

## Sustainability of Effective Use of Water Sources of Turkey

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**Abstract:** Natural water resources had been threaten by increase of temperature due to global warming and not proper usage of them this causing health problems both for human and aquatic environment.

Therefore new studies have been forced in the rehabilitation and sustainable usage of water sources recently in the world.

In this paper information about their currency state and future projections is given based on many published data.

**Keywords:** water resources, Turkey, sustainable

### Introduction

One of the important vital resources of sustainable development is water. World population in 20.century increased approximately three fold in proportion to 19.century. On the contrary it is seen that utilization of water resources increased six fold.

However the fast consumption doesn't have properties about providing equal opportunities and benefits to beneficiaries of resources. Swedish hydrologist Malin Falkenmark points out that annual capitation of agricultural, domestic-urban, industrial water demand limit of minimum sufficiency is 1000m<sup>3</sup> in a country. So under this limit means poverty in point of water. There are water famines especially in three regions of world at present time. These are Africa, the Middle East and South Asia.

In 20.century, it is written official enrolments that the speed of water consumption increase is two half fold of the speed of population increase broad world. Even the Middle East in which has trouble with water problem, the rate of population increase exceeds %3 in lots of counties, and new generation doubles up the previous one numerically. On the other hand, it is guessed that with the increasing population in the developing countries in 20 years, in ratio of %17 more water will be needed to grow food products. On that account, it is guessed that the increase in total water consumption will be %40 in 2025. According to World Bank experts' guesses, the number of countries which have substantially troubles with water famine is anticipated to rise to %34, and it is pointed out that more than 3 billion people will be faced with water famine in 2025.

Water crisis is described like that over one billion people's not gaining enough access to healthy

drinking water and half of world population's not having enough water and groundwork of waste water. So, unavoidable water crisis is possible in the whole world.

On the other hand, according to evaluations, dirty waters cause %80 of illness in developing countries, and death of approximately 10 million people ever year. The recession of water quality and the anxieties about qualification of water provided that water resources are included in environmental protection and development content of United Nations Environment Program.

### ***Turkey's Water Potential and Assessment of Situation***

When the water potential of a country, which is reinforced by rainfall, is divided to population, capitulation of annual average of water amount is gotten. It does not mean that the water potential of a country is always usable property. There are important differences between the total water potential and usable water potential in countries where rivers have irregular flow.

Turkey is 779.425 square kilometers in total area, land area is 765.152 square kilometers and water area is 14.300 square kilometers.

The climate of Turkey is semiarid and there are excessive temperature differences among some regions. Annual average amount of rainfall is 643mm<sup>3</sup> (TÜİK 2008). Water resources are limited according to irrigable solid in Thrace and Central Anatolia regions, in Eastern Black Sea is reverse of this. Underground and aboveground waters of our country are given in Table 1 and 2.

Flow	186,05
Consumable Annual Average Amount of Water	95,00
Actual Annual Consumption	27,50

Table 1. Aboveground Waters (billion m<sup>3</sup>) (Kıran, 2005)

Drainable Annual Water Potential	12,20
Assigned Amount	7,80
Actual Annual Consumption	6,00

Table 2. Underground Waters (billion m<sup>3</sup>) (Kıran, 2005)

When population increase of our country is considered, capitulation amount of annual water is guessed 2750m<sup>3</sup> in 2010; capitulation amount of usable water is 1300m<sup>3</sup> in same term. It shows that there will be critical deficiency of water in further years especially in arid years in some parts of country (Kıran, 2005).

While the annual population increase is %2.3 in Turkey, this rate is %3.6 in Southeastern Anatolia Project region, and this is twofold of %1.8 increase in world. Actually when capitulation annual water amount is considered, the common aspect is that Turkey is not a rich country about water resources. The capitulation annual amount of water is 1300m<sup>3</sup> in our country. However this amount is 3000m<sup>3</sup> in Asia, 5000 in Western Europe, 7000 in Africa, 18000 in North America, 23000 in South America and 7600m<sup>3</sup> in overall world (Türkkan 2009).

### ***The Possible Effects of Global Warming and Insensible Use of Water to Our Country's Water Resources***

All world countries and science world started to ponder about more productive use and development sustainability of available water resources because of global warming and unconscious usage of natural water resources.

Global warming is named shortly "the rising of temperature on surface of atmosphere, oceans, and land masses". The cause of this warming is guessed as greenhouse gases which are included to atmosphere with the burn of fossil fuels like coal, natural gas, crude oil.

Global warming started to produce clearly its effects in our country too like whole world. Turkey is in the risk group countries about potential effects of global warming. Our country will be affected by negative part of global warming like forest fires, arid, desertification and especially reducing of water resources.

According to V. technical report of IPCC, which was published in 2002, it is made determined that temperature increases to 0.25°C every 10 years in Turkey, there is fall average %10 in rainfall, when a line is drawn from Samsun to Adana between 2071-2100 years, its west part will warm up 3-4°C, its east part will warm up around 4-5°C, daily rainfall amount will fall to 0.25mm, vaporization and evaporation will increase, summer aridity will increase, there will be decline in fish species which live in interior waters depending on reducing in water resources (Atalık 2005). Again it is made determined a lot of researches in parallel to report of IPCC; the negative effect of climate change to water resources will be pretty much in 10 years terms to come.

One of the biggest problems of available recourses is water pollution when it is considered that aridity

and desertification problems will increase more with global warming in our country which takes place in arid and semiarid belt.

Natural water resources are become dirty and unusable by upward industry and industrialization, and polluting resources day by day. Water pollution is one of the most important environment problems in nowadays (Uslu & Türkman 1987). Chemical pollutions are frequently come across by usage of pesticide and chemical drug in agricultural strife with the development of industry and industrialization especially late years in waters of our country (Sönmez et al. 2008). Wash, which is a physical pollution, is one of the biggest problems of water resources. Our barrages are established for kind of aim with big investments, another aim of them is irrigation. Our barrages fill in shorter time than estimated economic life with soil materials which are carried by river and surface flows. Generally economic lives of barrages are determined 50 years, but it is seen that some barrages fill in 15-20 years with the effect of excessive wash (Karamanlı 13 years, Altınapa 10 years, Kemer 22 years).

It is clear that our country's water resources are become weak day by day, and they are not developed enough according to upward population. So, it is possible that there will be water problems in 10 years in our country which is not water wealthy.

### ***Water Policy of Turkey and the Conformity with World Strategies***

Turkey aims to join European Union in the near future. With this aim, our country has to make consistent own legislation to legislation of Union and has to make applicable this new legislation. Water Frame Directive was prepared frame by European Union in 1996 and put into effect in 2000. It is a conjunctive directive to all member countries and candidate countries in concession process. The necessary precautions and constitutional transforms of candidate member countries are clear especially. The two main titles of Water Frame Directive of European Union attract attention. First of them is "Usage of Sustainable Water" (80/68/EEC) topic (Efeoğlu, 2005). To provide continuity of available resources is emphasized and to constitute necessary substructure about financial support is wanted in this main title. The other important title is "Aquatic Ecosystem and Prevention of Waters". In other words to prevent pollution in available resources and to avert damage to nature stability is aimed.

When the two materials are handled holistically, providing sustainability and averting pollution of our available resources are only possible with again attend to production with make refining of used waters or return them to nature stability. The same situation appears when development and strategic plans of our country are looked at. The two provisions support regulation of management of resource in 9th development plan of 2007-2013 years. "Environmental Protection and Development of Urban Groundwork" title of plan is 159.provision. It emphasizes that "Fast population increase and industrialization duration continue to be an important force factor on sustainable usage of natural resources. The uncertainties in distribution of duty and authority between institute and institution about protect environment and not being negative affected of production duration about sustainable usage of natural resources have not been dispelled sufficiently." 162. Provision points out the agreement on the topic that "United Nations Climate Change Frame Engagement was approved by the Turkish National Assembly in 24 May 2004.

As a conclusion, our resources are limited and bounded sustainability because of industrialization, upward population and especially climate change. First of these resource are waters without doubt. So the waters which are used in areas of industry, industrial and production, are necessary to take for provident and refinement certainly.

### **Conclusion**

Water resources should be used to satisfy the needs of present day and future for the protection of ecologic stability and also providing sustainable development of human societies. It is more important for our country which is in the risk group countries because of global climate change. The most important solution way is the providing sustainability of available resources. Our rivers, which are the most important renewable water resources, should be used consciously, should be protected regime of them, short built dimension catchments should be constituted and evaluated instead of high built dimension catchments. Waters, which are used in industry and industrial, should be returned to natural environment with least damage after refinement. Economic lives of river, lake and barrages should be lengthened with taking necessary precautions about erosion and water pollution which is based on agricultural pest control. To constitute an applicable "Sustainable Water Policy" is necessary with founding a functional government unit and determining inventories of water resources. The most important of them is to encourage people about conscious water usage, and stoping waste should be emphasized because water is not an endless resource.

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