

# DRIVING FORCES OF LAND USE CHANGE IN SYRIA 2001

## INTRODUCTION

**T**he total area of the Syrian Arab Republic is 18.5 million hectares out of which 6 million hectares are cultivable and the remainder area is steppe and rocky mountains. The Syrian desert is suitable for grass growing and it is used as pastures during the years of sufficient rainfall. The climate is Mediterranean and characterized by rainy winters and dry and hot summers. From the climatic point of view, Syria could be divided into four regions according to the rainfall which is affected by the Syrian mountainous ranges and the Western Lebanese mountains. The coastal area is characterized by heavy rainfall in winters and moderate temperature and high relative humidity in summer. The interior area is characterized by rainy winters and hot and dry summers, and daily big differences between the maximum and minimum temperature.

Water basin resources are distributed as follows: Al jazeera, Aleppo (Quaick and Al jabbool), Al-Badia (Palmyra, Khanaser, Al zelf, Wadi el miah, Al rassafa, Al talf, Assabe' biar), Horan (Al yarmook), Damascus, Al-Aassi (Orontes), and Al-Sahel basins. Rainfall and snowfall represent the major water supply for these basins except for al-jazeera and Al-Aassi basins, whose main sources are located in the neighboring countries. The three main water resources are (1) rivers, (2) lakes, and (3) dams.

The mountainous area with an altitude of 1,000 meters or more is characterized by rainy winters where rainfall may exceed 1,000 mm, and a moderate climate in summer. The desert region is characterized by a small amount of rainfall in winter and hot dry summers.

Moreover, based on land use, Syria is classified into four groups as follows: Cultivable land (5,987,000 ha), Uncultivable land (3,727,000 ha), Pasture and steppe land (8,283,000 ha) and Forests (521,000 ha).

The main sources of irrigation water in Syria are: Surface water (16,477,000 m<sup>3</sup>), Springs (3,693,000 m<sup>3</sup>), Renewable underground (2,321,000 m<sup>3</sup>) and the total is 22,491,000 m<sup>3</sup>. Annual rainfall in Syria amounts to 45 billion m<sup>3</sup> of water.

## CLIMATIC DRIVING FORCES AND CHANGES IN RANGELAND AREA AND CONDITION

The climate of the Mediterranean characterized by rainy winters and dry and hot summers prevails in Syria. The two seasons are separated by two short transitional seasons. From the climatic point of view, Syria may be divided into four regions according to the rainfall which is affected by the Syrian mountainous ranges and the Western Lebanese mountains. The coastal area is characterized by heavy rainfall in winters and moderate temperature and high relative humidity in summer. The interior area is characterized by rainy winters and hot and dry summers, and the daily big differences between the maximum and minimum temperature. The mountainous area with an altitude of 1000 meters or more is characterized by rainy winters where rainfall may exceed 1000 mm, and a moderate climate in summer. The desert region is characterized by a small amount of rainfall in winter and hot dry summers.

### Relative humidity

Except in the coastal area, the Syrian weather is characterized by high relative humidity during winter and low relative humidity in summer. It is observed that the desert and rangelands areas are those with the least relative humidity. During summer, the rate of humidity in the interior region varies from 20% to 50% and in the coastal region it varies from 70% to 80%. In winter it varies from 60% to 80% in the interior region and from 60% to 70% in the coastal region.

## Wind

During winter, the prevailing winds in the eastern part of the country are easterly and in both the northern and northwestern parts are northerly. While other parts of the country are subject to westerly and southwesterly winds. During summer the prevailing winds in the northeastern part of the country are northerly and the remaining parts of the country are subject to westerly and southwesterly winds.

Some local winds blow over a number of regions during both summer and winter for limited periods only. Thus northeasterly winds are observed over the north eastern region and south eastern regions. Southeasterly winds blow over the middle of the desert. During summer the coastal region is subject to the sea winds which are westerly in the day time and become easterly at night. Damascus region, in particular, is subject to northwesterly winds that blow continuously every afternoon.

During winter, Syria is subject to the influence of the high atmospheric pressure front formed at the center of Siberia and also to the low-pressure front formed in the Mediterranean or approaching from the north east and cause snowfall if they happen to meet the air masses coming from the Mediterranean. The later air masses are largely responsible for the rainfall in winter. In summer, Syria is simultaneously under the influence of the extended low pressure area of the Arab Gulf and the Red sea pressure front, thus dry territorial winds predominate. These winds are very hot when they blow from the Arabian desert or from the western desert in north Africa. There is no rainfall at all during summer.

## Temperature

The daily differences between the maximum and the minimum temperatures are generally quite high in most of the country. This difference sometimes reaches 23°C in the interior region and around 13°C in the coastal region. The fluctuations in temperature are greater in the interior and desert regions compared with the more moderate areas on the coast or in the mountainous areas of high altitudes (for it is frequently 25°C).

December and January are the coldest months of the year while July and August are the hottest. In winter the temperature frequently falls under 0°C (in all regions except for coastal areas) but rarely under - 10°C ( North Aleppo and North Hassaka), while in summer it may rise frequently up to 45°C (Al Badia and Al Hassaka).

Snow falls on mountains with an elevation of 1,500 meters above sea level, while areas located between 800 and 1,500 meters above sea level receive a mixture of rain and snow during the winter season.

## Precipitation

During winter, snow falls over all regions with an altitude exceeding 1500 m above the sea level. Regions with an altitude of 800-1500 meters are subject to both rain and snow. Other regions with lower altitude are subject to rain and rarely snow except desert regions where sufficient rain seldom falls. Rain falls continuously or at intervals. Frequently thunderstorms accompanied by heavy showers do occur during winter and the intensity of such showers reaches in some regions 75mm in 24 hours (see table 1-1 Annex).

The mountainous and coastal regions are the regions of heaviest rain. Second in order are the northern region (North Aleppo, Kamishly and Malikieh). Most of these rains are due to depressions accompanied by fronts coming from the Mediterranean. When they meet the mountains they are forced to rise and precipitate as snow and rain over these regions and the interior. The southeastern and the desert regions are the parts with the least amount of rain. From time to time, the country is subject to dry seasons and the rain shortage leads to a great decrease in agricultural production.

## LAND USE AND AGRO-CLIMATIC ZONES

### Land use

The total area of the Syrian Arab Republic (18,518 thousand hectares) is classified according to different criteria: land use and soil type. In 2000 -based on land use-land was classified into four groups as follows:

Cultivable land	5,987,000 ha
Uncultivable land	3,727,000 ha
Pasture and steppe land	8,283,000 ha
Forests	521,000 ha
Total area	18,518,000 ha

Figure 1 shows the distribution of total land use: 45% for pastures and steppe land, around 32% for cultivable land, around 3%for forests, and 20% for uncultivable land.

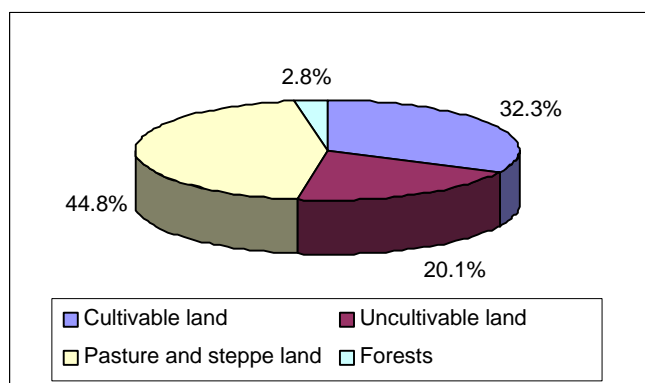


Figure 1 - Land Use in Syrian Arab Republic in 2000

The cultivable land (5987 thousand ha) was classified into cultivated and uncultivated land amounting to 5,522,000 ha (92%) and 465,000 ha (8%) respectively as shown in Figure 2. The uncultivable land is mainly used for buildings and services.

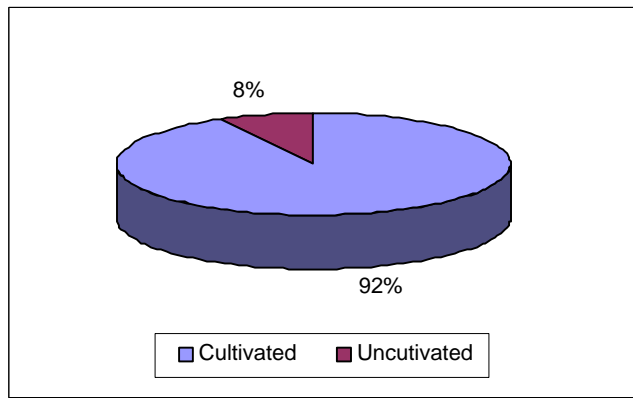


Figure 2 - Classification of Cultivable Land in 2000

In 2000, the total cultivated area (5522 thousand ha) was divided into cultivated lands under crops (4804 thousand hectares) representing 87% of the total cultivated lands, and fallow lands (718 thousand ha) representing 13% of the total cultivated lands as shown in Figure 3.

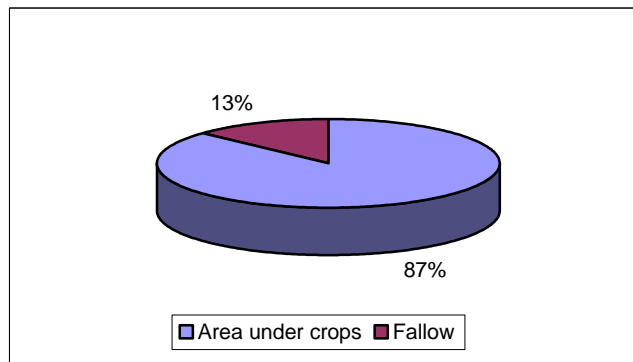


Figure 3 - Classification of the Cultivated Land in 2000

The cultivated land can also be classified, according to water source, into irrigated and rain-fed land. In 2000, irrigated area totaled 1,168 thousand ha (24%), out of which 128 thousand ha were planted with trees and 1,040 thousand ha were planted with annual crops. Rain fed areas totaled 3,636 thousand ha (76%), divided into five agro-climatic zones (see Figures 4,5,6), out of which 627 thousand ha were planted with trees and 3,009 thousand ha were planted with annual crops.

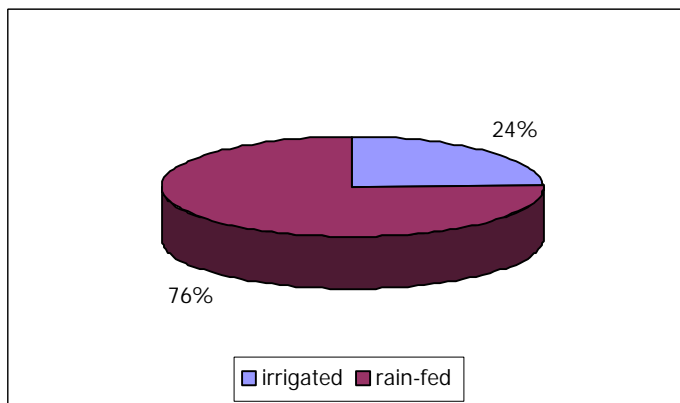


Figure 4 - Classification of Cultivated Lands According to Water Source in 2000

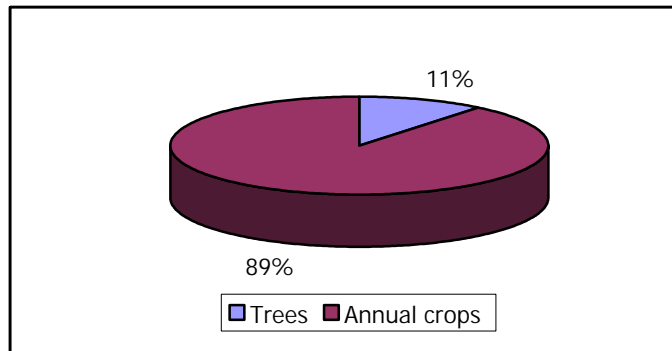


Figure 5 - Classification of Irrigated Land According to Crops in 2000

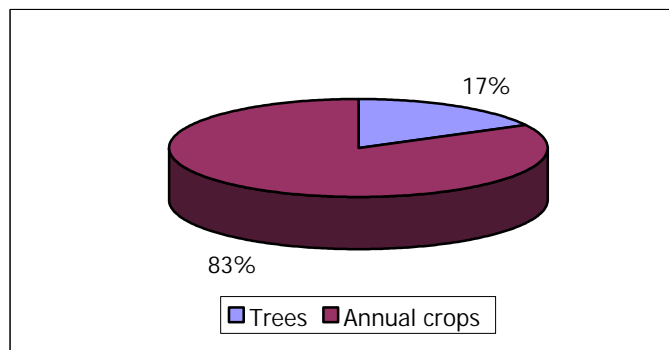


Figure 6 - Classification of Rain-fed Land According to Crops in 2000

The irrigated land can be classified into three categories according to the type of irrigation as follows (cf. Figure 7):

- pump irrigation from rivers: 20% of the total irrigated area;
- pump irrigation from wells: 60% of the total irrigated area;
- pump irrigation form springs and rivers: 20% of the total irrigated area.

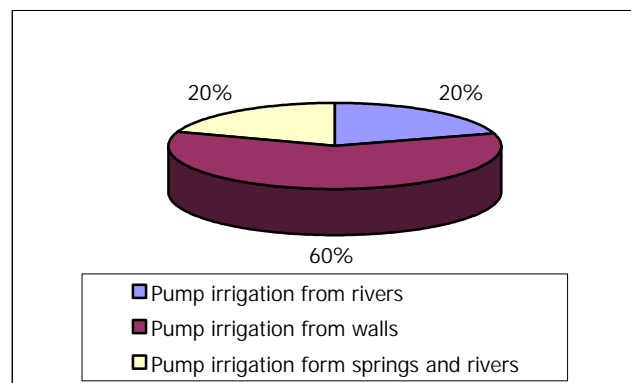


Figure 7 - Classification of the Irrigated Land According to Type of Irrigation in 2000

During the last two decades Land use developments can be summarized as follows: the cultivable lands decreased from 6154 thousand ha to 5987 thousand ha. Regarding the cultivable lands, the area under crops (irrigated and rain fed) increased from 3893 thousand ha to 4804 thousand ha while the fallow lands decreased from 1719 thousand ha to 718 thousand ha.

The uncultivated land fluctuated between 383 thousand ha in 1989 and 526 thousand ha in 1999.

The area of steppes and pastures is almost constant (almost 8 million ha).

The forests increased from 466 thousand ha to 723 thousand ha over the 1980's and then declined to 521 thousand in the 1990's.

Base on soil type, Syrian land is classified into the following:

Red Mediterranean soils	850,000 ha
Reddish-dark brown soils	2,217,000 ha
Yellowish-brown soils	4,782,000 ha
Desert soils	4,244,000 ha
Gypsum soils	5,528,000 ha
Others	897,000 ha
Total	18,518,000 ha

## Agro-Climatic Zones

The total area of rain-fed (3,636,000 ha) is divided into five settlement zones. The boundaries are mainly drawn on the basis of the rainfall patterns. These zones are:

- first agro-climatic Zone: with average annual precipitation greater than 350 mm. The total area of this zone (2071 thousand ha) represents 15% of the total area of the country and includes around 28% of the total cultivated land and 60% of pastoral land. It is subdivided into two sub-zones:
  - a sub-zone with rainfall greater than 600 mm where rain-fed crops are grown without any risk;
  - a sub-zone with rainfall between 350 and 600 mm where only two seasons out of three are secured. This zone can be mainly cultivated with wheat, legumes, and summer crops;
- second Agro-climatic Zone: with average annual rainfall between 250 and 350 mm. Two out of three seasons are secured in this zone. Its total area (2473 thousand ha.) represents 13% of the total country's area and includes 30% of the total cultivated land. The actual cultivated area in this zone in 1998 was 1358 thousand ha, out of which 143 thousand ha were planted with fruit trees and 1215 thousand ha with field crops (mainly barley, wheat, legumes, and summer crops);
- third Agro-climatic Zone: with average annual rainfall greater than 250 mm in more than half of the seasons. The total area of the zone is 1306 thousand ha representing 7% of Syria's total area. The actual cultivated area in 1998 (830 thousand ha) was planted with field crops (maize, lentils, and chickpeas);
- fourth Agro-climatic Zone: with average annual rainfall between 200 and 250 mm in more than half of the seasons. The area under this zone is about 1833 thousand ha representing 10% of the total country's area. The actual cultivated area in 1998 reached 592 thousand ha, out of which 7 thousand ha were planted with trees and 585 thousand ha were planted with field crops (maize, wheat, barley, lentils, and chickpeas);
- fifth Settlement Zone: with average annual rainfall of less than 200 mm in more than half of the seasons. It consists of rangelands and desert areas and covering 10208 thousand ha representing about 55% of the total area of the country). This zone includes 86% of the pastoral land is not suitable for rain fed cultivation.

For each settlement zone, the ideal crops and cropping patterns are determined centrally after extensive consultation between the local civil authorities and the representative bodies of the farming community. The decision is not only based on strict agro-climate factors but also on other criteria related to national objectives and policies, such as self-sufficiency in staple food commodities, and adequate supplies of raw materials for existing agro-processing plants.

## Agro-Climatic Zones Changes impact on regional water resources and balances

Syria has a total area of 18518 hectares. The actual cultivated area for the year 1998 was 4.05 thousand hectares of which 74% are rainfed and 26% are irrigated. In other words, most of the cultivated areas in Syria are rainfed. In addition, rain is very important in feeding the ground water and supplementing rivers and springs which are the main sources of irrigation water. Rain represents 68% of the available water in Syria.

Crop production is highly affected by annual rainfall and its distribution throughout the season, and consequently fluctuates between one season to another. Most rain-fed areas are cropped with cereals such as wheat, lentil, chickpeas (high rainfall) and barley (less rainfall).

## Drought phenomena in Syria

Drought is a complex phenomenon and is considered as one of the main environmental problems affecting Syria. The impact of drought on agriculture can be summarized as follows:

- as 75% of the cultivated areas are rainfed, any shortage of rain will definitely affect agricultural production;
- as most of the irrigation sources are fed by rain -except rivers- irrigated areas are also affected by drought. However, the impact of drought on irrigated areas is less relevant than on rainfed ones;
- as the sheep population graze basically on rangelands (barley as the main source of concentrated feeds and on crop residues as well) livestock production is affected by drought. Also, drought affects rangelands as well as feeds barley production because most pastures are in settlement zone V where barley is grown in areas with low rainfalls.

The present season 98/99 was characterized by very low rainfalls especially in the northern, eastern and southern regions. Consequently, all rainfed crops were badly affected as well as rangelands, ground water, check dams, springs and rivers. The main characteristics of the current agricultural season can be summarized as follows:

- in most parts of the country, annual rainfalls dropped to a level that was unprecedented for more than 25 years;
- the rainy season was short. Rain started late by more than a month and stopped early in most areas.

## Impact of drought on agriculture

In order to analyze the rainfall situation for the seasons 98/99 and 99/00 the average rainfall data for the past two decades were investigated in the following geographical areas: the Northern region; the Southern region; the Midland region; the Coastal region.

**The northeastern region (Aleppo, Raqqa, Al Hassaka, Der Ezzor)** - During the last two decades, the average annual rainfall decreased from 424 mm to 419 mm in settlement zone I, from 275 mm to 270 mm in zone II, from 205 mm to 178 mm in zone IV, and from 145 mm to 129 mm in zone V. Figure 8 shows that rainfall slumped by 46% in zone I, 67% in zone II, 46% in zone IV, and 24% in zone V.

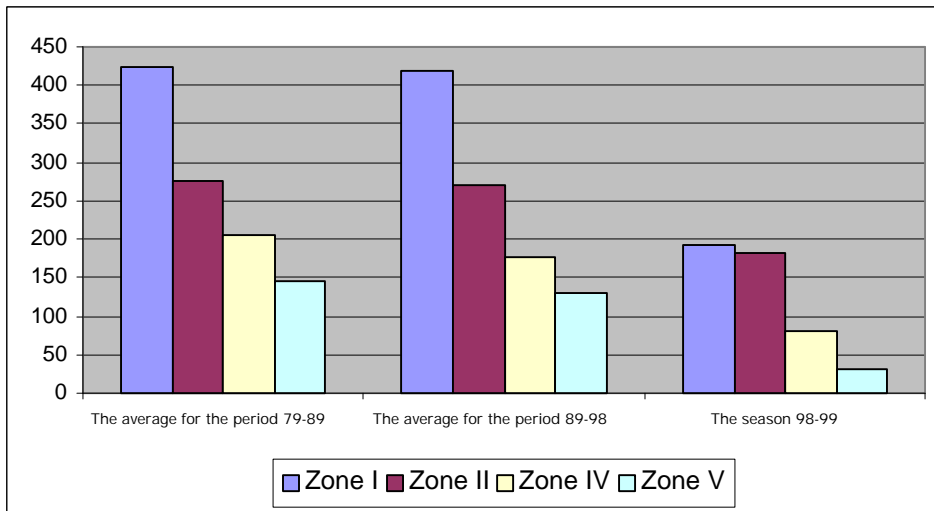


Figure 8 - Average Rainfall in the Northeastern Region

**The southern region (Damascus, Dera'a, Sweida, Qunaitra)** - Figure 9 shows that the rainfall slumped in the last season (1998/99) by 68% in zone I, 33% in zone II, 45% in zone IV, and 39% in zone V.

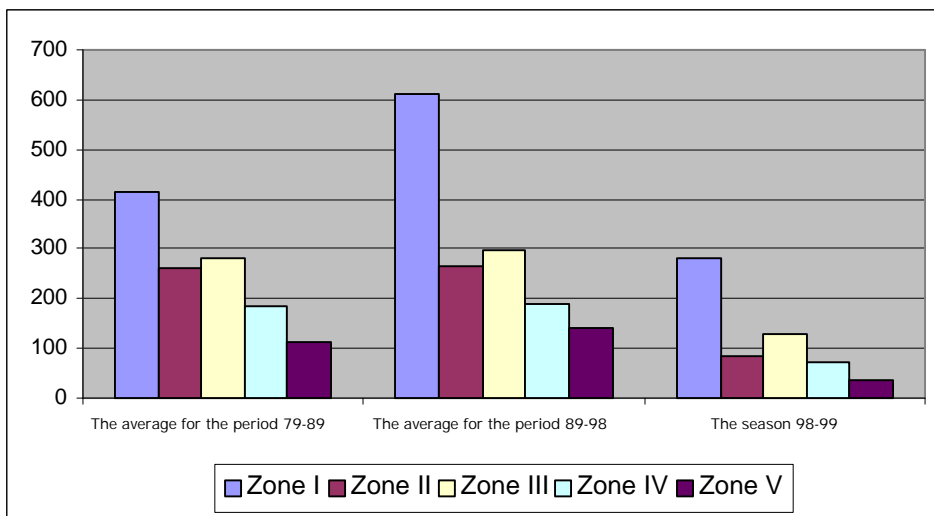


Figure 9 - Average Rainfall in the Southern Region

**The midland region (Homs, Hama, Idleb)** - Figure 10 shows the rainfall slumped in the last season (1999/00) by 85% in zone I, 69% in zone II, 62% in zone IV, and 25% in zone V.

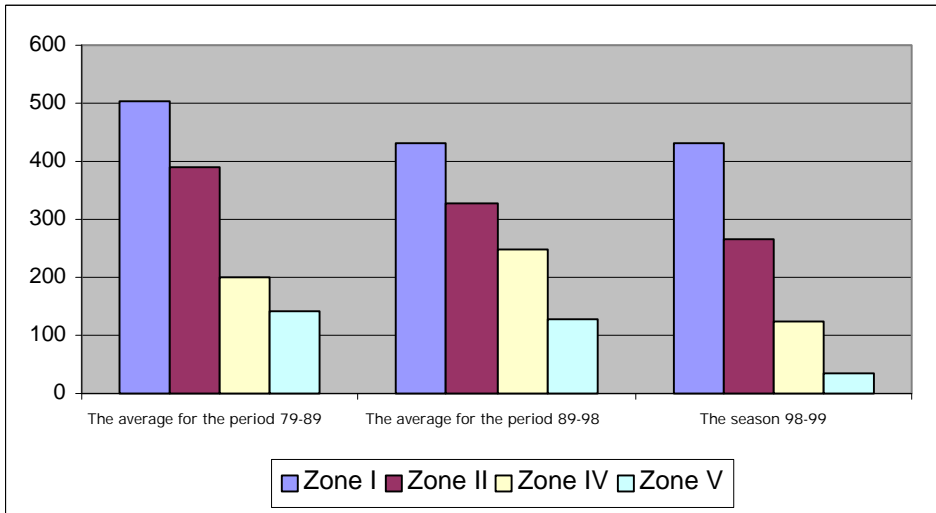


Figure 10 - Average Rainfall in the Midland Region

**The coastal region (Lattakia and Tartous)** - Figure 11 shows the rainfall slumped in the last season (1999/00) by 85% in zone I.

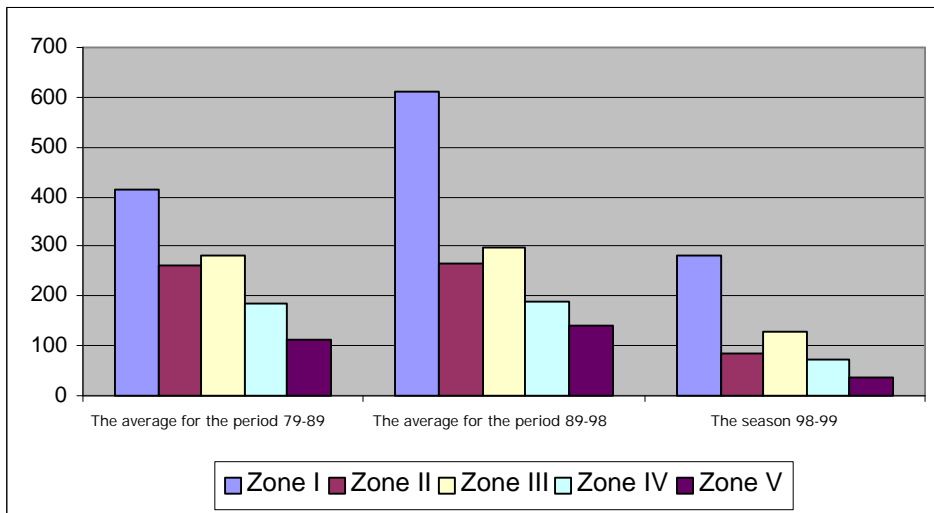


Figure 11 - Average Rainfall in the Coastal Region

From these figures we can conclude:

- all geographic areas have been affected by the drought. However, the drought was less severe in the coastal region;
- large areas were affected by low rainfalls and their distribution in settlement zones I and II which are basically the areas cultivated by wheat and legumes;
- settlement zones III and IV (the area cultivated by barley) and settlement zone V (the area of rangelands) are the most badly hit zones by the drought. The production of wheat and forage in those areas was almost nil.

In general, the drought wave, which hit Syria in the seasons 89/99 and 99/00 was the worst in the last two decades and rainfed and irrigated crops as well as ground water and spring and river discharge are affected.

Temperatures were around the average for the year around except few months. The minimum temperature reached - 3°C (below the average by 1-2°C) for a limited period (2-3nights) in December 98 and February 99. The maximum temperature was above average (2-4°C) in the first week of March 1999. Temperatures in some areas of the northeastern region were above average by 3-4°C at intermittent periods during May and June 99 which partially affected the irrigated wheat yield in those areas.

## The effect of drought on agricultural production for the seasons 98/99 and 99/00

The drought effect on agriculture can be summarized as follows:

**Rainfed crops** - In order to show drought impact on rain fed crops, the yield of three main rain fed crops (wheat, barley, and lentil) were compared during the last two decades.

**Wheat** - During the last 5 years the yield of irrigated wheat declined dramatically from 4.5 ton/ ha to 1.5 tons/ha in Daraa, from 2.8 tons/ha to 2.1 tons/ha in Homs, from 3.5 tons/ha to 2.9 tons/ha in Al Hassaka. Regarding the rain fed areas, the yield of wheat in zone 1 declined from 1.4 tons/ha to less than half ton per ha in Daraa, from 2.8 tons/ha to 2 tons/ha in Aleppo, and from 2.8 tons/ha to 200 kg/ha Al Hassaka. In zone II, the yield of wheat declined from 1.4 ton/ha to 0.7 ton/ha in Aleppo, and from 1.3 ton/ha to 33 kg/ha in Al Hassaka. In zone III, the yield of wheat declined from 730 kg/ha to 247 kg/ha in Aleppo as shown in Figure 12.

However, drought did not affect all the areas in the southern, eastern and northeastern regions to the same extend. The effect of drought was drastic in the southern and northeastern regions.

As a result of the situation, the production of rain-fed wheat will decline from 1524 thousand tons, which is the average for the last 5 years to around 580 thousand tons in this season (i.e. 38% of the average). This is basically due to the low rainfalls in the northeastern region where wheat, whether irrigated or rain-fed, is cultivated.

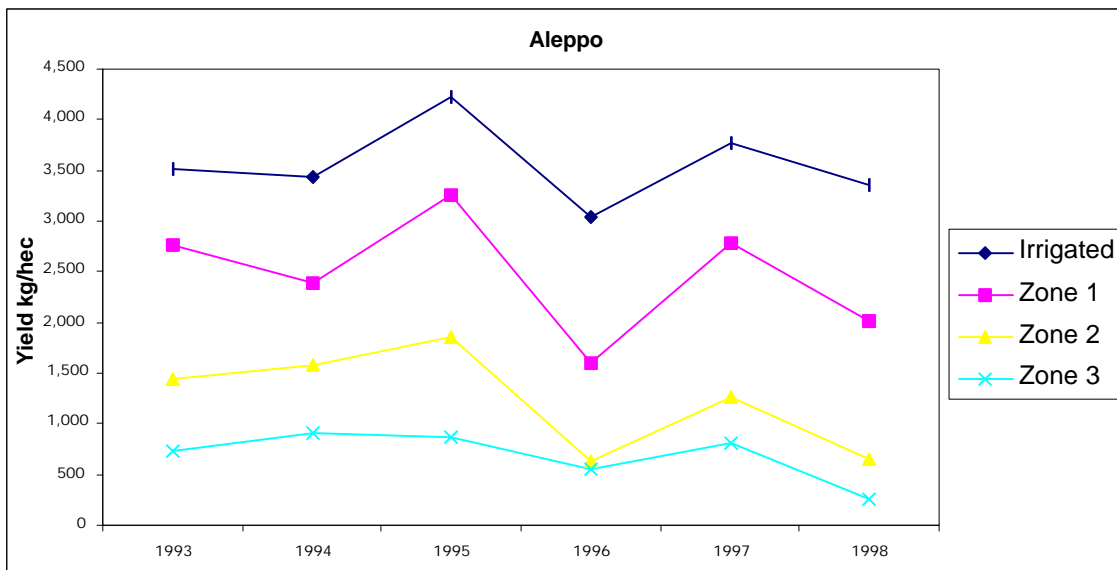
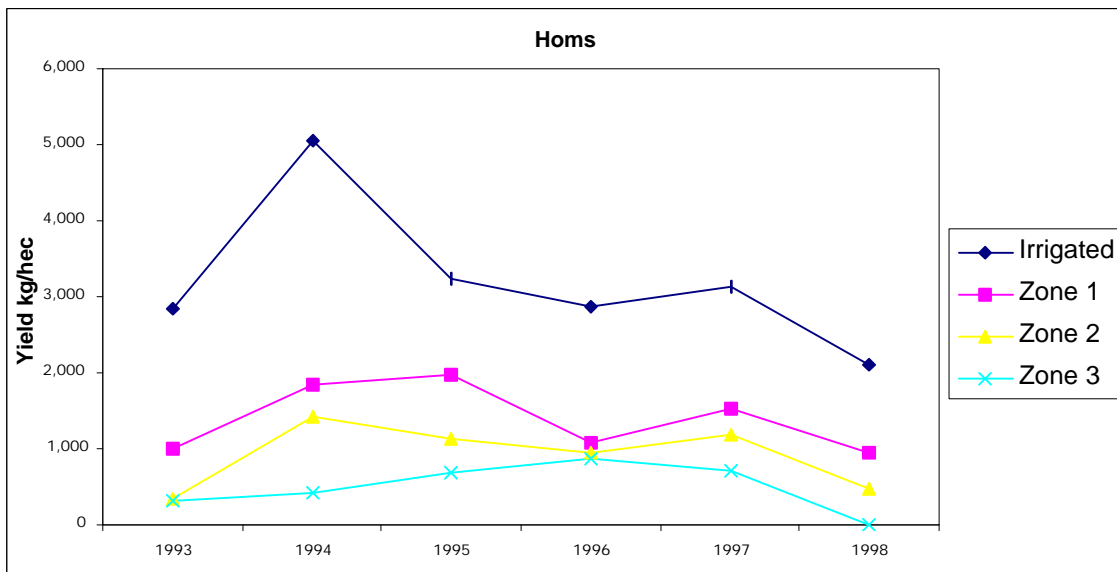
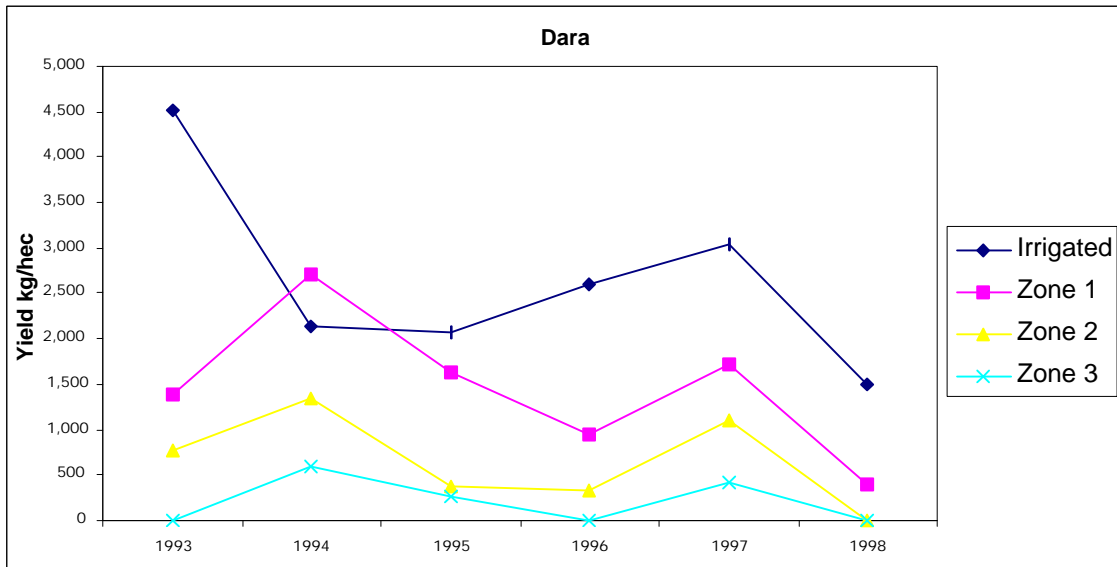
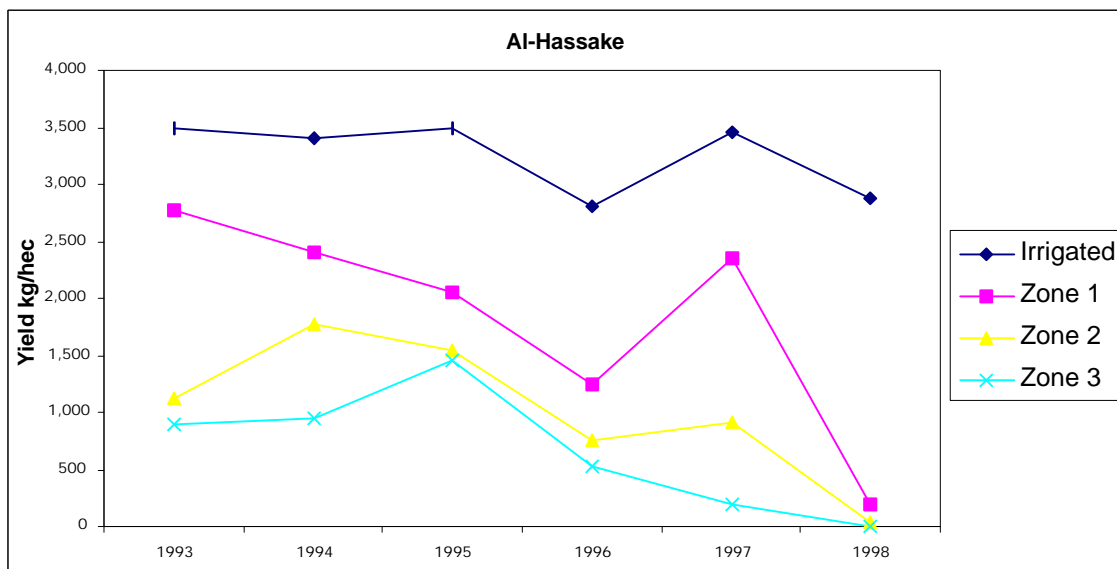


Figure 12 - Drought impact on the yield of wheat



**Barley** - Around 99% of the barley cultivated in Syria is rain-fed and most of the area cultivated by barley is located in the low rainfall areas. For example, the actual barley cultivated area for this year was 1409 thousand hectares of which 2.7% in settlement zone I, 63.8% in settlement II, 31% in settlement zone III and 29% in settlement IV. The estimated production is around 370 thousand tons of which 12% from zone I, 80% from zone II, 7% from zone III and 1% from zone IV.

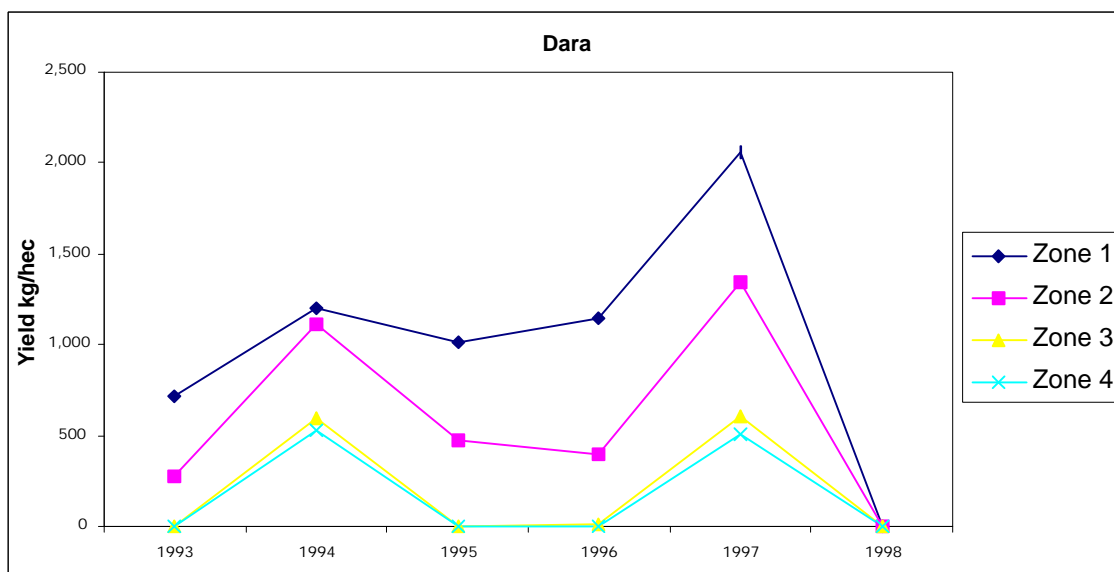
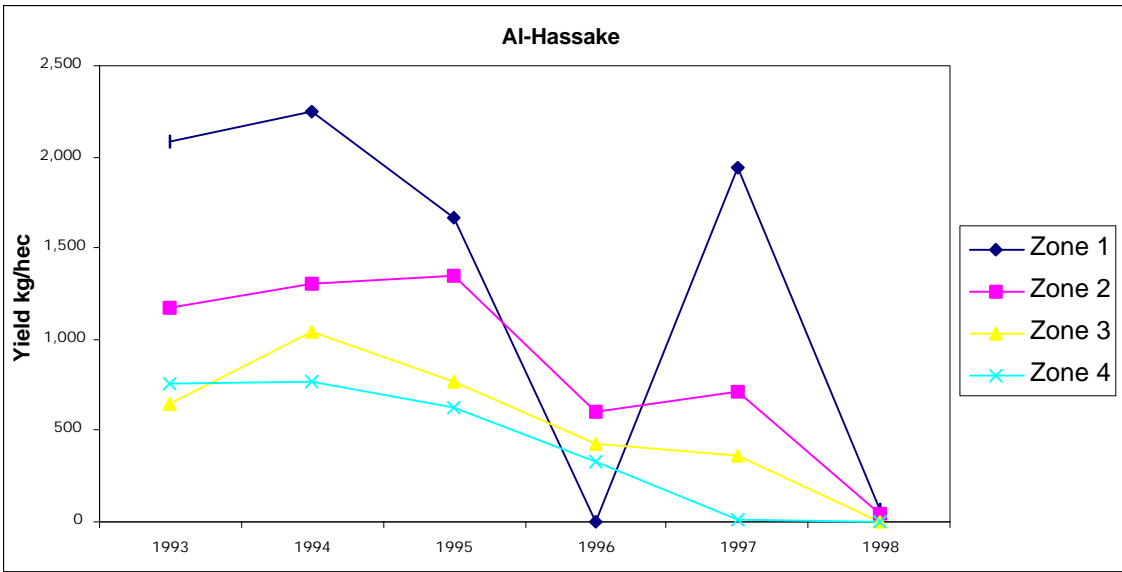
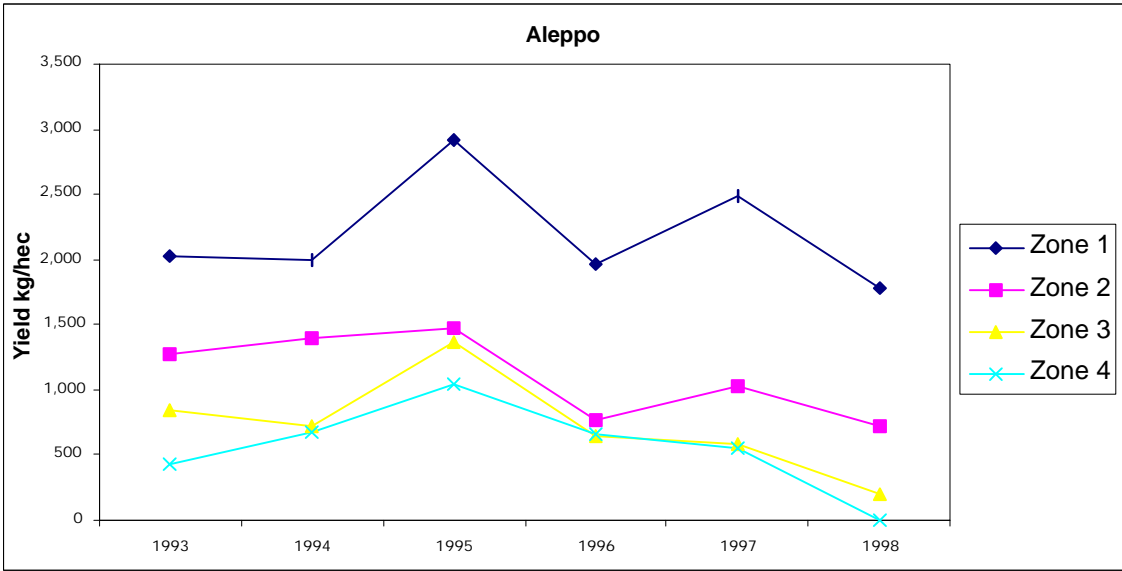
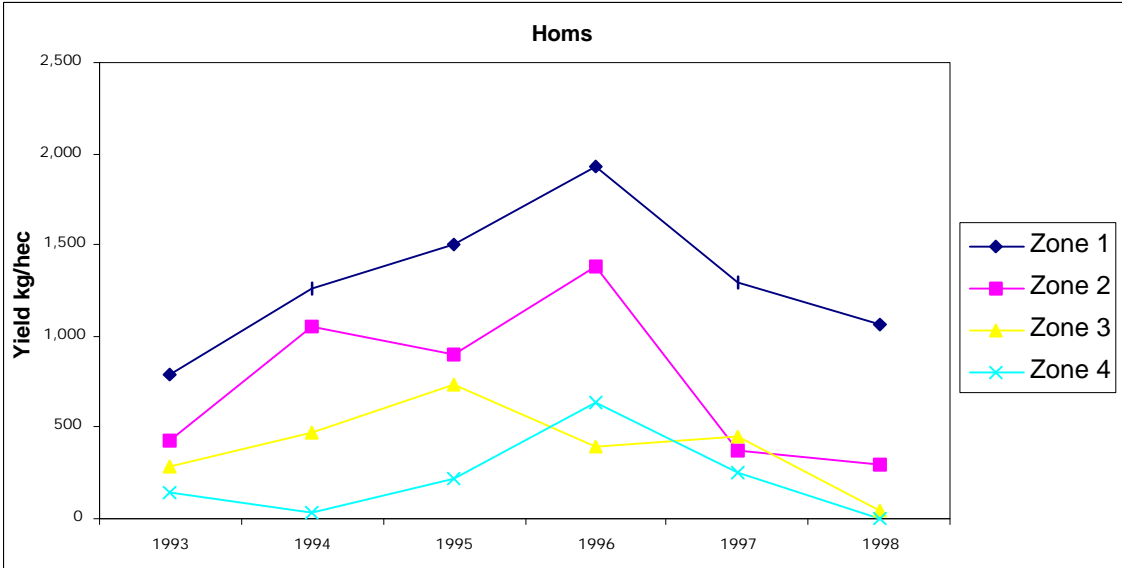


Figure 13 - Drought I Impact on the yield of barley



It is noticed that drought effect was significant in settlement zones III and IV all over the country. Similar to wheat, barley productivity was greatly effected in the southern and the northeastern areas and less effected in the midland the northern areas.

The yield of barley in zone 1 declined from 1.4 ton/ha to nil in Daraa, from 2 tons/ha to 1.8 tons/ha in Aleppo, and from 2.8 tons/ha to 67 kg/ha in Al Hassaka. In zone II, it declined from 5.8 ton/ha to 3.7 ton/ha in Daraa, from 430 kg/ha to 297 kg/ha in Homs, from 1.2 ton/ha to 715 kg/ha in Aleppo, and from 1.2 ton/ha to 45 kg/ha in Al Hassaka. In zone III, the yield declined from 280 kg/ha to 48 kg/ha in Homs, from 840 kg/ha to 199 kg/ha in Aleppo, and from 650 kg/ha to nil in Al Hassaka. In zone IV, the yield of barley declined from 140 kg/ha to nil un Homs, from 430 kg/ha to nil in Aleppo, and from 760 kg/ha to nil in Al Hassaka as shown in Figure 13.

In conclusion, barley yield was almost zero in all settlement zones in the southern and northeastern regions while it was close to average in settlement zone I in the north and midland regions and very low in the other settlement zones.

**Lentils** - During the last 5 years the yield of irrigated lentils declined dramatically from 1.6 ton/ ha to 213 kg/ha in Al Hassaka, and from 1 ton/ha to nil in Homs. Regarding the rain fed areas, the yield of lentil in zone 1 declined from 175 kg/ha to nil in Daraa, from 2.8 tons/ha to 2 tons/ha in Aleppo, and from 1.5 tons/ha to 59 kg in Al Hassaka. In zone II, the yield of lentils declined from 1.2 ton/ha to nil in Daraa, from 390 kg/ha to 203 kg/ha in Homs, from 800 kg/ha to 432 kg/ha in Aleppo, and from 1 ton/ha to nil in Al Hassaka. In zone III, the yield of lentil declined from 446 kg/ha to nil in Daraa, 1.5 ton/ha to 148 kg/ha in Aleppo, and from 900 kg/ha to nil in Al Hassaka as shown in Figure 14.

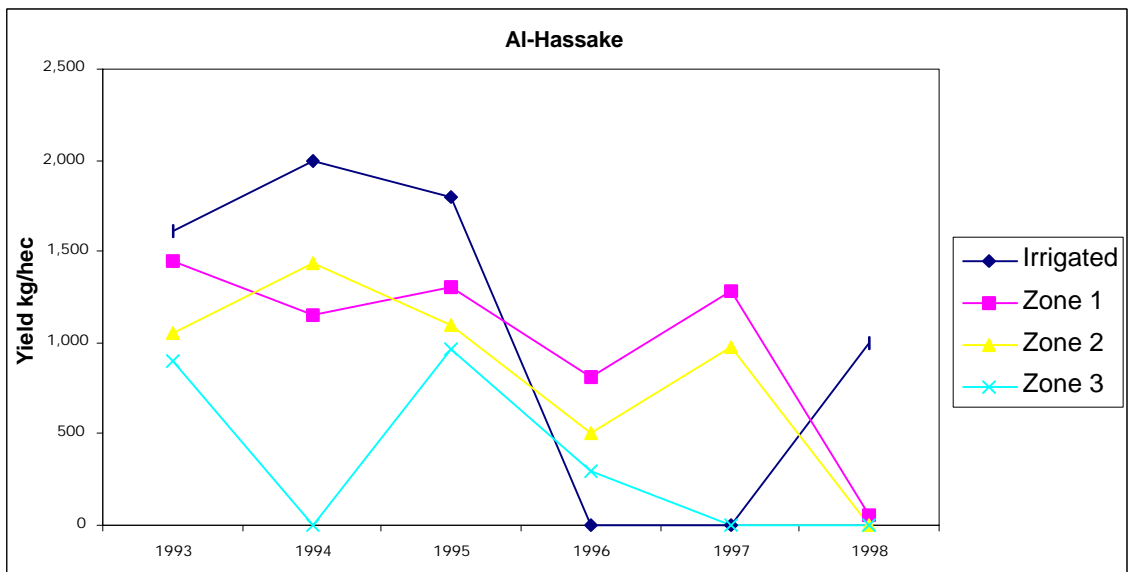
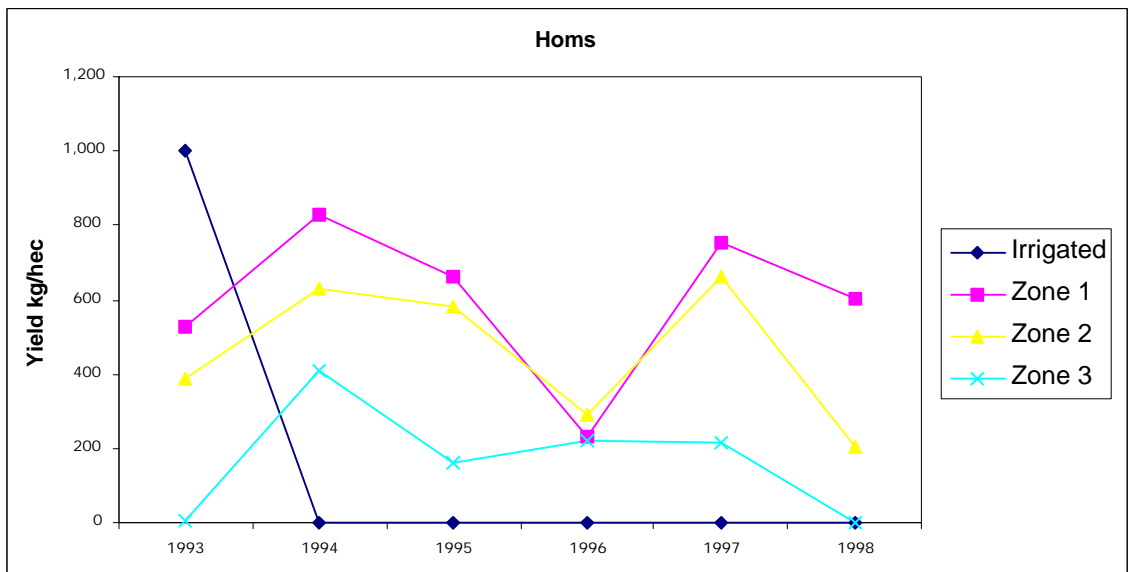
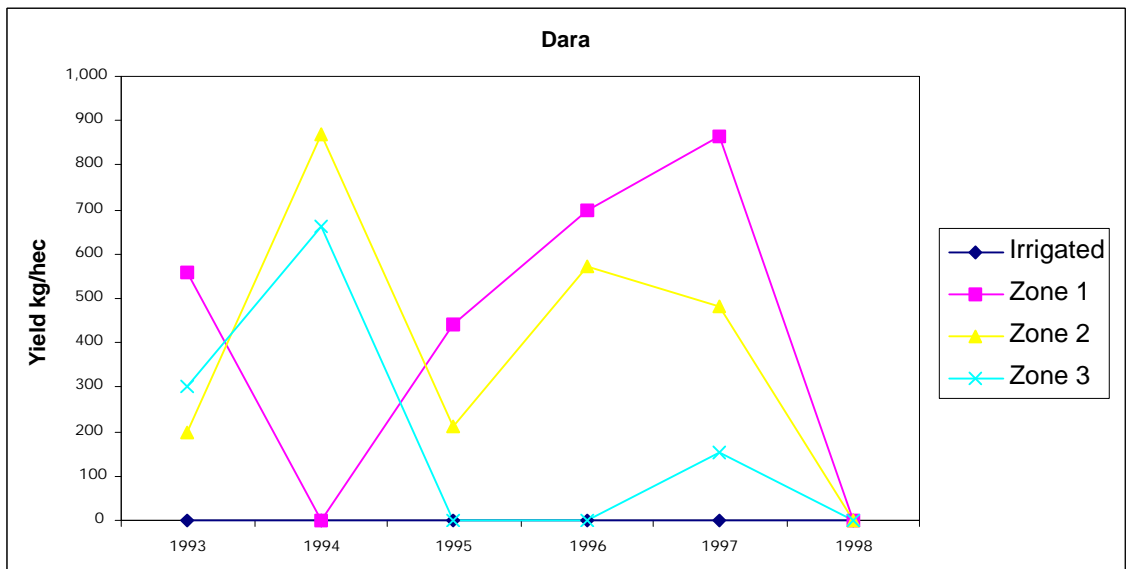


Figure 14 - Drought impact on the yield of lentils

**Rainfed Fruit Trees** - The area planted with fruit trees reached 775 thousand ha in 1998, out of which 641 thousand ha are rainfed and 134 thousand ha are irrigated. Rainfed fruit trees were clearly affected by drought especially in the northeastern, southern and midland regions in settlement zone II. Because of the drought, many trees were dried up. The drought badly affected the green belt area which is the project implemented by the Ministry of Agriculture and Agrarian Reform, which aims at combating drought, and desert encroachment as well as protecting the environment. The project is located in settlement zone III with rainfalls of 250-300 mm annually, where fruit trees and drought resistant crops are grown. In the period 1980-2000 more than 22 million fruit trees were planted on 77.7 thousand ha. All the sites of the project were affected by drought this year with average rainfalls for those sites where about 26 percent of their average annual rainfalls resulting in tremendous damage to farmers. Preliminary estimations indicate that 30% of the annually planted seedlings in the farmers' lands died because of the low rainfalls and the inability to transport water in order to water the seedlings. As for the areas cultivated with field crops (mostly barley) 90% of those crops were not harvested.

**Irrigate Crops** - Irrigated crops were also affected by drought but to a lesser extent than non-irrigated crops (rainfed). The damage could be summarized as follows:

- most irrigated crops depend on water resources, which are annually fed by rain such as ground water, check dams, springs and rivers. With the exception of the coastal region, all check dams were not supplied with water and spring discharge deteriorated considerably especially in the eastern, northeastern and southern regions and almost all areas of the northern regions;
- as a result of the reduced feeding of water sources, their irrigation capacity deteriorated, reducing the yield of irrigated crops. The area allocated for irrigated summer crops was much below than planned for;
- drought effect on irrigated crops varied according to geographical area and irrigation source. The areas most badly hit were those irrigated by the irrigation networks on the Orantes basin and Al Khabour basin followed by areas depending on check dams fed by winter runoffs, and areas irrigated by aquifers and boreholes. However, the situation of the areas irrigated by the Euphrates was stable;
- wheat is the main irrigated winter crop whose yield was affected.

The drought impact was more noticeable in the southern and northeastern region than in the midland and northern regions.

As for the areas irrigated by ground waters, boreholes in different sites were depleted. In other cases, the water level went so low, to increase in the cost of water pumping from wells. This effect would also be noticeable in the coming seasons.

**Rangelands** - The rangelands cover around 8.2 million hectares in Syria, most of which are classified as a special settlement zone with rainfalls not exceeding 200 mm annually. Rangelands usually provide around 60% of the annual feed requirements for the sheep population, which graze on crop residues and concentrated feeds for the rest of the year.

In this season, rain did not practically fall at all in most of the Syrian Badia, therefore, the forage plants did not grow forcing herders to buy feeds for their animals at the minimum rates as from the beginning of winter. This situation imposed a huge burden and resulting in heavily indebted. Sheep prices deteriorated as a result of the increase in supply. The government tried to help through distributing feeds to herders as loan to be repaid next season. It also provided veterinary medicines and vaccines for free. However, the overall picture is grim for the herds and their productivity, and herders incurred huge losses, which they might not be able to recover from for several seasons to come.

As for sheep products, meat prices deteriorated as a result of increased supply of sheep even ewes for slaughtering, resulting from herders needs to ease the burden of feeding and to generate income covering the household expenses.

Milk production also deteriorated reaching about 15 kg per a milking ewe, compared to an average in ordinary years in the range of 60-70 kg. These losses have to be added to the huge losses resulting from buying feeds for at least an entire year, which will lead to the depletion of the capitals of most herders and livestock owners.

**Forest and reforestation** - Forests in Syria were subject to tremendous encroachments before independence especially during the 19<sup>th</sup> century. After independence, necessary steps were taken to restore the vegetation cover of these forests. A huge reforestation program has been implemented for years, with more than 20 million seedlings

planted annually and serviced in the first few years by irrigation. Reforestation covered around 22 thousand hectares annually.

Due to the drought wave affecting Syria this year, not all produced seedlings were planted and the planting of 10 million seedlings were postponed till next year. In addition to that, the seedlings planted this year were not appropriately irrigated because of the greatest part of water tankers to service sheep.

According to preliminary estimates 30% of, the seedlings planted this season were affected by the drought.. This is due to insufficient humidity in the soil and the inability to provide the adequate watering for them.

As for the reforestation process, the seedlings planted in the last 5 years where badly effected as they haven't yet full, adapted to surrounding environment. It is worth nothing that Syria plants those trees in various areas (in the big cities and on roads, alongside some patches in heavily deteriorated forests, with a purely environmental objective). ◆

Contact:

**Bashar Akkad**

Ministère de l'Agriculture et de la Réforme Agraire, 7<sup>th</sup> floor, Akkad Building, Jaber Street, Tijara-Damas (Syrie)

E-mail: [bashar.akkad@wfp.org](mailto:bashar.akkad@wfp.org)