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Impacts of Global Warming and Climate Change on Drought

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Abstract: - There are huge effects due to global warming's impacts on underground water resources. Global warming and climate change not only affects the ecological system, but also affects the whole life in the negative way. From the reason of decreasing at raining amount by the effect of global warming and irrational water consumption, underground water levels start decreasing. Depending on world population increasing, water demand will be increased. So, it is really important to protect the underground water resources. In order to protection of underground water resources, each country must make regulations on water consumption and people must be informed about protection of environment and atmosphere. This paper is basically one of comprehensive research in the relationship between underground water resources and global warming, on account of provide many response for other research related to global warming.

Keywords: - *Global climatic change, Regulation, Water resources, Underground water resource*

I. INTRODUCTION

Water is one of the most important substances on earth. All living beings must have water to survive. If there was no water there would be no life on earth. Water is the resource necessary for the life activities of all living things. Considering the distribution of water in the world, seas and oceans constitute a large amount of the water resources (70%). 97,5% of those water resources are salt-water, whereas 2,5% of them are fresh-water. 75% of fresh water is on the poles in the form of ice. The small amount remaining is underground waters. Only 1% of that 3% is drinkable. These percentages indicate the importance of preserving water and water resources [1]. Global warming and climate change that have a direct impact on water resources decrease precipitation. From this situation drought is occurred. So the life has effected negatively. Taking the hydraulic balance, the rapid increase in world population, and the other factors into account, water consuming, water management, and future need for water have importance to keep the influence of global warming and climate change at minimum. This paper is basically one of comprehensive research in the relationship between drought and global warming, on account of provide many response for other research related to global warming.

II. GENERAL IMPACTS OF GLOBAL WARMING

In parallel with the increase in the world population day by day as it is known, industrialization and urbanization increases. Greenhouse gases caused by industrialization and urbanization have increased environment pollution and causes environmental change and drought [2]. The increase of temperature on the surface Earth caused by greenhouse gases is called global warming Global warming is, basically, the increase of average temperature on earth caused by natural means or human effects in parts of the atmosphere near the surface of earth [3]. Climate is commonly defined as the weather averaged over a long period [4]. The intergovernmental panel on climate change (IPCC 2001) defined climate as a "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. On the other hand the most general definition of climate change is a change in the statistical properties of the climate system when considered over long periods of time, regardless of cause [5]. In other words, climate change is a change in climate as a result of human activities that damage the composition of global atmosphere in addition to the natural climate change observed in comparable periods of time [6]. It is increasingly important to understand what might happen when climate changes [7]. In climate change, what people understand is temperature rising but the main point that we have to focus on is it will be effect not only temperature but also climate and it will also occur extraordinary nature events. It is believed that temperature rise won't be the same all over the world [8]. World can stand on maximum up to 2°C average global temperature rising. After 2°C, it is obvious that there will be huge damages on environment and ecological life. International panel on climate change has estimated future impacts of global warming. According to these estimations, global climate change has increased between 1.5-5.8°C end of 2010 when compare this situation against industrial revolution time period [9]. Temperature rise caused by global warming will have effects on the other factors (economical, health and agricultural). In addition to this, global warming influences ecological life, socio-economic structure, agricultural activities and industry negatively. It is estimated that temperature rising every passing year will cause losses in many species until 2050. It is stated that

agricultural production systems, product value and as a result of this, food production will be influenced by climate change. As a result of this, there will be losses in the industry directly related with agricultural production, decrease in production, and significant negative influence on unemployment, national income and tax losses [10].

III. WATER POTENTIAL OF WORLD

By the research of water in the world, total water potential is about 1.38 billion km3, seas and oceans constitute a large amount of this potential (70%). 97,5% of those water resources are salt-water, whereas 2,5% of them are fresh-water. 75% of fresh water is on the poles in the form of ice. The small amount remaining is underground waters. Only 1% of that 3% is drinkable. This situation tells us, drinkable water potential is insufficient. Considering the world population growing rapidly, 2.5 billion in 1995, 6.5 billion in 2005, and about 7.5 billion in 2015, the current insufficient resources will be more insufficient in the future. Also the distribution of the water on the world is not fair. By looking at Africa, consuming water per person is only one out of five of Asian and it is one out of ten of South America [11]. By 2015, water consumption per person in the world is around 7600 m3/year. The amount of the utilizable fresh-water on earth hasn't changed for 2000 years, however, the world population increased 33 times. According to the researches by UN, in 2025, there will be 2.5 billion more people in the world and the need for water will be 56% more than the available amount. Apart from this, water resources are polluted unreasonably and this situation will be occur problem between countries to supply fresh water [12, 13, 14].

IV. THE IMPACTS OF GLOBAL WARMING ON DROUGHT

A drought is a period of below-average precipitation in a given region, resulting in prolonged shortages its waters supply, whether atmospheric, surface or ground water [15]. A drought can last for months or years. It can have a substantial impact on the ecosystem and agriculture of the affected region [16]. In practice, drought is defined in a number of ways that reflect various perspectives and interests. There are three commonly used definitions; Meteorological Drought, Agricultural Drought and Hydrological Drought. Meteorological drought is usually defined based on the degree of dryness (in comparison to some "normal" or average) and the duration of the dry period. Drought onset generally occurs with a meteorological drought. Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, soil water deficits, reduced ground water or reservoir levels needed for irrigation, and so forth. Hydrological drought usually occurs following periods of extended precipitation shortfalls that impact water supply (i.e., streamflow, reservoir and lake levels, ground water), potentially resulting in significant societal impacts. Because regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area [17]. We can also think about hydrological drought, or how decreased precipitation affects streamflow, soil moisture, reservoir and lake levels, and groundwater recharge. Environmental pollution and ozone layer depletion that threatens the life of living beings have a global warming effect on earth's crust which results in climate change. As a result of this, some parts of earth receive excessive rain, whereas some parts are in danger of drought. Global climate change affects a variety of factors associated with drought. There is high confidence that increased temperatures will lead to more precipitation falling as rain rather than snow, earlier snow melt, and increased evaporation and transpiration. Thus the risk of hydrological and agricultural drought increases as temperatures rise [18]. In recent years, it is observed that the amount of underground water decreases with noticeable effects of global warming such as drought, decrease in rainfall, and unconscious use of water resources (well and boring). With the rise in urbanization, it is observed that areas that complicate the pass of water such as asphalt and concrete increase. Such platforms decrease the amount of absorption of rainwater. This decreases the ground water level. With the decline in the level of underground water, river regimes change and as a result of this, floods, erosions and landslides will be occur [19, 20, 21].

V. CONCLUSION

Considering the relationship between climate and human, measures to be taken to decrease the effects of global warming must be a priority [22]. The problem of climate change is global and it has an impact on the whole structure from local to center. Today, Kyoto Protocol is the convention that leads the international climate policy and countries have agreed on. Kyoto protocol is the most comprehensive agreement on fighting climate change. It was prepared as a result of negotiations for 2.5 years following the entry into force of United Nations Framework Convention on Climate Change, and it was opened for signatures in 1997. However, it didn't enter into force immediately [22, 23]. There are international studies on ecological effects of global climate change besides the economic and political effects. United Nations and European Union file significant reports on this issue. These goals may be summed up as an approach of searching for a common solution directed to stop the possible damages on ecological value of the water resources. As a result of the rise in individual water

consumption, to meet the need for water intended for human consumption shallow or deep wells are opened irregularly. It is observed that evaporation rises and amount of rain decreases as a result of global warming, and underground water resources are affected negatively as a result of unreasonable consumption. Therefore, preserving underground water becomes crucial. Raising the awareness of public becomes more of an issue. It will be helpful to use surface water instead of underground water in the times of drought. We should better monitor and measure water supply and uses nationwide, reduce indoor water use through more efficient appliances, technologies, and behaviors, reduce outdoor water efficiency through drought-tolerant landscape design and improved irrigation technologies. Increase recycling and reuse of water, including capturing and reusing storm water, greywater, and wastewater. Make more strategic use of groundwater. Using underground water excessively at the areas near seas causes' sea water to replace the water underground, and it is not possible to use those salted resources [24]. It is getting harder to meet the increasing demand for water. Thus, instead of using underground water excessively (shallow or deep water), efficient use of water should be provided by means of technology such as water treatment and obtaining fresh-water from sea water (desalination) which is a popular method nowadays. Moreover, international measurements should be taken in order to preserve underground water and sanctions should be applied based on the conscious consumption of underground water resources. Each country should review their legislation and legislations should be prudential and long-term. Implementation of this legislation should be inspected. In addition, micro climate areas should be formed in as much wetland area as possible. Energy consumption should be lowered and renewable energy sources should be featured. Sanctions should be applied to preserve environment and atmosphere and the awareness of public on these kinds of issues should be raised.

REFERENCES

[1] *Shiklomanov, I.A. & J. Rodda., (2003). World water resources at the beginning of the twenty- first century. Cambridge U.P./UNESCO*

[2] *Kadıoğlu, M., (2008). Climate change today to going through 2010(in Turkish), TMMOB İklim Değişimi Sempozyumu, Ankara, Türkiye*

[3] *Aksay, C.S., Ketenoğlu, O., Kurt, L., (2005).Global warming and climate change (in Turkish),S.Ü. Fen Edebiyat Fakültesi Fen Dergisi. 25, pp.29-41*

[4] ''Climate''. Glossary of Meteorology. American Meteorological Society. Retrieved 14/05/2008
Ipcc 2001, Ipcc2007

[7] *Mendelsohn, R., Nordhaus, W., Shaw, D., 1994. The impact of global warming on agriculture: a Ricardian analysis. American Economic Review 84,753–771.*

[8] *Zülal, A., (2000). Global warming and forests (in Turkish), Bilim ve Teknik Dergisi. 392, pp.47*

[9] *B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer, (2007).Mitigation Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. 1, 1-8.*

[10] *Türkeş, M., Sümer, U.M., Çetiner, G., (2000). Global warming and its probable effects (in Turkish) pp.7-24*

[11] *Mcneill, D., Anwar, M., Nelson, R., (2005). Climate change impact on rainfed wheat in south-eastern Australia, Field Crops Research. 104, pp.139-147*

[12] *Haviland, W. A., (2002). Cultural anthropology (in Turkish), Kaktüs Yayınları. 3, pp.143*

[13] *Dağlı, H., (2005). Drinking water quality and its effects on human health (in Turkish), Bizim İller, İller Bankası Aylık Yayın Organı. 3, pp.16-21*

[14] *Atalık, A., (2006). The impacts of global warming on water resources and agricultural areas (in Turkish), Bilim Ütopya Dergisi. 139, pp.18-21*

[15] *It's a scorcher - and Ireland is officially 'in drought' Irish Independent, 2013-07-18.*

[16] *MCMA, 2009. 2008-09 Drought Impact: Irrigation Status Report for the Sunraysia Pumped Irrigation Districts. Mallee Catchment Management Authority (MCMA).*

[17] http://www.ncdc.noaa.gov/news/drought-monitoring-economic-environmental-and-social-impacts what is Drought? May, 2008. Linked: 25/11/2015

[18] Mote, Philip W. "Climate-Driven Variability and Trends in Mountain Snowpack in Western North America." Journal of Climate, 19.23 (2006): 6209–6220.

[19] *Mehmet, K., (2004). The Effects of urbanization on the Climate Change and Floods (in Turkish), Marmara Coğrafya Dergisi. 6, pp.30*

[20] *Sandalcı, M. & Yüksel, İ., (2007). Impacts of water resources using upon climate change, I. Congress on Global climatic change in Turkey (in Turkish), TİKDEK, İstanbul. ss.447-453*

[21] *Sandalcı, M. & Yüksel, İ., (2011). The effects of climate change on dams and lakes in Turkey (in Turkish) 181, ss.25-29*

[22] *Ayhan, D., (2010). Sustainable Development Efforts In The Frame of Global Climate Change and Turkey (in Turkish), Phd thesis, Marmara University, İstanbul*

[23] *World energy committee, energy and environmental study group' report (in Turkish) (2008).*

[24] *Ateş, İ., (2008). Global Warming Causes of Political and Economic Developments and its Possible Turkey Reflections (in Turkish), Master Thesis, Gebze Yüksek Teknoloji University, Gebze. ss.76*