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Environment degradation and security

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To all those who always believe in me ....

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CHAPTER 1

INTRODUCTION

There have always been wars over scarce non-renewable resources. But only recently, the non-sustainable exploitation and misuse of vital renewable resources - such as water, vegetation, soil and air - have become a major concern in both domestic and international politics. As a result of worsening conditions and the destruction of the physical environment, environmental degradation and scarcities are increasingly becoming potential sources of serious and violent conflict. By endangering the natural base for economic and social development and triggering forced migration movements, environmental scarcities can lead to internal revolts, violent clashes between different groups and domestic insurgency. This is especially true for developing countries. A specific example of how the trans-boundary nature of ecological issues helps turn them into a source of conflict between states is the case of the Middle East in regards to water resources.

Traditionally, military power and political dominance were the only variables that define what security means; i.e. a state or a group's security was dependent only on its military capabilities and political weight.

Currently, researchers and policy makers tend to include any threat to the survival and welfare of the state as well as the survival and well-being of citizens as potential threats to national security. Such broad ways of defining security cover physical, social and economic welfare. This new interpretation of the concept of security is referred to as "comprehensive or common security".[1] By the logic of the broad definition of security and the concept of comprehensive security, environmental degradation is currently considered to be one of the most serious threats to security.

Research Problem:

In this thesis I examine the causal relationship between environmental degradation and scarcities on one side and conflict situations on the other. I do this by focusing on the linkages between the physical environment, environmental scarcities and security. My intention in this research is NOT to define the factors that explain incidences of violent conflict; rather it is to investigate whether the degradation of the environment and the resulting scarcities of vital resources can be significant contributors to conflict situations and therefore jeopardize the security of some states and regions.

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[1] Gareth Porter, Ganet Brown. Global Environmental Policies. (1991), 109.

To do this, in chapter two I define the concept of security in a broad sense - beyond its traditional geo-political and military focus - to take define into account threats and challenges that jeopardize human survival and well-being. In chapter three, I examine the different links between environmental degradation and incidences of conflict. I conclude with chapter four investigating these linkages in some situations in the Middle East region, Egypt and Gaza.

Linking Environment Degradation and Security:

There is a rising consensus among environmentalists and policy makers that the relationship between human beings and the resources of the international system sustaining life and human activity is increasingly emerging as a serious challenge. This challenge can offer threats to the very survival of human beings and states and not only their security. Therefore, there is a current growing widespread fear that the natural basis of human civilization and activity can be destroyed through the very dynamics of that civilization and its associated negative consequences.[2] Becoming aware of the present and future trends of environment degradation and the resulting consequences, it is more and more

[2] Brock, Lother. "Peace Through Parks: Environment on the Peace Research Agenda" Journal of Peace Research, 28.4 (1991), 406.

recognized that the future appears to be one of environmental insecurity.[3]

Today, a number of scientists argue that the Earth is becoming less habitable as a result of many human activities destroying the natural ecosystem and resources supporting and sustaining human life.[4] In this case, different kinds of resource scarcities will characterize the global environment what will lead to adverse competition among different groups over available resources. Such severe competition can escalate to traditional kinds of inter-state conflicts and even war situations. A dimension that should not be neglected here is the rate of population growth. If the prevailing population growth rate continues, coupled with the depletion of resources, the issue of conflict situations induced by resource scarcity will become increasingly intensified.[5] In addition, this will also threaten the carrying capacity of our planet.

Homer-Dixon - Director of the Project on Environment, Population and Security at Toronto University - asserts that "environmental changes lead to acute conflict by shifting the balance of power between states either regionally or globally, producing instabilities that could lead to war"[6]. He

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[3] Dennis Pirages. "Focus on: The Greening of Peace Research" Journal of Peace Research, 28.2 (1991), 132.
[4] Brock :418.
[5] Charles W. Kegley Jr., Eugene R. Wittkopf. ed. The Global Agenda: Issues and Perspectives. (1988), 332.
[6] Thomas F. Homer-Dixon. "On the Threshold: Environmental Changes as Causes of

argues that the degradation of the environment will deepen and strengthen the disparity and inequalities between the poor and the rich countries over increasingly shrinking resources[7]. Homer-Dixon lists possible scenarios that help make the link between environmental issues and security clearer including how warmer temperatures can lead to conflict and strife over new ice-free sea-lanes; how soaring population growth and land stress may result in producing waves of environmental refugees that will spill over boarders with dis-stabilizing effects on the recipient's domestic order and on its internal stability; and how countries can fight over decreasing supplies of water and the effects of upstream pollution as well as how in developing countries, the drop in crop production may lead to internal strife, especially across urban-rural and nomadic-sedentary cleavages.

In addition, the degradation of the environment can lead to the further impoverishment of societies in the South that may intensify the competition of different groups over shrinking resources, thus fueling ethnic conflicts. Further impoverishment of the South can in turn lead to the impoverishment of the North as increasing scarcities in the South induce more and more people to migrate to the more prosperous economies in the North. As a result we may see ethnic conflicts in the receiving countries between the local population and the incoming groups. Also, as a result of declining

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Acute Conflict" International Security, (Fall 1991), 76.

resources and increasing scarcities in the South, industrial economies in the North dependent on these resources will suffer from the shortages of raw materials.[8]

Literature Review:

There are two categories of literature that I will be using to support my research. The first category is the theoretical framework that establishes the issue of environment degradation as a potential threat to national security. This includes the article by Thomas F. Homer-Dixon "On The Threshold: Environmental Changes As Causes of Acute Conflict," published in the Fall 1991 issue of International Security in which he suggests how environmental degradation can induce conflict situations and the implication of that on national and international security. In this article he identifies both the kinds of "acute conflict" that may result from environmental degradation and the consequences of environmental degradation that relate to creating conflict situations.

In his article "Environmental Scarcities and Violent Conflict: Evidence from Cases," published in the Summer 1994 issue of International Security, Homer-Dixon argues that environmental scarcities are already contributing

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[7] Ibid.

to violent conflict in many parts of the developing world. He defines "environmental scarcities" to be the umbrella concept of the concepts of scarcity of renewable resources, population growth and explosion and the unequal distribution of resources. He further supports his premise with case studies from the Senegal River Valley, the Occupied West Bank and Jordan River, the Philippines, El-Salvador, Mauritania, Egypt, Peru and other countries.

Trying to define security, Barry Buzan identifies four of the changes that happened in the North and their impact on the South as a result of the end of the Cold War and on the redefinition of security on a broad basis in his article "New Patterns of Global Security in the Twenty First Century", published in the July 1991 issue of International Affairs. For him, security means the pursuit of freedom from threat and the ability of states and societies to maintain their "independent identity and their functional integrity against forces of change which they see as hostile".[9] Thus, the essence of security is survival. However, security also includes a substantial range of concerns about the conditions of existence. He also defines environmental security to mean the "maintenance of the local and the planetary biosphere

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[8] Ibid. 78

[9] Barry Buzan. People, States and Fear: The National Security Problem in International Relations. England: Harvester Press Ltd. (1983), 51.

as the essential support system on which all other human enterprise depend".[10]

Highlighting the seriousness of environmental issues, Robert Dorfman argues in his article "Protecting the Global Environment: An Immodest Proposal", published in the January 1991 issue of World Development, that the resulting situation from the problems associated with environmental degradation resembles that of the "prisoner's dilemma". Therefore, unless all countries cooperate and reciprocate the regulations helping to limit and dilute the negative effects of the degradation of the environment, the arrangements arrived at will be advantageous to those who will tend to free-ride and the sufferers will be those who comply. However, as it is a prisoner's dilemma situation, states will have a built in motivation to cooperate and also defectors will eventually realize that it is in their interest to cooperate. This realization will induce cooperation among states in the system.

The book The Global Agenda: Issues and Perspectives, edited by Charles W. Kegley, et al., presents an ecological approach to the study of international relations that builds on the argument suggested by Harold and Margaret Sprout in their book Towards a Politics of the Planet Earth. This

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[10] Ibid.

approach is based on four related concepts: "environment, environed populations, environmental relationships and interrelated communities". Also, the book paid special attention to the "tragedy of the commons" allegory suggested by Garret Hardin. Another piece of literature that offers a discussion of Garrett Hardin's concept of the "tragedy of the commons" is the article "The Tragedy of the Commons: Twenty-Two Years Later" by David Feeny et al, published in the Human Ecology issue of March 1990. The article is an attempt to operationalize related concepts and issues. These two articles clarify the allegory by presenting its basis. The allegory argues that in a common pasture it will be in the short term benefit of all herdsmen to add more cattle. However, in the long run they will all lose as the number of the cattle will exceed the capabilities of the pasture which will be exhausted and then cease to be able to support and sustain the cattle. Applying the same logic to the environment - in this case the global environment will parallel the pasture, human activity the cattle and human beings the herdsmen - it will be deduced that in the long run all are losers. The logic of the commons functions on a universal basis and no state or individual can escape it.

The second category of literature deals with the situation in the Middle East region, Egypt and Gaza to illustrate the research propositions as well as to verify them. Here I investigate possible and existing conflict

situations induced by environmental degradation. (The impact of environmental degradation causing or inducing conflict could be a result of resource scarcity - water in the Middle East or the upstream of the Nile River). I will identify the conflict situation, trace its causes and origins hypothesized to be induced by the degradation of the environment.

Methodology:

In my research, I adopt the "process tracing" methodology, advocated by Thomas Homer-Dixon in his occasional paper "Strategies for Studying Causation in Complex Ecological Political Systems" presented to the Project on Environment, Population and Security in June 1995.[11] Here, Homer-Dixon argues that research on the links between environmental scarcity and conflict is helped by the deliberate choice of cases where environmental scarcity and violent conflict both take place; i.e. researchers explicitly select both the dependent and the independent variables. This approach is particularly helpful in studying links between environment and security as the subject matter under study is exceptionally complex; to-date both conflict and environmental degradation "are characterized by an immense number

[11] Homer-Dixon, "Strategies for Studying Causation in Complex Ecological Political Systems" Occasional Paper. Project on Environment, Population and Security. Washington, D.C.: American Association for the Advancement of Science and the University of Toronto (1995), 2.

of unknown variables; by interactions, feedback, and non-linear relationships, and by high sensitivity to small perturbations".[12]

In my research, I do not attempt to identify and examine the whole range of factors that are responsible for causing variations in the dependent variable (security), but I aim to show whether and how my hypothesized independent variable (environmental degradation and scarcities) cause conflict. I will gather and analyze current data on causal linkages among environmental scarcities and degradation on one hand and conflict situations on the other. My effort is guided by three main questions: 1) What do we currently know about the linkages between environmental scarcities and conflict? 2) What can be extrapolated from what we know about these links with regards to similar situations? 3) What do such linkages mean?

In addition to the "process tracing" methodology outlined above, I also use the three "levels of analysis" advocated by scholars of International relations to analyze the situations chosen and help answer the research questions.[13] Using the levels of analysis I define security by discussing it in relation to threats to specific reference. In studying how can environmental

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[12] Ibid.

[13] The three levels of analysis advocated by International Relations scholars are the individual level, the state (national) level and the international system one.

degradation and scarcities induce conflict situations, I study also their impact on the security of the individual human being (be it jeopardizing the life sustainability system, affecting his health or even inducing conflicts that involve the individual himself in violence). In addition, I study the effects on national level by analyzing how environmental scarcities can endanger the infra-structure and institutional capabilities of states inducing insurgencies and terrorist movements. Also, I look at how deteriorating environmental conditions and increasing competition over diminishing resources such as water may trigger states to go into war and the consequences of that on the international system.

Research Questions:

My research question is: Can environmental degradation and scarcities result in threats to security and cause conflict situations? Thus, I will examine the current and potential causal relationship between the two variables instead of explaining the current incidences of conflict. Specifically, I'll answer these two questions:

1. Can environmental scarcity and degradation be a threat to security and help to induce conflict situations?

2. Can environmental degradation and scarcity contribute to conflict and the insecurity in the Middle East Region, Gaza and Egypt?

Hypothesis:

My research hypothesis is that the degradation and scarcities of renewable resources including water, cropland, forests, fish and air, are contributing to several conflict situations - especially in the developing world - and thus offer serious threats to security. My research validates this assumption and tries to show that the situation will worsen in the coming decades as environmental scarcities and degradation continue to polarize. I will also describe with more attention some situations in the Middle East region and Egypt.

My thesis is organized in two parts:

I. The first part establishes environmental degradation as a threat to security.

II. The second part will be describing certain situations in the Middle East region, Gaza and Egypt to illustrate the proposition of this research.

To conclude, the argument of my research is that there is a similarity between threats to security induced by environmental scarcities and degradation and the ones induced by political and military power struggles as well as traditional wars. If wars result in denying the claim of national identity and integrity to some groups, global environmental degradation has exactly the same effect with many more people as victims. All humanity - with no distinction - suffers from the negative effects of environmental degradation. However, many analysts argue that the poor and the impoverished are suffering more as many argue these nations are paying the bill for the development in the industrialized world and do not have resources to use the expensive clean technology. In fact, the issue is becoming one of major importance and urgency on the agenda of International Relations. Therefore, in the coming chapters I will investigate how and why environmental degradation offers a challenge to security as well as investigate the linkages between environmental degradation and scarcity and conflict situations in the Middle East region, Gaza and Egypt. However, I start by defining the concept of security.

social and cultural dimensions, as well as habits and attitudes that reinforce war or peace.[45] Like other social concepts used to discuss human condition, the idea of security embraces different levels of analysis, ranging from individuals, through states to the international system.[46] Thus, the security problematic cannot be understood without reference to factors at all three levels of analysis. This is because the concept itself binds together individuals, state and the international system in such a close way necessitating its treatment in a holistic perspective.[47] Accordingly, the object of security no longer needs to be almost exclusively the state but needs to be broadened to encompass the individual human being at the individual level of analysis as well as the international system.[48] However, it should also be noted that the concept of security is not static as its associated problems rise and decline in response to different systematic and unit-level changes.[49]

In my research I adopt a more inclusive definition of security. I consider challenges to security that move beyond the traditional notion dominated by the military orientation. There are a range of non-military issues that are increasingly threatening both the survival and the coherence

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[44] Ullman. (1983), 133.
[45] Harry B. Hollins, et al. The Conquest of War: Alternative Strategies for Global Security. (San Francisco: Westview Press, 1989), 16.
[46] Booth. (1991), 39.
[47] Buzan. (1983), 245.
[48] Booth. (1991), 341.

of states.[50] Therefore, I adopt a broader definition of the concept of security covering physical and "economic well-being, civil and political liberties, a sustainable environment and social justice." Accordingly, a broader perception of threats to security is advocated.

This view includes environmental threats, the unequal and unfair relations between rich and poor countries, poverty and famine, oppression of minorities, and other issues traditionally regarded as belonging to the realm of "low politics" that were traditionally regarded as items of low priority.[51] It is worth noting that the challenges to security become more and more complex as we turn our attention to such issues that do not challenge the viability of the state directly or in traditional terms. Nevertheless these issues "undermine the sovereignty of the state, compromise its ability to control the penetrability of its boarders, and exacerbate relations whether between groups within the polity or between states within the regional or global system."[52] Moreover, traditional notions of security are being increasingly eroded by the rising, inescapable interdependence in economic, military and environmental affairs.[53]

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[49] Job. (1992), 37.
[50] David Dewitt, et al. eds. Building A New Global Order: Emerging Trends in International Security. (Oxford: Oxford University Press, 1993), 5.
[51] Booth. (1990), 309.
[52] Dewitt. (1993), 9
[53] Micheal Renner. National Security: The Economic And Environmental Dimensions. (Washington, D.C. : World Watch Institute, 1989), 62.

Environmental Threats To Security:

As a result of the new trends in defining security outlined above, the need to broaden our thinking into the long term future instead of the short term is being increasingly recognized. In this thesis, I argue that ecological issues offer a clear case of threat to security. Security will be an insignificant and void concept if it does not include "the preservation of livable conditions within a country or on the planet as a whole." Today, more states are realizing that their security is being undermined by environmental factors ranging from the degradation of the environment, global warming, depletion of resources, salinization of soil, to those environmental threats originating in other countries, such as air and water trans-boundary pollutants or floods unleashed by denuded watersheds far from their boundaries.

On the global level, serious challenges presented by climate change, ozone depletion, deterioration of the agriculture base and deforestation jeopardize the safety and well-being of the entire race, as well as the survival of life on the planet. Thus, these environmental threats with their potential to not only endanger but also to erode the habitability of the earth force us all to consider them as security challenges. Further, they draw our attention to the fact that existing rates of environmental degradation will

soon be irreversible and we will be caught in a new security race aiming to save the planet.[54] Therefore, environmental aspects are serious security threats as the degradation of the environment endangers the most fundamental aspect of states' security by undermining the natural support systems on which all human activity depends.

This is also true because of the fact that the degradation of the environment and pollution respect no borders, and therefore they jeopardize not only the security of the country in which they occur, but also that of others. Such environmental factors that offer serious threats to national security include: the depletion of the ozone layer, global warming and greenhouse effect, desertification, deforestation, trans-boundary pollution and resource depletion. These threats leave us in a situation where all are losers.[55] These threats cannot be met by the traditional military means. Moreover, within this approach military means are considered to be a source of environmental insecurity. On the one hand, the production of weapons can directly cause serious damage to the environment. On the other, the military sector consumes much resources that could have otherwise been allocated to the purpose of protecting the environment.

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[54] Ibid. 6.
[55] Ibid. 29-37.

As outlined previously, several factors contribute to the reason we consider the issue of environmental degradation as part of the agenda of security studies and peace research. Adopting the broad definition of the concept "security", security is concerned with environmental or resource problems that result in and aggravate international and domestic conflicts what may lead to war and armed conflicts. Also, our pursuit of security needs to aim to prevent the damage to the physical environment resulting from military operations as well as from disarmament mechanisms.

In addition to the above, we often find the justification for the necessity of "environmental security" usually based on one or more of the following four arguments: First, a conceptual argument which suggests that for the sake of conceptual consistency whatever poses a threat to the welfare of human beings must become a security problem. Second, a theoretical argument focusing on cause and effect relationships with particular reference to the potential of environmental changes to generate and intensify conflict among and within states. Third, a political argument suggesting that adding an environmental dimension to security draws attention to the impacts of military operations and war on the ecology as well as the use of environmental blackmail, and therefore it can be used as a rational justifying collective action. Also, this argument suggests that perceiving environmental changes as a security challenge gives the issue a

greater sense of urgency. Finally, a normative argument which adopts the view that adding an environmental dimension to security places societal values in a more appropriate hierarchy that reflects societal priorities. The above five arguments convey the need for the term "environmental security" to acknowledge the ways in which environmental degradation directly threatens human welfare, even without the immediate prospect of armed conflict.[56]

A metaphor that helps us visualize the seriousness of environmental threats to security is the "boiled frog syndrome." The metaphor argues that if "frogs are placed in a pan of water, which is then slowly heated, they will rest contentedly while deadly trends slowly threaten their very existence."[57] This is the danger confronting us in the case of the environment. Environmental changes, in most scenarios, do not have immediate effects but long term ones. Thus, in the face of environmental problems of such magnitude, current national responses and strategies prove to be inadequate without international cooperation. Security is then seen as mutual and indivisible. Obstacles to such cooperation include the traditional definition and pursuit of national interests in an exclusive sense, as well as the fact that neither the harm of environmental degradation nor the benefits arising from protection measures are equally distributed amongst states,

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[56] Soroos. (1994), 318-9.

especially the different financial burden of remedial policies and the level of awareness.[58] On the other hand, these environmental threats contributed strongly to the development of the concept of common or collective security.

Common Security:

The roots of the concept of collective security are considered to be several centuries old[59], found in a series of proposals for maintaining international peace. The central idea of collective security has remained that "the governments of all states would join together to prevent any of their number from using coercion to gain advantage, especially conquering another."[60] As argued above, new trends and thinking about national security widened the scope of the concept of security in order to be relevant to the challenges and threats to security in the world today. As we know, traditional security policies were designed for nations. However, current and new ones have to be about the world as a response to a world challenge outlining how people threatened by common dangers can be secure. This can only be possible through international cooperation. The need for

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[57] Booth. (1991), 339.
[58] Renner, (1989), 37-9.
[59] Collective security is not a new idea. Traces of the concept can be found in a number of peace plans and discussions of international politics since the 1300. Pierre DuBois, of the fourteenth century, proposed a Common Council, composed of the sovereigns of Christian Europe, to agree to use sanctions against those who defined the Council's decisions. Buzan:39.

international cooperation together with the process of interdependence among levels and units of analysis, are the inertia that resulted in the emergence of the concept of common security, advocated by neo-realists. The neo-realists accept the premise of the necessity to work within the existing framework of states as well as see room for improving security within the limits set by the prevailing conditions through cooperation between these states.[61]

The concept of collective security argues that national security is obsolete as a nation can no longer enjoy security by unilateral strategies. A state can only promote its own security by enhancing that of other countries, and accordingly if a country acts in a way to increase the insecurity of others, it ultimately increases its own insecurity.[62] Said in other words, sates need to think win-win vis à vis other states. What is in pursuit is increasingly the security of the whole system and not that of one actor on the expense of others. However, common or collective security does not mean alliance-building, which is considered selective security. At their optimum, alliances can provide security to member states from those threats originating from external sources outside the alliance system. The worst effect of alliances is that they contribute to political and military polarization and as a result feed

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[60] Thomas G. Weiss. ed. Collective Security In A Changing World. (Boulder: Lynne Rienner Publishers, 1993), 3.
[61] Booth. (1991), 45.

and intensify the feeling of insecurity in both the regional or global sense.[63] Collective security does not select participants. It includes all and every state in the system. If states choose to adopt the concept of common security as a main orientation in their security strategies, then they accept limits to how much they can destroy. Common security is a new type of strength that is about power over oneself rather than over others.[64]

A remark worth mentioning before concluding the discussion on the concept of security is that "security" is about actors; about relations between actors and structures between actors from the micro to the macro level. Here we recognize that security comes from societal units. Thus, if it is not find there, in the core of human community, it may not be obtained from outside. In this sense, a society is its own security base.[65] This is extremely true in the case of "environmental security". The patterns of behavior, values and choices as well as policies of states and individuals are the determining factors of environmental security.

As threats and vulnerabilities define the elements of insecurity and set the agenda for national security strategies and policies, I argue that security is both contextual and situational. This means that to define

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[62] Ibid. 305
[63] Weiss. (1993), 48
[64] Fisher. (1989), 219.

security we need to define the perspective we are adopting. the level and the unit of analysis, i.e. the reference object, the threats at stake and the vulnerabilities of this reference object. Within this framework, we can define the security of a unit in a certain situation from a certain dimension and vis a vis certain threats. This does not contradict the arguments of collective security nor defining security in a holistic sense but is meant to define the problem by its related aspects. Thus, the concept security can be summed up as beginning in personal security and culminating in a general global comprehensive security.

[65] The society can be a group of individuals within a group, a group of people within a state or a group of states within a system.

CHAPTER 3

ENVIRONMENT DEGRADATION AND CONFLICT

As outlined in the previous two chapters, the closing years of the Twentieth Century have witnessed a revision of the definition of "national security" as a concept. Recent global issues and events necessitated the broadening of the concept to include such problems driven by resources, physical changes in the environment and their consequences and demographic issues.[66] To be effective and sound, nowadays security policies need to include non-military threats under their umbrella.

From this premise stems the significance of having the objective to preserve livable conditions as a key dimension of security policies. Unless this objective is sought and realized "national security" will be a hollow concept, as discussed in chapter two above.[67] Therefore, ensuring the security of its people from any threats or dangers that affect them or disrupt the society has become a major responsibility of any government. Here we need to clarify that the goal is not security itself but the state allowing a

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[66] Michael T. Klare, Daniel Thomas. World Security: Challenges For A New Century. (New York: St. Martin's Press, 1991), 274.
[67] Klare, 1994: 404.

society to preserve its values and living conditions.[68] In the following pages I will present a brief overview of some of the environmental changes that are threatening the welfare of human beings and then discuss some types of conflict situations that can result from environmental degradation.

Environmental dimension of Security:

I have briefly discussed how issues presented by environmental changes and degradation and the resulting irreversible damage can pose one of the most serious threats to the world's security. According to a report by the World Commission on Environment and Development, pollution, depletion of resources and population pressures will lead to an unprecedented danger of extinction of the life support systems for all living species.[69] Today, the fact that the effects of these environmental issues cannot be restricted to one specific geographic region despite their origin at a state level is widely realised. The global scope of the effects of these issues is a distinguishing feature pushing them to the top of the non-military security agenda.

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[68] Normal J. Vig, Micheal E Kraft. Environmental Policy in the 1990's: Towards a New Agenda. (Washington, D.C.: Congressional Quarterly, 1994), 323
[69] Ibid.: 410.

The environmental dimension of security is based on the argument that certain security values are considered to be of high value in and of themselves. The first of these security values is the "survival of human species" in a healthy physical and mental state. Second is the "reduction in the amount of killing and other brutal treatment of human beings" and third is the "provision of conditions for healthy subsistence to all people".[70] These values are based on the premise that all human beings have the right to enjoy their naturally given life which should not be threatened by any kind of physical violence nor by the lack of prerequisites for survival; i.e. clean unpolluted fresh water, food or air, a secure shelter and protections against diseases.[71] In the following pages I discuss how such issues resulting from the degradation of the physical environment may lead to violence and conflict on both the national and international levels.

The following scenarios highlight that ecological security is an important condition to the survival and well-being of human beings and is only achieved by sustaining a balance among the needs and demands of human beings, other living species and what nature can

[70] Ian Rowlands. "The Security Challenges of Global Environmental Change" The Washington Quarterly, Winter 1991:101.

render. Accordingly, as discussed earlier, security as a concept covers not only such issues as physical attacks but any restraint on or interruption to human well-being and survival whatever the nature of these threats is. These restraints or interruptions include such threats offered by other species as viruses as well as natural phenomena as floods, droughts earthquakes, ... etc. Thus, it is argued that surging rates of population growth increasingly competing over resources and clashing with each other or with other species over resources is a source of environmental or ecological insecurity at the dawn of the Twenty First Century.[72]

Natural resources as an aspect of environmental security:

In this section, I examine a key aspect of the environmental dimension of security. This is the relation between the demand for natural resources and the eruption of conflict and resorting to violence. Traditionally, triggered by the desire to control natural resources and to increase their wealth, many nations went to war with each other over resources. The more scarce resources have become the more the

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[71] Michael T. Klare, Daniel Thomas, World Security: Challenges for a New Century. (New York: St. Martin's Press, 1994) 19-21

[72] Ibid:315-6

probability was to resort to violence to control these resources.[73] History offers us a safe base for the argument that increasing scarcity and decline in world-wide resources result in insufficient quantities of food and large waves of migration. These migration waves create large numbers of environmental refugees who in turn put stress on other regions and areas. Increasing population pressures, coupled with expanding numbers of impoverished people, will result in the over-exploitation of marginal lands, massive loss of forests, and the overuse of croplands causing desertification and soil erosion. This will destroy large areas, threaten local ecosystems and thus increase the probability of conflict eruption and resorting to violence.[74] Here the vicious circle of population growth and impoverishment is clear. A significant feature of this vicious circle is the fact that once any nation is trapped, the possibilities to escape are minimal.

The survival of our human species depends on a range of environmental services provided by natural systems. When we damage, change or over-exploit these natural systems, environmental services needed to support human activity are interrupted and jeopardised. Consequences include a chain reaction of environmental decline; widespread floods, soil erosion, deforestation, expanding droughts, crop

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[73] Natural resources is becoming more and more scarce as a result of population growth competing over a shrinking pie, deterioration of the quality of resources, depletion and over-

losses, desertification and aquatic pollution resulting in losses of fisheries.[75] These phenomena of environmental degradation are induced by three main human sources. The first source is **human activity** which reduces the quantity or degrades the quality of the resource faster than it is renewed. The second source is **population growth** that reduces the amount of resources available per capita. Third is the **resource distribution system** whereby some few privileged people may have access to resources or dominate them and the rest of the population will be improvised. These three sources of environmental degradation work both singly and in combination to cause a range of serious social effects. These social effects include decline in food production, economic stagnation, population displacement as well as disruption of institutions and traditional social relations. It is significant how these social effects can in turn affect and reinforce each other. For example, population displacement and migration caused by declining food production can further reduce food output as a result of shortage in the labour force.[76] Again, the vicious circle is clear. Here, the threat to security touches the three levels of analysis; the individual whose living conditions are jeopardized, the state where impoverishment due to declining resources can lead to internal strife and the

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usage as well as because of such natural changes causing decline in both the quality and quantity of resources as global warming.

[74] Vig: 326.

[75] Christopher D. Strake. The Gnat is Older than Man: Global Environment and Human Agenda. (New Jersy: Princeton University Press, 1993) 8.

[76] Klare, 1994: 294.

international system where conflict can erupt between states over diminishing resources or between sending and receiving countries as in the case of environmental refugees.

Peter Gleick in his article "Environment and Security: The Clear Connections" - published in the April 1991 issue of the Bulletin of the Atomic Scientists - identified four sources of security threats originating from environmental and resource issues. These are: i) conflicts to control resources considered to be "strategic goals"; "attacks on resources" like power plants, oil fields dams, ... etc. in order to deny the other party competitive capabilities; ii) conflicts where resources are used as a military tool like blocking or diverging the water flow of a river or destroying forests; and iii) conflicts where one party disrupts the environmental services of another such as the over-utilization of river-water by an up-stream party or exporting ecological problems to others as in the case of trans-boundary pollution.[77] Central to each of these four sources of conflict are resources. These three scenarios support the argument that resources decline, as a result of environmental degradation, poses serious threats to the security of different nations. Here, we see how the independent variable

[77] James A. Winnefield, Marry E. Morris. Where Environmental Concerns and Security Strategies Meet: Green Conflict in Asia and the Middle East. (California: St. Monica, 1994) 4.

(environmental scarcities and degradation) can affect the dependent variable (security) and induce conflict situations.

In the following section, I will further examine how certain environmental issues and ecological phenomena (my independent variable) affect security (my dependent variable) and lead to the eruption of violence and strife. I will start by describing some environmental issues prominent in our world today.

Deforestation:

One of the most serious forms of resource decline is tropical deforestation. These tropical forests are fragile ecosystems vulnerable to any kind of distortion or disorder. The loss of trees via deforestation disrupts the nitrogen cycle below and above the ground. Consequently, the soil loses its fertility, plant and animal species suffer from extinction after losing their habitats and there will be a severe shortage in fuel-wood. Also, soil erosion takes place as a result of the missing ground cover provided by trees and plants, and rivers suffer from salination that will result in floods, droughts and the damage of irrigation and hydroelectric systems. Effects of tropical deforestation on agriculture, energy supply and water resources are

estimated to impoverish about a billion people.[78] Deforestation also contributes to the issue of global warming by increasing the amount of carbon available in the atmosphere as a result to the loss of forests that absorb large amounts of carbon dioxide in their photosynthesis process. In addition, tropical forests are the habitats of 80 percent of the world's species of plants and animals and therefore deforestation seriously impacts biological diversity. Related issues considered as a consequence of deforestation include the degradation of the soil, desertification resulting from over-cultivation, over-grazing, erosion, salinization and water logging. Also, it should be taken into consideration that as a result of land holdings that do not meet the needs or satisfy the livelihood conditions of agricultural workers, migration from rural to urban areas can soar.[79]

This disruption of the natural nitrogen and carbon cycles, increasing global temperatures as well as the deterioration and over-exhaustion of the soil will in turn lead to shortages in food production, water supplies and thus lead to increasing scarcity of resources. Coupled with overpopulation problems and trans-boundary migration as well as inequalities in the distribution of shrinking resources, this ultimately leads to confrontations and conflict between different groups. Factors behind the phenomenon of deforestation are the migration of landless peasants and the unemployed,

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[78] Klare, 1994: 276.

increasing demand for agricultural lands and crops as well as the need of governments for foreign exchange, all inducing the cutting of more and more forests.[80]

Population displacement and immigration waves contribute as a main source of "civil unrest and political instability leading first to internal conflict and ultimately to international conflict". Such immigration waves bring different ethnic, religious or even cultural groups together next to each other and under severe economic hardship. This results in having these groups struggling over an increasingly shrinking pie of resources. "Terrorism, religious fundamentalism, economic aggression, and revolution" are other forms of conflict induced by population displacement triggered by shrinking resources.[81]

Global Warming:

Global warming or the greenhouse effect is another serious environmental issue. Either term describes the natural atmospheric phenomenon keeping planet Earth warm enough to sustain different forms of life. The greenhouse effect is caused by the fact that the earth's

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[79] Winnefield, 5.
[80] United Nations. Global Outlook 2000: An Economic, Social, and Environmental Perspective. (USA: UN Publications, 1990) 85.

atmosphere is transparent to incoming radiation from the sun and at the same time absorbs much of the lower energy re-emitted by the earth what makes the plant warm enough to support life. This greenhouse effect is currently aggravated by the increasing emission of the greenhouse gases - carbon dioxide through the combustion of fossil fuels, methane from rice paddies and nitrogen oxides from fertilizers. This increasing level of carbon dioxide emission creates uncertainty about the future of the Earth and the resulting consequences of the increasing unnatural temperature of our planet.[82]

This increasing temperature is only one consequence of the greenhouse effect. Other consequences include shifting patterns of precipitation and ocean currents, increased storm intensity, flooding, damaged ecosystems and rising sea levels as a result of the expansion of water when warmed and the melting of ice regions. This rise in the sea level will in turn immerse large coastal areas under water, erode shores, destroy swamps, and pollute the fresh water getting mixed with the salty sea water. Also, river deltas will be flooded, leading to huge waves of population displacements and increased competition over shrinking land and resources. Estimates are that half a meter rise in the Mediterranean sea

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[81] Lisatt Newton, Catherine K. Dillingham. Watersheds: Classic Cases in Environmental Ethics. (California: Wadsworth Publishing Company, 1994) 175.
[82] Klare, 1994:282.

level will lead to the displacement of 16 percent of the population in Egypt and a similar rise in the Bay of Bengal will displace around 59 million people in Bangladesh by the year 2030.[83] Other negative effects of the phenomenon of global warming include threats resulting from decreasing agricultural production as a result of expanding droughts and desertification as well as the spread of diseases transmitted by pests and insects that prosper in hot weather.[84] All the above effects will in turn threaten the security of human beings, through both threatening their living conditions and health as well as depleting different natural resources upon which human activity and prosperity depend.

Depletion of Ozone Layer:

The depletion of the ozone layer is another issue of environmental degradation with serious implications.[85] The ozone layer is currently depleting with an accelerated rate and studies show that the ozone hole is widening across space and time. Contrary to early beliefs, this depletion is not limited to polar areas where the density of population is low but can also extend to areas where most of the world's population live in the mid-latitudes. Harmful ultra-violet radiation passing through the ozone hole and

[83] Stone, 1993: 14-15.
[84] United Nations. 81
[85] The ozone layer is the thin stratospheric layer of the atmosphere protecting life on earth

not filtered by the protective ozone layer causes "damage to DNA resulting in mutations, and is directly responsible for skin cancer and cataracts, sun-burns, eye damage, the aging and wrinkling of skin and damage to the immunity system of humans".[86] Destructive and harmful effects on other species include the disruption of the world's ecosystem by hindering terrestrial and aquatic flora production and growth, damaging plant hormones and chlorophyll as well as the reduction of the rate of photosynthesis. The rate of growth of crops sensitive to ultraviolet radiation such as cotton, peas, beans, melons and cabbage will occur more slowly and in extreme cases, pollen will not be able to germinate. This harmful effect of the ultraviolet radiation will not only hinder terrestrial flora production and growth but its effect will also extend to the growth and production of aquatic flora and fisheries, thus disrupting the world's ecosystem.[87] These disruptions have negative effects on agriculture in terms of both the quantity and the quality of corps. As a result, food production will witness a sharp decline in output and human health will suffer

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from the killing side-effects of ultraviolet radiation.

[86] DNA is the material in the chromosomes that determine the genetic characteristics of the individual.

[87] This depletion is caused by a mixture of gaseous chemicals known as Chloro-fluro-carbons (CFCs) that are often used in refrigerators, armaments, solvents and thermal insulators. These are very stable chemicals that remain in the atmosphere for a century or more after their release, and before reaching the upper atmosphere. There they are the main factor behind the global thinning and depletion of the ozone protective layer. And although ozone itself is a greenhouse gas, the loss of the stratospheric ozone layer is a global environmental issue different from global warming.

from both the direct harmful effects of the un-filtered radiation as well as the changing DNA and composition of plants and crops.

Desertification and Soil Erosion:

Desertification and soil degradation are two other forms of environmental degradation. Human and animal pressures on forests and agricultural lands have resulted in increasing the rate of vegetation loss and consequently led to soil erosion. Also, as a result of the disturbance of the ecological system, rainwater has decreased and ground-water levels have been lowered. This causes the drying up of surface water, loss of topsoil and soil nutrients. All that, in addition to the disturbance of both the natural nitrogen and carbon cycles from other issues related to environmental degradation, has resulted in increasing drought waves that reduce food output and induce widespread famines.

On the other hand, farmlands are under severe pressure. Topsoil is washing away into rivers, becoming overgrazed and under-watered, and blowing away in the wind. World-wide, arable land is being lost or degraded through water-logging, acidification, salinization and rising water tables saturated with toxic chemicals.[88] These issues cause a severe decline in

[88] Two-fifth of Africa's non-desert land, one-third of Asia's and one fifth of Latin America's are

food production, and the displacement of large numbers of groups of people which will cause conflict over water and food sources to erupt.

Water resources degradation:

The case of water resources and environmental issues is almost the same. The dilemma is that the demand for water is growing for irrigation, generation of energy, industrial or urban usage and at the same time its supply is getting to be more and more limited as a result of pollution, droughts, depletion of aquifers and deforestation. All over the world, river and aquifer water is subject to serious assault and pollution. In many countries of the world, surface and ground water are polluted by agricultural fertilisers, herbicides and pesticides as well as industrial and residential wastes, sewage and acid rain.[89] This pollution phenomenon is affecting the abundance of water and raises deep concern about both the quality and quantity of available water resources.[90] As a result, competition between households, industry and agriculture over the limited quantities available are becoming a common scenario in different parts of the world.

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at risk of desertification. In Africa alone, there are 10 million refugees from desertification today along the Sahel's 3000 mile front. (United Nations. 87).

[89] Acid rain is caused by of the oxidation of sulfur dioxide and nitrogen oxides in the air to form acid sulfate and acid nitrate which return to the earth in the form of rain, snow or even dry particles.

[90] Estimates are that by the year 2000 total global use of water will be less than half its stable renewable supply, way above the figures of the 1970s and 1980s. (United Nations. 87).

The pollution of water supplies results in serious threats to the health of human beings and thus the necessity of water treatment is increasingly recognized despite its high costs. Polluted water is responsible for the decreasing productivity of fisheries and the increasing associated risks of eating fish caught in such water. In addition to health risks, contaminated irrigation water causes decreasing production of crops. The case of the availability of water resources and how it can be a threat to national security will be further discussed in the next chapter with emphasis on the situation in the Middle East , Gaza and Egypt.

Pollution:

Oceans and seas suffer from pollution and are depleted as well. All over the world, coral reefs and marine mammals such as dolphins are dying. Here, pollution and modern technology are both to be blamed. Annually, tens of thousands of turtles, sea birds and fish die from the dumping of chemicals and plastics as well as from brutal fishing techniques commonly used. In addition to water and seas, the air we breath is under similar assault. As a result of human activities (especially industrial ones), hundreds of thousands of tons of carbon monoxide, nitrogen oxides, sulfur dioxide, hydrocarbons and other particles are emitted annually into the

troposphere.[91] These chemicals undergo a chemical reaction process together as well as with air and result in several phenomena such as smog, acid rain and fog that all threaten human health.[92]

Hazardous waste is another form of pollution and research shows that exposure to such chemicals results in serious health problems. The real and long term threat is posed by the fact that when dumped these wastes migrate to ground water and in turn affect agriculture, fisheries, cattle breeding and water resources. As these chemicals move very slowly, are long lived and are hard to detect, cleanup is very difficult.[93] The above issue is the case with both industrial wastes as well as nuclear ones.

Today, more and more concern is arising from the increasing ability of human beings to change their environment on a global scale. The above issues are clear examples of pervasive environmental threats.[94] They disrupt the natural environmental system and their effects threaten human beings at their very survival. The effects range from health risks, declining food production, shrinking water resources and fisheries, to population displacement and clashes among different ethnic groups as well as have

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[91] Troposphere is the layer of the atmosphere nearest the earth's surface.
[92] Sources of air pollution resulting from human activities include electric generation plants, melting of ores, industrial installations, and combustion of fossil fuels. (Stone. 12-13).
[93] It is getting more and more difficult to find a place to dump toxic wastes. Thus, the dispositions of these wastes is getting to be more and more expensive. This fact pushed industry towards source reduction and recycling of materials. (Newton. 24).

social consequences that enhance and cause different conflict scenarios. Also, as a result of many of these issues, the economies of Third World countries will continue to decline further leading on the one hand to a widening gap between industrialized societies and developing ones and within developing countries amongst themselves on the other. The result will be more competition over the more shrinking pie of resources. This will lead to serious local, regional and international security repercussions.

Today, there is a growing realization that the world is facing a situation where its well-being arises from humans' ability to use resources efficiently, distribute them equitably and reduce consumption levels on the whole. If this will not be the case, strong social tensions will prevail as a result of increasing competition over limited resources. This will lead to an aggravation in impoverishment and hunger, cross-border migration and conflict. In the following section we will discuss how such environmental changes may lead to conflict situations.

Types of conflict resulting from environment degradation:

Different studies project that by the year 2030 the human population on Earth will soar to around eight billion from its 5.2 billion in 1992 and

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[94] Linda Strake. ed. State of the World: 1994. (New York: World Watch Institute, 1994): 3.

global economic output will almost triple. The combination of these two global trends will cause environmental changes to take place with a faster pace and be more widespread and serious.[95] Despite the fact that research in the field of environmental security is limited and relatively young, possible linkages between the degradation of the environment and the outbreak of conflict are established. Possible links include the premise that environmental change may change the balance of power between countries either on the regional or international level, triggering unrest and instabilities as well as leading to war situations. Here, the case of Turkey and Syria comes to mind.

Another premise is that world-wide environmental decline can further widen the gap between poor and rich countries that may push poor societies to confront rich ones violently for a more equitable share in the world's resources and wealth. Violent conflict situations can also break out as a result of frustration with such countries that free-ride agreements to protect the environment. Also, surging population growth rates and the resulting stress on land and resources may generate waves of environmental refugees dispatched across borders and disturbing relations among different ethnic and religious groups. In addition, because of shrinking water

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[95] Thomas F. Homer-Dixon, "Environmental Scarcity and Inter-group Conflict" quoted in Klare, 1994:290.

supplies, declining food output and the effects of upstream pollution, conflict scenarios can erupt between and within countries.

Degradation of the environment will ultimately augment poverty and in turn frustrations. This will lead to increasing tensions across social classes and ethnic groups, institutions may erode and revolutions and insurgencies may be the result. Many experts argue that issues resulting from environmental degradation will intensify violence and conflict situations ranging from "war and rebellion to trade disputes" across states and the international community.[96] Here we emphasize that violent situations caused by environmental degradation will not take the pattern of traditional ones as many of the environmental issues stem from resources held in common as the climate or the ozone layer and as the social effects of such issues like population and economic decline are insidious.

Most of the scholars studying environmental changes and their effects assert that human induced environmental changes are a function of both total population and per capita activity as well as the vulnerability of the ecosystem in the region to these activities. In turn, per capita activity is a function of available resources and social and psychological factors as institutions. The following model, developed by Homer-Dixon in his 1991

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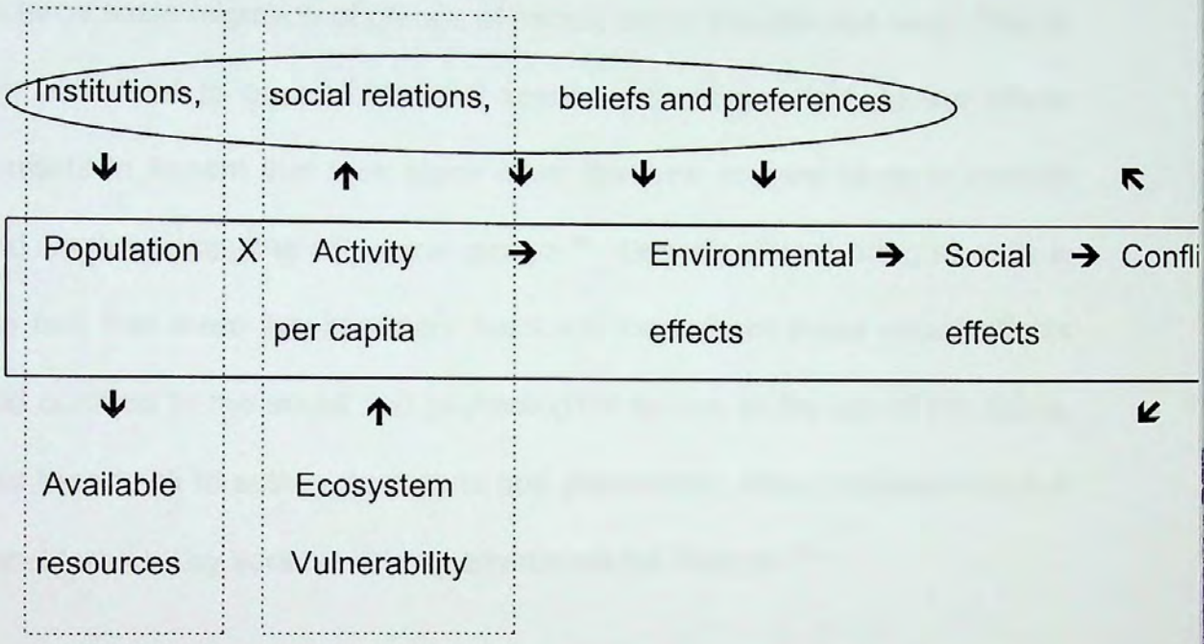
[96] Ibid:291

article , outlines this relation as well as how conflict induced by environmental degradation occurs. At the same time, this model summarizes the arguments in this paragraph.[97]



This figure illustrates how the environmental effects resulting from human activity in a particular ecological region are a function of two main variables: "first, the product of total population in the region and the physical activity per person (which in turn depends on the range of technologies people use in this region) and second, the vulnerability of the ecosystem in that region to those particular physical activities."[98] In turn, activity per capita

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[97] Ibid., 292-294.
[33] Thomas F. Homer-Dixon. Environmental Scarcity and Global Security. New York: Foreign Policy Association, 1993:15.

is a function of available physical resources in this particular region as well as several social and psychological factors. In addition, the figure reflects how environmental effects (such as the degradation of agricultural land) - the independent variable - may result in certain types of social effects such as large scale migration of groups of people out of the affected land. This in turn can lead to several kinds of conflict. Examples include the ethnic conflicts in Assam that took place when the new comers came in contact and began competing with local groups.[99] One significant thing to note is the fact that there are important feedback loops from these social effects and conflicts to the social and psychological factors at the top of the figure, and then back to activity per capita and population. Also, population size is considered a key variable driving environmental change.[100]

According to Homer-Dixon, environmental issues will trigger three types of conflict: The first is **scarcity conflicts** in which each country seeks solely its self-interest in a world characterized by fixed and limited resources. Scarcity conflicts are most likely to emerge over three types of resources which are river water, fisheries and fertile croplands. This is because these resources are essential and vital for the survival and well-being of human beings and at the same time their scarcity is increasing. They can also be

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[99] Ibid., 16.
[100] Ibid., 17.

"physically seized and controlled".[101] The resource that is most likely to generate a conflict situation is fresh water. As rivers usually flow from one country to another, the actions of one country to control water clearly affect the others' access. The assumption is that conflict situations are likely to arise when a downstream riparian state is strongly dependent on river water and is relatively strong and believes it has greater military capabilities in comparison to the upstream riparian state. Many experts believe in this scenario could take place between Egypt and Ethiopia or the Sudan.[102]

The second issue or threat that could trigger conflict is **group identity conflicts.** These may break out as a result of large scale population displacement because of increasing environmental scarcity. These waves of population movements will push different ethnic and cultural groups together. These people will come to see themselves and their neighbors in terms of "we" and "they" and so use their identity to judge negatively the worth of others, which ultimately could lead to the eruption of violence.[103] This has been the case in the conflict between Bangladesh and India. In this case, large numbers of people were pushed by environmental scarcities across the borders from Bangladesh to India sparking group identity conflicts. Bangladesh suffers from over-exploitation of agricultural lands,

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[101] Klare, 1994:294.
[102] Thomas F. Homer-Dixon. "Environmental Scarcities and Violent Conflict: Evidence from Cases" International Security, Summer 1994:19.

soaring population growth rates contributing further to cropland scarcity, and intensifying poverty. This resulted in social disorder that was further aggravated by the effects resulting from India's construction of the Farakka upstream dam on the Ganges River. This immigration caused pervasive social changes in receiving cities in India by changing the land distribution system, disturbing economic relations and the balance of power between different religious and ethnic groups and thus induced inter-group conflict.[104]

The third trigger is **deprivation conflicts** caused by the widening gap between poor and rich countries and the resulting frustrations of the poor. This is a consequence of the fact that poor countries will be producing less and less wealth because of environmental scarcities. The result will be a confrontation between rich and poor countries as well as the eruption of violence between rich and poor groups within the same society where deprived groups will violently act against those perceived to be causing their economic misery and benefiting from the unequal distribution of resources.[105] Environmental scarcity and its deprivation consequences will weaken different social institutions like the state as they will intensify the financial and political pressures on the government to alleviate the resulting social effects. Also, environmental scarcity pushes rural population to the

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[103] Klare quoting Homer-Dixon, 1994:300.
[104] Homer-Dixon, 1994:21-22.
[105] Klare quoting Homer-Dixon, 1994:301.

cities, thus putting increasing demand on the already exhausted services, food supplies, housing and shelter, transportation means, energy supplies and employment. This widening gap between what the state and government can supply and the needs of the people feeds unrest as well as the rivalry between the elite and the poor and further deteriorates the legitimacy of the state.[106] Here we can cite the case of the Philippines as an example where we can see evidence of the relation between the widening gap between the rich and the poor and how it led to "environmental strife."[107] The Philippines has witnessed a series of conflicts over the recent decades induced by economic pressures. This economic hardship has been intensified recently by such phenomena as declining agriculture production, deforestation and depletion of fisheries what resulted in further deprivation and suffering especially of the poor. This in turn fed civil strife and insurgency as well as guerrilla attacks on several civil and military stations, especially in the remote hills where the government faces serious difficulty in counter attacking this rebellion.[108]

The above section portrayed three different kinds of conflict most likely to result from environmental degradation. These kinds of conflict show how the independent variable - resource scarcities - resulting from

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[106] Homer-Dixon, 1994:21-25.
[107] Ibid:28.
[108] Ibid.

environmental degradation induce violence and thus threaten security - the dependent variable - at the individual, state and international systems levels. As outlined above, such scenarios can be found already in different places all over the world. Thus, if current environmental trends are not reversed, the resulting social repercussions will lead to increasing conflict and violent situations, especially in poor countries that do not have the capabilities to face or mitigate either such environmental issues nor their social effects. The following chapter traces these types of conflict in the Middle East, Gaza and Egypt.

CHAPTER 4

ENVIRONMENT DEGRADATION AND SECURITY: EVIDENCE FROM THE MIDDLE EAST, GAZA AND EGYPT

In the preceding chapters I discussed how the non-military aspects of security emerged and gained a significant position on the security agenda. I also discussed a brief overview of some of the environmental changes taking place in the world today and outlined how such changes could present a threat to security. I concluded the previous chapter by discussing three types of conflict that are most likely to occur as a result of environmental degradation. In this chapter I am going to focus on how the degradation of the environment affects the regional security in the Middle East region and Gaza and will assess how it affects the national security of Egypt. In these situations, I focus on water related conflicts.

Water resources and security:

Fresh water is a basic resource, part and parcel to almost all ecological and social activities including agriculture and food production, energy generation, transpiration, disposal of wastes, industrial development projects as well as human health.[109] The most immediate and serious

[109] Peter Gleick. "Water and Conflict: Fresh Water Resources and International Security"

environmental threat to international security, especially in the Middle East region, stems from water scarcity. In the twenty first century, it is expected that water resources will increasingly be both the "objectives of military action and instruments of war".[110] This case is particularly true as populations explode, demands on fresh water increase to meet improving living standards and global climatic changes result in more shortages of water supply.

As water is one of the world's most immediate environmental dangers, it is necessary to examine the causes for this scarcity. First, with the rapid expansion of the world's population, more water is necessary to support the domestic and economic activities of this increase. Therefore, it is argued that water related threats to security have their origins in growing populations and changing levels of development, that both affect the environment and in turn the supply of water. Along with population growth, climatic changes during the last twenty to thirty years also contribute to water scarcity. The facts are that the 1970's and 1980's were periods of world-wide drought (causing a lowering of river and lake levels) because of lower than average rainfalls. Another factor is the greenhouse effect that poses an equal threat through evaporative losses and increased water demands resulting from higher temperatures what in turn speed up the

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International Security, Summer 1993:79.

predictions of imminent shortages. Thus, it is expected that competition for an increasingly limited supply will induce confrontations and violence between different parties, in places where water is scarce. Accordingly, controlling water supplies will be a national security concern.[111]

One region where this is a high potential scenario is the Middle East, where over half of the population depends on water that is shared between several countries. In the Middle East, water and its supply has reached a crucial threshold where most of the nations are competing for extremely limited resources. At the present time, the Middle East region needs twice as much water as is presently available. Here the issue of water is so problematic and solutions are so uncertain that countries may consider military action and war over this scarce but important resource.

Water related conflicts vary in their potential levels and scales. These conflicts may be internal ones within the same state between different groups, regional ones with border disputes between two or more nations, or international ones involving many nations that share borders. There is strong evidence from history on water induced conflicts and disputes that extend from fighting over the control of water supplies to international

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[110] Ibid.

[111] This is especially true in cases where water supplies is shared and it should be noted that most rivers, lakes and ground water are shared by two or more nations. Ibid:80

attacks on water resources.[112] A few examples in the twentieth century include, inter-alia, the hydroelectric dams that were targeted during World War II, the attack on the dams of the Yalu River during the Korean war[113] and the outbreak of the 1967 war between Israel and the Arabs, when Syria and Jordan attempted to divert the water of the River Jordan.[114] In the coming decades, the resulting inequalities of the degradation and shortages of water resources are expected to increase the possibility of "international disputes, create refugees who cross borders, and decrease the ability of a nation to resist economic and military activities by neighboring countries." [115]

Peter Gleick argues that there are four features that make water the source of conflict or disputes. These are: "1) the degree of scarcity, 2) the extent to which the water supply is shared by more than one region or state, 3) the relative power of the basin states, and 4) the ease of access to alternative fresh water sources." [116] The more scarce water is, the more number of countries that share it, the stronger one of the riparian countries is than the others and the more scarce other water resource alternatives are, the more likely the eruption of conflict is. The existence of any of these features singly, in combination or all together, is regarded as a strong motivation to induce water-related conflicts. Many of these four

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[112] Ibid:83.
[113] The Yalu River serves both North Korea and China.
[114] Gleick:87.

characteristics, or water related conflict indicators, already exist in the cases of both the Middle East and Egypt examined below.

Environmental Degradation and Conflict in the Middle East:

The Middle East region presents a clear case for the spreading of conflict situations and disputes induced by environmental degradation. History, shows us how environmental issues have strongly contributed to conflict situations in the region. Moreover, the future stability of the region is predicted to continue to be influenced by many environmental issues. In the following section, I examine some environmental issues prominent in the Middle East region.

In the Middle East, there exist people from different religions and sects, governments facing economic and political hardships and increasing pressures that they cannot meet, soaring population growth rates, competing ideologies, depletion of resources and serious questions about the legitimacy of many governments.[117] Serious environmental concerns in the Middle East include soil degradation and its inevitable consequence of declining agricultural output. This decline in agricultural production is

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[115] Ibid:92.
[116] Ibid:84.
[117] James A. Winfield, Marry E. Moris. Where Environmental Concerns and Security

caused by over-cultivation, over-grazing, soil erosion, salinization and water-logging resulting from poor irrigation systems. The decline in agricultural output is coupled with a sharp decline in the soil's ability to retain moisture and further crop vegetation.[118] These environmental trends affect food supply and make Middle East governments heavily dependent on food imports that causes ample financial burdens and potential strategic vulnerability. In this case, national security is perceived in terms of food security which in turn is dependent on water security. This shows how environmental issues will pose threats to the quality of life and human survival as well as intensify the economic and political pressures already prevalent in many countries in the region.[119]

The increasing trends in degradation and pollution of crop land will push more and more rural people to migrate to urban cities. This migration wave will make the expected urbanization rate of the Middle East 73 percent by the year 2010, and result in more competition in areas already characterized by widespread unemployment and over stressed infrastructure. This will feed social unrest and strife. As a result, more agricultural land will be used for urban extension, and the remaining land will be over-cultivated. This in turn will contribute to further impoverishment and

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Strategies Meet: Green Conflict in Asia and the Middle East. St. Monica, CA, 1994:21.
[118] Jessica Mathews. "Redefining Security" Foreign Affairs, Spring 1989:167.
[119] Ibid.

degradation and further rural migration to urban cites.[120] Many of the fundamentalist movements are argued to have their origins in the increasing impoverishment and competition over limited resources, such as in the case of Egypt. Environmental and agricultural degradation will also contribute to the issue of environmental refugees,[121] where large numbers of people will cross boarders to neighboring countries. This will create massive unrest as in most host countries, "the infrastructure and services are often below standards and cannot meet the needs of indigenous populations. An influx of immigrants can also create conflict with existing populations. Additionally, immigrants find themselves in slums and squatter settlements, deprived of basic facilities, living in shelters where crowding and accumulating wastes lead to disease, conflict will erupt among settlement residents, as well as between refugees and the original population."[122] Here the cases of Palestinians living in the Occupied Territories as well as the one of Israeli settlers come to mind.

Another environmental concern in the Middle East stems from the global warming effect. Speculation on greenhouse warming predict serious changes in the conditions of life on earth. As the earth gets warmer,

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[120] Ibid:52.
[121] Environmental refugees are the people forced by severe environmental changes that threatened their survival and seriously jeopardized the quality of their life to leave their homeland.
[122] Michael Renner. National Security: The Economic and Environmental Dimensions. (Washington D.C.: World watch Institute, May 1989) 30.

precipitation patterns will change, "ocean currents will alter climates, sea levels will rise, shores will erode, and river deltas will be flooded. In Egypt's case a half meter rise in the Mediterranean Sea would displace 16 percent of the population."[123] Greenhouse warming will affect the regional security of the Middle East as demand for water and food increases and as water resources become scarce. Especially vulnerable to greenhouse warming is agricultural output as well as the quantity and quality of water resources.

As we study the case of the Middle East we note the fact that problems induced by environmental degradation are either a direct source of conflicts that erupted in the past or an indirect source as "a catalyst for conflicts arising from other causes."[124] Scholars and policy experts expect the future to bring more scenarios to support these assumptions. As touched upon above, in the Middle East, the environment is endangered by explosive population rates as well as fragile and impotent economic and agricultural strategies. The combining effects of these issues intensify the harshness of resulting social problems and therefore pave the way for conflict situations to emerge.

Other environmental issues existing in the Middle East region include soil erosion, declining agricultural production, over-grazing, desertification

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[123] Winnefield:36-8.

and over-irrigation. There is also global warming which contributes to water resource scarcities and shortages, spreading diseases and crop failure, diverting and pollution of water supplies, as well as the depletion and pollution of land and water resources. This is in addition to different threats resulting from the effects of urbanization and soaring population growth rates.[125] The Middle East also faces such natural hardships as those caused by droughts and crop failures that are in turn induced by environmental degradation.[126] However, it is widely recognized that water resources related issues are the most serious environmental issue in the Middle East.[127] It is no secret that the coming interstate violence in the region will be motivated by the countries' needs for Water resources:[128]

In most of the countries in the Middle East, water is a direct source of conflict as the competition for water in the region is much greater than anywhere else in the world. Day after day, shortages in supplies are becoming more severe.[129] More than 50 percent of the population in the region are dependent on either river waters running across borders of different countries or upon non -renewable well waters. Fresh water has two primary sources in the Middle East region: "the porous, permeable beds, or

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[124] Ibid:39.
[125] Ibid:22.
[126] Ibid:55.
[127] Such issues include the diversion, pollution, shortage and depletion of water resources.
[128] Anzovin Steven. ed. The Reference Shelf: Preserving the World Ecology. (New York: Wilson Company, 1990):133.

aquifers, below the desert"[130] and river water coming from the three river systems of the Nile, the Jordan and the Tigris-Euphrates basin. Both sources are subject to ownership rights and usage disputes and thus can induce conflict situations.[131] A serious concern is the fact that almost two-thirds of the Arab population depend on river water that originate in non-Arab countries and that 24 percent of the Arabs live in areas with no surface streams depending on water from wells, a rapidly depleting resource, or the expensive mechanisms of purifying sea water.[132]

In the Middle East, the desire to secure the waters of the Jordan, Litani and Yarmuk Rivers has already contributed to the tensions preceding the 1967 Arab-Israeli war. In addition, there is strong disagreement between Syria and Turkey over the Euphrates water. On the other hand, access to the extremely limited underground water resources is also an extra pressure in the Israeli conflict with the Palestinians over the future of the West Bank and the Jordan River.[133] In the following part I present an overview of the general situation of water in the Middle East region.[134] The

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[129] Ibid:132
[130] Winnefield:24.
[131] Ibid:23.
[132] These aquifers and wells are between 15,000 and 25,000 years old dating as back as to the Pleistocene era formed as a result of the melting of the ice in the northern hemisphere. These wells and aquifers are non-renewable sources of fresh water that are expected to last from 30-60 years. **Ibid.**
[133] Thomas F. Homer-Dixon. Environmental Scarcity and Global Security. New York: Foreign Policy Association, 1993: 27.
[134] By the Middle East region we mean the following countries: Syria, Lebanon, Palestine (Occupied Territories), Israel, Jordan, Egypt and Turkey.

following table lists selected countries in Africa and the Middle East where population growth will drive per capita water availability to 1,000 cubic meters or less per person by the year 2025. This 1000 cubic meter is the minimum level of water need set by the United Nations.

Country	**1990** per-capita water availability (m^3/person/year)	**2025** projected per-capita water availability (m^3/person/year)
Egypt	750	380
Ethiopia	1,070	620
Israel	470	310
Jordan	260	80
Lebanon	1600	960

Source: Peter Gleick, Pacific Institute, Oakland, California.

The Jordan River:

Water related insecurities in the Middle East are especially intensified when they are related to Israel which gets most of its water from sources in the territory it has occupied since 1967. Since 1948, conflicts over resource issues have motivated different security threats and disputes between Israel, Syria and Jordan. In these disputes water has been one of the central or

underlying cause of the conflict.[135] An important fact is that there is no agreement or treaty that defines the water rights and usage in the River Jordan basin. Therefore, every riparian state is motivated to unilaterally and fully utilize whatever water it can get hold of or claim, regardless of the interests or rights of other riparian states. The result of this is that the River Jordan basin has already seen much more aggressive inter-state conflicts over water than any other river basin in the Middle East and perhaps even in the world.[136]

Many policy makers and scholars speculate that this trend of conflict in the River Jordan basin will continue inducing conflict in the region in the coming years. Israel is currently using about five times as much water per capita as its much less industrialized Arab neighbors who are highly dependent on agriculture. Currently Israel gets about 60 percent of its water from the Jordan River and only 3 percent of the river's basin flows in its pre-1967 territory. Thus, for Israel the access and control over water supplies is an essential and significant priority for its survival and security. This is evident in the fact that water was one of the reasons Israel went to war in 1967 when Syria and Jordan were trying to diverge the stream of the Jordan River. On the other hand, Jordan is also in need of a growing share of the river's water for its current and very near future supply. Having an annual

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[135] Winnefield:29.

population growth rate of 3.7 percent and more than a doubling population by early the next century[137], as well as having the adequate water resources to be food self sufficient by the year 2000 is questionable. Therefore, Jordan's crucial need for water for irrigation purposes will dictate a more powerful interest in the river. Significant to consider when studying the River Jordan basin is the fact that Jordan's need for water is expected to exceed supply capabilities by 20 percent by the year 2000 at the same time Israel will face a 30 percent water shortage by the same year.[138] Here we find a scenario of increasing water scarcity between two neighbors where one of them is stronger in military terms (Israel) which makes the other (Jordan) more vulnerable.[139]

The above paragraph outlines how water is vital for the survival of the states of Israel and Jordan, as it is essential for all human and social activity from irrigation affecting food production to health conditions. At the same time, both Israel and Jordan face increasing deficits in their water supplies to meet their current and future needs. We also need to consider the current situation in which the Jordan river is "already developed to its maximum

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[136] Ibid.
[137] This is the third highest population growth rate in the world.
[138] Anzovin:133.
[139] Here we refer to traditional arm military capabilities. If we include nuclear arm capabilities, Israel has a clear advantage over all its Arab neighbors altogether and not just Jordan alone. Ibid.

capacity."[140] Moreover, Syria intends to build a series of dams on the Yarmuk River, the principle feeding river to the Jordan River, which will result in the divergence of over 40 percent of the Jordan river's water and thus further contributing to severe water shortages in both Israel and Jordan. These facts reflect how important water is and indicate how critical the situation in the basin region will be as a result of the increasing insufficiency and shortage of water supply for the needs of the riparian states.

The situation in the Jordan River basin is what can typically induce what Homer-Dixon defines as "scarcity conflicts", discussed in the previous chapter. Scarcity conflicts arise over limited resources especially those that can be physically seized and controlled. Another imperative for scarcity conflicts is when one of the competing parties is relatively stronger, especially in military terms, than the other parties. These two features strongly apply to the River Jordan basin case. No one can challenge the fact that Israel has military capabilities that are not available for most of its Arab neighbors, not to mention Jordan in this case. Further, Jordanians perceive Israel's attempts to utilize the waters of the River Jordan as attempts to deprive them of their natural right to access and control the river. This adds strongly to the complexity of the situation. Peace treaties in the region must define and outline the system to manage water resources in the

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[140] Ibid.

Middle East in a way that takes into account the collective long term interests and needs of all riparian states at the same time. Also, all riparian states need to recognize the equal rights of basin countries to utilize the river waters and have to agree to coexist peacefully and abide by the rules of the game. The above analysis is equally true in the case of Israel and all its Arab neighbors as in the case between Israel and Jordan.[141] However, it should be noted that such a system will be dependent on the mutual trust and co-operation of all players and to the extent they abide by the rules of the game.

The Tigris-Euphrates Basin:

The riparian states of the Tigris-Euphrates basin are Turkey, Syria, and Iraq. In this relation Turkey clearly has "a natural advantage, a political lever, and a potential military advantage"[142] as both Syria and Iraq strongly depend on water originating in Turkey.[143] Among these riparian states, water has been used as both a political and an economic weapon. The battle over the Euphrates water can result in a war between the three

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[141] This discussion did not include the Israeli occupation of South Lebanon. Many analyst argue that this occupation is motivated by Israel's shortages in water supply and its desire to control the Litani River. Further, it is argued that Israel is currently diverting the water flow of the Litani River to its interest.

[142] Recently, Turkey has joined the NATO. Also, Turkey is the upstream riparian while Syria and Iraq are downstream ones.

[143] For Syria, the Euphrates river is the single main source of water for irrigation, drinking and industrial usage. Winnefield:25.

riparian states. The river originates in Turkey, while Syria and Iraq are highly dependent upon its flow. For Syria, the Euphrates is the only major river crossing its territory with reliable annual flow. Iraq also has 1-2 million people relying on the river water for irrigation and survival. These three countries have a history of territorial and political disputes over water since the end of World War II and the time of Ataturk. Dam construction has been directly responsible for the deteriorating relations among these countries over the last three decades. As the upstream riparian, Turkey alleges that it has the right to control the amount of water the downstream riparian need to receive. Recurrently, Turkey has denied its downstream neighbors a secured share of water from the Tigris and Euphrates Rivers.

Syria and Iraq are not only at a risk in terms of the quantity of water received, but the risk exists in terms of the water quality as well. The danger is that irrigation backwash water into the rivers is contaminated with salts, fertilizers and pesticides that strongly threaten the downstream countries with the possibility of causing health side-effects and limiting their ability to use the water. A further serious trigger to conflict situation between the three riparian states is Turkey's Southeast Great Anatolia Project (GAP) that has begun in 1983 for the optimum utilization of the rivers water in Turkey. Through GAP, Turkey will build 13 hydraulic and irrigation dams on both

rivers. The Ataturk Dam alone[144] is expected to enable Turkey to almost double its agricultural land as it will provide sufficient water for almost 7000 square miles of land.[145] On the other hand, this will deprive Syria of one-half its current inflow of river water and two-thirds the inflow to Iraq.[146] Other analysts argue that as a result of the GAP Syria will lose up to 40 percent of its Euphrates water while Iraq will lose up to 80 percent. Currently, Turkey is using this GAP as a political tool to deter Syria and Iraq from supporting the Kurdist separatist movement in its hostile behavior against the central government in South Turkey. In 1990, Turkey decreased the flow of the Euphrates river so as to fill the Ataturk Dam, which deprived both Syria and Iraq of about 500 cubic meter per second. This pushed Syria and Iraq to take a series of measures with the objective of cutting consumption of water, electrical power as well as cut crop failure incidence.

On the other hand, the history of conflict between Syria and Iraq, where water resources was a major contributor, is also rich. In 1974 - 1975 the two countries came very close to war except for Saudi and Soviet successful mediation. First, Iraq accused Syria of decreasing the flow of the Euphrates River to a degree that strongly threatened the survival of three million Iraqi farmers totally dependent on river water for irrigation. A series

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[144] The Atatutrk dam is one of the 13 facilities of the GAP.
[145] This 7000 square mile is almost equal to the size of Israel.
[146] Anzovin:133.

of mutual accusations was exchanged between the two countries resulting in Syria holding Syrian flights to Iraq and moving troops to the Iraqi boarders from the Israeli ones to face an alleged grouping of Iraqi troops. As a result, Iraqis threatened to bomb al-Tabqa dam in Syria. Another dispute over water resources arose between the two countries in 1990 - 1991 and in this case Iraq put human shields to prevent the anticipated Syrian destructive attacks.[147]

Right now, Turkey holds an absolute economic and military edge over the other two states competing for the Euphrates river. Today, Turkey can be considered to have hegemony in the sub-region especially after the destruction of Iraq's power during the Gulf War. On the other side, Syria and Iraq do have a few bargaining tactics themselves, where they use their support to the Kurdish Workers Party as a point of leverage over Turkey. In this case, Turkey makes use of its military advantage and leverage gained by being the upstream country to control the flow of the rivers to downstream countries so as to deter them from supporting Kurdish separatist PKK movement. In trying to pay Turkey back, the downstream countries continue to support the Kurds. The shortages of water in Syria and Iraq will cause exactly the consequences discussed above as a result of shortages in the Jordan River, ranging from decreased agricultural

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[147] Winnefield:27.

production to health side-effects. However, it should be noted that up till now, Syria is the only Arab country still in a state of war with Israel. This state of war drains the country's resources contributing further, in addition to environmental and especially water resources issues, to the impoverishment of people and thus increasing the possibility of the outbreak of civil strife and social unrest. Also, Iraq is currently under an international blockade, imposed by the United Nations in the aftermath of Iraqi invasion of Kuwait. The objective of this blockade is to build resentment among the population with the current Iraqi regime as a result of the increasing impoverishment and suffering of the people and thus leading to civil unrest and revolts to topple the regime. The shortage of water supply resulting from the above discussed situation will contribute strongly to the realization of the objective of the international blockade.

The Euphrate-Tigirs riparian states present another case of scarcity conflicts, where one country is trying to unilaterally control a shared water resource at the expense of downstream countries. The downstream countries here support separatist groups in the upstream one so as to help cause instabilities in the government and divert the attention from the control of the river water towards solving internal insurgencies. We can also argue that this case may present a scenario of group identity conflict, where many of the Kurds living in North Iraq flee their hard conditions to south Turkey,

coming in contact with the local population and competing over available resources. This competition can lead to the eruption of violence and group identity conflicts.

The case of the Nile:

The case of Egypt presents an important scenario in regards to river water-related conflicts in the Middle East Region. Until the 1960s Egypt was able to meet its food production needs locally. However, the case is now different as Egypt is currently suffering from increasing hardship in providing the sufficient food for its people. The main reason behind the absence of self sufficiency in food is the high rate of population growth coupled with the poor mechanisms of land management. Also, Egypt gets almost 90 percent of its water supply from the Nile upon which 99 percent of the cultivated land depends.[148] Here, I highlight the fact that almost 97 percent of Egypt's water resources originates outside its territorial land.[149]

The 1970s saw demonstrations and violence that can be regarded as revolts against the government following its attempt to raise the prices of

[148] Mohamed Hatem El-Atawy. "Nilo-politics: A Hydrological Regime, 1870-1990" Cairo Papers in Social Sciences Cairo: AUC Press, Spring 96 : 1.
[149] Ibid.

food items and agricultural products.[150] These riots are what Homer-Dixon describes as deprivation conflicts. Underlying causes will be discussed briefly in the following section focusing on the effect of environmental degradation on Egypt's national security.

As a result of the rapid growth rate of population as well as environmental issues prevailing in Egypt, grain production per capita decreased by 18 percent from 1971 to 1985. The agricultural land in Egypt is less than 3 percent of the total territorial land, restricted to the narrow strip of the Nile River Valley that is of average width of 6 miles. Agricultural activities and tilling are highly dependent on river water irrigation. However, by the year 1982 almost 50 percent of plantations dependent on river water for irrigation has been affected by salinization and the rest were moving in the same direction. As a result of the declining quality of soil and soil fertility, 10 per cent of agricultural output per annum is lost. Also, another 10 percent is lost to desertification.[151] On top of these severe conditions, Egypt faced shortages in water resources availability as the eight successive drought years in Ethiopia and Equatorial Africa, where the Nile originates, has reduced by 1988 the Nile stream water to the lowest level since 1913. In 1988, storage water in lake Nasser was sufficient just to support the 1988 agricultural season after which the 1989 has been regarded at great danger

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[150] Anzovin:134.

because of the insufficient water supply. As a result it was estimated that Egypt would have to import 15 percent of its food requirements. This 1988 situation also threatened to freeze, if not damage, Egypt's program for the reclamation of desert lands.[152] This has contributed to the impoverishment and suffering of people and thus is considered to be the sowing seeds for social unrest.

Also, the drought has contributed to Egypt' environmental problems through increasing desertification, the salinization of soil and the declining soil fertility. Although Egypt was saved by the end of the upstream drought in 1989, it was estimated that to rebuild the water reserves depleted by the drought years, two above average flood years are needed. If the 1980s drought events were repeated - as highly anticipated by scientists to happen as a result of worsening environmental conditions and global warming trends - the shortages in water supplies will not just affect agriculture. The effects will extend to Egypt's electrical energy generation capacity. In 1988, the low water flow into the hydropower turbines of the High Dam, that supply 40 percent of Egypt's total electricity needs were reduced by 20 percent. Any new drought will affect this energy generation capacity as far as reducing it to up to 60 percent. This will affect all sectors of the economy and the society, resulting in a cost of millions of dollars as damage to the

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[151] Ibid:134.

economy. In addition, this deficit in power supply will necessitate the usage of oil as a substitute, what will cause revenues from oil exports to decline sharply, what will further reduce Egypt's ability to import food.

Another underlying source for shrinking Nile water supplies to Egypt in the future stems from the ability of upper-stream riparian to control the flow of water to Egypt. This is an increasing threat as upstream countries are increasingly regarding themselves as having the full right to control the stream originating or flowing in their lands. And at the same time, there is no agreement or treaty that outlines the water rights between the upper-stream riparian states and the downstream one; Egypt. Such a situation can force Egypt, being at a military advantage and at critical situation for its survival and internal security, to go to war with other riparian states; creating a resource scarcity conflict. So, the Nile has and continues to be a contentious issue as eight riparian countries share its resources. Thus, as countries become more desperate for water, the chances for conflict become stronger. The area could be a nightmare, as nations like Egypt get more than 97% of their water from the Nile river. But Egypt is also the last nation along the path of the river which leaves it hostage to the actions of upstream countries. At the same time, Egypt is considered to be the most powerful economic and military power in the Nile basin, which makes a lot of

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[152] Ibid:135.

policy makers and scholars consider it as a quasi-hegemon. As the basin states of the Nile become more desperate for water, and as Egypt's allocation will most likely decrease, the more likely it is that a war scenario can take place between Egypt and one or more of the Nile basin riparian states. The shortage in water resources in Egypt coupled with increasing soaring population growth rate hurts every area of its domestic and international economy, leading to conditions that invite domestic instability.

The Case of Gaza:

Not long ago, the area currently known as the Gaza Strip enjoyed great strategic value. This is because it was the first source of fresh water in the area North of the Sinai Desert. However, this area has witnessed a strong pressure on its weak resource base as a result of the massive influx of refugees in 1948. This stress on the area's resources left Gaza on the verge of a water supply crisis by the time of the Israeli occupation in 1967. After more than thirty years, today Gaza is considered to be the "most horrifying case of all" in the Middle East region; the area well known for its water scarcity as outlined above.[153]

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[153] Kimberley Kelly, Thomas F. Homer-Dixon. "Environmental Scarcity and Violent Conflict: The Case of Gaza" Occasional Paper Project on Environment, Population and Security Washington, D.C.: American Association for the Advancement of Science and the University of Toronto. June 1995. 1

Currently, Gaza is characterized by a rapid deterioration of water supplies. This deterioration is in terms of both quality and quantity and is evident by recurring outbreaks of water transmitted diseases, increased alkalinity and salinity of the soil as well as the non-existence of a proper sewage disposal or domestic hygiene systems. These combined made Gaza "an area which even the most fervent Zionists recognize as a drain on the state and should be off-loaded to any Arab country willing to accept it."[154] Actually, this is what took place in August 1993 when Israel gave partial authority in Gaza to a Palestinian Administration led by Arafat. Since then, we can faithfully assert that the move to a Palestinian self government in Gaza has been anything but peaceful.. We have seen several incidents of violence and conflict erupting between Israeli security forces and the Palestinians. Within Gaza, similar incidents between the new Palestinian Administration and its opposition - especially Islamic militants - also took place.

In the following part I will study how the years of occupation and resistance have worked together with harsh resource scarcities and induced the eruption of violence and conflict situations between different groups. I will discuss how water resource scarcity triggered by environmental conditions as well as occupation policies produced a socio-economic

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[154] Ibid.

situation where living conditions are horrible to the extent that left people with no option but resuming to violence. In the case of Gaza, we can find scarcity induced conflicts, deprivation conflicts as well as group identity conflicts, described in the previous chapter. One thing worth noting is the fact that water scarcity in Gaza has in turn contributed to the deteriorating socio-economic situation that is often cited as the main cause of violent against Israel and among different groups of Palestinians. To portray this relationship, I will first present an overview of the recent political history of Gaza and then analyze the impact of water scarcity on the area's stability and peace.[155] Here, I highlight the argument presented by Dr. Sharif El-Musa in his book Water Conflict: Economics, Politics, Law and the Palestinian-Israeli Water Resources where he divides the Palestinian - Israeli water issue into six categories: "the land-water nexus or control of the hydrospace; the mal-distribution of water rights of water resources and the attendant water use gap between the two sides; the encroachment by Israeli settlers on Palestinian water resources; Israel's control of water institutions, information and legal mechanisms; out of basin water transfer; and the future management of the common resources."[156] Dr. El-Musa argues that "the first issue refers to the interlocking of the historical control

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[155] It should be noted that any information on water in Gaza is politically sensitive. Also, figures on population, water supply and consumption vary from one source to another. This is due to the fact that several bodies administer resources and population in Gaza. These include the UN Relief Works Agency (UNRWA), the Israeli government and the Palestinian Authority. However, all agree that the water situation in Gaza is desperate.

[156] Sharif S. El-Musa. Water Conflict: Economics, Politics, Law and the Palestinian-Israeli

over land, recent claims by Israeli policy makers and strategists about the need to retain land in the West Bank for securing Israel's water supply and ramifications for Palestinian water supply of Israel's potential retention of land for reasons other than water. The second issue deals with the unequal distribution of water rights between the Israelis and the Palestinians in favor of Israel and the attendant wide gap in water use between them. The third issue concerns the appropriation of water from the West Bank and Gaza for the benefit of the Jewish settlers in these territories. The fourth issue, institutional and legal control, arises out of takeover of the management of water production, The fifth issue, out of basin water transfer, concerns Israel's transfer, beginning in 1964, of water from the Jordan basin to the Coastal plain and the Negev Desert. The sixth issue has to do with the opportunities for, and constraints against cooperation between the Arabs and Israelis for the management of the common ground water."[157]

Economic and Political History of Gaza:

In the period 1917-1948, Gaza was part of Palestine under the British mandate. The current borders of the Gaza area resulted from the Arab-Israeli war of 1948, which put two-thirds of mandate Gaza under Israel. The remaining one third was put under Egyptian military administration and since

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Water Resources. Washington, D.C. Institute for Palestine Studies:1997:213.

then was referred to as the Gaza Strip. As a result of the 1948 war, about 900,000 Palestinians were displaced out of their homeland. 250,000 of these fled to the Gaza Strip, increasing the population there by more than 300 percent, what caused a tremendous stress on the already exhausted and fragile resources of the area.[158] In June 1967, all the area of the West Bank and Gaza came under Israeli occupation as a result of the Six-Day War. The occupation authorities promulgated policies that made the area completely dependent on Israel, especially in economic terms. These policies aimed to ensure "absolute control over land and water resources in the Occupied Territories and suppression of any form of independent political or economic organization."[159]

Tensions and violence between Israeli authorities and Palestinians in Gaza manifested itself in several forms through out the 1970s and 1980s. This resistance culminated in the outbreak of the intifada (uprising) in late 1987. The intifada drew tremendous media coverage and helped gain support for the Palestinian cause in Western countries. However, it did so at a high price for the Palestinians to pay. It resulted in "large loss of life, declining living conditions and intra-Palestinian violence, including the killings of suspected collaborators. Israel's imposition of prolonged curfews

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[157] Ibid.
[158] Ibid. 2.
[159] Ibid.

and closures of the Territories in response to the uprising cut off Palestinians from their livelihoods."[160]

The Gulf War in 1990 further brought this vulnerable economic situation in Gaza into more hardship to the extent that many people, especially those In refugee camps, could hardly survive. A major reason contribution to this hardship is the drastic drop in remittances from Palestinians working in the Gulf due to the exploring condition in the area after the Iraqi invasion of Kuwait. Also, PLO and Palestinian support to the Iraqi move resulted in not only many Palestinians losing their jobs in the Gulf, but also Saudi Arabia cut its economic support to the PLO as well as Gaza losing its prime export market in the Gulf region.

As a result of this deteriorating economic conditions, violence continued to escalate and we continued to see clashes between Israeli security and different Palestinians, suicidal attacks from Palestinians on Israeli targets as well as turbulence among Gazans themselves. At the time the situation was getting worse and worse, secret talks was underway between the Israeli Labor government led by the late Prime Minister Yetzhaq Rabin and the PLO led by Arafat. In 1993 these talks resulted in the mutual recognition of the Israeli government and the PLO as well as the

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[160] Ibid. 3

Gaza-Jericho Accord. The Accord provided Palestinians in the Gaza-Jericho area limited autonomy under a Palestinian Authority led by Arafat.

Everyone hoped the Accord will bring peace and ease in the area. However, by the time the agreement was signed, the economic situation was in crisis and competition over scarce resources was getting more fierce and visible.[161] Now, it is recognized that "the Accord has transferred responsibility for a resource-poor, overpopulated, and politically unstable region - a region frequently referred to under Israeli Occupation as a time bomb - from Israel to the newly formed Palestinian Authority."[162] In the following section, I will analyze how environmental scarcity (particularly water scarcity) is inducing violence and conflict in the Gaza strip.

Water and Conflict in Gaza:

As discussed in chapter three above, Homer-Dixon argues that environmental consequences of human activity are the product of the total population in the area and this population's per capita physical activity.[163] A significant factor that must be considered here is the vulnerability of this region's ecosystem to the activity. Thus the more the population in a region

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[161] Ibid.
[162] Ibid.
[163] See chapter 3 above.

and the more intensive the per capita activity in the same area, the more stress on the environment and on resources we have. Chapter three also outlined how the degradation of agricultural land, forest water and fisheries contributes to serious environmental effects that trigger social turmoil and unrest.[164] Here we note that it is not only the degradation and depletion of the quality and quantity of a resource that induce conflict, but rather it is the overall scarcity of resources.

In the case of Gaza, three types of "environmental scarcity" exist. These are: a) demand induced scarcity as a result of overpopulation, b) supply induced scarcity as a result of the depletion and deterioration of the quantity and quality of resources and c) structural scarcity arising from the concentration of resources in the hands of few people leaving the rest of the population to suffer from extreme shortages. These three forms can either follow each other or occur simultaneously. In the case of Gaza, we see them not only happening at the same time, but also interacting to produce a situation of severe overall resource scarcity.[165]

In Gaza, these scarcities manifest themselves in four social effects. These are: "decreased agricultural production, regional economic decline, population displacement and disruption of legitimized and authoritative

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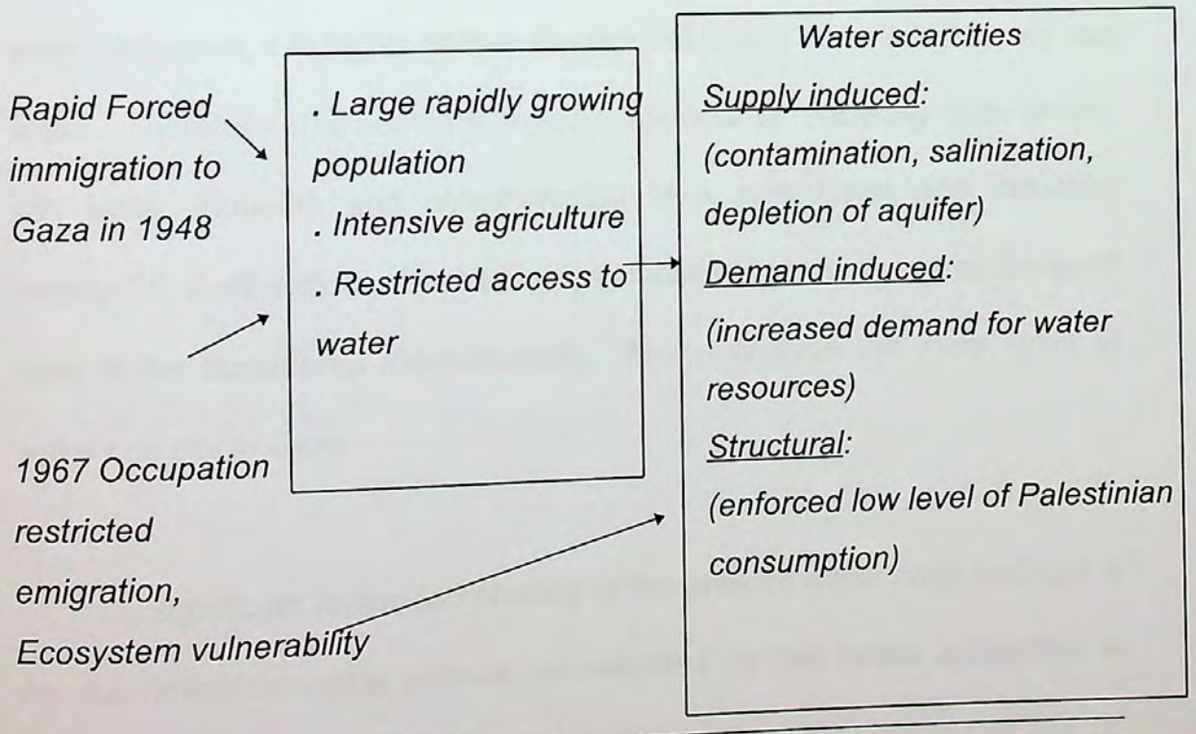
[164] Homer-Dixon, 1991:85.

institutions and social relations."[166] Such social consequences work singly as well as they interact producing tensions and violence in the area. As, I outlined in this paragraph the link between environmental scarcity and conflict in Gaza presents itself in various forms. However, in the coming part I focus on analyzing how water scarcity is triggering conflict.

The water crisis in Gaza is argued to be "a function of population growth, an agriculturally intensive economy, a fragile water ecosystem, and a highly inequitable distribution of resources."[167] The following figure explains the dynamics of interaction of these factors.[168]



[165] Homer-Dixon, 1994:10.
[166] Homer-Dixon, 1991: 91
[167] Kelly:4
[168] Ibid. 5

Fresh Water in Gaza:

The weather in Gaza varies from arid in the south to semi-arid in the north. This warm weather results in high rates of evapo-transpiration.[169] Estimates for Gaza put transpiration rates between 1,040 and 1,900 millimeters per year. On the other hand, only 40 percent of the rainfall in Gaza is used to recharge freshwater aquifers underlying the area while the rest is lost as runoff to the Mediterranean or to evaporation.[170] Gaza is completely dependent on ground water drawn from this aquifer for its freshwater supply. The aquifer is a few meters below the surface, shallow and ranges in thickness from 120 meters near the coast to 10 meters in the east. Moreover, it is highly saline; almost double that of the neighboring sea water. Therefore, this aquifer is highly vulnerable to "declining water levels, salt water intrusion and contamination from agricultural and industrial activity."[171] Furthermore, this aquifer is self-contained which makes it a good case to be considered independently. Now I analyze the three kinds of water scarcity in Gaza.

A significant factor contributing to the present water crisis in Gaza is the discriminatory water policies promulgated by the Israeli authorities in

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[169] Evapo-transpiration, or enviro-transpiration, is the loss of water experienced by an ecosystem via evaporation from plant and soil.
[170] Rainfall in Gaza is estimated to be between 200-400 mm/year. Kelly:5

terms of water allocation, access rights and pricing. In 1967, the occupation authorities announced all water resources in the area as state owned under the auspices of the Israeli military and set strict quotas for Palestinian consumption. Furthermore, military order 158 forbid the digging of new wells or the restoration of old ones without a permit from Israeli authorities. This order applies only to Arab residents of Gaza and not to Israeli settlers and aims to preserve the aquifer. The quotas for the Palestinians are almost frozen since 1967, with minimum adjustments for increased drinking water demand. On the other hand Israeli settlers enjoy more freedom for using water drawn from the same source and consume on average eight to ten times more than Palestinians.[172] In addition, because of discriminating pricing policies between Palestinians in Gaza and Israeli settlers, Palestinians pay as much as twenty times what Israelis pay for water, relative to the per capita income of the two groups. This is despite the weak institutions and deteriorating infrastructure which barely provide adequate quantity and quality of water. This disparity helped in creating a prosperous Israeli settlers economy coexisting alongside a stagnant Palestinian economy characterized by overall resource scarcities. These consumption quotas and the widening gap triggered serious tensions and friction between these two groups. These structural inequities cause two types of conflict: deprivation conflict due to the widening gap between the two groups and the

[171] Ibid.

increasing frustrations of the deprived Gazans group as well as group identity ones as a result to the "we" - "they" mentality between Gazans and Israeli settlers.

As outlined above, the size of the current population in Gaza is a function of the refugee influx to the area after the 1948 war.[173] Over fifty years, the increasing population in Gaza and the severity of water shortages are diminishing per capita water availability to as low as 100 cubic meters per person annually.[174] Water insufficiency for economic activities in agriculture and industry has in turn hindered economic development in Gaza. Here is a case of demand induced water scarcity that trigger conflict amongst Palestinian groups as well as with Israeli settlers as a result of the increasing competition over the limited resource.

On the supply side, the over-pumping from the Israeli side of the aquifer has reduced the Gaza aquifer to well below sea level and continues to reduce it by 15 to 20 centimeter per year.[175] This decline results in a reduction in the aquifer's pressure and thus increasing its salinity as sea-

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[172] Ibid. 6.
[173] Most estimates of the current Palestinian population growth rate range between 5.2 and 6 percent which is considered among the highest rates identified for any group in the world. On the other hand, estimates of average population density range from 1,936 people per square kilometer to 2,055 people per square kilometer. This high population density is coupled with extremely poor living conditions. Ibid.
[174] Ibid. 7.
[175] Ibid. 8.

water and saline water from the east flow into Gaza's aquifer. In addition, agricultural activity has resulted in chemical contamination of the groundwater what leaves the groundwater loaded with herbicides and fertilizers and unsuitable for irrigation. This resulted in declining yield and quality of crops. Also, the deficient disposal of waste water has contributed to the degradation of Gaza's aquifer. It is estimated that more than 10 percent of Gaza's residents are not served by any waste water management system or any solid waste collection one. The recurrent overflow of sewage water into lanes, streets, homes and agricultural land pose serious health hazards. As a result of the inadequate infrastructure, both sewage seepage and solid waste have in turn contaminated the aquifer leaving Gaza's groundwater simply not fit for human consumption. The Applied Research Institute in Jerusalem has conducted a water quality survey in 1992 and identified high concentrations of several substances that by far exceed the accepted levels for potability. The regular use of contaminated water or saline water in Gaza leads to the overall deterioration of health of the population. A recent report by the World Bank promulgate that inadequate and contaminated water supplies are responsible for the high incidents of gastrointestinal and parasitic infections found in Gaza. Today, it is widely recognized that the most prevalent and serious health problem in Gaza is infections caused by waterborne bacteria, viruses and parasites. The two

following tables give us an idea on how serious the situation on the quality of fresh water is in Gaza compared to the accepted levels of potability.[176]

Potability of Groundwater in Gaza		
Dissolved substances	Accepted concentration (ppm)	Gaza concentration (ppm)
Total dissolved solids	500	1,200 - 3,200
Sodium	20	300 - 1,100
Chloride	250	400 - 1,500
Calcium	36	40 - 120
Sulfate	250	50 - 400
Magnesium	30	40 -120
Bicarbonate	225	300 - 700
Potassium	4	6 - 10
Nitrate	45	40 - 140
Fluoride	1.5	0.4 - 2.9

Suitability of drinking water wells in Gaza		
Material	Suitable wells	% of suitable wells
Total dissolved solids	23	39.7
Sodium	27	46.6
Chloride	24	41.3
Calcium	46	79.3
Sulfate	52	90
Magnesium	57	98.3
Potassium	32	55.2
Nitrate	0	0
Fluoride	47	80
Hardness	6	10.3
Alkalinity	0	0

The following table shows that water availability in Gaza by year 2000 will meet only one-third of the water needed for agricultural use and 43 percent for domestic use.

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[176] Ibid. 10

Water Balance in the Year 2000. Sources and Uses in the Gaza Strip in millions of cubic meters.[177]

Use	drawn from wells	purified sewage	other uses	total
Drinking	23	0	30	53
Agriculture	20	40	0	60
Total	43	40	30	113

Now, I discuss the social effects of water scarcity in Gaza.

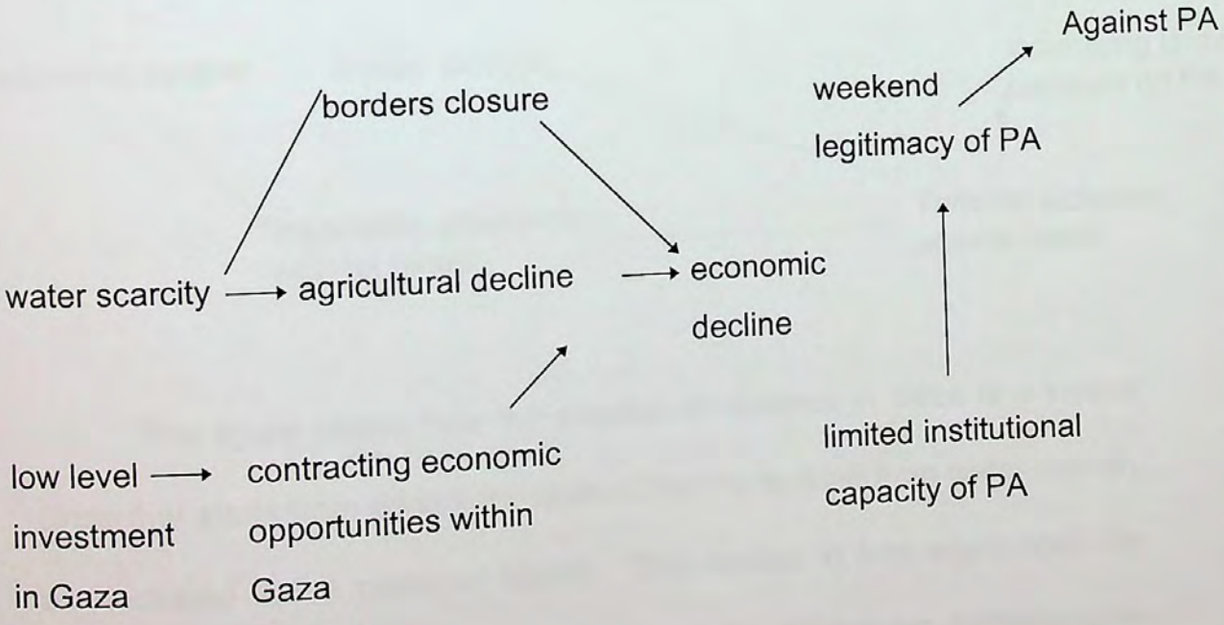
Economic decline:

Agriculture, the main economic activity in Gaza has been in decline since the mid 1970s. The percentage of the workforce in the agricultural sector dropped from 31.8 in 1968 to 18.3 in 1988. Between 1981 and 1991, per capita agricultural GDP dropped from $5,235 to $4,330. Taking into consideration the fact that this decline of the agricultural sector took place at the time other economic sectors developed very slowly we can understand the effect this development had on the employment market. As the other sectors hardly absorbed any significant percentage of labor moving out of agriculture, the net result of agricultural decline has been increased poverty and economic dependency on Israel.[178] Water deterioration has also

[177] Sara Roy. The Gaza Strip: The Political Economy of De-development. Washington, D.C. Institute for Palestine Studies. 1995:163.
[178] Ibid. 13.

significantly affected grazing areas and animal husbandry. On the other hand, as mentioned above, industrial growth in Gaza has been slow. As a result, labor moved to wage employment in Israel rather than moving to other sectors of Gaza's economy. By 1994, more than 140,000 out of 2 million Palestinians had at some point worked in Israel.

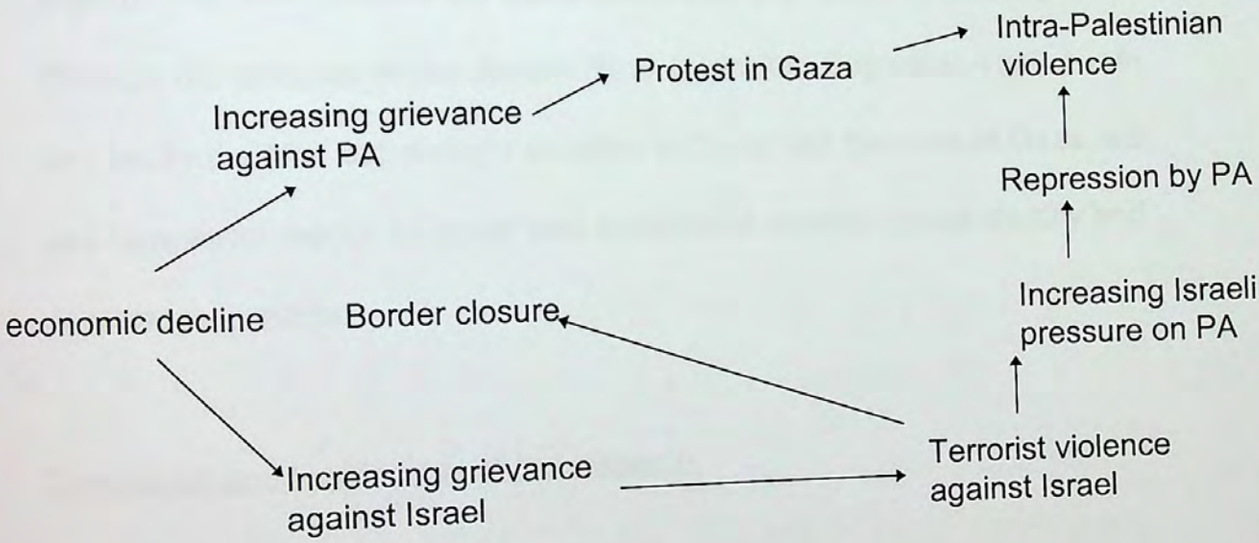
As a result of this economic decline in Gaza, the hardship faced by Gazans increased. It further fed strife between Palestinians and Israelis as well as amongst themselves. It also contributed to the dissatisfaction with Arafat's regime. The following figure demonstrates how the government legitimacy in Gaza is threatened.[179]



[179] Ibid. 19.

The above figure outlines the sources of challenges and threats facing how the legitimacy of the Palestinian Administration (PA) in Gaza. These challenges are triggered by economic decline which results from water scarcity and induce Palestinian groups to revolt against their administration. Here we see a threat to the individual by getting involved in the conflict, as well as to the state by having its authority in jeopardy.

The following figure illustrates the dynamics of conflict in Gaza.[180]



This figure shows how the eruption of violence in Gaza is a vicious circle that starts from economic decline (that starts itself from water scarcity as illustrated in the previous figure). This decline in turn aggravated the frustration of Palestinian people against both the Palestinian Administration as well as Israeli settlers and occupation authorities. These frustrations led

to several situations of scarcity conflicts, deprivation ones as well as group identity ones. In turn, this threatened the security of the individual human being living in Gaza, both the state of Israel and Palestinian Authority as well as offered threats to the security of the Middle East region.

In this chapter we discussed how the Middle East region is highly vulnerable to environmental degradation. We studied the environmental challenges facing the Middle East and their relation to inducing conflict in the region. We then focused on water resources and water related conflicts. Through our analysis of the Jordan River basin, the Euphrates-Tigris basin and briefly the Nile and drought situation in Egypt and the case of Gaza, we saw how water resources could lead to resource scarcity, group identity and deprivation conflicts.

Conclusion and key findings of the research:

As described throughout this thesis, my study focused on exploring what is the link between environmental degradation and scarcities on one hand and conflict situations on the other. My objective was to investigate whether the degradation of the environment and the resulting scarcities are significant contributors to conflict situations and thus can jeopardize security.

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[180] Ibid. 24.

Through the analysis of the link between the two variables as well as the analysis of some situations in the Middle East, Egypt and Gaza, my key findings are the following:

1. Scarcity of renewable resources (whether through a shortage in supply or degradation of the quality) such as cropland, fresh water and forests do produce civil strife, could induce violent conflict and instability. Environmental scarcities and degradation often generate intermediate social effects, such as poverty and migration, what aggravate tensions among different ethnic, cultural and religious groups, increase wealth and power deferencials among them and weaken political and social institutions. This ultimately, threatens the security of the states and individuals living where such situations exist.

2. Environmental degradation and scarcities are often caused by the depletion and deterioration of renewable resources, the increased demand for them and / or their unequal distribution. A pie metaphor illustrates this effect strongly. A decrease in the quantity or quality of the resource shrinks the pie and thus some groups get portions too small to sustain their well-being and therefore struggles emerge for survival.

Applying these conclusions to the Middle East region, Gaza and Egypt, we find that they are on the verge of an environmental crisis. Everywhere, the traditional economic system dominating in the region is undermined by the degradation of soil, water and vegetative resources: erosion of rain-fed farmland and overgrazed pastures, salination of irrigated valleys as well as pollution and depletion of surface and underground water resources. These processes are intensified by the soaring rate of population growth. As a result, huge numbers of people, are driven off their land, and migrate into cities that lack essential infrastructure and offer few prospects for employment. This intensifies gaps between groups, polarizes group identification and contributes to conflict situations among different groups.

At the core of the issue here is fresh water resources. For, although some of the countries of the Middle East are oil-rich, nearly all are water scarce countries that are poor and getting poorer. Reasons behind that are mainly increasing scarcities of supplies and degrading quality, as well as inappropriate usage patterns. Equally turbulent are the issues regarding the division of the Nile River waters between Egypt and the other riparian states, especially Ethiopia. Also, the case remains that unless an alternate source of fresh water is developed, water scarcity in Gaza will continue to place restrictions on the economic development of the area and threaten political

and social stability there. Despite the fact that rivalries over water are widespread in the region, they are not insoluble. In fact, the common need for water presents a challenge and an opportunity for regional cooperation that can result in a net gain for all. States in the region need to think win-win and not in a zero-sum game mode. Adopting the win-win mode of thinking and acting, states will need to focus on solutions that accommodate the interests of all parties involved and do not harm any of them. The process will not be easy, especially when we take into consideration the heritage of war in the Middle East, however, the pay off will be worth it; the security of all the people in the region.

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CHAPTER 2

THE CONCEPT OF SECURITY

Security As A Socially Contested Concept:

The concept of "security" lies at the core of many approaches to studying international relations and is central to the realities of the international political environment.[14] Many analysts, academics and practitioners build their theories and policies and defend them on the basis of security needs. In the following part, I define the concept of "security" in order to discuss the issue of national security and how it can be affected by environmental degradation. To do this, my research examines the different approaches to define security and looks at the concept from several points of view.

"Security" is an abstract concept that is subject to a variety of interpretations. The usefulness of this abstract concepts lies primarily in the discussions and controversies it provokes that lead to new insights and perspectives and not in conveying a precise meaning.[15] Many scholars like

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[14] Scott W. Thompson, et al. ed. Approaches to Peace: An Intellectual Map. (1988), 286.
[15] Marvin S. Soors. "Global Change, Environmental Security and the Prisoner's Dilemma" Journal Of Peace Research, vol. 31 no. 3. (1994), 320.

Barry Buzan believe that it is fruitless to attempt to define security precisely for it is a "contested concept".[16] According to him, a contested, value-based social concept contains a variety of normative, subjective and ideological dimensions that generate continuous debates about its meaning. For these scholars, the utility of the concept of "security" lies in its ambiguity and absence of a clear cut definition especially when it is used as a justification for political and military actions.[17] In attempting to define "security", an interesting finding is that despite the fact that there is a large and growing set of literature on security issues, the concept "security" itself is rarely directly addressed. This is true especially when we attempt to discuss situations other than the interests and policies of specific actors that do not emphasize the military dimension.[18]

However, both academics and policy makers tend to consider the concept of "security" either as a derivative of the concept of power or as a consequence of peace. Security can be a derivative of power in the sense that an actor's security derives from possessing adequate power to achieve dominance as in the case of a hegemony. It can be a consequence of peace in the sense that a long lasting peace or status quo of absence of war

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[16] Brian L. Job. ed. The Insecurity Dilemma: National Security of Third World States. (Clorado: Lynn Reinner Publishers, Inc., 1992), 14.
[17] Dietrish Fisher, et al. Winning Peace: Strategies and Ethics For A Nuclear-Free World. (New York: Crane, Russek & Company, 1989), 189.
[18] Barry Buzan. People, States, and Fear: The National Security Problem in International Relations. (England: Harvester Press Ltd., 1983), 2-3.

or aggression provides security. However, many argue that a more developed concept of security lies between the two poles of power and peace. According to this view, we consider security as a companion to, rather than a derivative of, power, and a prior condition to peace than a consequence of it. Still, this does not fully define what is meant by the concept "security". Thus, this view still reflects an underdevelopment of the concept. In the following section we attempt to analyze why the concept of "security" is underdeveloped and how this underdevelopment of the concept affects reaching a clear cut definition for it.[19]

The Underdevelopment of The Concept of Security:

Barry Buzan lists five main reasons to explain why the concept of security is unexplored and thus underdeveloped. The first reason is that the concept of security is too complex to attract analysts. Despite the value of this premise, it should be noted that the concept of security is not more difficult than other social concepts, whose utility lies in their ambiguity stimulating theoretical discussion about them.[20] The fact that such social concepts cover a whole domain rather than just one fixed point contribute to the difficulty of defining them in any general sense. Therefore, social

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[19] Ibid.
[20] This is true of almost all contested, value based social concepts, as justice, democracy, equality, etc... .

concepts such as security can be defined in reference to particular cases as they indicate a domain of interests and not just a particular condition.

The overlap between the concepts of security and power offers the second explanation for the neglect of the concept of security. This overlapping situation resulted from the dominance of the realist school of international relations, the bipolar structure of the international political system after World War II and the rivalry between the two camps headed by the USA and the USSR during the years of the Cold War. Influenced by the pressures resulting from these situations, states seemed to be blocked into a power struggle and security just slipped into a subordinate role and thus became regarded as a derivative of power.[21] The third reason for the overall conceptual underdevelopment of the concept of security stems from the different dissents against the dominance of the realist school, where none of its advocates was passionate or tolerant of the idea of security defined in any terms other than power advantage and the sole emphasis on military aspects. The focus of strategic studies on military dimensions presents the

[21] Realists in general view security as enhanced by the accumulation of power by one actor to the expense of others. This situation creates a security dilemma, as every actor works to accumulate more power than the others, and in doing so others will react, usually individually, as realists view main actors to be sovereign states. In turn, each actor (sovereign state) will try to accumulate more and more power. The resulting situation will be a pursuit of power in which the security of each actor is defined at the expense of others and thus the conclusion will be the increasing insecurity of the whole.

fourth explanation for the conceptual underdevelopment of security.[22] This premise is further explored below.[23] The fifth reason for the neglect of security rests on the argument that practitioners maintain its ambiguity as a justification for actions and policies.[24]

This underdevelopment of the concept of "security", mainly due to the above outlined reasons, resulted in a commonly held view of "security" defined primarily in military terms. For several decades the conventional use of the term "security", in the domain of the studies of international relations as well as that of foreign policy, has been synonymous with the ability of a sovereign state to defend itself against aggression, either from other states or from challenging groups within its borders. Nowadays, this conventional view is too narrow. It focuses on one source of challenge to security ignoring many others. In a generic sense, to be secure implies freedom and protection from serious threats to human well-being. Accordingly, whatever poses a threat - be it in military, economic, resources,

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[22] The field of strategic studies and thinking dates almost 2500 years back to Sun Tzu, the Chinese philosopher. Modern strategic studies emerged in the 1950s as a result of the competitive deployments of nuclear weapons. According to Barry Buzan, "the distinctive identity of strategic studies stems from its focus on military strategy. Strategy can be broadly defined as the art or science of shaping means so as to promote ends in any field of conflict: for strategic studies, the means to be shaped are military ones". Thus, the academic field of strategic studies addresses issues of the high politics of war and peace and focuses almost on military considerations. Bary Buzan. An Introduction to Strategic Studies: Military Technology and International Relations. (London: Macmillan Press, 1987), 1-3.

[23] This is in the section on the dimensions of security.

[24] Buzan. (1983), 6-9.

health, food or environmental sense - is deemed as a security issue.[25] Hence, the need to broaden the definition of the concept "security" beyond its traditional geo-political and military focus is increasingly realized and gaining support. In this case, security will take into account other threats and challenges seriously jeopardizing human well-being. Throughout this research I adopt this broad and wide definition of the concept "security".

Levels of Analysis:

A great deal of ambiguity is inherent in dictionary definitions of the concept of "security". By referring to such ideas as danger, safety and freedom from doubt, these reference threats are very vague and encounter subjective judgments which makes security a relative concept. This is true in regards to the three levels of analysis of international relations; namely the individual level, the state (national) level and that of the international system. Factors involved in defining security are complicated and often plagued by the distinction between objective and subjective evaluation. This is the dilemma of feeling or perceiving oneself as insecure and in fact being insecure. Again, the dilemma is true of all three levels of analysis. To have an understanding of the complex concept of security, we need to answer such questions as: what is the reference object of security; i.e. the security

[25] Soroos. (1994), 318

of what? what are the necessary conditions for security? and how do we define security? Moreover, as we discover that security has many reference objects, we will discover a strong link between the reference object of security and its necessary condition. This is because each object has its own perception, priorities and understanding of what it means to be secure.[26]

The objects of security multiply not only as the membership of the society of states increases, but also as we move down through the state level to that of the individuals and beyond it to the one of the international system. As a consequence of current globalization trends and increasing interdependence, it is increasingly recognized that the security of any one reference object or level cannot be achieved in isolation from that of the others as the security of each becomes a condition for the security of all.[27] Thus, as we adopt a broad definition of security that includes serious threats to the well-being of our reference object (be it the individual, the state or the international system), the conditions of security will also to be broadened and therefore it becomes a necessity to consider threats that are not in the domain of military affairs and power structure.

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[26] The argument is that if the reference object of security is a country, it may be secure from external threats or occupation and at the same time it may be insecure about its culture, values and norms. This is due to being exposed at the level of the international system as a whole. In this case, such a country enjoys territorial security but suffers from cultural insecurity.

[27] Buzan. 1983, 13-19.

My argument is that one such relevant threat or challenge to security (cutting through the three levels of analysis) is offered by the degradation of the physical environment. The physical environment is the support system to all human activities and the physical mellieu of the three levels of analysis. The degradation of the environment and the resulting consequences do not only present a threat to the security of all three levels of analysis, but also offers a threat to the very survival of all units. Accordingly, the term "environmental security" is gaining an expanding attention and many analysts are now genuinely considering threats to security resulting from the degradation of the physical environment.

Trying to define security, we also need to be aware of some other important aspects such as the political context of security, the several dimensions - political, military, economic, social or environmental - within which it operates, as well as the new trends in defining security.[28] By focusing on these three frameworks we are in fact focusing on the national and international levels and dimensions of security. However, the individual level should not be neglected or ignored but given special attention and analysis. After all, no reference object or level of analysis can achieve its security at the expense of that of the others.

The Political Context of Security:

Traditionally, the principle political context for international security is the anarchic structure of the international system embodied in the absence of a central government. The context of anarchy suggests three major suppositions that come to mind when we discuss the concept of international security. These are:

1. States are the main object of security as they are considered to be both the framework of order and the highest source of governing authority. This explains, to a great extent, the dominating policy concern with "national security".

2. The dynamics of national security tend to be highly relational and interdependent between states, and external threats will always comprise the major element of the national security problematic. Thus international security is traditionally best used to refer to the systemic conditions influencing the way in which states make each other feel more or less secure. In the light of this framework, individual state security has to be considered in relation both to

[28] Ken Booth. ed. New Thinking About Strategy And Security. (London: Harper Collins Academic, 1991), 31,

each other and to large patterns of relations in the system as a whole.

3. Given the durability of anarchy, security has to be considered within a political environment in which relations are competitive. As a result, security is seen to be dependent on either harmony or hegemony and thus cannot be permanent and therefore, it can only be relative and never absolute.[29]

These three suppositions helped feed the dominance and prevalence of the military dimension of security, that in turn became synonymous with national security. This issue is further discussed below.[30] This assumption of international anarchy rests on the concept of national sovereignty and the reluctance of governments to relinquish any of their hard won sovereign rights.[31] This anarchic context also fed the tendency of states to pursue their interests regardless of that of others or that of the system as a whole. This tendency in itself contributed to environmental degradation and to the deterioration of the quality of the physical bio-sphere.

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[29] Booth. (1991), 34.
[30] See below for new trends in defining security.
[31] Micheal Renner. National Security: The Economic And Environmental Dimension. (Washington, D.C.: World Watch Institute, 1989), 39.

Dimensions of Security:

There are five main dimensions to the concept of international security: military, political, economic, societal and environmental. Military security is concerned with the interplay of the armed offensive and defensive capabilities of states and their perceptions of each other's intentions. Political security is concerned with the organizational stability of states, government systems and regimes, as well as the ideologies that give them legitimacy. Economic security deals with the access to the resources, finance and markets necessary to sustain acceptable levels of welfare and state power. As for societal security, it concerns the sustainability, within acceptable conditions for evolution, of traditional patterns of language, societal values and life-style. In addition, it may also mean individual freedom from hunger, need, want, etc... . Thus, there is an area of overlap between societal and individual security. This is understandable as the individual is the forming unit of a society and accordingly if the security of a society is endangered, that of its forming units will be also threatened. Environmental security is concerned with the maintenance of the planetary biosphere as the essential support system on which all other human enterprises depend. Discussing and analyzing these dimensions is often referred to as studying the scope and content of the concept of security.

It is important to recognize that these dimensions do not operate in isolation of each other.[32] Each dimension affects and is affected by the other in an inter-connected web of interactions. Therefore, security should be defined in a holistic way and its dimension will determine the focus, circumstances and issues at hand.[33] Moreover, although the definition of security has been dominated for several decades by the military and the political dimensions, new challenges in the post Cold War era necessitate a shift towards other aspects. A dimension that should be seriously further examined, as it challenges the survival and welfare of life on Earth, is that offered by environmental degradation and the resulting consequences. It is worth noting that without environmental security and with the current trends of environmental degradation we are increasingly becoming insecure in regards to the rest of the dimensions of security. The coming chapters examine this argument further.

The Dominance of the Military Orientation:

The military dimension of security has attracted more attention, compared to the other five ones, in both the thinking and research about the concept. Many attribute this to be a consequence of the fact that throughout

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[32] Booth. (1991), 35.
[33] For example, if the focus is on the incapability of the biosphere to sustain human activities then we are studying environmental security.

modern European history and during the decades of the Cold War the idea of security was formulated to reflect a set of challenges and threats that were usually, though not exclusively, external to the state.[34] As a result of the predominance of the military dimension, thinking about international security has become heavily concentrated in strategic studies, that is in fact a sub-field of security. This contributes to the underdevelopment of the concept of security for two reasons. First, because of the almost exclusive focus on military aspects, the field of strategic studies is not rich enough in terms of expertise required for security analysis that does not fall in the domain of the military dimension, and thus the study of security is geared towards the military arena ignoring the other dimensions and leaving them inadequately explored or developed. Secondly, as it has immediate policy implications and linkages, strategic studies encounter strong ethno-centric tendencies and affiliations that push analysts towards the interdependent aspect of national security among states and the systemic aspects of the concept.

Therefore, the identification with strategic studies may be argued to have doubly prevented and curtailed the development of the concept of security. Taking into mind these facts, we can adopt with confidence Barry Buzan's argument that the proper domain of the concept of security lies in

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[34] Job. (1992), 50.

the much broader field of international relations. In the field of International Relations, we find the necessary conditions and the range of expertise as well as the scope of interest needed for the full development of the concept of security.[35] Defining national security primarily in military terms does not only cause analysis to focus only on military threats and neglect others but also contributes to the militarization of international relations what increases global insecurity, especially in the long run.[36]

As stated above, the concept of security has social, economic, political, military and physical dimensions including ecological and environmental challenges. Thus, it may be defined in terms of any of them. We also pointed to the primacy of the military dimension in the study of security and the associated debate about its usefulness and contribution to the development (or under-development) of the concept of security. Another related point concerns the debate on whether the long or the short term considerations of the above mentioned sectoral components of security deserve priority. For the advocates of the military dimension, security is mainly about military-political threats in the short run. For them, to define security more broadly to include long term environmental challenges will be diluting and alleviating the nature of the concept itself. In their view, if at all these long term challenges actually exist, they will eventually present

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[35] Booth. (1991), 35-6

themselves, in terms of their consequences, as short term military-political concerns.

On the other hand, there are also some analysts who adopt the argument of the special relevance of environmental factors, economic productivity, demographic trends, and resource supply to the creation and influencing of the conditions of security.[37] Here, I advocate the argument that environmental degradation and the resulting trends, as those of global warming, desertification, etc... will lead to changes in demographic trends, resource allocation, and economic production and thus contribute to insecurity. In this case, insecurity will be mainly due to the accompanying social disturbances of the situations and the consequences resulting from environmental degradation and scarcities. Accordingly, I adopt throughout my research the view of this group of analysts who advocate the broadening of the scope and the theoretical framework of the concept of "security".

Security in Relation to the Sources of Threats:

Another useful dimension to help defining security is by discussing it in relation to specific threats. On the three levels of analysis, there are some threats about which each reference object can achieve high levels of

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[36] Richard H. Ullman. "Redefining Security" International Security, Summer 1983:129-53.

security. However, there are also threats towards which each unit or object feels insecure, especially those ones where cause-effect relationships are obscure. Usually, analysts interested in studying the concept "security" in its broad sense tend to focus on what is viewed to be social threats; i.e. those originating from a situation where people find themselves in an environment with unavoidable social, economic and political consequences and hardship. This tendency can be explained by the premise that in such situations important links between security and between both the individual and the national levels do exist clearly.

Social threats to the individual present themselves in a variety of forms. However, four basic types are most obvious:

1. Physical threats that may result in pain, injury, or even death;
2. Economic threats as in the seizure or destruction of property and the denial of access to resources;
3. Threats to rights as in imprisonment and denial of civil rights, and
4. Threats to position or status by public humiliation for example.

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[37] Job. (1992), 15.

What needs to be emphasized here is the fact that none of these threats is by any means exclusive, and thus they can happen at the same time and can even induce each other.

On the state level, there are in general three types of threats to security:

1. Threats to the physical base of the state, such as in the case of foreign interference or aggression, and wars where there is the risk of losing territory, large numbers of the population, and in the case of loss of resources by their depletion for example;

2. Threats to the institutional expression and organization of the state. This is basically as in the case of challenges to the regime as offered by separist groups, ethnic or religious conflicts, coups d'etats or revolutions; and

3. Threats to the idea of the state itself for as the state is more a metaphysical entity - an idea held in common by a group of people (the population of that state) - the idea itself becomes a major object of national security, and this establishes a framework for the link between nations and state. This is in short how citizens view

their state, its coherence, the legitimacy of the regime and the extent to which they are supportive to their governments.

What we notice is that there are common as well divergent traits and qualities of different states. Because of the difference among states and the effects this difference has in determining their relations with each other, the concept "national security" can not be defined in any general sense or have the same meaning for different states. Therefore, the meaning of security varies according to and is as diverse as the conditions of different states to which it applies. Each state has its security agenda, priorities, perceptions, definitions and its own interpretation of perceived threats. This adds to the difficulties in analyzing the concept of security and offers an obstacle to its use in any general sense.[38] Thus, if we are to analyze national security we have to study the relation of states to their environment and each other, and here comes the third reference object; the international system.

The above sections show that insecurity reflects a combination of threats and vulnerabilities which cannot be separated. They also show that it is only when we capture a reasonable understanding of the nature of these threats and the vulnerabilities of the objects of study, we can establish a sense of what security is. The dichotomy between threats and

[37] Buzan. (1983), 18-44.

vulnerabilities draws attention to the argument that units can seek to reduce their insecurity either by reducing their vulnerability or by preventing or elevating threats. Generally, a situation of insecurity will often arise when there is a combination of threats and vulnerabilities. Therefore, the pursuit of security involves reducing, if not eliminating, possible insecurities resulting from these two phenomena.

A threat is argued to be present when possible developments on a certain issue will be harmful to the security of the object of analysis if they occur, and a vulnerability is when this object lacks the means to limit the harmful impacts of threatening events.[39] Moreover, threats to the state can take a variety of types, that can be identified by sector and are analogous to the above mentioned dimensions of security[40]. Richard Ullman defines a threat to national quality and the relation between threats and security as "an action or sequence of events that (1) threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of a state or (2) threatens significantly to narrow the range of choices available to the government or a state or to private non-government entities within the state."[41]

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[38] Ibid.
[39] Soors. (1994), 321.
[40] These dimensions are outlined in page 19 above.
[41] Ullman. (1983), 133.

Adopting the above definition and taking into consideration the theory of threats and vulnerabilities, the issue of environmental degradation presents itself as one of the sources of insecurity in the coming decades. Environmental degradation threatens the security of the individual, can result in threats to the physical base of the state and ultimately disturbs the security and peace of the international system. Ecological problems can also offer threats to national security as they damage the physical base of the state. In addition, these challenges and threats have trans-boundary effects what may trigger conflict situations among states to emerge.[42] In addition, as no state or individual can manipulate the physical environment or even stop its degradation by any unilateral action, the vulnerability to environmental changes is increasing with the increase in the range and magnitude of the deterioration of the physical support system.

In addition to sectors, threats to security can be differentiated along other lines. They may vary according to the source they come from which can be either internal or external. Internal threats have their origin in the internal structure and fabric of the state itself. They can be threats from separatist groups, terrorist ones, the dysfunction of the system, the dissatisfaction of the population with the regime, the lack of a sense of belonging or solitude among the population or the use of unclean

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[42] Buzan. (1983), 65-82.

technology at manufacturing sites. External threats on the other hand are those that originate from outside the state; examples include foreign aggression and fluctuating international market prices. Some threats may have both internal and external origins, as in the case of ecological threats and ideological ones. Threats may also differ along the line of intensity, although in this case we risk subjective considerations.

Further, we need to realize that the character of threats themselves does not remain constant over time. It changes in response to both new developments in the means of threats (technology of warfare for example), and evolution altering the nature of vulnerabilities.[43] Therefore changes in the definition and perception of threats also influence the definition of security. The fact that the concept of security is defined not exclusively as a goal but also as having consequences makes it important to recognize the significance of defining it by its challenging threats.[44]

New trends in defining Security:

The above discussion outlines how difficult it is to define the concept of security. The above also helps to clarify that security depends on many factors other than the disposition of military power. There are intangible

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[43] Ibid. (1983), 82-4

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