

Water and human
security
environmental
sciences essay



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Abstract:

In the modern society paradigm, water plays a crucial role in any country's economy and budget. By the end of nineteenth-century the demand for water, its quality and its usage efficiency represented issues of a secondary importance. Since the twentieth century water reaches the stage of critical resource, with direct influence to the security of a state while limited water sources more frequently constitutes a major risk by highly potential to generate local and regional conflicts. This article aims to highlight the key drivers associated with water and human security, advancing potential solutions for identified problems.

Keywords:

water, human security, water resources

INTRODUCTION

The current meaning of the term " security" is diverse and supports multiple interpretations from the strict definition of safety in the view of armed conflict, to a more general interpretation of " human security", which includes social and environmental issues, along with other broader concepts which integrate new terms as " food security", " energy security" etc. The relationship between environment and security increasingly comes to the <https://assignbuster.com/water-and-human-security-environmental-sciences-essay/>

attention of security experts and the access to natural resources has been discussed extensively within recent decades. In particular, water resources are one aspect that provides a link between environmental degradation and conflicts outbreak. Human water usage is very diverse because its properties are also diverse, its presence being a prerequisite condition for creation and development of life. By its very nature water is a direct cause of insecurity to a state considering its high potential to lead to conflict and mass population movements. The earliest human civilizations have developed, particularly in the vicinity of watercourses. Their existence ensured drinking water resource, food, travel opportunity etc. Therefore, basic needs were provided with greater ease compared to places more distant from water sources.

Through its various manifestations and widespread that is, water makes up one of the largest shells of the Earth, known as the hydrosphere. This interaction and mutual influence modulate relationships with other spheres of the Earth (atmosphere, lithosphere and biosphere). In nature, as is well known, water is present in three aggregation forms: gas, liquid and solid.

Moreover, it occupies two distinct environments: the surface and inside the bark. Terra has a total area of 510 million km², of which oceans represent 361 million km², or 71% of the planet surface, and continental land 149 million km², or 29%. Of the total volume of water that our planet holds, meaning 1, 454 million km³, the oceans hold 1, 370 million km³, representing 94. 2% of the total volume of water, while land has 84. 3 million km³, or 5. 8%; the amount of water in the atmosphere is 14, 000 km³. [1]Of the 84. 3 million km³ of land there are: 60 million km³ underground waters (71. 17%); 24 million km³ glaciers and polar caps (28. 36%); 315, 000 km³ (0. 37%) available water storage: 230, 000 km³ in lakes, 16, 5003 soil

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moisture; 1, 120 km³ biological water; 2, 120 km³ watercourses and 12, 900 km³ water from the atmosphere. [2]

WATER AS STRATEGIC RESOURCE

Fresh water is one of the natural elements mandatory for the existence of the living world and the Earth's most important resource. It has a fundamental role in the development of natural processes (physical, chemical, biological, climatic, Earth shaping) and socio-economic activities, being an important means of communication and defense, a strategic material for industry, a valued source of energy for irrigation and public supply. Most water resources are found in the oceans, which mean that it cannot be used for potable water supply, industrial or agricultural activities. The remaining is the potable water from continents, which may be confined to rivers, lakes, glaciers, groundwater, atmosphere, etc. Unfortunately, it cannot be fully utilized because a good part of it is found in inaccessible forms for nowadays-technological capacity. Of the 5. 8% as fresh water only 0. 37% is deposits of usable water. Of the total, the highest proportions are owned by groundwater and ice caps. Water confined in mountain glaciers and ice caps totals a volume of 24, 000, 000 km³. The largest proportion holds Antarctica with 21, 000, 000 km³, Greenland follows and then at a great distance mountain glaciers from other continents. Their importance is bound to appreciable amount of water produced during the melting period because is the source of supply for streams. There are research projects towards finding effective methods for using icebergs. Melt water could represent a source for domestic supply, as well for irrigation in dry areas near the coast. Rivers is one of the poorest sources of freshwater. However,

the mankind uses them from ancient times. Each year the Planetary Ocean receives around 1, 200 km³ of water from rivers. Hydrographic network structure varies from one continent to another, depending on a number of factors. The existence of highly developed river organisms in Asia secures the first place among continents (30. 7%), followed by South America (25. 3%), North America (17. 6%), Africa (9. 7%), Europe (6. 8%), Australia and Oceania (5%) and Antarctica (4. 9%).[3] Water availability per capita is more than 8 times in Asia and 6 times in Europe, compared with the current average consumption. The fact that the population is increasing and water always remain the same (in some regions is even reduced by intensive use or pollution), has led to concerns about the management of water supplies, particularly for overcrowded continents. Compared to Europe and Asia, Africa is twice better equipped with the available freshwater resources per capita, North America 4 times, 10 times South America and Australia and Oceania more than 20 times. However, even within continents, there are large differences, even within the same country (Australia, South America, Africa, North America etc.). In this regard may be mentioned the Sahara and Kalahari deserts from Africa, the central deserts of Australia, the Atacama Desert and Patagonia Plateau in South America, Great Basin Plateau and Mexico Plateau from North America which are far from continental average index of water availability. Europe has the largest freshwater availability per capita in the western part of Scandinavia, where the index value is over 12 times higher than the continental average. Media is exceeded only by the northern and eastern Europe, in the high mountainous region of Alpine Carpathian-Balkan chain and in some parts of Western Europe. Values close to the average continental can be found in some parts of Western Europe,

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the Iberian and Italian peninsulas. The lowest values (two to three times lower) are typical for Central Europe, the latter case being not explained by the lack of water, but by the massive concentration of people, where densities often exceed the value of 200-300 inhab/km². Among countries, Norway has the largest fresh water available per capita, while Hungary is on the last place. Asia, in this respect, is a continent of contrasts as water availability per capita is between 500 m³/inhabitant/year and 50,000 m³/inhabitant/year. Best equipped regions are Northern Asia, Eastern and South-Eastern Europe; in Central Asia and South-West values are 5 to 20 times lower than the continental average. Among countries, the largest availability is found in Indochina, the Asian part of the CIS and Mongolia. For Mongolia and other Central Asian countries, availability is high due to the small number of people. The lowest values of this index are specific to countries in the Arabian Peninsula (5-10 times lower than the continental average), followed by Pakistan, Bangladesh and South Korea (2-5 times lower than the continental average value due overcrowding). China and India, countries that hold almost two-thirds of the continent's population, receive a relatively low rate of available freshwater, ranging from 2500-5000 m³/inhabitant/year. In those countries there are regions where the index is very low and poor water supply (Thar Desert, the Loess Plateau, Djungaria, Takla Makan etc). Africa has the greatest disparities between regions and countries in terms of availability per capita of fresh water provided by rivers. There are regions and countries where availability of freshwater index drops to 500 m³/inhabitant/year, but there are countries that exceed 100 times the global average consumption. Among the top in terms of water availability are countries from Central and Western Africa and Madagascar and at the <https://assignbuster.com/water-and-human-security-environmental-sciences-essay/>

bottom are countries such as Algeria, Morocco, Tunisia and Egypt. Situation analysis over countries only partial reflects reality of the availability of such resources. In most countries (especially the large ones) the average considered comes from very different values of the existent freshwater index in the various regions of those countries. Annual average, however, does not give an indication of the distribution of water volume by months or seasons. To ensure water requirement it is of great importance that periods of the year which have a large volume of water drained from rivers to coincide with high consumption, especially in agriculture. Therefore, on Earth, there are regions where water demand problem arises acutely: desert and semidesert areas, arid steppes, some Mediterranean regions etc. There are also areas where water resources exceed the demand of the population: the equatorial regions, those with rain winds and monsoons etc. For some regions which are characterized by poor groundwater runoff, underground waters are indispensable (Africa, Australia, Central Asia, China and so on). Between the topographic surface and a depth of 4. 000m, the volume of water is estimated at 8. 34 million km³ (70 times the volume of lake water). The modern era has created favorable conditions for the new water sources exploitation to complement the traditional ones. To this end, the most important measure is to use the World Oceans water through desalination. For this task different methods are employed such as desalination using solar energy (Greece), nuclear power plants (CSI, USA), plants based on oil (Kuwait, Saudi Arabia, Qatar, UAE, Egypt, Libya, Iran, Venezuela etc). In the latter case there are countries that have large oil reserves and can afford additional expenses for water production. Desalination is practiced also in countries with a high consumption of water that do not have oil reserves, but <https://assignbuster.com/water-and-human-security-environmental-sciences-essay/>

have the necessary funds: Japan, Netherlands, Singapore, Malta, Bahamas etc. Glaciers and ice caps have huge reserves of fresh water. Because most of the ice is located at Earth's poles, thus far away from population centers, water use of these glaciers is less prevalent today. Glaciers in mountain areas closer to the industrial and agricultural regions may be important sources of water supply. In this connection may be mentioned water supply projects in mountain glaciers of Central Asia. However, in the warm season, there is very little water from melting and rivers are poorly fed. The use of artificial methods of enhancing the melting of glaciers has been developed in the Tian Shan Mountains, but it is still in the experimental stage. Water supply in the world is uneven distributed, says the 12 March 2009 resolution of the European Parliament. European politicians affirm that water is a shared resource of mankind and that access to it should be a fundamental and universal human right. Water should not represent a commodity, managed under market rules, says the resolution. European Parliament urges efforts to ensure that, by 2015, access to water is granted for populations suffering from its absence. Politicians call on Member States to increase, despite the financial crisis, development aid contribution to achieving the Millennium Development Goal on water supplies.

2WATER AND INTERNATIONAL SECURITY

Approximately 2.8 billion people live in regions where water scarcity is a problem, and their number could rise to 3.9 billion by 2030. Global water shortages could lead to conflicts and increasing number of refugees. Some experts predict that future wars will emerge from water shortage and not oil. Water is already the cause of tensions between regions that use the same

rivers or streams. Nile, for example, is used as a source of water for nine countries: 100% of the water used in Egypt (where it does not rain) derives from this stream. Ethiopia and Sudan, upstream, could use more water in the future due to population growth, thus reducing the amount of water which supplies Egypt. Tigris and Euphrates Rivers are another example of this kind. They supply three countries: Turkey, Syria and Iraq (80% of the water used in Syria derives from rivers coming from Turkey). Syria and Iraq downstream of Ankara, might feel threatened by the " GAP" project developed in Turkey, which involves the construction of 22 dams and 18 hydraulic power plants. Once operational, the GAP project could reduce the flow of the Euphrates River in the territory of Syria and Iraq with 40% to 80%. The Intergovernmental Committee for Climate Change has released alarming data on the consequences of global warming for some of the poorest regions of the globe. From 2010, between one billion and three billion people already suffer from water shortages. Global warming will increase evaporation process and dramatically reduces rains - about 20% decrease in the Middle East and North Africa. In these regions, the amount of water available per capita will halve probably by mid-century. Sudden scarcity of an element whose symbolic and spiritual importance equals its primary role for human life will likely exacerbate tensions and conflicts all over the world. Africa, Middle East and Central Asia regions are the first exposed, but the repercussions will be global. According to the UN Commission for Sustainable Development, over 40% of countries are in areas where drinking water is a problem. This means that water used exceeds 20% of the total annual amount of renewable freshwater supplied internally. A substantial amount of freshwater in the different basins is shared by two or three countries.

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Therefore, deficient quantities of water can lead to low-intensity conflicts or wars. Water-related tensions between countries are often caused by reasons such as: high population density, low income per capita, the existence of hostile relations and minority groups which determine the problem internationalization due to deficient quantities of water, the implementation of large projects regarding water and limitation of treaties on freshwater. Tensions can be generated by building dams or canals that have an impact on access to water for littoral states, as in the case of Turkey, Syria and Iraq on Greater Anatolia Project in Euphrates-Tigris basin of Ankara, the last decade of the last century. International conflicts around water represent only one side of the coin. Most violent wars for this resource happen more within states than between states. Water shortages fuel ethnic tensions, as communities begin to fear for survival and try to control water resources. In Darfur, recurrent periods of drought have poisoned relations between farmers and nomadic livestock breeders and the war we are witnessing now, helpless, is a result of many years of escalating conflict. Chad is another victim of the same cycle of violence. There are a number of gloomy predictions in terms of this resource about future conflicts arising from sharing of water in poor regions. These predictions are based on the history of the conflicts that had as starting point the water issues with all aspects on which it rests. It is estimated that from 3000 BC and by 2012 there were no less than 265 inextricably bound water conflicts from its use for construction of defense systems to military operations. [5]

CONCLUSION

The main current security threat linked to the quantities of deficit water is not the wars for this resource. Rather, it may be human security issues of lack of water that seem most likely to cause security threats, both nationally and internationally. Analysis of water demand and consumption along with available resources existing on Earth requires highlighting some conclusions:

a) Current average per capita consumption is much lower compared with the availability of freshwater, globally. Even if current technical means do not allow full exploitation of freshwater on favorable terms, global consumption is provided. Dams - assuming they are correctly sized and designed - can contribute to human development by fighting climate change and water supply regulation. In the new context of water scarcity though, upstream infrastructure projects of international rivers can affect the quality or even the existence of this resource in the neighboring states, thus causing tensions. Organizations from hydrographic basins such as those established for Nile, Niger and Senegal, help facilitate dialogue between states that share the same hydro resources. By promoting a common vision on the development of international waterways, such cooperation initiatives work for the joint management of resources and thus reduce the risk of disputes on the use of water to escalate and become violent. b) Overall resource-consumption balance is in surplus, but uneven distribution of resources leads to quite large regions of the Earth with deficiency balance. Such regions are found in arid, heavily populated and highly developed economy, where consumption far exceeds the global average, and the degree of pollution is increasing. Excessive growth of water consumption in cities causes an acute shortage of it. c) About one fifth of the world's urban population and one

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third of the rural population do not have an adequate supply of drinking water due to uneven distribution of water resources and technical base deficit. The phenomenon directly affects population health. According to the report " Beyond scarcity: Power, poverty and the global water crisis"[6], in many developing countries, dirty water is a more serious threat to human security than violent conflicts. The report's authors say that 1. 8 million children die annually because of diarrhea, a disease that could be prevented by the consumption of one glass of water and providing minimum sanitary conditions; from diseases caused by lack of water is lost about 443 million school days and nearly 50% of the population in developing countries suffers from both the diseases caused by lack of water and sanitation. In addition to this, the water and sanitation crisis hinders economic development and the countries of sub-Saharan Africa loose annually because of that 5% of GDP, more than foreign aid received. d) About 60% of the world population in 2032 will live in regions with insufficient water resources, according to UN-HABITAT agency. According to the European Commission Green Charter on adaptation to climate change, by 2080 the rainfall in the Iberian Peninsula (in which there is now insufficient water regions) will decrease to less than half the level now. e) Global warming has a strong impact on glaciers and increases ocean evaporation. No one knows the exact cause-effect relationship or full consequences of this warming, but it is certain that changes in the water cycle will impact on our lifestyle, flora, fauna, and on agriculture. f) Population and agricultural production growth (70% of the water we use is consumed in agriculture mainly to breed livestock for human consumption), mismanagement of water resources and sometimes political situation may lead to water shortages in some regions. In this century,

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climate change will intensify the desertification of Africa, which will result in population immigration from areas affected by water shortages to regions with proper access to water as Europe. Research in the field of agronomy and technological innovations must be intensified, they are crucial to maximizing water efficiency in this sector. But concerns over the decline of water resources should lead to reviewing the agricultural policies and practices all over the world to ensure their sustainability. The challenge for development policy is now not only to bring water for agriculture in areas where it does not exist. To eliminate potential water conflicts and radicalization of organizations, disadvantaged groups must be given the insurance that they will have access to resources necessary to their survival. Strengthening security requires more and more that access to water resources to be ensured through cooperation, not competition.