Climate Change and the Security Dynamics

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Introduction

Climate Change as a result of alteration in volcanic activity, solar output, the Earth's orbit around the Sun and more predominantly due to emission of Greenhouse gases from anthropogenic and natural activities1 has been a major concern across the globe. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007) analysed many climatic uncertainties and concluded that some extreme weather events have changed in frequency and intensity over the last 50 years.2 Cold and hot climatic conditions, heavy precipitation events, intense storm waves, incidence of extreme high sea level etc have become more prevalent and highly unpredictable. Over the last century, atmospheric concentrations of carbon dioxide increased from a pre-industrial value of 278 to 379 parts per million in 2005, and the average global temperature rose by 0.74°C.3 An increasing rate of warming has particularly taken place over the last 25 years, and 11 of the 12 warmest years on record have occurred in the past 12 years.4 The projections by IPCC for the 21st century indicate that the Earth could become warmer by 3°C by 2100 and would continue to accelerate even if countries reduce their greenhouse gas emissions. Further, the Sea levels during the 20th of storm surge, inundation and wave damage to coastlines, sinking of islands and loss of fertile land, particularly of countries with low lying deltas. Thus climatic threat and associated risks to life and livelihoods has impacted living conditions of millions of people across the world.

Effect of Climate Change

Climate change is an emerging phenomenon, intricately related to widespread threats that can impact physical and social environment. These threats are largely uncertain, diffused, difficult to quantify yet potentially calamitous with potential to derail development and endanger human security. Some of the prominent effect of climate change are analysed in the succeeding paragraphs.

Resource Scarcity. Climate change may have adverse human security repercussions through its effect on availability of resources necessary for sustained livelihood. Resource scarcity may be due to dwindling resource base or increased demand of resources on account of population rise and increased consumption.6 Escalating temperatures, changing precipitation patterns, and an overall reduction in annual rainfall suggest that some of the most crucial subsistence resources will become increasingly scarce in the foreseeable future.

Natural Disasters. Natural disasters related to climate change can be categorised as either geological or hydrometeorological type. Almost all of the temporal increase in disaster frequency is accounted for by the hydrometeorological category. More than one-third of the world's landmass and 82 per cent of the world's population live in flood-prone areas; and drought, the second most frequent type, threatens about 70 per cent of the world's population.7 Thus, the ever volatile climate change phenomenon is likely to have catastrophic outcomes on social systems that are sensitive to intense occurrences and lack capacity to respond to various climatic hazards. The intensity of some disaster may be so intense that the affected region may still be struggling to get over that event, when another hazard strikes the region.

Population Displacement. Climate change is likely to contribute to the movement of people within and across borders, creating 'Climate Refugees' over short and long periods of time, through its effects on livelihoods, health and the sustainability of settlements. Large scale unplanned displacement of people is likely to increase pressure on public goods and services, create rivalry over resources, and can even generate problems of border control. These alterations may directly challenge living conditions of already disadvantaged communities in many regions, increasing their vulnerability across social, economic and institutional settings.8 Thus, increase in climate related susceptibility could potentially trigger large-scale internal displacement and migration in search of new avenues for employment and settlement that can further lead to destabilisation, change in demographic profile and violence.

Economical Vulnerability. Climate change effects will impose significant stress on ecological and socio-economic systems due to increase in pollution, resource shortage and natural calamities. It can cause a number of economic disruptions, negatively impacting growth and undermining governance capacities. It may contribute to land degradation, infrastructure damages and crop losses from drought or flooding, affecting productivity and the economy. Sea-level rise can damage coral reefs and other coastal ecosystems which will have an adverse effect on tourism and fisheries, in turn affecting the economy of some of the dependent countries.9 Thus economic sectors like tourism, fisheries, agro industries etc would suffer a major blow and social disparities already wide in the present day society would further intensify.

Climate Change and Security Concerns

The earth's climate sustains life and strongly influences the existence of ecosystem. In order to understand the contours of relationship between Climate Change and Security it is essential to analyse varied facets associated with climatic phenomenon that can impact socio-political, economic and ecological development of a region. Some security risks associated with climate change are discussed in the succeeding paragraphs.

Energy Security. Climate change is likely to have impact on the supply of climate sensitive energy sources, in particular biomass, fossil fuels and hydroelectricity. It may also affect use of infrastructure designed to extract and distribute energy, such as oil and gas platforms and pipelines. The impact on security may manifest in the form of disruption of energy supplies needed for the health and well being of the rural poor, industries, households, and critical public services.

Food Security. Wide uncertainty of climate change is likely to destabilise agro meteorological conditions and coastal

environment including marine fisheries, leading to declining yields and short term food production failures. It may also damage food transport and storage systems, causing rise in food prices. Further, the expanding volume of water due to global warming is likely to cause higher sea levels which in turn can submerge a significant portion of arable land area. More extreme precipitation could also increase top soil erosion, affecting productivity due to loss of fertile soil. Faster evaporation could also turn more land into deserts. Reduced agricultural productivity is often conceived as potentially the most worrisome consequence of climate change which affects food security, especially in the poorest part of the world where hunger is already an issue. More than 850 million people worldwide are currently undernourished and the situation is likely to worsen in future as a result of climate change.10

Health Security. Deteriorating weather conditions heavily impact the health of poor people, and the uncertainty of climate change has a multiplying effect. Climate change is the main catalyst that augments disease exposure risks worldwide by exposing people to vector borne diseases such as dengue fever and malaria, water borne diseases such as cholera and gastrointestinal disorders.11 These, along with heat stress and cardiovascular illness due to smoke haze may lead to increasing mortality and morbidity; or result in epidemics that may cross borders, impact economic growth, and may have wide ranging security implications. Changing disease vectors is likely to aggravate social and political instability, increase humanitarian emergencies or may even lead to civil conflicts.

Water Security. Climate change can worsen the already existing problem of water quality and availability in various regions across the globe. 1.1 thousand million population of the world are currently devoid of safe drinking water and the situation is likely to be aggravated through climate change.12 Climate change is likely to reduce run-off in major catchments, increase pollution of surface water, deplete and contaminate groundwater resources, and may cause coastal subsidence. These are likely to undermine livelihoods, industrial and agricultural production, and may lead to tensions over the management of transboundary water resources. The global crisis may in turn fuel existing internal or inter-state conflicts and heighten competition among different users of the scarce water resources.

Cultural Security. With increasing number of people losing their dwellings and traditional lifestyle, climate change can jeopardise the cultural heritage of people and society, leaving history and tradition behind only in text. Climate change poses a fundamental threat to cultural survival for those societies whose territories are threatened by rise in sea-levels and inundation, especially small islands and deltaic states. It is predicted that some of the endangered species in Africa which are coming under immense stress due to climate impacts is likely to disappear in future, thereby posing a threat to the cultural security of the society and the state. Thus the impacts of climate change on vulnerable societies will need to be addressed not only as an issue of sovereignty and statelessness but also as a threat to cultural identity.13

National Security. Climate change that exacerbates social, economic and environmental vulnerability can rightfully be termed as a threat multiplier. Weaker states fails when large populations subjected to famine, flood, pandemic or disaster migrate across international borders as they do not have requisite resources and infrastructures in place to cope with the situation. Extreme events due to climate change coupled with other factors such as poor or nonexistent governance has in the past led to widespread unrest and violence, leading to regional instability and national security ramification. Further, when States fail to deliver services to its people, conditions are ripe for the extremists and terrorists to fill the vacuum leading to radicalism and terrorism in many developing societies due to the climate induced social and economic deprivation. Climate change can also fuel political tensions and conflict between developed and developing countries over emissions of greenhouse gases and on issue of sharing of burden caused by unabated climate change. The biggest concern is that the climate change is a "high probability, high impact" risk, that is likely to occur (between 90 and 97 per cent), and will have a very large and widespread impact on national security.14

Climate Change and Challenges for Military

The impacts of climate change, particularly the growing risks of natural disasters and the damaging effects on development potential, may increase the pressure on defence forces to participate in growing numbers of humanitarian assistance, disaster relief and evacuation operations. Challenges that the militaries are likely to face on account of climate change and its effects are analysed in the succeeding paragraphs.

Operational Conditions. Climate change and extreme meteorological conditions pose a range of operational concerns. Conditions of extreme heat or cold can cause unsafe environment for training and employment of forces, thereby reducing the efficiency of men and the machine. Ice/sleet storms, avalanches and landslide can cause hazardous conditions for operation in mountains; while floods/soil saturation can affect operation in plains; and coastal storm can make amphibious and riverine operation dangerous. Similarly, lightning can endangers soldiers in the open and cloud cover can cause unsafe flying conditions.

Military Installations. Coastal military facilities and equipment are threatened by frequent and high intensity damaging weather events such as hurricanes and tornadoes. Rising sea levels is yet another concern which is real and dangerous for coastal military establishments.

Environmental Refugees. Developing countries already weighed down by poverty, unresolved conflicts and poor governance are at risk of more instability caused by people fleeing due to drought, catastrophic storms, resource scarcity and economic vulnerability caused by climatic disaster, which may need serious military intervention.

Humanitarian Intervention. As extreme weather events batter more population centres, the military will increasingly be asked to provide humanitarian support. Disastrous climatic events of high intensity will require frequent mass mobilisations of the military to cope with humanitarian disasters, affecting preparedness of defence forces for their conventional role.

Pandemics. As certain regions become warmer, researchers view that the range of insects and other disease carrying vectors will expand. Pandemics not only cause humanitarian catastrophes, they can directly threaten deployed of troops for military operations.

The Way Forward

Climate change is one of the greatest threats facing the planet. Climate related disaster can have enduring consequences on human security and can trigger a catastrophe, if concrete steps are not initiated sooner than later. Some of the actions which need consideration and immediate attention are given below : –

(a) **Reducing Greenhouse Gases.** Machines / equipments functioning on high-carbon path are the major contributors to greenhouse gases. There is an urgent need to develop domestic utility items including refrigerators and air conditioners with technology which emit lesser greenhouse gases. It is also important to introduce environmental friendly hi-tech systems to manage climate security risks, and improve public health institutions.15 Cooperation among countries within and beyond the region to overcome the technical and financial barriers including transfer of technologies is a must. As regards military, for most countries a strong technological capability with sleek force matrix is the objective. Hi-tech weaponry and aircraft bring a hefty carbon footprint and there is a need to 'green' its activities by adopting clean energy generation for reducing military's carbon footprint.

(b) **Adaptation.** As the impacts of climate change have a wide ranging ramifications, the support to adaptation needs to cover all affected sectors viz; water scarcity, agricultural resilience; public health systems to deal with increased disease incidence; disaster management system including preparedness; early warning and response at national and regional levels for various climate change effects. Power stations and oil facilities providing fuel for the military are undoubtedly the major concern and protection needs to be on the basis of their climate adaptation benefits and devastation avoidance. Developing countries need to be supported through investments in capacity-building, especially those overstretched by devastating cyclones, floods, droughts or other hazard events.16

(c) **International Law and Institutional Strengthening.** International Law needs to be formulated for unprecedented challenges posed by climate change such as displacement of persons due to submergence of costal land/ island nations, and the rights and relocation of citizens of such territories. There may be issues concerning national sovereignty, claims over marine resources etc. Legal and political arrangements may be necessary for the protection of affected populations. It also includes enhancing coordination among institutions working at regional, national and local levels, across policy domain, and between the public, private and community sectors.

(d) **Preparation for Climatic Disaster Mitigation.** Mitigation efforts till date unfortunately have been painfully slow and inadequate. In future the dynamic climate change phenomenon is likely to witness more and intense events such as tsunamis, flooding, earthquake etc and when these coincide with armed conflict then it can lead to devastating impact on populations. The challenges for armed forces in such situations will be to maintain a level of control between the battle-space and managing utility by ensuring provision of adequate food, shelter and medical supplies. Chaos, confusion, human vulnerability and suffering will thus compound any conflict situation and militaries will need to be prepared to face such an eventuality. Militaries will need to establish their own responses as they might be drawn into more frequent combat operations17 due to events such as large-scale migrations or conflicts over resources or adverse climate disaster.

Conclusion

Climate change presents both direct and indirect threat to the security and stability of the society and the state. It is a well known fact that the autocracy of climate and weather adversities is only getting worse with each passing day. These are not just a narrative, or a probability, it's an absolute reality. The worrying factors are the magnitude, geographical extent and timescale of given impacts. Climatic crises with ever increasing intensity and unpredictability have the potential to present more pervasive and large scale security implications than any other crisis. For this reason, climate change challenges need to be placed at the core of security considerations in the present day scenario. This may well require a change of mindset in the strategic hierarchy and preparation at all levels to deal with various climatic eventualities. Military being one of the major assets of nation states needs to be incorporated into national response mechanisms. Despite differences among regional countries with respect to the responsibilities, capacities and mechanisms to respond; the determination of intellectuals, society and nations to take up the challenges is an encouraging signal. Time is just ripe for undertaking a sincere climate audit and work towards a holistic response.

Endnotes

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