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## **ENVIRONMENTAL SECURITY: IS ENVIRONMENT A SECURITY THREAT?**

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### **Abstract**

The evolving concepts of environmental security are debated in the discourse of security studies. Major theoretical paradigms of international relations have been quite successful to interpret the practical security problems arising from environmental and climatic changes. Academics and practitioners have started exploring the security implications of the changes at various levels. This paper explores how environmental degradation poses significant challenges to security. It reviews both traditional and nontraditional schools of thought of security studies. The paper examines the conceptual linkages between environment and security, focusing on the contributions of the constructivist school of thought in the construction of the idea of environmental security. It also examines the contribution of other schools, and acknowledges the importance of environment-threat-vulnerability framework that establishes the relationship between environmental degradation and potential conflicts. It works with a small set of empirical information to explain the prevalence and effects of ecological degradation and climate change, and national and international policy responses to address the threats. This paper concludes that environment is a significant threat to security.

### **Introduction**

Environment is increasingly being associated with non-conventional notion of security. Considering environment as a threat to individual, national or global security has created a new agenda in the discourse of security studies. The widening of the scopes of international security includes environmental degradation, global warming and climate change. These issues have extended the understanding of global change, conflict and vulnerability, and explored the roles

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of conservation and sustainable development in promoting peace, stability and human security.<sup>1</sup> This is broadly considered as environmental security.

The legacy of understanding environmental security is two-fold. First, one has to understand the transformations in the theoretical developments of the concept 'security'. Second, one has to envisage the link between environmental change and livelihood strategies of human being, and the impact of environmental changes on a society. These two dimensions help to portray environmental issues as important concerns for security. The academic strength of environmental security and its current position in the international security discourse largely depend on some questions. What is security? Whose security is talking about? What counts as a security issue? How can security be achieved?<sup>2</sup> Exploring straightforward answers to the questions is critical to the contemporary research in security studies. However, environmental security offers an intricate relationship between the contemporary environmental changes in the world and the scopes for transnational/global threats and cooperation.

It is in these contexts that the research question of this paper is: is environment a security threat? The paper explores how environmental degradations pose significant challenges to security. It argues in favor of a revised framework of security that includes environment as a referent object of security. It reviews conceptual approaches of security - both traditional and nontraditional schools of thought. The paper explains the conceptual linkages between environment and security through theoretical viewpoints. It focuses on the contributions of the constructivist school of thought (securitization) in the creation of the idea of environmental security. It explains environment-threat-vulnerability framework that clarifies the relationship between environmental degradation and potential conflicts. The paper presents empirical data to discuss the prevalence and effects of ecological degradation and climate change, and national and international policy responses to address the threats. The paper concludes with the argument that environment is a significant threat to security.

### **Conceptual understanding of security: the making of an alternative security discourse**

With the demise of bipolar rivalry in the early 1990s, the study of international security was elevated to a new dimension. The new and unconventional notion of security considered that the traditional notion of state-centric military security was insufficient to explain emerging threats. As an alternative to the conventional understanding of security affairs, human security

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<sup>1</sup> Richard Matthew and Brian McDonald, "Networks of Threats and Vulnerability: Lessons From Environmental Security Research", *ECSP Report*, Issue 10, 2004.

<sup>2</sup> Paul D. Williams (ed.), *Security Studies - An Introduction*, New York: Routledge, 2008, p. 5.

discourse incorporated diverse threats to an individual's life. Thus, the security discourse had experienced a shift from traditional to nontraditional security.

The traditionalists, backed by political realism, define security in terms of power.<sup>3</sup> The meaning is closely linked to the military capability of a state. This concept of security is challenged by the post-realists. Redefining the concept of national security has been a prime target of many research agenda since the 1980s. Nontraditional security (NTS) is a significant paradigm shift from the conventional idea of national security. The NTS concept 'widens' and 'deepens' the conventional understanding of security. Security nowadays includes poverty, economic insecurity, environment and climate, health, and various other social problems as threat factors. 'Wideners' discuss the scope of the security studies and have included diverse issues as part of the security affairs. On the other hand, 'deepeners' discuss the focus of security (i.e. whose security is being threatened).<sup>4</sup> Furthermore, there are threats that do not create risks only for a single state. These are transnational security concerns such as ethnic conflict; proliferation of weapons of mass destruction; political and ethnic instability; and drug and human trafficking.

The Copenhagen School, led by Barry Buzan and Ole Waever, has developed a framework called securitization to conceptualize security. The framework introduces a social-constructivist perspective that considers how problems are transformed into security issues.<sup>5</sup> The School has established the hypothesis that security can be understood as a result of 'speech acts' through which perceived problems become a national and international security threat.<sup>6</sup> Securitization quite successfully labels an issue as its prime concern and transforms the way the issue is dealt with. According to the concept of securitization, security problems are transformed into existential threats that require exceptional, emergency, and rescue measures. These measures include new ideas that may contradict the traditional rules of governance. A kind of 'political manipulation' is present in the whole process of convincing the concerned actors that environmental change is a significant security matter. Buzan and Waever have projected their logic to establish the idea that security is a socially constructed concept. They have proposed a different methodological survey to study security, focusing on the details of specific issues such as poverty, environment, climate and their

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<sup>3</sup> Colin Elman, "Realism", in Paul D. Williams (ed.), *Security Studies - An Introduction*, New York: Routledge, 2008, p. 16.

<sup>4</sup> Sarah Terry, *Definition Security: Normative Assumption and Methodological Shortcomings*, Canada: University of Calgary, 1998, p. 1.

<sup>5</sup> Barry Buzan, Ole Waever and Jaap de Wilde, *Security. A New Framework for Analysis*, London: Lynne Rienner, 1998, pp. 24-27.

<sup>6</sup> John L. Austin, "How to Do Things with Words", *William James Lectures*, Oxford: Clarendon Press, 1962.

interrelation with the ‘locus’ of security.<sup>7</sup> Locus refers to the context and framework of security.

Buzan and Waever have also discussed the nature of security as a self-referential practice. Through the process of securitization, a potential issue may transform into a security matter. It may happen not necessarily because a real existential threat exists but because the issue is presented in such a way that creates an image of security.<sup>8</sup> Followers of this school of thought advocate that security is a speech act. The process of securitization is a methodological task ignited by the stakeholders (securitizing actors) who speak in favor of the particular issue and debate it so that the image of the issue is built as a proper referent object of security. Thus, the Copenhagen School explores “one of the most innovative, productive and yet controversial school of thoughts in contemporary security studies.”<sup>9</sup> The School has done quite a large amount of research on the nature of the securitizing actor, the scope of the diverse context and the framework of the act.<sup>10</sup> Actors can talk or do anything logical about the particular referent object.

Simultaneously, no single actor conclusively holds the credit of securitizing the issue. Therefore, when an issue is securitized, it reflects the institutional and individual hierarchy that exists in the society. In other words, the socially constructed nature of the society is very much reflected in the securitization process of any particular issue. Typical examples of securitizing actors include political leaders, bureaucrats, governments, media, lobbyists, and various pressure groups. Along with the actors and the environment (context of securitization), another significant factor is the audience who will be at the receiving end of the securitization process. According to Buzan and Waever the “securitizing move” will only be successful if the audience accepts that there is an existential threat to a shared value.<sup>11</sup> In a nation-state, the government is mainly in the driving seat of the securitization process. Buzan and his colleagues have agreed that government is usually the speaker for and promoter of security for a society and a state at large. It is a part of the national responsibility that the

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<sup>7</sup> Rens van Munster, *Logics of Security: The Copenhagen School, Risk Management and the War on Terror*, Denmark: Political Science Publications and University of South Denmark, 2005, pp. 3-5.

<sup>8</sup> Barry Buzan, Ole Waever and Jaap de Wilde, *Security- A New Framework for Analysis*, London: Lynne Rienner, 1998, p. 27.

<sup>9</sup> Michael C. Williams, “Words, Images, Enemies: Securitization and International Politics”, *International Studies Quarterly*, Issue 47, No. 4, 2003, pp. 511-531.

<sup>10</sup> Matt McDonald, “Securitization and the Construction of Security”, *European Journal of International Relations*, Vol. 14, No. 4, 2008, p. 563.

<sup>11</sup> Barry Buzan and Ole Waever, “A Slippery- Contradictory- Sociologically Untenable- The Copenhagen School Replies”, *Review of International Studies*, Vol. 23, No. 2, 1997, pp. 241-250.

government feels mandated to it. Securitization can, thus, be seen as an extreme version of the political matter.<sup>12</sup>

“Wideners” have significantly contributed to expand the scope of security. Apart from the state-centric idea of national security that scholars of international relations and security studies have mostly dealt with, issues of “societal security” is very significant at the moment. An issue is a matter of concern under societal security if a society perceives it to constitute an existential threat to the society. Similarly, it becomes necessary that society perceives/constructs the issue as a security concern. This implies that a society can also ‘desecuritize’ an issue (i.e. cease to perceive it as a threat).<sup>13</sup> Richard Ullman widened the concept with non-military threats including threats to the quality of life of its citizens in a society.<sup>14</sup>

Defining non-military threats has become a challenging task for the scholars. In the International Conference on the Relationship between Disarmament and Development by the United Nations General Assembly in New York, this was addressed for the first time that non-military threats to security had moved to the forefront of global concern. Underdevelopment and declining prospects for development as well as malgovernance and waste of resources constitute challenges to security. The new methodology to study security includes another significant concept - ‘development’. Professor Amartya Sen has argued that environmental change can undermine human development, which is important for economic growth and human security.<sup>15</sup> If economic development is not ecologically sustainable, it is true that national security cannot be equally sustainable.

### **Is environment a security threat?: linking environment and security**

Literature on environmental security has introduced an interdisciplinary perspective into security studies. Environmental security has explored the interactive dynamics of the diverse human and natural networks that constitute the modern world.<sup>16</sup> Besides, environment has strategic significance for nation states. Nation states create their power base on the natural resources like water, oil, gas and various other natural energy sectors. Increasing state-control over

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<sup>12</sup> Barry Buzan, “A Rethinking Security after the Cold War”, *Cooperation and Conflict*, Vol. 32, No. 1, 1997, pp. 5-7.

<sup>13</sup> Mathias Albert, “Security as Boundary Function: Changing Identities and Securitization in World Politics”, *The International Journal of Peace Studies*, Vol. 3, No. 1, 2008, p. 1.

<sup>14</sup> Richard Ullman, “Redefining Security”, *International Security*, Vol. 8, No. 1, 1983, pp. 129-145.

<sup>15</sup> Amartya Sen, *Development as Freedom*, USA: Alfred A. Knopf Incorporated, 1999, pp. 175-191.

<sup>16</sup> Richard Matthew and Brian Mcdoland, “Networks of Threats and Vulnerability: Lessons from Environmental Security Research”, *ECSP Report*, Issue 10, 2004, p. 36.

nature has spillover effects on environmental degradation and hence resulted in undue catastrophes such as uncontrolled migration, demographic fall, and human casualties. These catastrophes have become real security concerns today. Traditionally, realist understanding of security does not include environment as its matter of concern. On the contrary, post-realist schools of security studies include environment as an important security concern. For example, constructivism provokes new thoughts in the security studies. The contribution of the Copenhagen School, influenced by constructivism, not only transforms the perspective in academic thoughts of national security, but also changes the national and international responses towards addressing environmental policies. Securitization applies the methodology for the analysis of how environmental matters are gradually securitized, gaining a renewed expression in the politico-security agenda.<sup>17</sup> Environmental degradation and its consequences could be prospective referent objects; those are referred by the securitization actors as a potential reason for threat.

A wide range of studies on the relationship between environment and security are available. Shaukat Hassan discusses the relationship between the environmental foundation of a nation and its effect on the economy. According to his argument, continuous environmental calamities will decrease the economic growth of a nation, hamper its social cohesion, and destabilize its political structure.<sup>18</sup> Environmental catastrophes can reduce economic opportunities, causing demographic displacement within states and across international borders. This can raise political tension between neighboring countries. Environmental stress may cause an affected sub-national group to shift its allegiance from the centre to the periphery, increasing the possibilities of political disorder, civil strife and even insurgency. Environmental calamities may trigger policy choices which can catalyze a potential conflict or aggravate an existing one. Environmental devastation faced by a country due to natural calamities, especially those originating from beyond its borders, can sour bilateral relations to the detriment of regional security. Environmental issues may be politically manipulated to serve narrow group interests, which can upset domestic power balances and contribute to political instability.<sup>19</sup> These hypothetical assumptions can cause different and unique kinds of security threats and hamper the stability of an individual, a society or a state. In recent times, environmental challenges such as pollution, excessive carbon emissions and rapid pollution growth increase scarcity of natural resources like water, energy and food across the region. Thus, it may escalate into both intra-state and inter-state conflicts.

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<sup>17</sup> Barry Buzan, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, Boulder: Lynne Rienner, 1991, pp. 19-20.

<sup>18</sup> Shaukat Hassan, "Environmental Issues and Security in South Asia", *ADELPHI Paper*, No. 262, 1991, pp. 5-6.

<sup>19</sup> *Ibid*, p. 6.

Alan Dupont argues that environmental difficulties are unlikely to be the primary cause of major conflicts between states. Environmental issues interact with other sources of conflict to prolong or complicate existing disputes.<sup>20</sup> On the other hand, Jessica Tuchman Mathews argues that environmental decline occasionally leads directly to conflict especially when scarce water resources must be shared. Jessica shows that the impact of environmental decline on nations' security is felt in the downward pull on economic performance and therefore, on political stability. The study of Jessica illustrates that "the underlying cause of turmoil is often ignored; instead governments address the poverty and instability that are its results."<sup>21</sup> The findings are vehemently opposed by Daniel Deudney considering environmental degradation as a reference object of international security. Daniel articulates that the concept of national security, as opposed to national interest or well-being, is centered upon organized violence. He gives the example of natural calamities like earthquakes or hurricanes that cause excessive damage. He opposes the fact that such events are threats to national security.<sup>22</sup> Deudney's analysis is criticized based on the natural disasters of typical kinds which have comparatively fewer effects on the developed countries. The capacity of the underdeveloped countries to tackle these environment disasters is not considered. For example, a cyclone has different post-effects to the United States and to Maldives. A cyclone may devastate Maldives because it has poor capacity for protection and recovery from natural disasters.

On the contrary, Ian Rowlands argues that "any force that has the power to inflict such harm upon a state and kill some of its citizens and displace others, reduce its agricultural output, threaten its water supply, and destabilize its ecological balance, should be received with considerable attention."<sup>23</sup> If remain uncontrolled, the natural disasters could be more threatening and ominous to the underdeveloped states, and would wreak more unmanageable security concern.

Daniel Deudney suggests that applying the concept of securitization in environmental problems is nothing but a convincing act for a statesman or actor who runs the state to legitimize military action to protect the state.<sup>24</sup> Waever and Brock also identify the idea of linking the army and environmental degradation

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<sup>20</sup> Alan Dupont, "The Environment and Security in Pacific Asia," *ADELPHI Paper*, No. 319, 1998, pp. 75-76.

<sup>21</sup> Jessica Tuchman Mathews, "Redefining Security", *Foreign Affairs*, Vol. 68, No. 2, 166.

<sup>22</sup> Daniel Deudney, "Environment and security: Muddled thinking", *Bulletin of the Atomic Scientists*, Vol. 47, No. 3, 1991, pp. 22-28.

<sup>23</sup> Ian Rowlands, "The security challenges of global environmental change", *The Washington Quarterly*, 1991, Vol. 14, No. 2, p. 103.

<sup>24</sup> Ole Weaver, "Securitization and Desecuritization," in R. D. Lipschutz (ed.), *On Security*, New York: Columbia University Press, 1995, pp. 46-86.

as a counterproductive linkage. This is because of the nature of the traditional defense institutions controlled by the state that lack instruments of cooperative measures or support in tackling natural disasters like cyclones or floods.<sup>25</sup> However, this argument may not be feasible to the modern security institutions of many states. Military institutions are now quite adaptive to such situations and develop their capacities to handle the disasters and conduct relief and recovery programs, among other activities. The study of Homer-Dixon contributes a lot to the conflict-oriented approach of environmental security and tries to establish environment as a security concern. The study also shows the links between environmental scarcity and extreme situations of violent conflict. It acknowledges the traditional approach to security focusing on violence, and introduces human-induced environmental degradation as a key driver in causing violent conflict.<sup>26</sup> Furthermore, it considers environment as an important referent object of international security.

The idea of human security plays a significant role in improving the narrow focus of environmental security from conflict-oriented approach. Human security usually concentrates on the security of the individual or groups in a society to ensure their well-being. Human security or insecurity is then a function of multiple factors affecting the well-being of the concerned group. A report by International Union for Conservation of Nature (IUCN) and Organization for Economic Cooperation and Development (OECD) mentions that the human security approach takes the focus away from state-centered interests and highlights the multiple stresses that may cause insecurity and the types of resilience that promote security for individuals and groups.<sup>27</sup> The report justifies this approach by nullifying the distribution and composition of defense forces in the traditional war-like situation. It favors the idea that security and insecurity are closely related to poverty, resource scarcity or social discrimination. This approach also advocates that environment-induced conflict is one of the many factors influencing individual or societal security.

In the areas of environment and security, the study of Steve Lonergan describes the linkages between environmental change and human security. The study addresses a particular case of population displacement and scrutinizes how environmental change and lots of other concerned stimuli contribute to insecurity

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<sup>25</sup> *Ibid.*; L. Brock, "The Environment and Security: Conceptual and Theoretical Issues", in N. Gleditsch, (ed.), *Conflict and the Environment - NATO ASI Series*, Dordrecht: Kluwer Academic Publishers, 1997.

<sup>26</sup> Thomas Homer-Dixon, *Strategies for Studying Causation in Complex Ecological-Political Systems, Occasional Paper*, Project on Environment, Population, and Security, Toronto: The Peace and Conflict Studies Program, University of Toronto, and the American Association for the Advancement of Science, 1995.

<sup>27</sup> G. Dabelko, S. Lonergan and R. Matthew, *State of the Art Review of Environmental Security and Co-operation*, Paris: IUCN and OECD, 2000.



and vulnerability.<sup>28</sup> The study explores the status of environmental refugees as a significant cause for human insecurity that arises because of environmental change. The study also finds that there are many hypothetical statements available regarding the causal relationship between environmental degradation and displacement. The study concludes that it is difficult to identify or isolate precisely the specific role that environmental drivers play in causing the displacement of people.<sup>29</sup>

The traditional security concept does not totally reject the environment as a security concern. Robert D. Kaplan tries to link military metaphors of nature as a hostile force with geopolitical threats to national security. He argues that it is time to understand the environment for what it is: the national security issue of the early twenty-first century. The political and strategic impact of surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, rising sea levels in critical overcrowded regions like the Nile Delta and Bangladesh will be the core foreign-policy challenge.<sup>30</sup>

According to the study of Daniel Deudney, the making of environmental security is an outcome of the causal relations of securitization of the environment and the policy response of the state institutions.<sup>31</sup> The study sets a link between the securitization process and environment, which legitimizes states' policy initiatives regarding the mobilization of different institutions in tackling environment-induced security threats. Environment is, therefore, identified as a cross-border issue that requires a shared responsibility of concerned nation-states. This transnational character of environmental drivers upholds its links with international security. Therefore, securitization is not always able to satisfy all requirements to link the environment and security. It is often a conjugal method of more than one conceptual thought of security that helps to identify environmental changes as a security threat.

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<sup>28</sup> Steve Lonergan, *The Role of Environmental Degradation in Population Displacement*, Global Environmental Change and Human Security Project, International Human Dimensions Program on Global Environmental Change, *Research Report 1*, Victoria: University of Victoria, 1998.

<sup>29</sup> *Ibid.*

<sup>30</sup> Robert D. Kaplan, *Coming Anarchy: Shattering the dreams of the Post Cold War*, New York: Random House Incorporated, 2000, p. 20.

<sup>31</sup> Daniel Deudney, "Environmental Security: A Critique", in Daniel Deudney and Richard Mathew, (eds.), *Contested Grounds: Security and Conflict in the New Environmental Politics*, New York: State University of New York Press, 1999, pp. 187-219.

### **Environment-threat-vulnerability nexus: real security threat**

The environment-threat-vulnerability nexus plays a vital role to prove that environment is a real security threat. This nexus currently gains new momentum due to a number of factors. Two aspects of this nexus are significant. First, the ecosystem integrity is crucial for people's sustainable livelihoods. Therefore, certain environmental conditions - often resulting from environmental change, such as qualitative (pollution) or quantitative (depletion) scarcity of ecosystem services - and also natural disasters can pose an acute threat to security.<sup>32</sup> This perspective on security is based on a broadly understood meaning of the term human security. The idea of human security centers on an individual as the object of security and considers vulnerability as a crucial factor. Environmental security also considers an individual as a significant referent object of security. Environmental degradations and climate change increase an individual's vulnerability. Moreover, environment is linked with international security as it becomes evident that national solutions to environmental problems would not be sustainable in the long run without international cooperation. Besides, there are possibilities of fears from international tensions caused by environmental issues.<sup>33</sup>

The second aspect is the direct relationship between environment and transnational/global conflict. One assumption in this context is that a number of environment-related factors such as environmental degradation, depletion and lack of access to natural resources can lead to the outbreak of violent conflict.<sup>34</sup> Günther Baechler shows how environmental conflicts are characterized by the principal importance of degradation in one or more of these fields: "overuse of renewable resources, overstrain of the environment's sink capacity, and impoverishment of the space of living."<sup>35</sup> He argues in favor of the existence of the environment-violence nexus. It says that "violent conflicts triggered by environment due to degradation of renewable resources (water, land, forest, vegetation) generally manifest themselves in socioeconomic crisis regions of developing and of transitional societies if and when social fault lines can be manipulated by actors in struggles over social, ethnic, political, and international power"<sup>36</sup>. There are attempts to link ecological degradation and resource scarcity as the significant risk factor for a society and a nation. Scarcity

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<sup>32</sup> Jon Barnett and W. Neil Adger, "Climate Change, Human Security and Violent conflict", *Political Geography*, Vol. 26, No. 6, 2007, pp. 639–655.

<sup>33</sup> Lars Wirkus and Ruth Vollmer (eds.), *Monitoring Environment and Security Integrating Concepts and Enhancing Methodologies*, Bonn: Bonn International Centre for Conversion, 2009, p. 8.

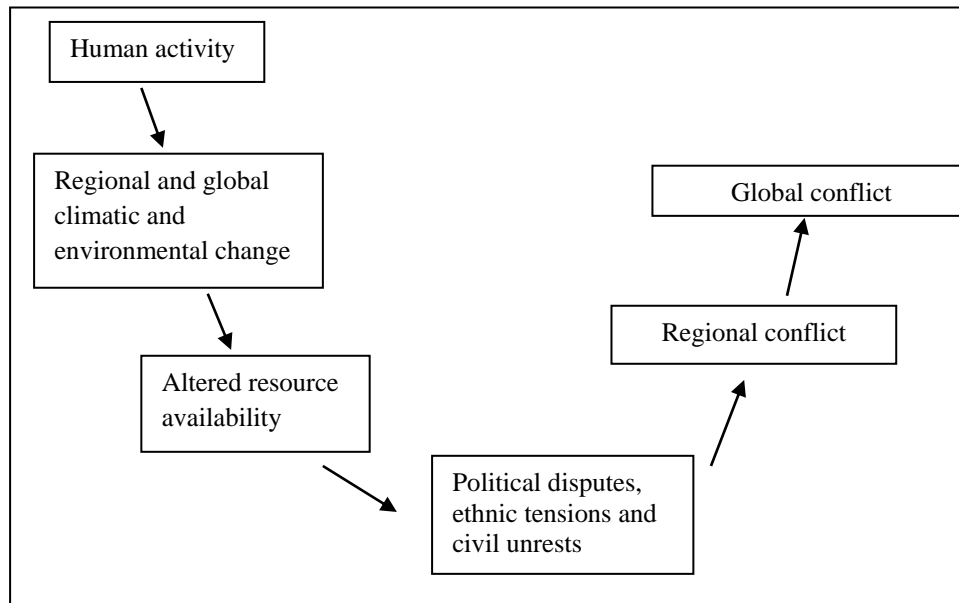
<sup>34</sup> *Ibid.*

<sup>35</sup> Günther Baechler, "Why Environmental Transformation Causes Violence: A Synthesis", *Environmental Change and Security Project Report*, Issue 4, 1998, p. 24.

<sup>36</sup> *Ibid.*, p. 25.

generates more demands for the natural resources. Lack of supply in response to an increasing demand increases environmental risks and bring adverse changes to the world system. The changes raise environment-induced tensions or conflicts. Figure 1 illustrates the potential for economic activity to cause environmental changes that lead to a conflict.<sup>37</sup>

**Figure 1: Environmental routes to conflict**



The study of Chalecki explains how the patterns of human behavior and its interaction with the economic variables of the society can bring climatic changes both regionally and globally. The relevant example is the increase of carbon dioxide gas emission due to large industrialization in many parts of the world. Climate change and ecological degradation hamper the natural flow of resource supply and lead to political disputes, ethnic and civil unrests. As the environmental resources are transnational in nature, conflicts over scarcity of resources can be amplified to regional and global level in the long run. The study of Homer-Dixon investigates the relationship among population growth, renewable resource scarcities, migration and violent conflict and, thus, contributes to frame a model of environment-threat-vulnerability nexus. The study mentions three reasons that relate environment with conflict. These are the degradation and depletion of renewable resources, the increased consumption of

<sup>37</sup> Elizabeth Chalecki, "Environmental Security: A Case Study of Climate Change", in *Pacific institute for Studies in Development, Environment, and Security*, 2009, p. 2, available at [www.pacinst.org](http://www.pacinst.org)

those resources, and their uneven distribution.<sup>38</sup> Population growth is also critical to uneven distribution and increased consumption. The study adds social distribution of resources into the definition of environmental scarcity. Therefore, the link among environment, resource scarcity, conflict, and threat to security is established.

### **Impact of environmental degradation and national and international responses**

The Germanwatch Global Climate Risk Index reveals that more than 650,000 people died worldwide from extreme weather events, and losses of more than US\$2.1 trillion occurred globally since 1990.<sup>39</sup> Available other reports also provide detailed information on environmental degradation and its impact on human life and biodiversity in the 21<sup>st</sup> century: 50 per cent of the forests have been destroyed; only one-fifth of the earth's forests are undamaged.<sup>40</sup> Forest area has increased slightly since 1980 in industrial countries, but has declined by almost 10 per cent in the developing countries. Carbon emission is a big crisis. With the current rates of emissions, the earth will experience an 1 °C (1.8 °F) warming by 2030 at the latest, and a 3 °C (5.4 °F) increase in temperature before the end of the next century.<sup>41</sup> This will have tremendous consequences, such as widespread extinction of plants and animal species, sea level rise and coastal flooding.

It is projected that by 2050, the sea level will rise approximately 1.5 meters, submerging low lying areas like Bangladesh and Maldives.<sup>42</sup> Numbers of storms and other climatic disorders such as hurricanes, cyclones, and typhoons will increase due to global warming. Biological diversity will be severely hampered. There are biological species that will become extinct in the next 20 to 50 years. The ocean plays a vital role in maintaining biodiversity, regulating climate and weather patterns, and providing food and jobs for millions of people worldwide. These roles will be hampered significantly. Coastal areas are increasingly experiencing habitat loss due to sea level rise and severe storm events. Due to the rise in temperature of the sea water, the intensity of extreme weather events such

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<sup>38</sup> Betsy Hartmann, "Population, environment and security: a new trinity", *Environment and Urbanization*, Vol. 10, No. 2, 1998, pp. 116-117.

<sup>39</sup> Sven Harmeling, *Global Climate Risk Index 2011: Who suffers most from extreme weather events? Weather-related loss events in 2009 and 1990 to 2009*, Berlin: Germanwatch, 2010, p. 5.

<sup>40</sup> The World Revolution 2010, available at <http://www.worldrevolution.org/projects/globalissuesoverview/overview2/EnvironmentNew.htm>, accessed on 20 November 2010.

<sup>41</sup> *Ibid.*

<sup>42</sup> *Ibid.*

as hurricanes, typhoons and cyclones is expected to rise.<sup>43</sup> Climate change and ocean acidification create negative impacts on marine and coastal ecosystems. This degradation is caused by over-fishing, pollution, coastal destruction and declining water quality, which is already limiting coastal and marine ecosystems in performing their functions.<sup>44</sup> A sharp rise in urbanisation also creates unexpected pressure upon nature and makes the process of resource distribution uneven.

There are responses to the crises both at national and international levels. One of the responses is known as adaptation strategy. Adaptation refers to the adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices and structures to moderate potential damages or to benefit from opportunities associated with climate change.<sup>45</sup> As part of the national response, countries usually go through a consultative process to integrate environmental and climate change issues into sectoral policies. States also conduct “need assessments” of the availability of resources to implement relevant policies. Institutional capability at the state level has been identified as a major constraint in implementing policy and enforcing environmental acts and regulations.

To overcome the constraints, states concentrate on developing the capacity of individuals and institutions in this regard. States conduct research studies and implement action plans to prevent further deterioration of the environmental resource base and to assess the making of environment-friendly sectoral policies. Furthermore, states explore avenues for regional and international cooperation to fight against environmental insecurity. For example, the government of Bangladesh has adopted a set of environment policies to manage its environment effectively. Bangladesh has started its activities with limited capacity to fight against the impacts of climate change. However, it is playing a proactive role in many regional and international environmental forums nowadays. The reason of the initiatives is that Bangladesh has been identified as one of the most vulnerable countries in the world considering the environmental impact assessment.<sup>46</sup> The government of Bangladesh has ratified the UN Framework Convention on Climate Change (UNFCCC) and has kept its commitment to

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<sup>43</sup> R.K. Pachauri and A. Reisinger (eds.), *Climate Change 2007: Synthesis Report*, Geneva: IPCC, 2007.

<sup>44</sup> Caitlyn Toropova, Imèn Meliane, Dan Laffoley, Elizabeth Matthews and Mark Spalding, *Global Ocean Protection: Present Status and Future Possibilities*, Switzerland: IUCN, 2010, p. 64.

<sup>45</sup> E. Lawrence, *Henderson's Dictionary of Biological Terms*, UK: Longman Scientific and Technical Harlow, 1995, p. 693.

<sup>46</sup> Sven Harmeling, *op. cit.*, p. 6.

adopt the National Adaptation Programs of Action (NAPA).<sup>47</sup> These programs address urgent needs for adaptation strategies to avoid more vulnerabilities in future.

In recent times, international community is paying attention to the security implications of environmental problems and climate change. The Fifteenth Conference of the Parties (COP) of the UNFCCC in Copenhagen creates sufficient incentives for environment. The governments of the participatory nations in the Sixteenth COP renew their hopes for a concerted effort to combat climate change. They negotiate for a ‘balanced package’ (‘six-pack’ package), which combines progress on mitigation, transparency (measurement, reporting and verification), adaptation, finance, technology, and REDD (reducing emissions from deforestation and forest degradation).<sup>48</sup> They also set up a new ‘Green Climate Fund’ to manage US\$100 billion in aid by 2020 to the nations affected by climate change.<sup>49</sup> The fund will be monitored by a board of 24 members evenly selected from developed and developing nations.

International pressure along with national awareness is on rise to protect global climate and environment. National governments are working in joint collaboration with their international development partners. The Government of Bangladesh is implementing its long term planning to manage environmental risks with the help of international development agencies.<sup>50</sup> The Asian Development Bank, the World Bank, Department for International Development (DFID), Canadian International Development Agency (CIDA) and many other development partners are involved in building the capacity of the government and non-government organizations to produce an effective and efficient governance mechanism to fight against environmental threats. Therefore, attaining environmental security has become a significant policy issue where the stakeholder is not only the government of a state. Various actors from non-government to international development agencies are also involved in the process. The development and implementation of environment management strategies to address the negative impacts of climate change are a complex process. Any action which is not planned properly may inadvertently contribute to further insecurity and violence.

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<sup>47</sup> Ministry of Environment and Forest, Government of the People’s Republic of Bangladesh, *National Adaptation Program of Action (NAPA)*, Final Report, Dhaka, 2005.

<sup>48</sup> Peter Wood, “Cancun COP 16: A ‘six-pack’ for long-term cooperative action”, available at: <http://www.eastasiaforum.org/2010/12/10/a-six-pack-for-long-term-cooperative-action/>, accessed on 10 December 2010.

<sup>49</sup> “Nations set up climate fund” available at: <http://www.newagebd.com/2010/dec/12/front.html>, accessed on 12 December 2010.

<sup>50</sup> ADB Technical Assistance Report 2009, *Supporting Implementation of the Bangladesh Climate Change Strategy and Action Plan*.

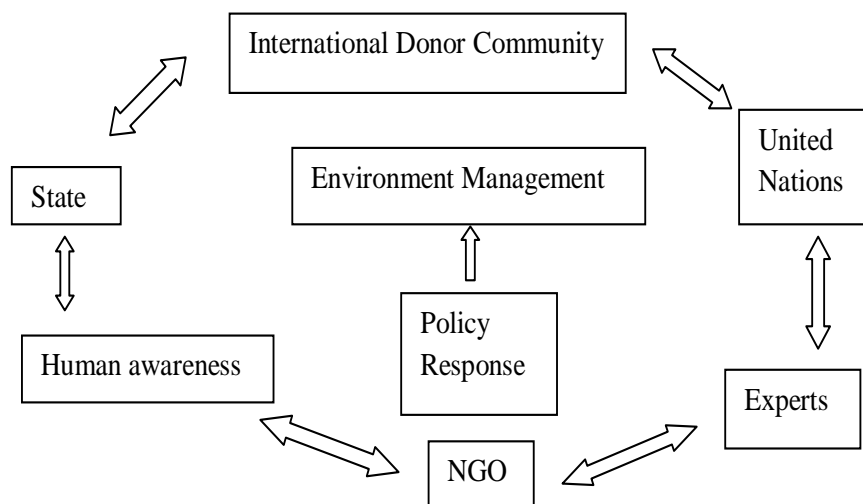
**Figure 2: Collective responses to attain environmental security**

Figure 2 explains the policy formulation process of adaptation strategies regarding environmental management. Environmental adaptation strategies today are formed and implemented collectively by different stakeholders: government, NGOs, international donor community, and experts from home and abroad. The issue is now transnational for further cooperation among the divergent actors. The cooperation may embrace a framework of collective security to decipher the codes of environmental threats and promote mutual engagements. One can relate environment and security through the framework from the securitization perspective. The securitization actors may be increased from the vulnerable population group to more active agencies like NGOs and IDCs. The actors may formulate policies which are foremost concerns of the security dilemma. Speech act (i.e. the politicization factor of securitizing the environment) is significantly present when the actors are involved to create a framework of environmental security. Both national and international responses to negate environmental risk factors are important to rationalize environment as a security threat.

### Concluding remarks

This paper represents different schools of thought of security studies with especial focus on environment-led security threats. It discusses the contribution of post-realist schools of thought in constructing the idea of environmental security. This paper articulates that formulating cooperation strategies to encounter environmental threats require all the concerned actors to critically observe whose security is addressed and how the security can be addressed. To consider environment as a security threat, it is obvious that conventional security discourse requires a reform to overcome its state-centric conceptual

underpinnings. A mono-disciplinary approach is unlikely to perform the task of understanding the security concerns in the 21<sup>st</sup> century. An interdisciplinary research approach is essential to understand the environmental security. This approach assumes to involve a wide range of experts from environmentalists to defense specialists; understand the research questions and permit detailed investigation about security; observe the capacity of the concerned actors to secure the subjects; sketch the network of security actors who define/redefine security. The approach should correlate the causal factors of environmental threats to human security. Identifying environmental threats as security concern has, therefore, become the comprehensive task for academics and practitioners.