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New International Security Paradigm related to Water and Environmental Security

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Strategic threats demand strategic response

ABSTRACT

Security is constantly changing, which means security professionals need to be proactive, says a former US military Chief Information Officer. Water security has become a central feature of the global policy agenda. Climate change, population growth, and pollution are altering the distribution of water resources and the political control of these resources is becoming increasingly contested. These and other water security threats are a source of conflict not only within countries but across international boundaries. Security is a multidimensional issue, because individual welfare is more central to policy-making than it was fifty years ago. Individual security can no longer be satisfied only through military measures; it needs a multidimensional understanding. Security is elusive; more than ever, it is embedded in the interaction of localizing and globalizing forces. The axes of conflict in the shadow of the Cold War and under the impact of 9/11 are already proven to be more complex, not less, and more difficult to manage, not easier. The Word is in a very fast changing prosess including international security paradigm. Indeed, everything has not changed - but what has changed did so faster than we ever expected.The Cold War superimposed on the international security agenda a political and conceptual framework that simplified most issues while magnifying some and obscuring others. During this period, almost every western government defined national security in excessively narrow military terms. That meant there was an enduring acceptance of the need for a balance of

terror, with mutually assured destruction ensuring a stable international system. The end of the Cold War revealed a different set of threats and dangers, not really new but previously kept outside the Cold War context. These new threats are again global in scope, persistent in nature, and potent in their implications [12]. It's easy to equate "national security" or "global security" with military defense against rogue states and terrorism, but a leading U.S. military expert says that view is far too narrow—and could lead to catastrophe if not changed. The environmental matters had little overall public concern before. It was a reflection of how limited and unstrategic our thinking about security. Environmental change, in general, can lead to a decrease in the quality of life and increased tension, competition, instability and conflict. In parallel to climate change, water security is an issue today closely linked to environmental security. Natural resources, such as water, show a number of threats and risks that may contribute to the amplification of a conflict. Perhaps if we were to pay more attention to the documented effects of particular conditions and events, rather than to the threat-worthiness, we could see the world differently-and more accurately. The question of the water and environmental security is more ominous than that of peace and war.

1. INTRODUCTION

Real political concept created by Century 20 conflict-oriented and state-centric security paradigm has fallen short of the safety of the facility. this condition played critical role in "Crisis Century".

20th Century was a very bloody Century for humanity and this period of conflict has left the place of the 21st century came a new security paradigm. In the quarter of beginning 20 Century, global economic relations in the 21st century globalized entering the social political and cultural areas, At the end of this century world system together with the end of the Cold War began to evolve toward a new process and structure.

New risks, new opportunities as well as the effect of globalization in this process is reshaped with dangers and threats (Fig. 1).

This transformation in the concept of multidimensional security under the new security paradigm, energy-water-food environment more forward with the relationship makes it necessary to be discussed in the "Water Security"

Climate Change and more concern about Climate Change

Climate change is defined as "it is not an isolated phenomenon, but can be better understood as a web of interlinked issues from melting glaciers, natural disasters, rising sea levels, floods and droughts to health and economic deterioration" [25]. Understanding these complexities and the variability of climate change today is crucial for any adaptive and mitigation strategies. This is especially the case in vulnerable regions across the world [25].

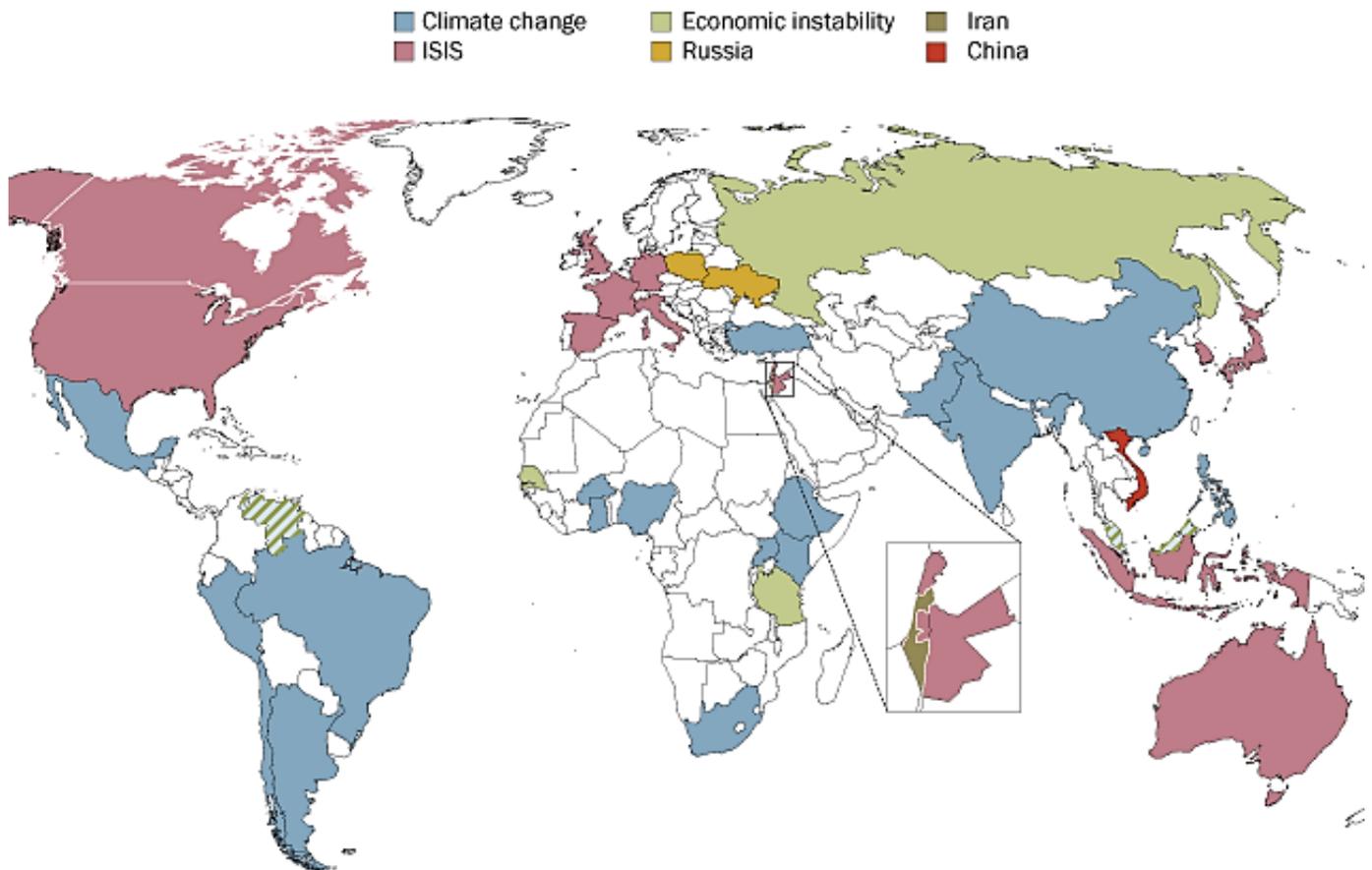**Complexities of climate change**

Scientists have predicted that in the near future climate change will affect the world in unprecedented ways, and Africa will be one of the most severely impacted continents. Climate change is likely to have disastrous impacts on the social, economic, environmental

and political prosperity of the continent [25]. Some estimates predict that by 2050 average temperatures will rise by 1.5 to 3 °C, floods and droughts will become more common and rain- fed agriculture will be reduced by 50%. As early as 2020, between 75 and 250 million people 4 in Africa will experience water stress due to climate change. The poorest and most vulnerable in the region will be the least equipped to counter acute changes in climate patterns. The fear is that this may lead, among other things, to greater levels of migration, disease and conflict in the region. The map in Figure 2 shows how a large part of the African continent is at high risk of being affected by the negative impacts of climate change [25]. These areas represent parts of the continent, which have and are experiencing high rates of desertification and deforestation causing serious environmental issues such as droughts, water scarcity and land degradation.

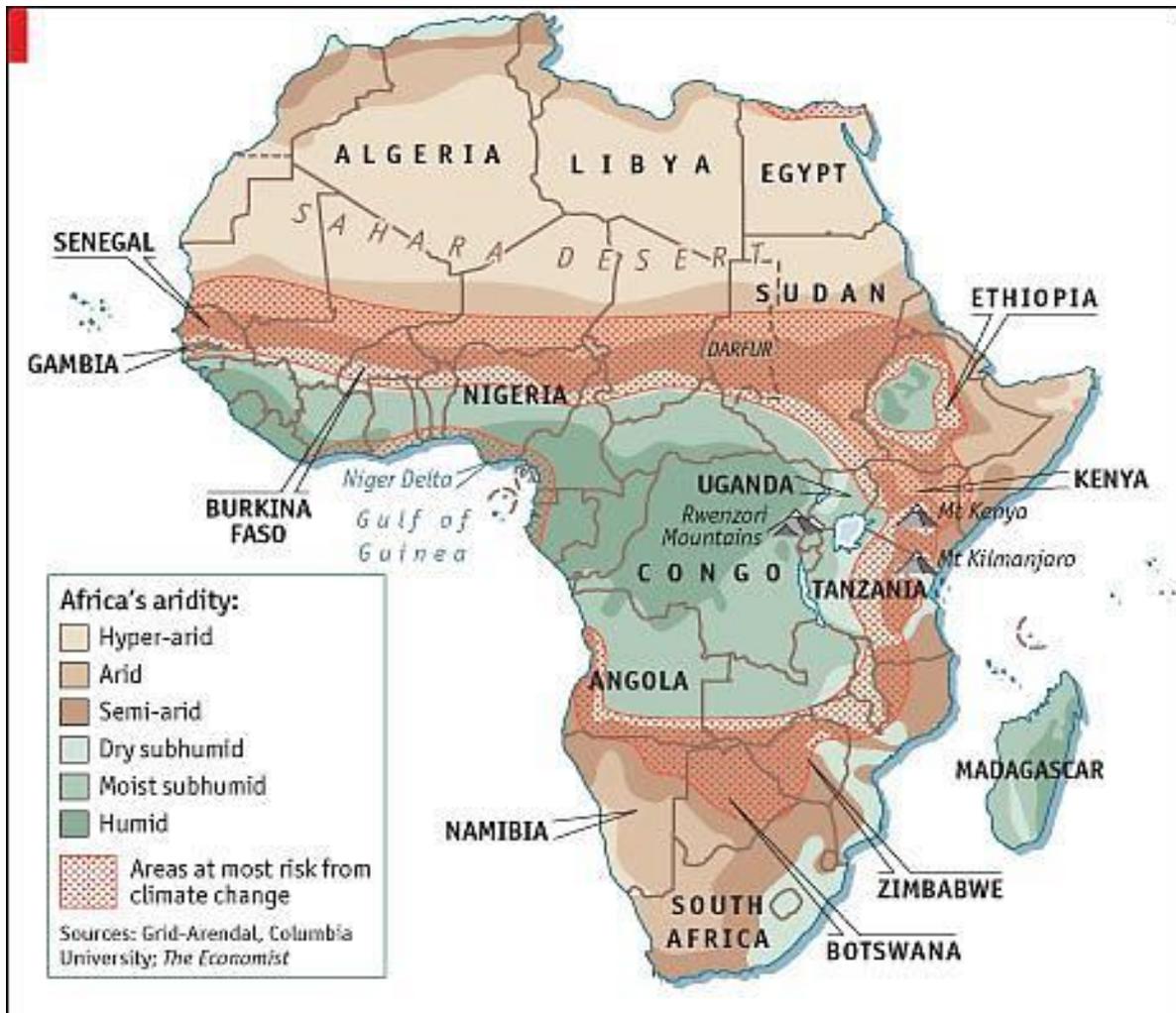**Fig. 1.** Greatst Threats around the world.

Figure 2. Africa's Aridity.

Concern about Climate Change

In advance of the United Nations Climate Change Conference in Paris in this December, many publics around the world name global climate change as a top threat, according to a new Pew Research Center survey measuring perceptions of international challenges. This is particularly true in Latin America and Africa, where majorities in most countries say they are very concerned about this issue.

Publics in 19 of 40 nations surveyed cite climate change as their biggest worry, making it the most widespread concern of any issue included in the survey. A median of 61% of Latin Americans say they are very concerned about climate change, the highest share of any region. Sub-Saharan Africans also voice substantial concerns about climate change. A median of 59% say they are very concerned, including about half or more in all countries surveyed. Climate change is particularly worrying in Burkina Faso (79%), Uganda (74%) and Ghana (71%), while South Africans (47%) and Tanzanians (49%) are the least concerned.

Both regions are especially vulnerable to the effects of climate change, as is Asia, where a median of 41% voice great concern about the issue. Indians (73%) and Filipinos (72%) are particularly worried, but climate change captures the top spot in half of the Asian countries surveyed. Top Threats by RegionConcern about climate change is relatively low in Europe. While a median of 42% report being very concerned, global climate change is not one of the top two threats in any European country surveyed. Anxiety about this issue is highest in Spain (59%). Global climate change ranks substantially lower as a comparative global threat for Americans, with 42% saying they are very concerned about the issue.

The latest report [24] related with climate change published in USA responds to the Congressional request to the Department of Defense to identify the most serious and likely climate-related security risks for each Combatant Command.

According to the report:

> *"The Department of Defense sees climate change as a present security threat, not strictly a long-term risk. We are already observing the impacts of climate change in shocks and stressors to vulnerable nations and communities, including in the United States, and in the Arctic, Middle East, Africa, Asia, and South America. Case studies have demonstrated measurable impacts on areas vulnerable to the impacts of climate change and in specific cases significant interaction between conflict dynamics and sensitivity to climate changes. Although climate-related stress will disproportionately affect fragile and conflict-affected states, even resilient, well-developed countries are subject to the effects of climate change in significant and consequential ways. The ability of the United States and other countries to cope with the risks and implications of climate change requires monitoring, analysis, and integration of those risks into existing overall risk management measures, as appropriate for each Combatant Command."* [24].

Concern was different before

The 2002 White House national security strategy, in 34 pages of text, mentions the word environment in only one short paragraph about U.S. trade negotiations.

In his February 2004 "Worldwide Threat Briefing" to Congress, Director of Central Intelligence George Tenet devoted five pages of testimony each to terrorism, Iraq, and proliferation, three paragraphs to global narcotics, a paragraph each to population trends, infectious disease, and humanitarian food insecurity, but nothing at all to environmental matters [10]. But there had been some reports pointing out importance of climate change in coming years.

> *For instance the National Intelligence Council's Global Trends 2015 report, issued in December 2000 (before the following year's 9/11 attacks), identified natural resources and the environment as one of the most important "drivers and trends that will shape the world of 2015."*

Focusing principally on food, water, and energy security developments, the experts who collaborated on the report acknowledged the persistence and growth of global environmental problems in the years ahead, a growing consensus on the need to deal with such problems,

and the prospect that "global warming will challenge the international community." In the year of 2015 we see that the report's projections have came true.

The Chicago Council on Foreign Relations study of U.S. public opinion on international issues, Global Views 2004 had showed that environmental matters were of such little overall public concern than those of today's concern .

Asked to identify the most critical threats to U.S. vital interests, the public ranks global warming a distant seventh (37% of respondents), behind the likes of international terrorism (75%), chemical and biological weapons (66%), unfriendly countries becoming nuclear powers (64%), immigration into the United States (58%), and other developments.

Another (February 2004) poll by **Gallup found that environmental concerns don't even make the public's top-eleven list of possible threats to** U.S. vital interests-international terrorism and the spread of weapons of mass destruction far outpacing all other prospective threats [10].

2. SECURITY IN COLD WAR

Security first time has been discussed conceptually in the discipline of international relations by Arnold Wolfers. According to him, security; It is the state of the absence of any threat to the acquired current value. Moving realist school of this definition is considered within the scope of security threats and power relations. However, security is a concept that can not be widely discussed and reached consensus on. The definition of security experts, varies according to academics and politicians. There are various schools of thought in the field of security studies. Security is defined, future as the removal of obstacles to the realization of requests received on or guarantees of expectations.

Here we stand on our issues "It covers the requirements found in the temporal and systemic dimensions of the security concept and reflects" that and the definition of security in this sense, is a matter of scope and nature may vary. In this context, Hans Günter Brauch, "Peace in the work of the Security reconceptualization, Security, Development and Environment" has addressed the conceptual quartet, In the 1990s created a turning point in the conceptual safety study, Barry Buzan to examin security on military security, political security, economic security, social and environmental security subtitile.Gobalization, according to Cha, was severed from the physical security grounds (Cha, 2000: 395). Towards the end of the 20th century, except to sovereignty and territorial protection, environment and technology have been developed mainly new security definitions (Buzan, 1987).

3. NEW SECURITY PARADIGM

Security issues in the Cold War period, more "power struggle of the state" was taken as the axis. Widely accepted theories of international relations during this period of neo-realism and neo-liberalism, the idea of non-state actors could be determinative of the other were found to be too far away.

But the 21st century has started to experience the field of security with a paradigm shift. The most basic reason for the 21st century progresses the individual, society, state and the

system, such as the classic definition of security in many areas of vehicle safety and it is starting to fail.

Today, the concept of security as well as actors and has become multi-dimensional and multilateral issues. Safety literature range is expanded. This is in relation to the regional problems of the actor-based security problem, the water level in the global economic threats, such as health and energy issues began to take the place. In other words, the new security paradigm, globalization with national and international security, global security has begun extending the experience of change and transformation in a wide range of plane.

New areas and new actors on the forefront of new security operation. Today asymmetric conflict between states, for example, to be seen more conflict with each other in different groups of states and non-state and state actors in proxy wars.

To sum up; After the Cold War not only expanded the definition of security and safety studies of migration on the agenda, the environment, different topics such as human rights and the economy began to take. This study led to expand and deepen the definition of security areas, individual / human security approach from the international /global have carried out a wide range of discussions to security concept (Wendt 1992).

3. 1. Securitization

Post-Cold War international relations suffered structural change, which makes security and the handling of international relations with a new perspective mandatory. In addition to the attack, security measures and elements of deterrence to justify the state of the policies and actions has been a case of freedom of movement, allowing the central authority. Bonding of a security label in any event when placing the perception of him by a special state provides the legal basis to take measures on the central authority (O.Tanrısever 2005).

Security elite, the show is more important than some of the issues, creating enemy-threat security chain and want to keep the issue in the hands of the prioritization of areas. This process is called securitization. Securitization, the country's security and interests to identify the enemy and threat detection enables the creation and therefore be a determining factor in the security of domestic and foreign policy elites (Aras, Toktash, Kurt 2010).

Securitization, has a key role in transporting any size problem of security issue. After the Cold War has led to the conversion of the different social actors and the security situation have identified together of diverse security elite. Today will be escalated to the level of threat and enemy security issue is shaped under the influence of other actors (Aras, Toktah, Kurt 2010).

3. 2. Is Global Security Possible?

That it is difficult to determine what the security boundaries in terms of foreign policy of a country. Security measures of a country beyond their political boundaries may extend to other countries; but it is unclear where it ends. In this case, the "global security" makes it difficult for the realization of the case. Already global security cases are under constant threat of the hegemonic politics. However, the interdependence of the global system and the increasing uncertainty of the security actors, issues, theories and applications to be added to the new national security from collective security, said that the expansion of the security perimeter until the security information from the environmental safety (N. Ergül 2012).

Now the security in all of the theoretical approach is a multidimensional concept that includes diversity and economic security, military security, cultural security, it is accepted

that covers many security areas such as demographic security and environmental security. In this context, "Climate change forced water security and environmental security" also is emerging as an important issue to be examined by considering the scope of the concept of environmental security.

3. 3. Links between Security and Environment

Much of current research has focused specifically on the conjunction between environmental changes and violent conflict. It has been observed that environmental issues such as the lack of access and the deterioration of the natural resources has led to tension, competition and conflict among different factions of society [25].

As a consequence of rising environmental distress across the world, researchers and institutions have attempted to define the links between the environment and security. According to Peter H. Gleick, "threats to security include resource and environmental problems that reduce the quality of life and result in increased competition and tensions [26] among sub- national or national groups." Similarly, the United Nations Environmental Program (UNEP) defines the link between the environment and security as "environmental degradation, inequitable access to natural resources and the transboundary movement of hazardous materials that can lead to conflict and pose a risk to national security and human health [27]".
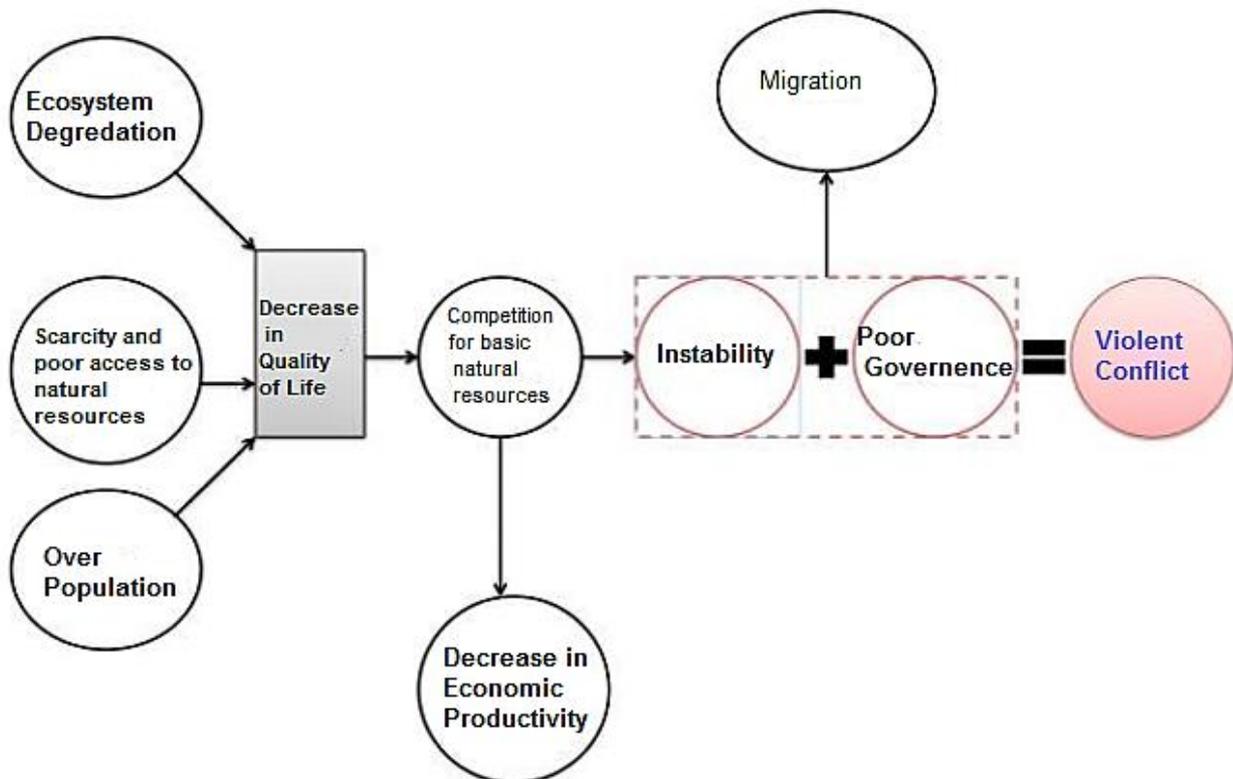

Figure 3. Complexities of Water and Environmental Security [30].

NATO is another platform from which to understand the nature of environmental security threats. In a paper regarding NATO's contribution to European Environmental Security, environmental security is defined as *"a threat to national security posed by unattended international environmental problems and their capacity to promote conflict and political instability* [28]". The different definitions show a similar premise for understanding environmental issues in that, environmental change, in general, can lead to a decrease in the quality of life and increased tension, competition, instability and conflict [25]. In order to better understand the interlinkages between human security, water security and environmental challenges, the GWI's Team developed the diagram bellow in Figure 3 to illustrate how environmental insecurity may, eventually, lead to violent conflict.

As seen on the far left in Figure 3, three key environmental problems may negatively affect the quality of life in terms of basic human needs such as food, water, shelter, toilet, health and education. On the one hand, poor quality of life can lead to instability and struggles that may cause people to willingly or unwillingly migrate to areas where the potential for a better life is greater.

On the other hand, environmental issues, a decrease in quality of life and instability that comes with it, can also lead to a decrease in economic productivity. A change in climate patterns for example can strongly affect the agricultural sector and food production [25].

Water scarcity can also greatly impact other highly water-dependent industry sectors, such as hydropower energy and irrigation systems, for instance. Environmental challenges will have serious implications for security interests of both developed and developing nations in the next few decades. Local populations will have to adapt to new ecological realities and the frequency of conflicts in an environmental context will likely increase [25].

Some people may be forced to move to areas where natural resources, fundamental for their survival, are more accessible [25]. People who are forced to leave their homes due to environmental changes have, in some cases, been classified as "climate refugees".

3. 4. Climate Forced Migration

There are already some 50 to 60 million people displaced either across state boundaries or within states, and this figure is expected to rise dramatically as the consequences of global climate change begin to have an effect. As a result, numerous countries in Europe are beginning to reexamine their immigration policies and enforce more stringent standards, thus, moving towards neo-conservative, undemocratic practices. This could have a destabilizing effect on the less economically advanced nations in Europe and could threaten inter-state relations. It also could lead to domestic unrest if more is not done soon to regulate the flow of refuges and expedite safe repatriation of those not accepted for long term residence

3. 5. Environmental Security and Water Security

Environmental security is defined as "the area of research and practice that address the linkages among the environment, natural resources, conflict and peace-building." Environmental security is also considered within the scope of negative effects being examined in connection with the above-mentioned four security zones and mainly security to be created in other areas of the consequences of environmental problems.Working in the field of environmental security on a global scale in 1972, the UN International Environment Programme (UNEP) has increased with the establishment and continued this process in 1992 with the UN Rio Declaration on Environment and Development Conference. There

underscored the relationship between security and the environment and it has been involved in important steps towards the institutionalization of environmental law.

Environmental change, in general, can lead to a decrease in the quality of life and increased tension, competition, instability and conflict.

1999 World Charter of the major environmental problems of climate change in the Commission, environmental degradation, pollution of natural resources, overpopulation, poverty and ranked as armed conflicts; prevention of environmental pressures, and to live in peace and to curb population growth is presented as solutions to these problems. In this context of low politics on climate change has been taken the highest policy (high politics) by the UN.

The Kyoto Protocol is an attempt to enable steps to be taken in the fight against climate change was adopted in 1997 and entered into force in 2005.

35 years later, one in every 45 people the world will be forced to migrate due to climate change (Oli 2008). Currently, the necessary work to be done between global security for more than 1 billion people have access to water supply and 2 billion people have access hygiene conditions.

For instance; Current environmental challenges of Sub-Saharan Africa may be a source of future environmental insecurity leading to social and political conflict. With a changing climate and resources such as water becoming more scarce, there is a risk for greater competition over natural resources. Further research using New International Security Paradigm is needed in the area of conflict prevention strategies in order to mitigate some of the negative impacts of climate change and environmental insecurity [25].

4. RETHINKING SECURITY

One of the major issues that has most divided those who debate the water -environment-security relationship is how broadly or narrowly to define security. The water-environment, climate change in particular, and, for that matter, other unconventional threats and challenges might be taken seriously as matters of serious security concern, is for fundamental strategic transformation to take place. US former Secretary of State Hillary Clinton has warned of the risk of terrorism, political instability and conflict over competition for scarce water supplies worldwide over the next few decades. US former Secretary Mrs. Clinton highlighted risks outlined in the unclassified version of a report on global water security that was released by the National Intelligence Council. in 22 March 2012

"I think it's fair to say the intelligence community's findings are sobering," she said about the report that focused on the potential water problems between now and 2040.

A summary of the report said North Africa, the Middle East and South Asia *"will face major challenges coping with water problems",* particularly as a result of population growth and increased economic demand.

> *"These difficulties will all increase the risk of instability within and between states," she said.*
> *"Within states they could cause some states to fail outright. And between and among states, you could see regional conflicts among states that share water basins be exacerbated and even lead to violence."*

Water scarcity will be a particularly acute problem in states with ineffective governments or impoverished populations, where rising tensions over water will likely increase the risk of instability and state failure, exacerbate regional tensions, and distract countries from working with the United States on important policy objectives, according to a copy of the report obtained by the Associated Press.

Complexities of water security

According to the Pacific Institute, conflicts, instability and insecurity that arise due to water insecurity can be classified into different categories. In Figure 4 the type of conflicts, the potential actors and the reasons for the tension are outlined to elucidate the complexities of water security.

Qualification of conflict	Actors	Tensions
Control of Water Resources	State and non-state Actors	Water supply or access to water are the root of tensions
Military Tool	State	Water resources are used by a nation or state as a weapon during a military action
Political Tool	State and non-state	Water resources are used by a nation, state or non-state actor for a political goal
Terrorism	Non-state	Water resources are either targets or tools of violence or coercion by non-state actors
Military Target	State	Water resources are targets of military actions by nations or states
Development Disputes	State and non-state	Water resources are a major source of contention and dispute in the context of economic and social development

Figure 4. Classification of instabilities due of water insecurity [29].

Water As A Weapon?

The report says the shortage isn't likely to cause clashes between nations over the next decade, but adds: We judge that as water shortages become more acute beyond the next 10 years, water in shared basins will increasingly be used as leverage; the use of water as a weapon, or to further terrorist objectives, also will become more likely beyond 10 years.

Control of water supplies could affect the geopolitical balance of power, the report warns, predicting that upstream nations will exert influence over their downstream neighbors by controlling the flow of water. Water-related infrastructure including reservoirs and bridges could emerge as a terrorist target. Clinton was to stress the issue's importance during an address at the World Bank to commemorate World Water Day on Thursday. By 2025, more than two-thirds of Earth's population could live in areas struggling to provide enough water, she will say.

The water crisis is a health crisis, it's a farming crisis, it's an economic crisis, it's a climate crisis, and increasingly, it is a political crisis, reads the text of Clinton's prepared remarks. And therefore, we must have an equally comprehensive response. Unclean water contributes to diseases that kill more than 5,000 people a day, while women and children in developing countries often spend hours every day walking long distances to obtain water, Clinton notes. Water security for us is a matter of economic security, human security, and national security, because we see potential for increasing unrest, conflicts, and instability over water. The top U.S. diplomat will also stress the need to reduce the risk associated with extreme water events such as floods and droughts.

5. CONCLUSION AND EVALUATION

21st century has brought new norms with the new security paradigm. Instead of just political and military issues with the transformation taking place in the paradigm of security have been moved to the under the new security approach social, cultural, economic, ecological security.

Generally the safety of the natural resources in particular water resources, security, peace throughout history, has played a decisive role in security and social relations. UN summit decisions taken and used in all the rhetoric emphasizes the interdependence between environmental security with other security dimension; collective and multidimensional security are to the forefront.

The UN's peace in a globalized world conditions and the safety not only of the political variables, it is also economic and social variables now, the World Charter established within the (Earth Charter) place given that "without destroyed social and economic justice and poverty isn't come peace" revealed messege (Göksel 2008). This message also reveals the importance of water safety and food security. Insteaded the changing state of the world entering the 21st century replace "security of transnational corporations". These companies rather indirect effect of making policies have begun to prefer to sit in the path of direct negotiations with the government on the table.

21st century world of interdependence, globalization, poverty, ecological degradation will be a world of increasing aging and the intersection of the crisis. Energy, water, food crisis will trigger a global scale and will begin to overlap each other. Here you will play the most important role in increasing water problems as a result of climate irregularities.

Scientists have predicted that in the near future climate change will affect the world in unprecedented ways, and Africa will be one of the most severely impacted continents. Climate change is likely to have disastrous impacts on the social, economic, environmental and political prosperity of the continent.

Due to the uncertainty created by the unequal distribution of water and increased water shortage and climate change, water resources has gain a geopolitical importance. It began to have an impact on the international balance of power. This global water resources has been an important factor on political, strategic and hegemonic plans. These developments carry water resources along with the results of global climate change began to take place in a very important place in the new security paradigm. Scientists have predicted that in the near future climate change will affect the world in unprecedented ways.

In parallel to climate change, Much of current research has focused specifically on the conjunction between environmental changes and violent conflict. It has been observed that environmental issues such as the lack of access and the deterioration of the natural resources has led to conflict among different factions of society. Water security is an issue today closely linked to environmental security. Natural resources, such as water, show a number of threats and risks that may contribute to the amplification of a conflict. Water and environmental security is also closely linked to national, regional and international security.

> *In 2012, a US intelligence report based on a classified National Intelligence Estimate on water security, commissioned by then Secretary of State Hillary Clinton, concluded that after 2022, droughts, floods and freshwater depletion would increase the likelihood of water being used as a weapon or war, or a tool of terrorism.*

Environmental issues may negatively affect the quality of life in terms of basic human needs such as food, water,energy, health and security. A new international security paradigm is essential to understand changing new security factors, conditions and links between them in the 21st century.

Biography

Dursun Yıldız is a hydropolitics expert and Director of the Hydropolitics Academy Association located in Ankara, Turkey. He is a civil engineer and used to be Deputy Director at State Hydraulic Works in Turkey; completed hydroinformatics post graduate course at the IHE in Delft,Technical training programme in USBR-USA and a master`s degree in Hydropolitics at the Hacettepe University-Turkey. He has over 5 years of teaching experiences in some Turkish Universities and now works as head of his own Hydro Energy & Strategy consulting company located in Ankara. He has published several international articles and 11 Books. He received the Most Successful Resercher Award on International Water Issues from Turkish Agricultural Association in 2008.

References

[1]   Josepha Ivanka Wessels (2015) Challenging hydro-hegemony: hydro-politics and local resistance in the Golan Heights and the Palestinian territories, *International Journal of Environmental Studies*, 72:4, 601-623, DOI: 10.1080/00207233.2015.1041836

[2]   Wessels, J., 2009, Water crisis in the Middle East: An opportunity for new forms of water governance and peace. *Whitehead Journal of Diplomacy and International Relations*. John C. Whitehead School of Diplomacy and International Relations, Seton Hall University, USA, 10(2), 131-141

[3]   Zeitoun, M. and Warner, J., 2006, Hydro-hegemony – a framework for analysis of trans-boundary water conflicts. *Water Policy*, 8, 435–460.10.2166/wp.2006.054

[4]   Zeitoun, M. and Mirumachi, N. 2008, Transboundary water interaction I: Reconsidering conflict and cooperation. *International Environmental Agreements: Politics, Law and Economics*, 2008(4), 297–316.10.1007/s10784-008-9083-5

[5]   Murphy, R. and Gannon, D., 2008, Changing the landscape: Israel's gross violations of international law in the occupied Syrian Golan. *Yearbook of International Humanitarian Law*, 11, 139–174.10.1017/S1389135908001396

[6]   Cooley, J.K., 1984, The War over Water. *Foreign Policy*, 54, 3–26.10.2307/1148352

[7]   Okbazghi Yohannes (2009) Hydro-politics in the Nile basin: in search of theory beyond realism and neo-liberalism, *Journal of Eastern African Studies,* 3:1, 74-93, DOI: 10.1080/17531050802682788

[8]   Amer, Salah, Yacob Arsano, Atta el-Battahani, Osman El-Tom Hamad, Magdy Abd El-Moenim Hefay, Imeru Tamrat and Simon A. Mason. Sustainable Development and International Cooperation in the Eastern Nile Basin. *Aquatic Sciences* 67 , no. 1 March 2005: 3-14

[9]   Benvenisti, Byal. Collective Action in the Utilization of Shared Fresh Water: The Challenge of International Water Resources Law. *The American Journal of International Law* 90, no. 3 July 1996: 388-415

[10]   Arsano, Yacob, and Imeru Tamrat. Ethiopia and the Eastern Nile Basin: Riparian Perspectives of International Cooperation in the Eastern Nile Basin. *Aquatic Sciences* 67, no. 1 March 2005: 15-27

[11]   Falkenmark, Malin. Global Water Issues Confronting Humanity. *Journal of Peace Research* 27, no. 2 May 1990: 177 -190

[12]   Hulme, Mike. The Changing Rainfall Resources of Sudan. *Transactions of the Institute of British Geographers*, New Series, 15, no. 1 1990: 21-34

[13]   Kagwanja, Peter. Calming the Waters: The East African Community and Conflict over the Nile Resources. *Journal of East African Studies* 1, no. 3 November 2007: 321-337

[14]   Suvarna, Shrevani. 2006. Development Aid in an Environmental Context: Using Microfinance to Promote Equitable and Sustainable Water Use in the Nile Basin. *Environmental Affairs Law Review*, 33(2): 449-84

[15]   Shlomi Dinar (2012) The Geographical Dimensions of Hydro-politics: International Freshwater in the Middle East, North Africa, and Central Asia, *Eurasian Geography and Economics,* 53: 1, 115-142, DOI: 10.2747/1539-7216.53.1.115

[16]   Brochmann, Marit and Paul Hensel. The Effectiveness of Negotiations over International River Claims. *International Studies Quarterly,* 55, 3:859-882, 2011.

[17] Brunnee, J. and S. J. Toope. The Changing Nile Basin Regime: Does Law Matter? *Harvard International Law Journal,* 43, 122-131, 2002

[18] Gleick, Peter. Water and Conflict. *International Security,* 18, 1:79-112, 1993

[19] Lowi, Miriam. Rivers of Conflict, Rivers of Peace. *Journal of International Affairs* 49, 1:123-144, 1995

[20] Spykman, Nicholas. Geography and Foreign Policy I. *The American Political Science Review*, 32, 1:28-50, 1938

[21] Spykman, Nicholas and Abbie A. Rollins. Geographic Objectives in Foreign Policy II. *The American Political Science Review,* 33, 4:591-614, 1939.

[22] Zeitoun, Mark and Jeroen Warner, Hydro-hegemony—a Framework for Analysis of Transboundary Water Conflicts. *Water Policy*, 8, 5:435-460, 2006