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EFFECTS OF CLIMATE CHANGE ON AGRICULTURE PRODUCTION UNDER RAINFED CONDITION AND THEIR ROLE ON AVIATION IN SOUTHEASTERN ANATOLIA REGION OF TURKEY


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In recent years, our country has affected from climate change and drought as shown in the world. Global warming has been observed a significant impact on water supply. Therefore, the increase in the variability of precipitation, constitute the major problems in agricultural production.

As a result of warmer climatic conditions accelerate of the hydrological cycle, climate change, increase of the precipitation and evapotranspiration (ET) will cause.



The average temperature of the earth and water masses, have been increasing since 1861. The earth, to the present 1861 as the year of 1998 has been the warmest meteorological measurement process.

Over recent years, the development of the industry and the increased use of fossil fuels, CO_2 emissions, increasing of the temperature rise caused in the last 20 years.



Drought, rainfall is less than the average for many years associated with the realization of which can occur at any place and at any time the climate is a natural phenomenon.

The amount of greenhouse gases released into the atmosphere after the industrial revolution, with the increase in the world, has been in the process of an artificial climate change. Globally, the average temperature of the earth and water bodies has been increasing since 1861.

Global warming will affect our country, especially in front of the Mediterranean basin will be felt more and more regions are entering into. Global warming is likely to occur in conjunction with agricultural drought, affected only one geographic region to be affected in all geographical regions as possible.

Reduce the negative impacts of agricultural drought, drought and drought periods of measures to be taken without the prior periods of planning with the right to be. Therefore, while there was drought and drought measures taken steps to be taken in the previous period should be planned separately.

- Agricultural drought is closely related to soil moisture, soil moisture in the definition of this is given special attention.
- **Drought:** Rainfall, a result of falling significantly below the normal values of land and water resources and hydrological balance disorder that causes negative effects can be defined as a natural event.



Drought

- ***Meteorological Drought:*** Drought is defined on the basis of the duration and degree of drought. Precipitation, humidity, and temperature as well as climate data, the high, low, or average values are determined by the comments made.
- ***Hydrological drought:*** Aquifer (ISS), available water sources such as lakes and reservoirs will fall below the statistical average. Even in these circumstances, the use of water in times of average rainfall increases, the reserves are low, may occur.



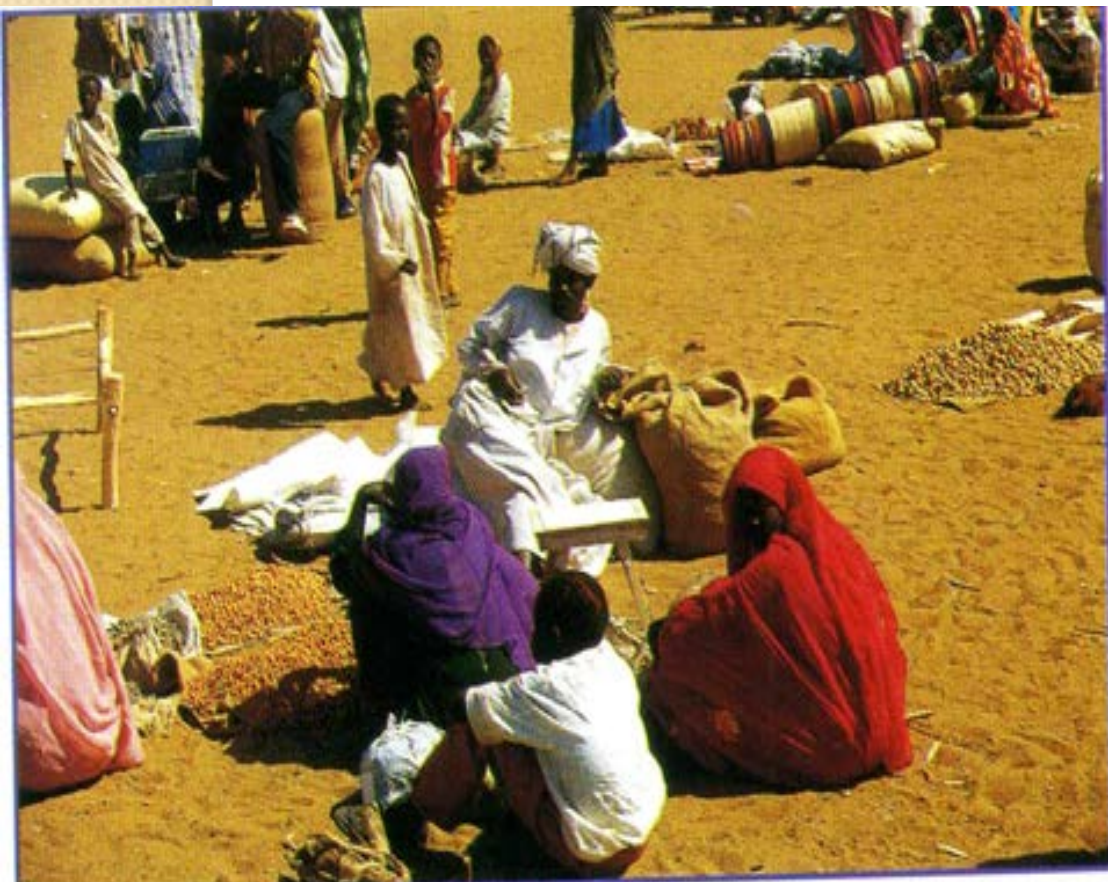
Agricultural drought: The soil can be described as the lack of amount of water to meet the needs of the plant.

Each meteorological drought, agricultural drought in the coming together of each meteorological drought, agricultural drought is experienced.

Agricultural Drought

Agricultural production is decrease as a result of agricultural drought, economic losses, disruption of the ecological balance and social life will inevitably be affected.

Socio-economic drought: meteorological, hydrological and agricultural drought, some of the elements of the supply and demand of goods that the economic effects. When it affects the lives of people and their socio-economic drought, water shortage is mentioned.



Socio- economic drouht

Drought Effects on Agriculture



Climate change projections made up to 2100 for indicate an overall increase in temperature by 2-40 °C with no substantial change in precipitation quantity.

Within agriculture, it is the rainfed agriculture that will be most impacted by climate change. Temperature is an important weather parameter that will affect productivity of rainfed crops.

General Climate Characteristics in Şanlıurfa

Şanlıurfa's climatic condition is summers are very dry and hot, rainy winters, relatively mild pass.

In Şanlıurfa daily and annual temperature differences are severe. Şanlıurfa - Ceylanpinar the highest temperature 46.5 c (July) were measured. Şanlıurfa's cold -12.4 c (February) were measured. Average annual precipitation is 462 mm calculated in Şanlıurfa.

The annual average temperature is 18.6 c, evaporation 2048 mm, wind speed 2.8 mğsn' dir. The number of days with snow and frost is very low.

For these reasons, Southeastern of Turkey is among the countries at risk group in terms of the potential effects of global warming.

Summer; temperatures are often increasing on Turkey's Southeast Anatolia region. In addition, in the last 50 years the amount of precipitation during the winter season the west of Turkey, has been significantly reduced.

Climate change and the scarcity of rainfall limited agricultural production in Turkey.

Between in 1982 - in 2011; the lowest rainfall measured 227.3 mm in 2008, while the highest rainfall measured 573.1 mm in 1996.

Most of the agricultural production is in dry conditions in southeast of Turkey. The mentioned with rain water research in the field of barley, grapes, peanuts, almonds produced agricultural products such as. Many products cultivated dried up the field in the region in 2008 and 2010 droughts.

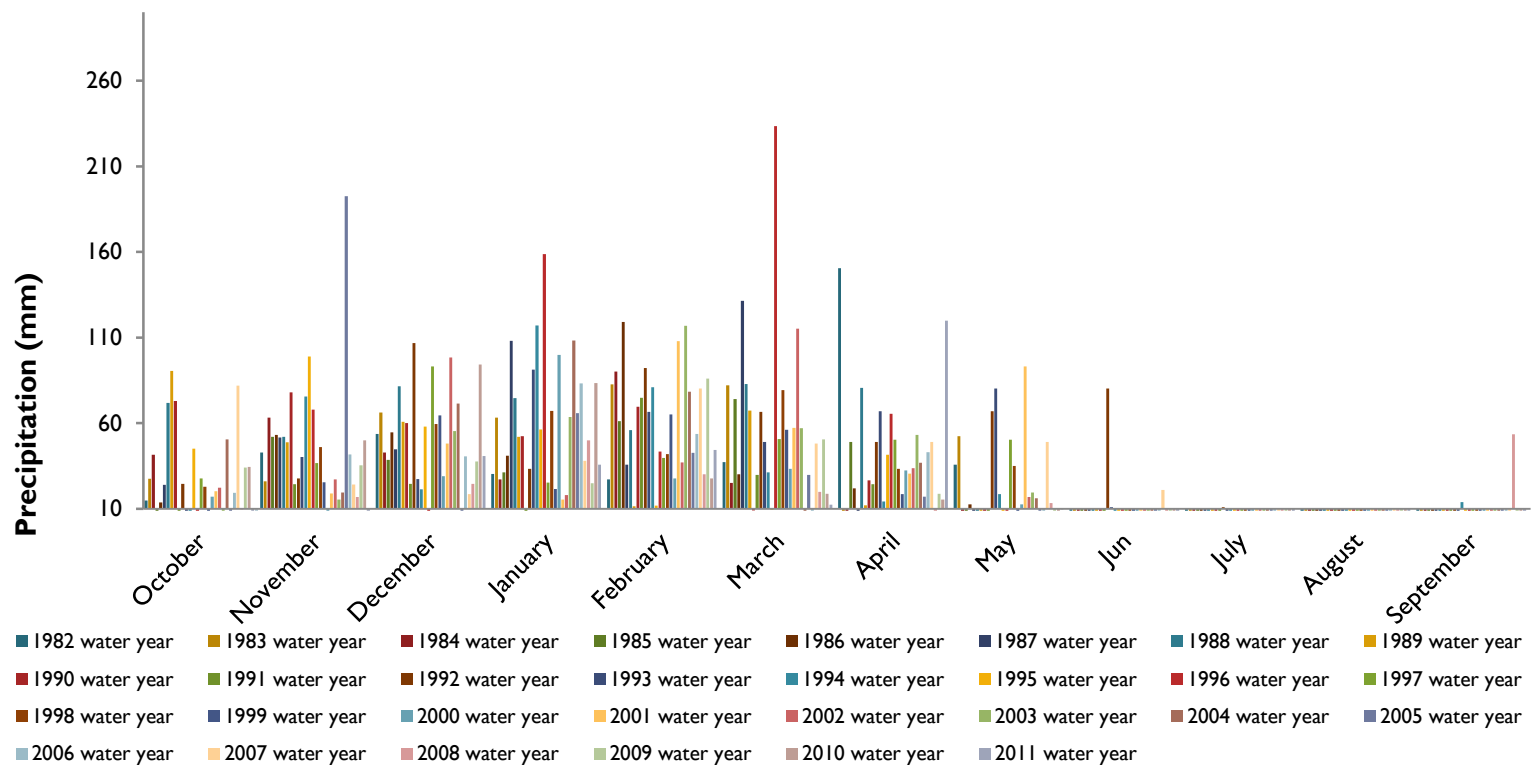
Climate change and the scarcity of rainfall limited agricultural production in Turkey. Especially in the southeastern region of Anatolia, agricultural production has been hampered by the drought in 2008 and 2010. The average of total 30 years rainfall was 344.1 mm in this semiarid region.

Years	Average Temperature (°C)	Average Precipitation (mm)	Average Moisture (%)	Average Wind Speed (km/h)	Average Evaporation (mm)
2009	20.2	299.2	66.8	5.8	1317.6
2010	20.7	326.0	72.4	6.3	1561.7
2011	19.7	263.2	65.7	7.2	1643.5
Long Term Average (30 year)	18°C	344.1	70.6	6.4	2047

Average Climate Data of Research Area

The average of total 30 years rainfall was 344.1 mm in this semiarid region. Between in 1982 – in 2011; the lowest rainfall measured 227.3 mm in 2008, while the highest rainfall measured 573.1 mm in 1996.

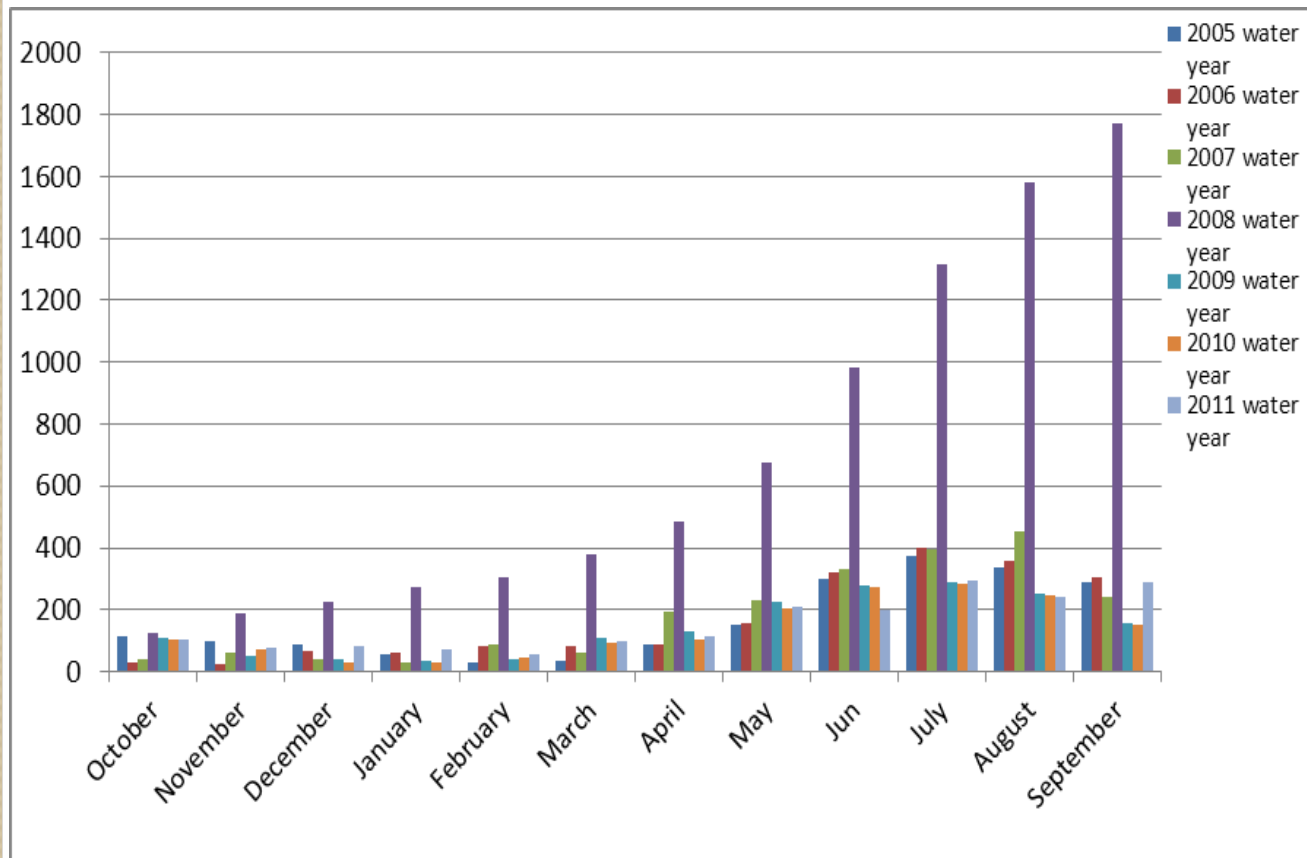
Agricultural production is products are in very difficult circumstances under rain-fed conditions. The amount of precipitation from year to year was irregular and very less.



Long-term Precipitation Data in Southeast of Turkey

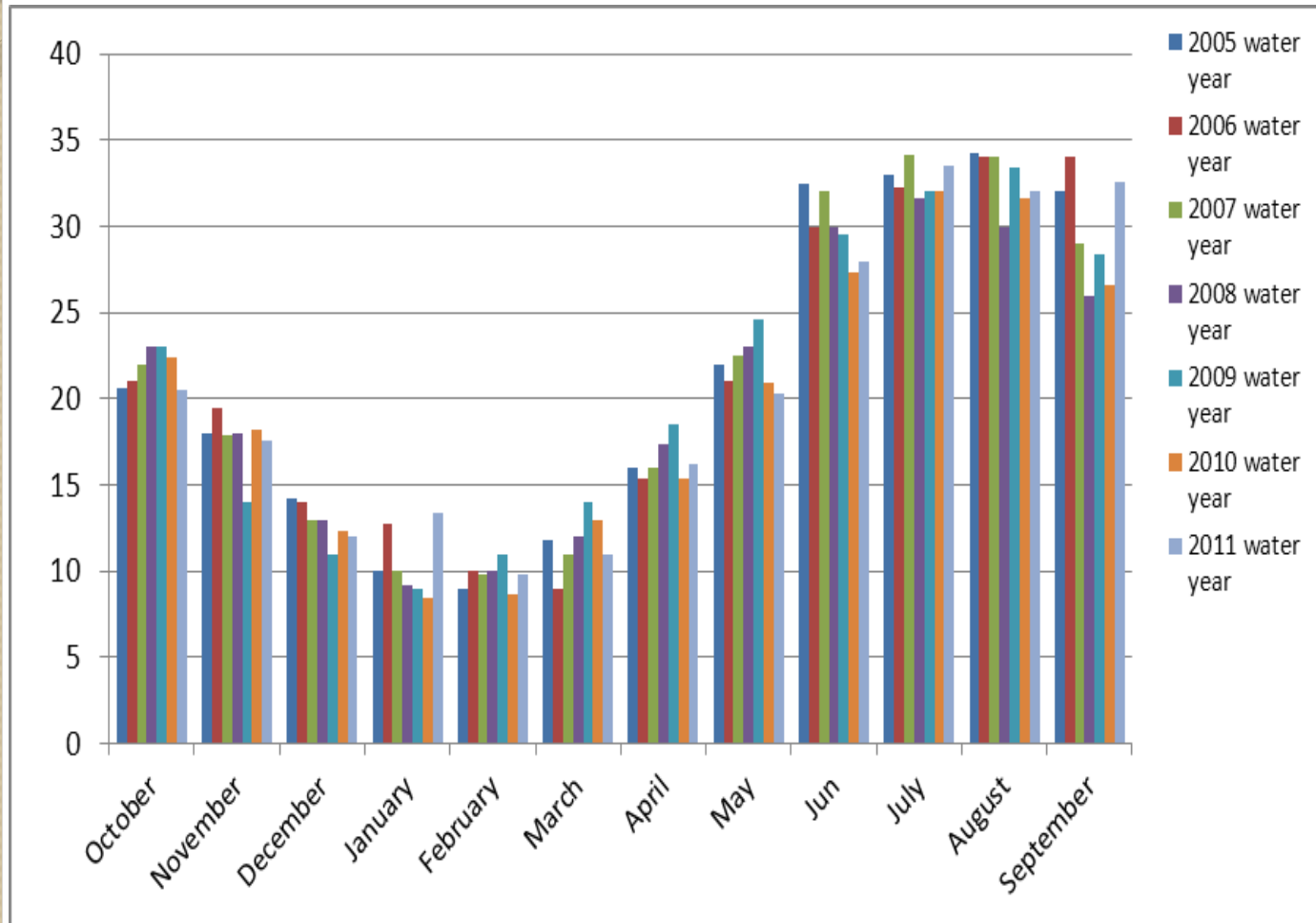
Evaporation occurred too much in this semi-arid agricultural area.

Effects of high evaporation, plants live under stress conditions. There was agricultural drought year, high evaporation measured in 2008 water year.



Long-term Evaporation Data in Southeast of Turkey

In this study area monthly temperature increased during the summer months. There were high temperatures for rain fed conditions.



Long-term Temperature Data in Southeast of Turkey

- **Precaution for Agricultural Production**

Renewable water resources of 70% used for irrigation. Water to agriculture saving vast, largely intact creates a new water supply. Irrigation reduces by 10% the amount of water used, the use of water for homes around the world provide more than twice the required water.

Therefore, this point on should be laid. To increase the efficiency of irrigation most practical, most economical and most convenient the method varies from region to region. However, in almost every case, farmers' water 10-50% of their use can be reduced.

For this purpose the high water usage selecting plants with efficiency and economic value of water, not blood on an open or closed communicating with the pipe system, pressure rather than surface irrigation methods (drip possible irrigation) and limited irrigation systems in practice to be preferred are. In addition to breeding drought-resistant varieties or the speed of adaptation be given.

This research study revealed that the climatic variation as occurrence of drought have significant impact on the production of Rainfed crops. The small and medium Rainfed farmers were highly vulnerable to climate change and to a larger extent the small and medium Rainfed farmers adopted coping mechanisms for climate change compared to large farmers.

The farmers already act to the changes in the climatic changes both by adopting the technological coping mechanisms on the positive side and negatively through shifting to other professions.

The study suggests that as the impact of climate change is intensifying day by day it should be addressed through policy perspective at the earliest to avoid short term effect such as yield and income loss and long-term effects such as quitting agricultural profession by the Rain fed farmers.



THANKS..

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