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Evaluation of Antalya Province With Regards to Soil and Water Resources

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Abstract

Agricultural production is mainly based on two bases, such as soil and water. The increase in plant production depends on preservation, improvement and sustainability of soil and water resources. With this regard, soil and water resources of Antalya Province have been investigated in this study. Antalya, located in the South West of Turkey by the Mediterranean coastline, has significant agricultural contribution to the economy. Almost 31% of the Province population settled in the countryside and they are all engaged in farming. Agriculture in Antalya is very strong in this region with regards to quality, yield and agro biodiversity. On the other hand, climate and vegetation show significant difference in coastline and highland. The total floor area of Antalya is 20874 km^2 and it owns a 2.6% of the total country land. The 77.8% of the Province is mountainous, 10.2% of it is plain and 12% of it is rough. It is possible to see 16 different soil structures in the Province. The 27% of the Province area consists of Red Mediterranean earth. According to the values declared by the State Hydraulic Works (DSİ) in 2009, the amount of water used in the province was 1081 million m^3. When the surfaces of dams and ponds were considered as water resources, the total Province surface area was 5207.9 ha. The rate of the land in the Province which was irrigated in 19 counties of Antalya was between 6 and 97%. The general rate of the land irrigated in the Province was 55%. The amount of land where vegetable production was carried out in 2009 in Antalya was 478105 decares including 232043 decares outdoor agricultural production and 246062 decares greenhouse production. The total vegetable production including mushroom production was 3535850 tons.

Keywords: Soil, water, agricultural production

Antalya İlinin Toprak ve Su Kaynakları Durumu

Tarımsal üretim toprak ve su gibi iki temele dayanmaktadır. Bitkisel üretimin artırılması toprak ve su kaynaklarının iyi korunması, geliştirilmesi ve sürdürülebilir olmasına bağlıdır. Bu bağlamda ele alınan bu çalışmada, Antalya ilinin tarım sektöründeki toprak ve su kaynakları durumu irdelenmiştir. Türkiye'nin güneyinde Akdeniz kıyısında yer alan Antalya tarımda son derece önemli bir yere sahiptir. İlin nüfusunun yaklaşık %31'i kırsal kesimde yaşamakta ve tarımsal üretimle uğraşmaktadır. Antalya'da tarımsal üretim kalite, verim ve çeşitlilik açısından zengin bir yapıya sahiptir. Öte yandan, sahil ve yayla kısımlarında iklim ve bitki örtüsü önemli farklılıklar göstermektedir. Antalya'nın yüzölçümü 20874 km^2 olup, ülkemiz yüzölçümünün %2.6'sını oluşturmaktadır. İl arazisinin yaklaşık %77.8'i dağlık, %10.2'si ova ve %12'si ise engebeli bir yapıyla sahiptir. İlin topraklarında yaklaşık olarak on altı farklı yapı görülebilir. Bunlar içerisinde Kırmızı Akdeniz toprağı %27'lik kısmı oluşturmaktadır. Devlet Su İşleri (DSİ) 2009 yılı verisine göre tarımsal üretimde sulama amaçlı 1081 milyon m^3 su kullanılmıştır. Su kaynağı olarak, baraj ve gölet göl alanı su yüzeyleri ile birlikte akarsu yüzeyleri toplamı 5207.9 ha'dır. Antalya ilinin on dokuz ilçesinde toplam sulanan alan oranı %6 ile %97 arasında çok geniş bir aralıkta değişim göstermektedir. İl genelinde ise sulanan alan oranı %55 düzeyindedir. Antalya ilinde 2009 yılı itibariyle açık tarlada 232043 dekar, örtüaltında 246062 dekar olmak üzere toplam 478105 dekar alanda sebze üretimi yapılmıştır. Toplam sebze üretimi ise mantar üretimi dahil 3535850 ton dur.

Anahtar Kelimeler: Toprak, su, tarımsal üretim

Introduction

We are one of the countries suffering from water shortage as a consequence of the rapid increase in the human population and industrialization in our country and the gradual increase in the use of agricultural pesticides and

fertilizers. We will face irreversible water-shortage-related problems 20-30 years later. We have to consume 2.5 L water daily either through foods or direct water consumption for every kind of biological and physiological activities. The quality of drinking water is very vital for our health. Water quality is also very important for not only us but also soil with regards to animals' health and productivity. Without any interference to the nature, we should be able to live in accordance with the nature creating the settings in which nature can sustain its well-being. Considering that the lives of future generations are in our hands, we should leave enough drinking water of good quality and arable soil and an inhabitable environment (Akın and Akın, 2007).

Agricultural production can be increased with the rational use of soil and water resources. Such resources need to be improved and new investments should be done for them. The studies aiming to improve soil and water resources are not adequate on their own for a highly productive, successful and sustainable agriculture. The following issues should also be considered, such as a good soil survey, choosing the plant profile matching with the soil profile cultivated, the rational choice of the size of the irrigation project land, the efficient use of irrigation water, the structuring of a good soil management, implementation of drainage system matching with the conditions and maintaining it and the training of farmers (Karaman, 2006).

The increase in life standards and human population has made compulsory to use water resources most efficiently. The social and economic significance of water resources increases gradually in the developing countries as our country is. It has become more important for both individuals and countries to do their parts fairly for environmental protection. We should always remember that the time that we are supposed to spend on the protection of our water soil and water resources will be much less than the time for cleaning of them after they are contaminated (Sağlam and Bellitürk, 2003).

The maintenance of water resources should be done considering that water resources have no alternatives for the continuity of human and natural life. It should not be considered as a method to be used in the lands suffering from water and soil related problems. The demand for soil and water resources is increasing and the quantity and quality of soil and water resources in nature are very limited and these resources directly affect economic life and economic structure. Since the emergence of the first primitive tribes on the earth, water has been a major cause for conflicts and even wars among the people in the world. The nations which could not meet their need of adequate water either immigrated to other places expecting better life conditions or faced the risk of disappearance for their civilizations. The water related conflicts exist as problems which are difficult to solve. Whereas technology advanced very dramatically, or whereas the water resources are very plentiful, the number of adequate clean water resources are limited (Meriç, 2004).

Whereas the amount of ecosystems is stable, human population is increasing day by day. As human population increases in number, the amount of share for stable natural resources per head decreases, which leads deterioration in human life standards as well as the lives of people. Soil and water are important resources which are commonly used at every phase of people's lives, even in death and it cannot be replaced with an artificial material. The soil, which is a living creature, also needs maintenance, nourishment, protection as all living things do. In a handful soil, there may be organisms as many as the number of the people in the world. It is possible to protect the structure of the soil and sustain the productivity through the use of quality irrigation water (İkincikarakaya et al., 2013).

Our country is positioned in the Middle East where water resources are very limited. Whereas Turkey used to be accepted among the countries which are rich in water resources before 2000, it is now one of the countries suffering from soil and water related problems. Malpractice in water management, policies related to water use, the increase in the demand for water as human population increases, global warming are all considered among the causes of water related problems (Aküzüm et al., 2010).

There is severe erosion problem in the sloping lands of Elmalı and Korkuteli, which are the counties of Antalya Province. Severe erosion is also seen in the high lands of Toros Mountains as a consequence of overgrazing, forest fires and clearing some pieces of land to grow crops. There are two main points that we should consider to protect and improve the soil and water resources. One of these is to conserve the production potential of the soil by bringing the factors ruining the structure of the soil, and the other is to give adequate importance to the choice of appropriate place for any use except agricultural purpose (Özdemir, 1995).

Agricultural production is based on two grounds, which are soil and water. Increasing the vegetative production depends on the protection and improvement of soil and water resources and sustaining it. With this regard, this study aims to

investigate soil and water resources of the farming lands of Antalya Province.

Materials and Methods

Geographical settlement and characteristics

Antalya Province is located along the Mediterranean coastline of Turkey, between the 29° 20' - 32° 35' east longitude and 36° 07' - 37° 2' North latitude. Its surface area is 20874 km^2 and it covers 2.6% percent of Turkey's land surface area.

Majority of the Province is covered with Toros Mountains. The land border of the Province is the Toros Mountains in the North. Mediterranean Sea is in the South of the Province. İçel, Konya and Karaman Provinces are in the east of the Province. Isparta and Burdur Provinces are in the North of Antalya, and Muğla is in the West of Antalya. The coastal length of the province is 640 km including the intrusions and protrusions. It is 500 km as a slicken line.

The 77.8% of the total Province surface is mountainous, 10.2% of it is lowland and 12 of it is rugged terrain. The number of 10 hills of the Toros Mountain are 2500 m higher than the sea level, 2 of the hills are 3000 m higher than the sea level. There are vast plateaus and basins in Teke region in the West. It is very common to see caves which are formed as a consequence of the melting of limestones, dolines, valleys and vast poljes with large hollowness and karst landforms in the plateaus and mountains which mostly consist of limestones. The topographical instability of the Province offers various settings for climate, agriculture, demography and settlement. The regions with varying characteristics can be defined as coastal and upland regions.

The coastal line counties are Muratpaşa, Konyaaltı, Kepez, Döşemealtı, Aksu, Gazipaşa, Alanya, Manavgat, Serik, Kemer, Kumluca, Finike, Demre and Kaş. The elevation of these counties from sea level is between 5 and 44 m. The upland counties are Korkuteli, Elmalı, Gündoğmuş, Akseki and İbradı. The elevations of these counties from sea level are between 900 and 1000 m. 60% of the land is covered with pinewood and the plants unique to Mediterranean climate. There are a lot of independent rivers flowing from the mountains to sea. The lowlands turn into fertile lands with the help of alluvial soil. 290 km of the 640-km-shore line consist of natural beaches. The southern borders of the Province are the shore line of the province to Mediterranean. The fact that the mountains in the east of the Province are parallel to the sea helped the formation of a long shore line beginning from Antalya to Gazipaşa between the mountains and sea.

Climate conditions

The climate in the province of Antalya is that it is generally hot and dry in summers, and it is warm and rainy in winters, which is a typical characteristic of Mediterranean Climate. When we look at the climate data of the province, we see that there is a typical Mediterranean climate in the shore line, there is a typical continental climate in the higher regions. The winds generally blow from the North to the South. The wind speed can reach up to high levels in winter months.

Vegetation

The vegetation of the province consists of forests, meadow and pastures, marquises and herbaceous plants. The marquises which consist of shrubs can be seen at the heights up to 700-800 m. The forests start beginning from sea level. However, the natural vegetation has been partly destroyed especially in the regions where settlement is dense and farming is common.

Calabria pine is very common in the forests of the Province. The Calabria pine which is the main element of the forests in the Province can be seen in the altitudes up to 1200 m. Beginning from this altitude, cedar, black pine and abies are common. When the altitude is higher than 2000 m, the forests are very rare. The other common plant types are oak, black pine, fır, juniper, cedar, cypress, maple tree, sycamore, eucalyptus and pine.

Except these, in the forests and moors, there are leftists, elm trees, rambutans, holm oaks, sandalwoods, phllyreas, laurels, mayflower, sumac, turpentine tree, chaste tree, phllyrea, fig, blackberry, woodwaxen, ruscus aculeatus, hedera.

Besides, there are some other annual plants in the region, such as couch plant, wild oat grass, lollium perenne, bluegrass, grasspea, whiteclover, clover, broad bean, sunflower, violet, hyacinth, clothbur, rockrose, boston fern, moss, spanish iris, milfoil.

Some plants which are unique to this region, such as sunflower, Çukurova orchid, Çukurova violet and etc grow in this region. Some of the other plants which have economic value for this region are bayleaf, thyme, herba sideritis, sideritis, rosemary, carop, all types of wild mushrooms, folium myrtishrub and moss. Our country hosts 75% of the total plant species in European continent, 1/3 of them are endemic to our country. There are 533 endemic taxons within the Province of Antalya.

Results and Discussion

According to the data gathered from DSİ (State Hydraulic Works) 13th District Office, the total amount of water reserves in Antalya Province in 2009 was 5207,9 ha including the dams, small

lakes and running water resources. The irrigation rate of 19 counties of Antalya Province changed between 6 and 97%. The figure related to provincial-wide is 55%. According to the data of 2009, 20% of the total surface area of (2087426 ha) Antalya Province was used as farming lands, 6% of it was used as meadow-range and 74% of it was forests and non-agricultural lands. The rate of the cultivated land was 231.229 ha, and 42.927 of it were used to grow vegetables, 506 ha of it were used for the growth of ornamental plant, 60.962 ha of it were used as fruit gardens and olive grove.

The size of the land in which vegetables are grown in the Province of Antalya was 478105 decares, and 246062 of which was done in indoor areas and 232043 decares of which was done in outdoor lands. The size of total vegetable production was 3535850 tones including the mushroom production.

There is a significant difference between coastal region and upland region with regards to climate and vegetation. Coastal region is fine for the growth of banana and citrus fruits, which are tropical and sub-tropical plants. The upland regions are fine for the growth of some fruit types which are cold resistant, such as apple, pear, quince

In brief, when we consider the total irrigation rate of Antalya Province (55%), we see that it is at an average value. It is possible to benefit from the soil and water resources more efficiently if this value is increased to a higher value.

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