

*Segufta Hossain***ENVIRONMENT-SECURITY NEXUS: BANGLADESH PERSPECTIVES****Abstract**

Global security scenario has changed with the beginning of the 21<sup>st</sup> century and dimensions of the definition of security have also changed with the end of the Cold War. Non-traditional security threats have in some aspects replaced the traditional security concerns. Sources of security threats have also increased and become diversified in the era of globalisation. Environmental stresses and degradation have become a security threat and the main concern of environment-security nexus is the scarcity of resources which initiates competition, displacement and gradually conflict. Bangladesh is highly vulnerable to global warming, climate change, environmental stresses and environmental degradation due to climate change. Climate change instigates increased frequencies and intensities of natural disasters. The geographical location and some other issues like over population, unplanned development activities, lack of proper rules and regulations have also made the country more vulnerable to environment related threats. There is a possibility of scarcity of resources and the competition over the scarce resources would displace a large number of people which may destabilise the country and gradually affect the stability and security of the region. Bangladesh government has adopted some policies and formulated strategies to protect the environment, properly use the natural resources and control the degradation of environment and pollution. The country is also trying to combat the impacts of climate change and climate change induced environmental problems with its own resources. International support is necessary to counter the impacts of climate change, climate change induced natural disasters and environmental degradations as they create not only development challenges but also security threats for the country. The present paper would focus on the interrelation between environment and security and try to highlight the nexus between environment and security of Bangladesh.

**1. Introduction**

The dimensions of the definition of security have changed with the end of the Cold War with new concerns over human rights, development and environmental risks. The beginning of the 21<sup>st</sup> century observed lots of dramatic changes in the global security scenario. The traditional security threats are replaced by non-traditional security threats which cannot be solved or effectively addressed by the traditional ways like employing military power. In the era of globalisation the threats to both traditional and non-traditional security have increased and environmental problems,

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**Segufta Hossain** is Research Fellow at Bangladesh Institute of International and Strategic Studies (BIISS). Her e-mail address is: [segufta@biiss.org](mailto:segufta@biiss.org)

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which affect both people and countries alike, are in the forefront. The interrelation between environment and security is a complex one. The issue of security and development is linked with access to natural resources and vulnerabilities to environmental changes. The main concern of environment-security nexus is the scarcity of resources which instigates competition leading to conflict. Resource scarcity, degradation, over exploitation of natural resources and environmental hazards increase risk and exacerbate internal as well as external security concerns. The existing tensions among and within the states due to non-environmental actors can also be intensified by resource scarcity, environmental degradation, competition over natural resources and environmental hazards.

A close interlinkage between effective natural resources management and national, regional and international security is being detected by the researchers. Consensus is emerging that around the globe, environmental degradation, inequitable access to critical resources upon which people depend in order to meet basic needs and competition to extract and control valuable commodities are each important contributors to conflict<sup>1</sup>. The scarcity of natural resources and degradation of natural system which increase threats to public health can increase insecurity which sometimes triggers violence. Environmental degradation and the exploitation of natural resources are recognised as important drivers of violence between and within states, contributing to poverty and state failure<sup>2</sup>.

Against this background the present paper would try to highlight the interrelation between environment and security and study the nexus between environment and security of Bangladesh. The paper is divided into five sections. After introduction, the second section of the paper discusses the relationship between environment and security. The third section focuses on the environmental concerns of Bangladesh. The fourth section deals with environment-security nexus from Bangladesh perspectives and the fifth section concludes the paper.

## 2. Environment and Security

Environment is one of the most important pillars of sustainable development and mainstreaming environment in development cooperation activities may contribute to stability and peace of a nation. There is a clear link between environment and security more precisely between the management of the scarce or abundant natural resources and conflict. History provides evidences that conflict could be driven from natural resource degradation, scarcity and competition for controlling

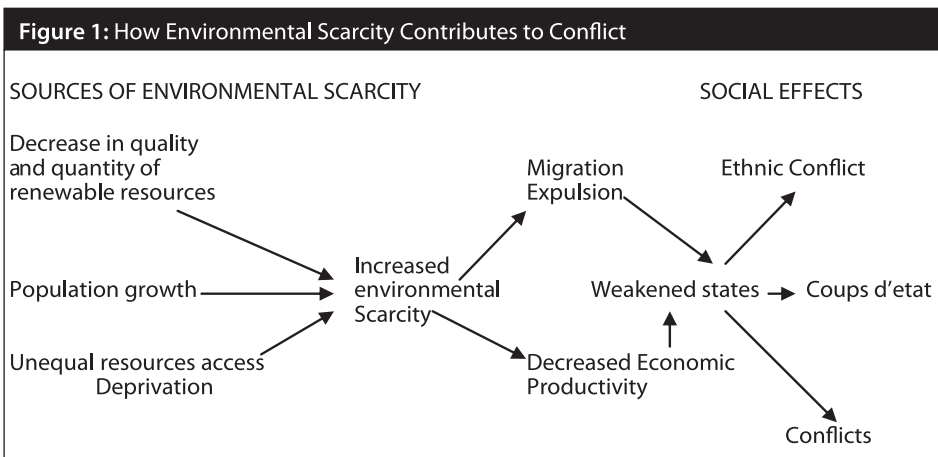
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<sup>1</sup> ENVSEC Initiative, *Environment and Security: A Framework for Cooperation in Europe*, Draft Background Paper, OSCE, UNDP and UNEP, 8 January 2002, p. 6.

<sup>2</sup> Oli Brown, *The Environment and our Security: How our understanding of the links has changed*, a contribution to the International Conference on *Environment, Peace and Dialogue among Civilizations*, Tehran, Iran, 9-10 May 2005, available at [http://www.iisd.org/pdf/2005/security\\_env\\_peace\\_iran.pdf](http://www.iisd.org/pdf/2005/security_env_peace_iran.pdf), accessed on 17 December 2012.

the areas where the natural resources are in abundance. Countries like Afghanistan, Burundi, Haiti, Indonesia, Iraq, Madagascar, Nepal, Pakistan, Philippines, Rwanda and the Solomon Islands are overwhelmed by environmental problems and, therefore, tend to develop political and economic problems<sup>3</sup>.

Environmental stress and violent conflict are not directly linked. Environmental scarcity creates some immediate negative social effects like poverty, economic decline, inter-group tension, population movements/displacements, disrupted institutions and hardening of existing social cleavages which gradually can lead to instability and violent conflict. Figure 1 depicts how environmental scarcity contributes to conflict.



Source: Homer-Dixon cited in Leah Fraser, Related Environment and Security Research in Richard A. Matthew and Leah Fraser, *Global Environmental Change and Human Security: Conceptual and Theoretical Issues*, p. 17, available at <http://www.auswaertiges-amt.de/cae/servlet/contentblob/389710/publicationFile/4505/17-GF-Matthew.pdf>, accessed on 02 December 2012.

The scholars are in dispute on the conceptualisation and identification of the links between environmental stresses and violent conflicts. Research is going on about the interrelation between environment and security. The environment, population and conflict thesis remains central to current environment-security debate.

Professor Thomas Homer-Dixon’s project on “Environment, Population and Security” after a thorough analysis of the relationship between environmental scarcity and conflict found out that “under certain circumstances, scarcity of renewable resources such as cropland, freshwater and forests produce civil violence and instability.....Environmental scarcity acts mainly by generating

<sup>3</sup> Jared Diamond, *Environment, Population, and Health: Strategies for a More Secure World*, Environmental Change and Security Project Report, Issue 10, 2004, p. 9.

intermediate social effects such as poverty and migrations, that analysts often interpret as conflict's immediate causes"<sup>4</sup>. Professor Homer-Dixon also mentioned that "Environmental scarcity is caused by the degradation and depletion of renewable resources, the increased demand for these resources, and/or their unequal distribution. These three sources of scarcity often interact and reinforce one another"<sup>5</sup>. The project also highlighted on the "resource capture" and "ecological marginalization" which reinforce environmental scarcity and raise the potential for social instability and conflict generated in part by environmental scarcity which can have significant indirect effects on the international community<sup>6</sup>. Figure 2 describes the three views of the role that environmental scarcity play in violent conflict.

Beat Sitter-Liver *et.al.* in "Sustainable Development Futures: A Selection of Swiss Academic Perspectives" mentioned "There is ample evidence for correlations between rural poverty, environmental stress in rural arenas and discriminatory access to resources. These factors coincide with political instability, i.e. non-democratic change in regimes and/or violent conflicts and wars. These findings primarily apply to the least developed countries, second to countries with medium development characterized by poor state performance and unstable political conditions"<sup>7</sup>

Environment and Conflicts Project (ENCOP) in its international project titled "Violence and Conflicts Caused by Environmental Degradation and Peaceful Conflict Resolution" pointed out that in the recent past, environmental problems have become increasingly significant in producing conflicts especially in developing countries where desertification, water scarcity and climate change play a big role in originating and escalating current conflicts and usually act in combination with other factors such as poverty, economic decline, over population and political instability<sup>8</sup>.

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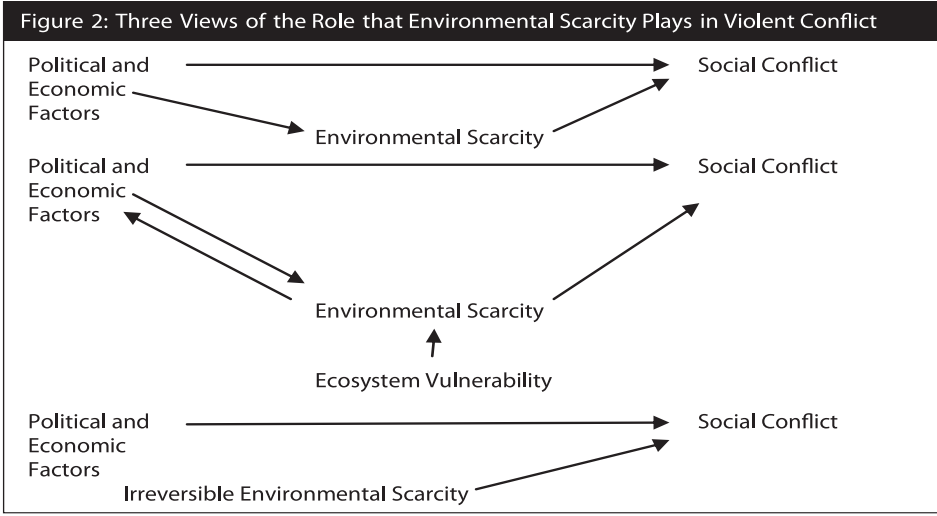
<sup>4</sup> EPS Project Description, The Project on Environment, Population, and Security, available at <http://www.homerdixon.com/projects/eps/descrip.htm>, accessed on 25 July 2012.

<sup>5</sup> *Ibid.*

<sup>6</sup> Environmental scarcity often encourages powerful groups to capture valuable environmental resources and prompts marginal groups to migrate to ecologically sensitive areas. These two processes are called – "resource capture" and "ecological marginalization". *Ibid.*

<sup>7</sup> Beat Sitter-Liver *et.al.*, Sustainable Development Futures: A Selection of Swiss Academic Perspectives, Encyclopedia of Life Support Systems (EOLSS), available at <http://www.eolss.net/Sample-Chapters/C16/E1-53-57.pdf>, accessed on 12 December 2012.

<sup>8</sup> Kurt R. Spillmann and Günther Bächler (eds.), *Environmental Crisis: Regional Conflicts and Ways of Cooperation*, Occasional Paper No. 14, Environment and Conflicts Project (ENCOP) International Project on Violence and Conflicts Caused by Environmental Degradation and Peaceful Conflict Resolution, September 1995.



Source: Thomas Homer-Dixon, *Strategies for Studying Causation in Complex Ecological Political Systems*, Occasional Paper, The Project on Environment, Population and Security, available at <http://www.homerdixon.com/projects/eps/method/methods1.htm>, accessed on 25 July 2012.

A NATO/CCMS Pilot Study on “Environment and Security in an International Context” identified the relationship between environment and security to be subsumed under two fundamental environment-security linkages which refer to problems of environmental degradation (including natural catastrophes) and resource depletion or scarcity as a consequence of military activity in times of peace and war on the one hand and a direct or indirect source of conflict on the other.<sup>9</sup>

The environment-security nexus has become an important issue of discussion for the scholars due to a number of factors which include growing concerns about global climate change, fears about increasing demand and competition for natural resources caused by population growth and economic development. The studies on environment and security indicate that there is strong correlation between environment and security which is complex. On the one hand, environment affects security by destabilising livelihood, competition over scarce natural resources which leads to conflict. On the other hand, instability or conflict also negatively impact environment through large population movements or conflicts.

<sup>9</sup> Alexander Carius et.al., *NATO/CCMS Pilot Study: Environment and Security in an International Context*, Interim Report, October 1996, available at <http://www.wilsoncenter.org/sites/default/files/report3b.pdf>, accessed on 12 December 2012.

### 3. Environmental Concerns of Bangladesh

The topography of Bangladesh makes it vulnerable to the effects of global climate change. Former Secretary General of the United Nations, Kofi Annan, has warned that a rise in sea level could lead to the disappearance of much of the world's largest delta, Bangladesh.<sup>10</sup> Bangladesh is highly vulnerable for its location in the delta of the Ganges, Brahmaputra and Meghna river basins and the dense population of the country. Its economy depends on agriculture and natural resources which are sensitive to climate change and sea level rise. The country is densely populated with 958 persons per sq.km, (BBS 2008).<sup>11</sup> Poverty, over population and ignorance of the common people about the environmental issues have worsened the environmental degradation and natural resources depletion scenario of the country. Bangladesh stands to be affected environmentally in a number of ways. Deforestation leading to desertification, destruction of the wetlands, use of excessive fertiliser and chemical pesticides which reduces soil nutrients, over exploitation of underground water, rapid unplanned urbanisation, deterioration of water quality, land degradation, discharge of untreated sewage and industrial wastes have manifested people's ignorance about environmental degradation and natural resources depletion. Environmental changes and natural calamities like extreme temperature, drought, excessive rainfall at the wrong time, floods and flash floods, salinity, cyclones also have severe negative impact on the socio-economic condition and creates huge environmental damage in the country.

In Bangladesh, extremely high drought risk areas are located in the north-western part of the country. High variation of annual rainfall has made these areas more prone to droughts. Higher poverty rates, dependence on agriculture, withdrawal of underground water for irrigation, deforestation, upstream withdrawal of water of the river Padma/ Ganges have exacerbated the situation and made the region more vulnerable to droughts. Bangladesh is facing increased frequency of drought in the recent years. Droughts cause sufferings for the life and livelihood of the people and its impact has been observed in many sectors especially in agriculture, livestock and fisheries. Meagre supply of water, food and fodder creates untold miseries for both human and livestock. Droughts not only impact the agriculture, livestock and fisheries, it also severely affects the social life of people as people face difficulties in getting safe drinking water. Sometimes conflicts arise among the people because of the scarcity of water which sometimes leads to migration of population from the drought prone areas.

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<sup>10</sup> "Bangladesh exposed to global warming: Annan", *BBC News*, 14 March 2001, available at <http://news.bbc.co.uk/2/hi/americas/1220036.stm>, accessed on 20 September 2012.

<sup>11</sup> Sudip Kumar Pal and Adebayo J. Adeloje, Challenges and adequacy of water resources management policies in Bangladesh, BHS Third International Symposium on *Managing Consequences of a Changing Global Environment* held at New Castle in 2010, available at <http://www.hydrology.org.uk/assets/2010%20papers/145Pal&Adeloje.pdf>, accessed on 17 December 2012.

Although the extent of changes in global climate by global warming and climate change is still under studies, the vulnerability of Bangladesh to the changes is widely recognised. It has been argued internationally that Bangladesh would suffer the most severe impacts of the climate change. Climate change would have an adverse impact on the agricultural production of the country, as well as there is a possibility of destroying infrastructures. So people would be forced to migrate either within the borders of Bangladesh or to adjacent countries which has the possibility of instigating regional conflicts. Climate change could induce more extreme natural calamities like more intense cyclones which could lead to intense storm surges, variability in temperature and rainfall which could lead to droughts and floods. The most important climatic change would take place along the coastline of Bangladesh as sea level rises. Bangladesh is a land mass which is on average no more than 10 meters above sea level, with that number drastically lower nearer to the coast. A 1 metre rise of the sea level will affect 15 million people and submerge 17,000 km<sup>2</sup> of areas and a rise of 1.5 metre will submerge 22,000 km<sup>2</sup> of land and affect 18 million people.<sup>12</sup> The rising sea level poses the biggest threat to Bangladesh as well as our delicate eco system. Most of the mangrove forests would go under water.

**Table 1: Climate Change Scenario for Bangladesh**

Year	Temperature Change (°C) Mean			Precipitation Change (%) Mean			Sea Level Rise (cm)
	Annual	Dec-Feb	June-Aug	Annual	Dec-Feb	June-Aug	
2030	1.0	1.1	0.8	5	-2	6	14
2050	1.4	1.6	1.1	6	-5	8	32
2100	2.4	2.7	1.9	10	-10	12	88

Source: M. Aminul Islam, "Climate change and development risk: Local perspective," *The Daily Star*, 15 March 2008.

Bangladesh is a riverine country which is criss-crossed by three major rivers - The Ganges/Padma, the Brahmaputra, the Meghna and their tributaries and distributaries. As 80 per cent of the country is floodplain, it is prone to yearly flooding. Between 30-70 per cent of the country is normally flooded every year<sup>13</sup>. But recently floods have become more frequent and serious. The Himalayan rivers carry sediments from the upstream and deposit them in the river beds which exacerbated the flooding of the country as the rivers lose their water carrying capacity due to sedimentation. Deforestation in the upstream areas increases the sedimentation rate of the rivers. Excessive precipitation due to climate change also increases the intensity of floods and flash floods of the country which hampers the life of the people of the country. Sea level rise would result in increasing coastal flooding and intrusion of saline water.

<sup>12</sup> United Nations Environment Programme (UNEP), Impact of sea level rise in Bangladesh in Vital Water Graphics: An Overview of the State of the World's Fresh and Marine Waters, 2008, available at <http://www.unep.org/dewa/vitalwater/article146.html>, accessed on 18 December 2012.

<sup>13</sup> Sudip Kumar Pal and Adebayo J. Adeloje, *op.cit.*

Excessive temperature would result in increased amount of glacier melting which would also increase the amount of water flow in the rivers. The Inter-Governmental Panel on Climate Change (IPCC) states that the Himalayan glaciers are receding faster than in any other part of the world. The impacts of climate change on the Himalayan glaciers could be catastrophic for an estimated 1.5 billion people living in the vulnerable densely populated communities in the downstream river basins<sup>14</sup>. Changes in temperature would increase the intensity of cyclones and storm surges. According to IPCC, there is a possibility of an increase in peak intensities by 5-10 per cent which has potentially serious implications for a country already vulnerable to storm surges driven by strong winds<sup>15</sup>. A projected increase of 20-30 per cent in the associated precipitation could make the concerns even more serious as Bangladesh is also prone to inland flooding because of its topography and location at the mouth of three major river systems<sup>16</sup>. Bangladesh is facing increased number of cyclones in recent years. Their intensity and timing has also changed from the previous ones and the cyclones are taking place more frequently than the earlier ones. In November 2007, tropical cyclone Sidr with a 100 mile long front covering the breadth of the country and with winds up to 240 km per hour, hit Bangladesh which is noted to be an unusual occurrence with unusual intensity and timing.

Bangladesh is facing immense difficulties in managing her limited water resources. Since the establishment of the Farakka barrage, the river system of the country has been severely affected. Some of the rivers like the Gorai, the Madhumati, the Bhairab, the Arial Khan, the Kapotakkhya and the Mathabhanga have lost their flow. Freshwater availability has been reduced due to lack of water flow in the rivers and saline water intrusion in the downstream rivers. The life and livelihood of the population of these areas have changed and a large number of populations have to change their occupation and would be forced to migrate to other places for better living. Melting of glaciers would increase untimely floods and flash floods which would worsen the river bank erosion scenario of the country. According to the Centre for Environment and Geographic Information Services (CEGIS) every year 0.1 million people become homeless because of river bank erosion.<sup>17</sup> Arsenic contamination, due to the increased use of ground water, depletion of ground water table and their inadequate replenishment, has increased the risk of arsenic poisoning throughout the country. At present water in 61 out of 64 districts of the country is arsenic contaminated and about 1.5 to 2.5 million

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<sup>14</sup> UNEP, *Recent Trends in Melting Glaciers, Tropospheric Temperatures over the Himalayas and Summer Monsoon Rainfall over India*, 2009, available at <http://na.unep.net/siouxfalls/publications/Himalayas.pdf>, accessed on 18 December 2012.

<sup>15</sup> Shardul agrawala et.al., *Development and Climate Change in Bangladesh: Focus on Coastal Flooding and the Sundarbans*, Organisation for Economic Co-operation and Development (OECD), p. 15.

<sup>16</sup> *Ibid.*

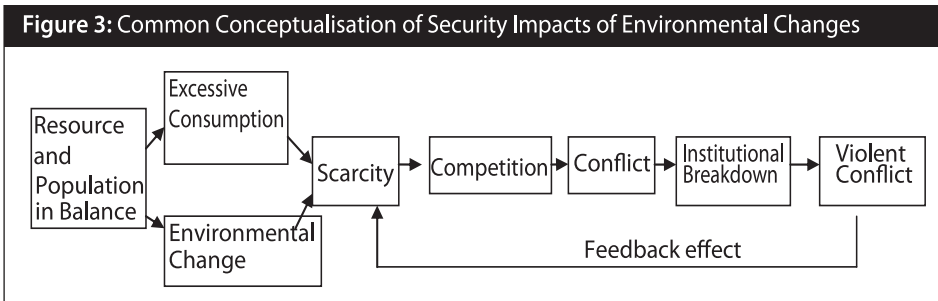
<sup>17</sup> Tahera Akter, *Climate Change and Flow of Environmental Displacement in Bangladesh*, Dhaka: Unnayan Oneshan– The Innovators, 2009, p. 8.



tube-wells are estimated to be affected with 35 million people are at risk.<sup>18</sup> A survey conducted by Ground Water Task Force has reported that 7 out of 12 most arsenic contaminated districts are located in the Ganges basins where water of more than 70 per cent tube wells exceeds the permissible limits of arsenic.<sup>19</sup> People in the arsenic contaminated areas are already suffering from arsenic poisoning and the country is going to face a serious threat from this.

#### 4. Environment – Security Nexus: Bangladesh Perspectives

Environmental stresses could initiate resource scarcity and competition over the scarce resources could initiate migration. Resource scarcity and competition could lead to conflict within a country or region and such conflict may increase emigration. According to Grievance models of conflict, people will fight if they see a decline in their living conditions, particularly in relation to others.<sup>20</sup> Migration, due to the increased frequencies of environmental stresses, increases the socio-political pressure which may lead to insecurity and instability in the source areas from where the people migrate as well as the transit and destination areas. The common thought about security impacts of environmental changes is given in Figure 3.



Source: Oli Brown, Anne Hammill and Robert Mcleman, "Climate Change as the 'new' security threat: implications for Africa", *International Affairs*, Vol. 83, No. 6, 2007, p. 1148.

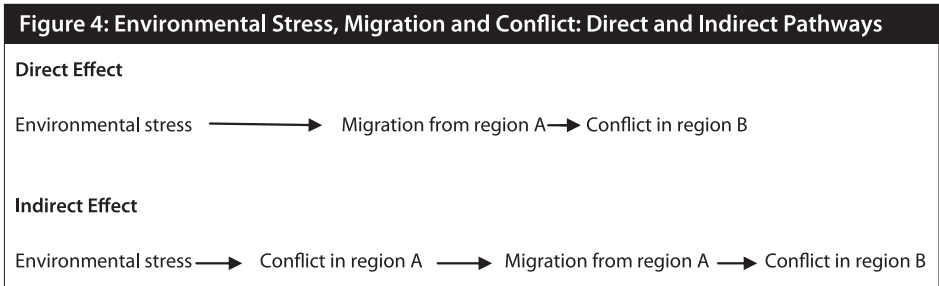
The direct and indirect pathways between environmental stresses, migration and conflict are depicted in the following figure (Figure 4). From the figure it can be observed that as the direct effect of environmental stresses, migration takes place from region A and begins conflict in region B. Indirectly, environmental stresses begin

<sup>18</sup> Department of Public Health and Engineering, Government of Bangladesh, *Arsenic Contamination of Ground Water in Bangladesh*, Final Report 2001, 1: Summary, Dhaka: Department of Public Health and Engineering, 2001, pp. 1-15.

<sup>19</sup> Mohammad Humayun Kabir, Neila Husain and Segufta Hossain, "Non-traditional Security of Bangladesh", in Mufleh R. Osmany (ed.), *Whither National Security Bangladesh 2007*, Bangladesh Institute of International and Strategic Studies (BISS) and The University Press Limited (UPL), 2008, p. 261.

<sup>20</sup> Nils Petter Gleditsch, Ragnhild Nordås and Idean Salehyan, *Climate Change and Conflict: The Migration Link*, Coping with Crisis - Working Paper Series, May 2007, available at [http://www.ipacademy.org/media/pdf/publications/cwc\\_working\\_paper\\_climate\\_change.pdf](http://www.ipacademy.org/media/pdf/publications/cwc_working_paper_climate_change.pdf), accessed on 28 November 2012.

conflict over the scarce resources in region A which prompts migration from region A and when these migrated people reach the destination area i.e. region B, conflict starts over there.



Source: Nils Petter Gleditsch, Ragnhild Nordås and Idean Salehyan, *Climate Change and Conflict: The Migration Link, Coping with Crisis - Working Paper Series*, May 2007, available at [http://www.ipacademy.org/media/pdf/publications/cwc\\_working\\_paper\\_climate\\_change.pdf](http://www.ipacademy.org/media/pdf/publications/cwc_working_paper_climate_change.pdf), accessed on 28 November 2012.

Although Bangladesh is not the only country affected by the impacts of global climate change, environmental degradation and stress associated with it, the country is the most vulnerable to the impacts of global climate change and environmental degradation. The geographical location and some other issues like over population, unplanned development activities, lack of proper rules and regulations have made the country more vulnerable. Climate change instigates increased frequencies and intensities of natural disasters. Cyclone *Sidr* (2007), affecting the livelihoods of 8.9 million people and loss of US\$ 1.67 billion and Cyclone *Aila* (2009) affecting 3.9 million people and loss of US\$ 270 million are the examples of the impacts of climate vulnerability of the country. The victims of *Sidr* and *Aila* are still suffering and living on embankments in makeshift shelters. According to a World Bank study titled *Economics of Adaptation to Climate Change: Bangladesh*, a warmer and wetter future climate that goes beyond historical variations will exacerbate the existing climatic risks and increase vulnerability which will increase the extent and depth of inundation from flooding and storm surges and reduce arable land due to sea level rise and salinity intrusion. The median predictions from the General Circulation Models (GCMs)<sup>21</sup> are for Bangladesh to be 1.5°C warmer and 4 per cent wetter by the 2050s.<sup>22</sup>

Creating settlements for the huge population of the country increases the rate of deforestation, loss of agricultural land, filling up of waterbodies. People also depend on the forests for fuel in the rural areas. Industrial pollution is also observed in the lands and waterbodies adjacent to the industries which decreases the productivity of the lands and make the waters poisonous for human and as well as animals.

<sup>21</sup> General Circulation Model (GCM) is numerical representation of the atmosphere and its phenomena over the entire Earth, using the equations of motion and including radiation, photochemistry, and the transfer of heat, water vapour, and momentum.

<sup>22</sup> The World Bank, "Economics of Adaptation to Climate Change: Bangladesh", 2010, p. xii, available at [http://climatechange.worldbank.org/sites/default/files/documents/EACC\\_Bangladesh.pdf](http://climatechange.worldbank.org/sites/default/files/documents/EACC_Bangladesh.pdf), accessed on 27 December 2012.

Environmental degradation and stress increase the competition for scarce natural resources like land and water and gradually people would be forced to migrate to meet their necessary demands. Declining water availability hampers the hydrological system of the country and leads to the competition on the scarce resource among the users. Increasing intensity of extreme weather conditions, natural disasters and environmental degradation may lead to displacement and forced migration. An array of this type of incidents may gradually lead to destabilisation of the state and subsequently to conflict.

The economy of Bangladesh is based on agriculture and two-thirds of the total population depend on agriculture directly or indirectly. So, the impact of climate change, environmental degradation and stress on agriculture would be widespread and hamper the country's economy. Extreme temperature, excessive rainfall, drought, salinity intrusion, cyclones, etc. are responsible for the fall of agricultural production of the country. Agricultural production is always vulnerable to the extreme climatic events. Climate change has particularly adverse implications for Boro rice production and will limit its ability to compensate for lost Aus and Aman rice production during extreme climate events.<sup>23</sup> Maximum temperature has significant negative impacts on Boro rice yield that reduce about 2.6 to 13.5 per cent due to increase of 2°C maximum temperature and 0.11 to 28.7 per cent for 4°C maximum temperature.<sup>24</sup> Like the maximum temperature, minimum temperature has also negative impact on Boro rice yield that reduce about 0.40 to 13.1 per cent due to increase of 2°C minimum temperature and 0.11 to 15.5 per cent for 4°C minimum temperature.<sup>25</sup> Natural disasters intensified by climate change damage crops of the country every year. In 1990s, drought in the north western Bangladesh caused a shortfall of rice production of 3.5 million tonnes and unprecedented flash flood in the *haor* areas had accounted for a loss of about 1,50,000 metric tonnes of rice at the beginning of 2010.<sup>26</sup> The loss of agricultural productions, agricultural land and fresh water resources due to various environmental and man-made reasons would have a negative impact on the food production and freshwater supply for the people of the country. The loss of agricultural land means loss of livelihoods of the people, loss of food production and rising prices of the foodstuffs.

Fisheries sector is also facing difficulties due to the changes in environment. As the fish species are sensitive to water conditions, they are in threat of becoming extinct with any change in water conditions and quality. Decreasing water in the waterbodies is also the reason behind the decreasing of fish species. Fish cultivation of the country is also facing difficulties and fishermen and fish cultivators are leaving

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<sup>23</sup> *Ibid.*, p. 73.

<sup>24</sup> Jayanta Kumar Basak, "Climate Change Impacts on Rice Production in Bangladesh: Results from a Model", p. 11, available at [http://www.unnayan.org/reports/Climate\\_Change\\_Impacts\\_on\\_Rice\\_Production\\_in\\_Bangladesh\\_Report.pdf](http://www.unnayan.org/reports/Climate_Change_Impacts_on_Rice_Production_in_Bangladesh_Report.pdf), accessed on 20 December 2012.

<sup>25</sup> *Ibid.*

<sup>26</sup> Ministry of Environment and Forests, "Climate Change and Agriculture in Bangladesh: Information Brief", p.4, available at <http://cmsdata.iucn.org/downloads/agriculture.pdf>, accessed on 27 December 2012.

their occupations and switching to other jobs. According to a study, the number of fishermen in the south west of Bangladesh dropped from 6 per cent to only 0.5 per cent while the number of rickshaw pullers increased from 1.3 per cent to 5.9 per cent.<sup>27</sup> These jobless people migrate to the cities for their livelihood and create pressure on the limited resources and facilities of the urban areas of the country and start competition for the urban amenities which sometimes initiate violence.

From the above discussion, it can be observed that changes in the environment destroy the resources of an area and initiate the risk of displacement of huge number of population. Scarcity of food and freshwater would have a negative impact on the food and freshwater availability of the country which might initiate competition among the common people. Increasing population would exacerbate the situation. Price hike of food items is the worst impact of the scarcity of foods. There is a possibility of conflict over food security, job security and land related issues due to over population. The displacement of large number of people instigates competition over resources of the areas where the displaced people settle down and may create instability in a country. A joint study titled "Climate Change and Security in Bangladesh: A Case Study"<sup>28</sup> by Bangladesh Institute of International and Strategic Studies and Saferworld found that the relationship between climate change and security is not always direct but depends on a chain of consequences such as climate change causes environmental degradation which undermines livelihoods of that area and reduce basic human security and create increased tension as competition for dwindling resources become more intense. This tension could lead to crime and violence and increase social instability. Deteriorating economic and social situation drives people to migrate from the affected areas to towns and cities in search of better life which sometimes again lead to disturbances. In Bangladesh, the violent unrest may have an effect on the stability and internal security of the country and there is also risk that international security will be affected by regional destabilisation.<sup>29</sup> According to the Saferworld study, "in Bangladesh socio-political pressures are increasing as more and more people migrate due to pressures brought on by an increase in the frequency and intensity of flooding, rising water salinity and loss of land. This in turn may lead to growing insecurity and instability in the regions of origin, transit and destination, as competition increases over resources such as water and land and people form groups prepared to use violence to defend their interests"<sup>30</sup>.

<sup>27</sup> See for details, Tajkera Khatun, "The Ganges Water Withdrawal in the Upstream at Farakka and Its Impact in the Downstream Bangladesh" in M. Feroze Ahmed *et.al.* (eds.), *Regional Cooperation on Transboundary Rivers: Impact of the Indian River-linking Project*, Dhaka: Bapa *et.al.*, 2004, p. 243.

<sup>28</sup> Bangladesh Institute of International and Strategic Studies and Saferworld, *Climate Change and Security in Bangladesh: A Case Study*, BIISS and Saferworld, June 2009.

<sup>29</sup> Thomas Ansorg and Thomas Donnelly, "Climate Change in Bangladesh: Coping and Conflict", *European Security Review*, Number 40, September 2008, p. 3.

<sup>30</sup> *Ibid.*

## 5. Conclusion

Environmental change does not figure as a separate, causal variable in the general migration literature, although older theories did allow for natural disasters under the category of “physical” factors.<sup>31</sup> Now-a-days the traditional concept and consensus about security has changed as the idea of security has taken new social, economic and environmental dimensions. The present trend shows that environmental changes cause displacement and migration. Environmental stresses and changed climatic events are influencing the people of Bangladesh by affecting the socio-economic conditions and would have severe impacts on the population of Bangladesh in future. The environmental stresses and environmental degradation would affect the land, water and other scarce natural resources on which people depend for their livelihood. The loss of land which is a living space and economic support would force people to migrate for their survival. The forced migration could lead to instability and violence which could further lead to violent conflicts inside the country.

Sustainable and equitable management of the environment could be an effective way to build cohesion, strengthen mechanisms for collaboration across the boundaries and reduce vulnerability to crisis. Efforts that are taken to reduce the risk factors could be beneficial for both environmental and national security. Environmental cooperation can also be a powerful tool for preventing conflict, building mutual confidence and promoting good neighbourly relations.<sup>32</sup> Sustainable management of scarce natural resources, with the objective to protect the environment and at the same time to contribute in poverty reduction, development, stability, peace and reconciliation, is essential.

The security of Bangladesh is under threat from climate change, environmental degradation and stresses. The stresses and degradations are affecting all aspects i.e land, air, water, etc. of environment. Deforestation, demolition of hills, river pollution, river erosion, loss of fertility, land degradation, urban congestion, sanitation problems in rural and urban areas, inadequate sewerage system in urban areas, pollution from solid and industrial wastes and natural disasters such as floods and cyclones all contribute to environmental and ecological degradation and loss of biodiversity.<sup>33</sup> Although Bangladesh does not have any responsibility for global warming and global climatic change, it is one of the most vulnerable countries of the world. The impacts of global warming and climate change such as sea level rise, salinity intrusion, cyclones, storm surges, changes in the nature and intensity of floods, changes in the nature of precipitation, changes in the temperature are

<sup>31</sup> Astri Suhrke, “Pressure Points: Environmental Degradation, Migration and Conflict”, available at [http://www.cmi.no/publications/1993%5Cpressure\\_points.pdf](http://www.cmi.no/publications/1993%5Cpressure_points.pdf), accessed on 17 January 2013.

<sup>32</sup> A. Wolf, “The Importance of Regional Co-operation on Water Management for Confidence-Building: Lessons Learned”, April 2002, available at [http://www.sustainable-peace.org/download/Regional\\_water\\_cooperation\\_and\\_confidence\\_building.pdf](http://www.sustainable-peace.org/download/Regional_water_cooperation_and_confidence_building.pdf), accessed on 10 July 2012.

<sup>33</sup> Ministry of Environment and Forests, *Bangladesh – Rio+20: National Report on Sustainable Development*, Government of the People’s Republic of Bangladesh, May 2012, p. XXI.

impacting the environment of the country and hampering the lifestyle of the people of the country.

Bangladesh government has taken some important steps to protect the environment, ensure proper uses of natural resources, control environmental degradation and pollution. Government has adopted National Environment Policy, National Water Policy, Bangladesh Climate Change Strategy and Action Plan and formulated National Conservation Strategy and the National Environment Management Action Plan to incorporate environment in the policy framework of the country. The country is also trying to combat the impacts of climate change with its own resources. Bangladesh government has set up Bangladesh Climate Change Trust Fund (BCCTF) in 2009 which has been receiving annual budgetary allocations for programmes related with climate change adaptation and mitigation. Over the past three years (2009/10-2011/12), the government has allocated the equivalent of US\$300 million (US\$100 million every year) which is being utilised in implementing the projects largely focused on climate change adaption and also on mitigation to an extent.<sup>34</sup> Bangladesh Climate Change Resilience Fund (BCCRF), established in 2010, gets its fund provided by the development partners and an amount of US\$125 million has been received until now.<sup>35</sup> Although Bangladesh is trying to continue the programmes and projects of adaptation and mitigation of climate change by its own allocations and different funds, it is very meagre to the huge demand for properly addressing the issues. It is necessary to have international support to counter the impacts of climate change, environmental degradations and stresses as the country is facing these issues not only as issues of development challenges but also as issues of security concerns.

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<sup>34</sup> *Ibid.*, p. XX.

<sup>35</sup> *Ibid.*