durum export	-0.1541434
Durum premium	-0.2173657
Soft wheat price USD/Ton	-0.9526433

Source: Summarized Data from spreadsheet.



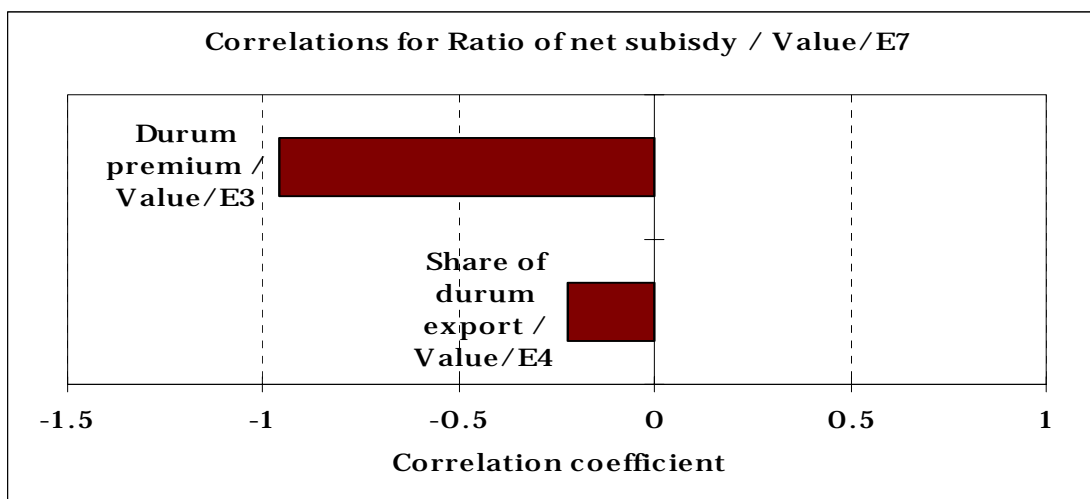
If the sensibility analysis take into consideration the price premium for durum and the share of the durum in wheat export only, the analysis show the level of the price premium is more important than the share of durum exported, meaning that the quest for quality might more efficient than expanding durum exports for any quality.

Correlations for Ratio of net subsidy

Input	Correlations Coefficient
Share of durum export	-0.220246
Durum premium	-0.960228

Source: Summarized Data from spreadsheet.

⁷ The value of correlation coefficient between variables ranges of -1 to +1.



4.3 Rainfed durum export for reducing pressure on irrigated land

The real opportunity cost of exporting durum wheat rather than soft wheat is actually the cost for import soft wheat, the CIF price for importing soft wheat in Syria. In other words, if soft wheat production expansion, might become an issue for Syria (land and water constraint). One strategy could be, to allow and promote the expansion of durum wheat on rainfed land (less land constraints and less water constraint with lower production cost) to export this durum wheat and import soft wheat when needed.

Based on the analysis of the soft and durum wheat performance, one can see that the biggest yield gain for a given ecologies is between rainfed soft and rainfed durum. In terms of yield growth the highest gain is recorded for irrigated soft and rainfed durum and the lowest for rainfed soft and irrigated durum. Therefore there is a possible specialization between the two ecologies for durum and rainfed.

Table 31: Average yield value per type of wheat and ecologies, 1998-2007 (tonne/ha)

Wheat	Ecologies				Differential
	Irrigated		Rainfed		
	Value	Trend	Value	Trend	
Soft	3.9	2.50%	1.25	0.34%	2.65
Durum	3.88	0.44%	1.34	2.74%	2.54
Differential	0.02		0.09		

Source: NAPC database.

An optimized configuration would be to reduce rainfed soft wheat production and increase rainfed durum, while the balance in terms of soft and durum wheat ratio would be adjusted on irrigated land as illustrated in table 24 and 25. Given the gradual decrease in the domestic demand for durum, durum irrigated production may decrease; rainfed durum production would be use for local consumption and export. This analysis could be further developed taking into account the water use efficiency of each type of wheat and other crops.

Table 32: Average production current per type of wheat and ecologies, 1998-2007 (000 tonne)

Wheat	Irrigated	Rainfed
Soft	1451	644
Durum	1543	613

Source: NAPC database.

Table 33: Optimized configuration of production

Wheat	Irrigated	Rainfed
Soft	1451+644=2095	0
Durum	1543-644=899	613+644=1257

5. Conclusions and perspective

Currently, competitiveness of Syrian durum wheat cannot be a significant tool to reduce the social cost of the food security policy given the rather low price reward to durum and the limited share of wheat exported. The perspective offered by price differentials shows that even though the durum has on average a premium over the soft, the differential is rather limited 10 to 15%, then the potential gain of reducing the cost of soft wheat supply to the Syrian population through export of durum is also restrained. However a genuine strategy focusing at competitiveness of durum wheat could be develop without being justified by the objective of reducing food security cost. Still it would be difficult to attract farmers toward this high quality value chain if they still have the opportunity to benefit from subsidy for low quality durum wheat. Moreover, the GECPT decision for export durum or soft wheat is not currently based on the demand but firstly by the level of surplus stored by the GECPT, while to build trust and confidence in potential customers, durum wheat export cannot be unstable!

5.1 Possible changes of durum status in the Syrian agriculture

The market dynamic at the local level shows a decreasing role for durum wheat in the food security (shift of subsidized wheat composition from 50% for both soft and durum wheat to 75% soft and 25% durum). However, durum wheat is an important crop in Syrian farming system. It has a reputation for having high quality associated with local production environment. It is not yet clear whether this natural advantage could be translated durably into higher price and higher market share in the durum foreign market. This market is dominated by large exporters and the requirement in homogeneity and marketing logistics are high in the quality demanding durum market segments (pasta market).

Less demanding market for export may be the Northern Africa market (Algeria, Tunisia and Morocco) and the neighboring Turkish market that may not be self-sufficient in the future. Syria durum export may take advantage of trade agreement that would facilitate durum export to these countries. These markets might be an option if the GECPT wheat system requires exporting large quantity of durum to increase the cost efficiency of the food security policy.

Another option is to focus the strategy on the development of high quality durum export targeting the more demanding segment of the markets in Europe and Northern America (pasta and other agro-food utilization). This strategy could be an option for the durum producers that are able to produce the best quality, but it might not be adapted to the GECPT management that is rather used to handle large quantity, and GECPT wheat export seems to be a mechanism to manage security stock (when the silos are too full there is a need to empty them to get new wheat in stock and maintain the quality) then the export are directly extracted from the past production to assess the trade off and make the food balance consistent. This means that export level are determined by the storage strategy of GECPT because the strategy of the GECPT is not market and quality driven, (although it try to get the best price). This is an argument to open export market to other institutions that are more concerned by exploiting the potential of the Syrian durum wheat. In other words, this strategy would require the emergence of specific operators (public or private, or both) that could invest in quality management along the value chain to prevent the adulteration of high quality durum by lower quality durum. It would also require that the durum is not consider only as strategic crop associated to food security strategy; for instance private company might be authorized to export durum and have more capacity in managing high quality durum value chain within Syria.

5.2 Enhancing durum production in some regions

If Syria would like to sustain the current strategy for planting wheat, it can enhance the production of durum wheat without big reduction of soft wheat production; According to the information on wheat yield, production, and production regions it can be conclude the following points:

- Syria can enlarge durum wheat farming by replacing soft wheat in some irrigated areas that have a high yield for durum wheat in comparison with soft wheat (Al-Ghab, AL-Rakka, Damascus rural, Hama, and Idleb governorate).
- Historically, durum wheat performs better than soft wheat in most parts of the middle regions of Syria and in all wheat production areas of southern Syria, that originally plant durum wheat only, because of appropriate external climate condition for wheat growth and completion.
- Durum wheat is considered more resistant to drought than soft wheat. Also, it is more resistant to epidemic and some diseases⁸ that harm wheat in some years, due to availability of certain climate condition and causes big drop in production (like wheat corrosion diseases that effected wheat in Syria in 1994,2002, 2004, 2007 season). And corrosion diseases were attacked wheat in Turkey in 1992 and Iran in 1996 and 2000, which caused great damage in their wheat production. Hence, promoting the concentration of durum wheat production with high quality in the driest cropping areas could support and facilitate the economic and financial viability of water saving agricultural development strategy.

⁸ -Wheat farming guide, extension division, ministry of agriculture (MAAR).

- General Committee of Agricultural Science Research, Studies on wheat planting, Syria.

References

- Al-Shareef, Mahmoud. Comparative Advantages of Syrian wheat, Jan 2009, NAPC, Syria.
- Brief memorandum, General Committee of Agricultural Science Research. Study about wheat breed, prepared by MAAR, 1995-1996. Syria.
- CGC (Canadian Grain Commission), study of RVA Technology (14/09/09).
- USDA report, 2007.
- Content on Starch Characteristics and Flour Pasting Properties, research paper, by:
Evaluation of Vitreous and Starchy Syrian Durum Wheat Grains: The Effect of Amylase
Ghassan H. El-Khayat, Jihad Samaan, Charles S. Brennan University of Plymouth, Applied Food Research Group, Faculty of Science Seale-Hayne Campus, Newton Abbot,
Devon, UK. University of Damascus, Faculty of Agriculture, Food Science Department, Damascus, Syria. Available at: (cbrennan@plymouth.ac.uk).
- Corporate Responsibility and the Competitive Advantage of Nation, Tracey Swit & Simon Zodiak, July 2002.
- Integrated Value Chain Analyses for the Cotton and Citrus Sector in Syria. Prepared for The World Bank June 2009, Prepared by Japan Development Institute.
- Lançon, Frédéric. Comparative Advantage Study, Aug 2005, NAPC, Syria.
- Lançon, Frédéric. Training course lecturers on Assessment of the Competitiveness of the Syrian Agriculture. CIRAD 2009, France.
- M. Westlake. Strategic Crops' Sub-Sector, April 2001, NAPC, Syria.
- Khothar, Ahsan. Indicators of External Trade Performance, Kuwait, 2005 (Arabic version).
- Measurement of Competitiveness, bridge development series, issue 24 Jan 2005, AEP, Kuwait (Arabic version).
- National Agricultural Policy Center (NAPC), data base. Damascus, Syria.
- Syrian Agricultural Trade, periodical report, 2007, NAPC, Damascus.
- The Annual Agricultural Statistical Abstracts, MAAR, Syria
- The Annual Statistical Abstracts, CBS, Syria.
- The General Establishment of Cereal Processing and Trade (GECPT), annual reports.
- The State of Food and Agriculture in the Syrian Arab Republic, periodical report, 2008. NAPC, Syria.
- Tracey Swit & Simon Zodiak. Corporate Responsibility and the Competitive Advantage of Nation, July 2002.
- Wheat farming guide, extension division, MAAR, Syria.