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Climate Change and its Implications for India's National Security



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Introduction

Climate change is increasingly emerging as one of the greatest threats to human security; it has and continues to transform the way one perceives security—It is usually referred to as the process involving changes in the usual weather patterns of a place in particular and the planet as a whole. By the end of the current century, average temperature over the Indian region is expected to rise by 4.4 degree Celsius ¹, leading to intensifying extreme weather like heat and cold waves, dust storms and extreme precipitations, which directly affects the death tolls in addition to the impact on overall life quality in the country. ²

While the day-to-day lives of Indian citizens are bound to be affected by climate change in terms of livelihood and homes being affected

Key Points

- Climate change is emerging as one of the greatest threats to human security.
- It is a potent threat multiplier exacerbating existing threats like ongoing conflicts, transnational water disputes, food and water insecurity, etc.
- The most pronounced impact of the climate change for the Indian Military would be along the Himalayas and along the coastline, with flash floods, avalanches, cyclones and sea level rise, thereby causing increased disruptions in the near future.
- Climate change could lead to major consequences like reduced military readiness, reduced funding for capital acquisitions and climate refugee flows.
- Pragmatic and timely measure needs to be taken to identify the risk posed to the military and ensure possible risk reduction.

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around the coastal areas; degrading quality of food production due to sped up photosynthesis leading to nutrient reduction and increased exposure to an increasing frequency of extreme weather events,³ could have a significant impact on the country's national security.

India, presently, faces two major unsettled boundaries—one to its west and the other to its north. India maintains a large military with bases throughout the country— from the Andaman & Nicobar Islands to the Himalayas— regions which have their own set of potential climate change related problems like sea-level rise, increasing cyclones, landslides, avalanches and flash floods. In addition to this, the Indian military has often been the first responder to major natural disasters across the country which required significant manpower and equipment to be deployed, based on the severity of the disaster. The growing impact of climate change is bound to have an 'accumulative effect' on the military and India's national security. In this context, the paper aims to study the potential impacts and possible ways to mitigate the impact of climate change- related phenomenon on India's national security.

Overview of Impact of Climate Change on India

Climate change' impact on India varies as much as the country's geography. Its diverse terrain poses different climate change challenges, and tackling such challenges would require a decentralised approach to manage the potential impact involving greater state agencies' participation in surveys, planning, data collection and impact mitigation. India's high poverty rate, socio-economic inequality and high labour market's dependence on agriculture would compound existing threats while creating new ones.

The Ministry of Earth Sciences (MoES)⁴ in a report titled "Assessment of Climate Change over the Indian Region", published in June 2020, highlighted the possible impacts of climate change under multiple emission scenarios. Some aspects of climate change impact that can be most relevant to the country's national security are as under:

- **Indian Ocean Warming.** The surface temperature of the tropical Indian Ocean has increased by 1degree Celsius during the period 1951–2015, which was higher than the global average rise in temperature of the sea surface. The surface temperature of the Indian Ocean is expected to rise till the end of the 21st century.
- **Precipitation Changes.** The report states that rainfall during the summer monsoon season over India has decreased by 6 per cent during 1951–2015. According to the report, "there has been a shift in the recent period towards more frequent dry spells (27 per cent higher during 1981–2011 relative to 1951–1980) and more intense wet



spells during the summer monsoon season”. Therefore, India will continue to witness extreme rain patterns due to climate changes.

- **Droughts.** As a result decreasing rainfall during the summer monsoon in the last seven decades and increasing variability of rains, India has become more vulnerable to droughts, in terms of frequency, intensity and location. The report highlights that by the end of the 21st century, India may face increased frequency and intensity of rainfall and at the same time may also see more areas affected by droughts.
- **Sea Level Rise.** Due to the increased frequency of ice melting in the Arctic and thermal expansion of ocean water, sea levels are rising globally. The sea level rise in the North Indian Ocean (NIO) increased from 1.06 – 1.75mm per year during 1874–2004 to 3.3mm per year during 1993 – 2017. Although this rise is congruent to the global mean sea level rise, it is an even more worrying trend for India considering its long coastline and thus increased vulnerability.
- **Tropical Cyclones.** While the cyclones’ frequency, over the tropical Indian Ocean remained unchanged during 1951–2015, the frequency of very intense cyclones in the post-monsoon period has increased during 2000–2018.
- **Changes in the Himalayas.** The Hindu Kush Himalayas (HKH) has witnessed a temperature rise of 1.3 degree Celsius during 1951–2014. The Himalayas have been experiencing declining snowfall and fast melting glaciers in recent decades. The mean surface temperature in the HKH may rise upto 5.2 degree Celsius by the end of the 21st century.

Possible Impact on the Indian Military and National Security

Climate change is often said to be a potent threat multiplier that will exacerbate conditions like poverty, environmental degradation, political instability, existing conflicts and social volatility. Its impact on developing countries, like India, is going to be disproportionate compared to the developed societies. This is because, more than half of the people in the developing world lives in rural communities and are dependent on agriculture which is prone to climate shocks. ⁵

- **Increased Responsibility on the Military.** Militaries worldwide have been experiencing a rise in events where they are called upon to respond to humanitarian crisis and natural disasters. The Indian military, with its considerable size of 1.4 million personnel and extensive expertise in Humanitarian Aid and Disaster Relief (HADR), is already witnessing an increase in the regular mandate. It has played an active role in conducting several HADR operations dating as early as 1960 during the

Koyna Earthquake and more recently the Himalayan Tsunami (2013), Kashmir floods (2014)⁶, Cyclone *Titli* (2018) and latest being the overseas evacuation amid COVID-19 pandemic⁷.

The Indian military's HADR activities are not restricted to India but extend to entire South Asia and the Indian Ocean Region (IOR). A key example of this is the 2015 Nepal Earthquake, wherein the Indian military played a crucial role. India was the first responder among the international community to aid Nepal by conducting extensive rescue operations and providing necessary relief materials to the locals. The Indian Air Force and the Indian Army flew a total of 2182 combined sorties rescuing a total of more than 5000 people from the affected areas. They also provided relief materials including food, medicine, 10,000 blankets, 1,000 tarpaulin and 1,000 tents.⁸ The Indian military had also conducted an operation in Maldives in 2014⁹ where they helped the country stave off a water crisis by providing emergency water shipments via air and sea. Here too, India was the first responder.

While such operations are necessary, both domestically and internationally, and help the military and the country gain significant goodwill, however, they also divert platforms and personnel from their primary tasks of managing the traditional security sphere while putting excess responsibility on them. This means the military personnel are spending more time and efforts away from their primary job of securing the borders. The rising frequency of climate change-related disasters will gradually increase the impact on country's military readiness for traditional security threats.

- **Resource Crunch and Conflicts.** The biggest concern for a country like India, with the second largest population globally, is facing resource shortage as climate change progresses. The most critical one would be water which in turn affects food security. India is already the '13th most water-stressed country 'in the world¹⁰ and climate change-induced precipitation changes will only make matters worse. The water shortage is going to have a compounding impact on the food and economic security of hundreds of millions of people. According to a 2018 *Niti Aayog* report on water management in the country, the low performers on the water index are home to about 50 per cent of the country's population and account for 20-30 per cent of India's total agricultural output, thereby posing a significant food security risk to the country. The report also highlighted that by 2030, water crisis is expected to lead to a loss of nearly six per cent in the country's GDP.

The Cauvery water dispute and the 2016 riots in the states of Kerala and Karnataka is an unfortunate example of the increasing impact of climate change. While only two

people died during the riots, however, the main reason of the massive protests was the worst drought that Tamil Nadu faced in 140 years.¹¹ While the dispute dates back to 1800s, the stresses exerted by climate change-induced intense droughts were a vital component in the situation. The MoES report (2020) referred to earlier, highlights the increasing intensity of droughts linked to decreasing precipitation during summer monsoons. Such a progression would put immense pressure, directly or indirectly, on the law and order situation. While the law and order remains outside the military's usual mandate, it has often been used as a last resort for bringing volatile situations under control domestically.

There seems to be an increasing trend of overlapping traditional and non-traditional security threats, which is especially true for internal security. Some studies have even linked intense natural disasters to major internal conflicts, for instance, John Waterbury's 2013 study "The Political Economy of Climate Change in Arab Region"¹² concluded that the droughts in Syria during 2007-2010 eventually led to the Syrian conflict which persists to this day— a claim shared by other studies using the same example.

The security context of resource shortage, mostly water, is not limited to national boundaries. However, for water-stressed states like India and Pakistan, who are already engaged in a conflict over political differences, may lead to a clash over sharing of transnational rivers. A Dutch institute— Water, Peace and Security's (WPS) global early warning tool has already identified, with a claim of 86 per cent accuracy— India and Pakistan as two of the six places for future water conflicts.¹³

- ***Climate Refugees and Internally Displaced Persons.*** Another crucial aspect of climate change is the developing trend of an increasing number of climate refugees. According to a World Bank report "Groundswell: Preparing for Internal Climate Migration" (published in year??), South Asia will be one of the worst affected regions of the world in the context of climate change migrants. In the worst-case scenario, South Asia may witness approximately 40 million internal migrants by 2050.¹⁴ Climate change, the report states, is becoming a growing contributor to internal migration and can eventually lead to human development and planning challenges. Another concern is the international refugee influx into India. Many of India's neighbours are incredibly ill-positioned when it comes to bearing the brunt of climate change. It is expected that around 17 per cent of Bangladesh's landmass i.e. approximately 13 per cent of its population, mostly the coastal areas, can be submerged by the end of the 21st century.¹⁵ For India, this is of particular concern,

since India is yet to overcome the socio-economic, political and security impact of the last *mass exodus* from Bangladesh during the 1971 War.

Another ground zero for climate change-related impact is expected to be Maldives. About 80 per cent of Maldives's landmass is less than a metre above sea level, rendering its population of about 500,000 people highly vulnerable.¹⁶ As per the Intergovernmental Panel on Climate Change's (IPCC) about 100 cm rise in the sea level, will result in the submersion of majority of the Maldivian landmass thereby, forcing potentially its entire population to migrate.¹⁷ Being the regional power, India might have to absorb a significant portion of the climate refugees. This could have potential law & order and security implications for the country.

- **Operational Readiness of the Military.** Threats to military installations due to climate change -related developments are of operational concern for militaries the world over. Even the powerful US military is not shielded from the changing climate and has witnessed delayed or suspended testing and training activities and increased maintenance requirements at its various installations— at home and abroad.¹⁸ In the past decade, the largest American naval base at Norfolk, Virginia has experienced nine major floods, affecting repair infrastructure and dry docks. The rising sea levels are continuously leading to delays in ship repairs, and the US Navy is resorting to building sea walls.¹⁹ Due to anticipated extreme weathers, the US military is already working on equipment and vehicles designed for higher heat and cold tolerance.²⁰

The Indian military installations are not immune to such threats either. During cyclone *Hudhud*, the Indian Navy suffered a loss of INR 2000 crore due to infrastructure damage.²¹ In 2014 Kashmir floods, border fencing of 50 km was damaged along the Line of Control (LoC)²² and along the international border in Jammu and Kashmir. The army's engineering teams were deployed on an emergency basis, to plug critical patches to prevent terrorists from filtering in. Problems are only going to mount for the Indian Army with its significant deployment across the Himalayas at different altitudes. Climate change is going to increase erratic and unpredictable weather conditions, thereby increasing the frequency of flash floods and cloud bursts and posing considerable threat to military equipment and bases deployed around India's most challenging borders.

Another indirect impact of climate change on the country's national security and its capabilities is the financial distress and limited budget for the military. The military has already been experiencing a shrinking fiscal space. According to an analysis by

PRS India²³, the defence spending, as a percentage of Gross Domestic Product (GDP), have reduced from 2.5 per cent of GDP in 2010-11 to 2.1 per cent of GDP in 2020-21. Similarly, the defence budget share in total central expenditure has reduced from 16.3 per cent in 2010-11 to 15.5 per cent in 2020-21. The worrying trend is in the capital outlay and pension budget— from 2010-11 to 2020-21, the share of capital outlay in total budget has shrunk from 30 per cent to 23 per cent, while the share of defence pension as a per cent of total defence budget has increased from 14 per cent in 2010-11 to 28 per cent in 2020-21.

The slow growth in defence budgets has severely impacted the military's capital equipment acquisition. Given the impending impact of climate change on GDP and finances in terms of economic losses, a Stanford University study concluded that, climate change resulted in a negative 31 per cent impact on India's GDP per capita from 1961-2010.²⁴ This will further redirect funds towards managing climate change. According to Saudamini Das, NABARD Chair Professor at the Institute of Economic Growth, India will be spending about 3 per cent of its GDP in the coming decades on fighting the impact of climate change.²⁵ Continued financial stresses will naturally hamper India's fighting edge over its adversaries.

- **Human Induced Weather Modifications and Water Weapons.** One of the biggest threats for India is the weather modification capabilities and designs of China. China has a proven capability of successfully modifying weather especially cloud seeding for managing precipitation. Studies have found that cloud seeding can severely impact rain patterns and food production. This could potentially disrupt the natural flow of three major rivers flowing from Tibet into India i.e. Indus, Ganga and Brahmaputra.

China is also aggressively pursuing dam construction on major rivers in Tibet—it is building one of the largest dams ever on the Yarlung Tsangpo (Brahmaputra) river.²⁶ This dam, along with others near Arunachal Pradesh, will provide immense water storage capacity to China, therefore, becoming a potential weapon and a strategic leverage over India. Already, China has proved its willingness to use water as a tool in times of conflict. For instance, during the 2017 Doklam standoff, China had stopped sharing river data with India.²⁷

India cannot rely solely on China's word, that it will do the right thing and share data timely. The stakes, in terms of lives and economic activity at risk, are too high. India therefore, needs to improve its own prediction models for risk mitigation in the

northeast region by using technologies like Remote Sensing Satellites and Geographical Information Systems (GIS).²⁸

Way Ahead

Some recommendations for dealing with the challenges of climate change are as follows:

- **Micro Level Database.** While the government has begun publishing *EnviStats*— a report on environment statistics, which helps put forward a compilation of data collected by several central and state ministries, departments and agencies. Government therefore, could identify the most vulnerable regions within the country and start creating a more extensive database for supporting decision-making by stakeholders at a micro level. This data should not be limited to the disasters and their locations only but also to pre- and post- disaster parameters including weather details, water levels in rivers and dams etc.
- **Risk Assessments and Audits.** The Indian Military needs to conduct a comprehensive risk assessment and audit of all its military installations and systems across the country, using the existing data on environment and past trends. The main objective should be to identify recurring disaster zones and respective risks and thereafter plan necessary steps to reduce future losses or diminished military readiness. This could mean the changing of physical designs of the existing military infrastructure and incorporating the possibility of disasters of incremental severity during the initial stages of concept and design. There should be an assessment of the impact of the increasing number and severity of disasters on logistical operations and the need to incorporate climate change components in long term logistical plans. Early warning mechanisms need to be integrated into both strategic and operational planning. For instance, in the Himalayas, avalanches are a complicated challenge. Extreme weather patterns like intense snow storms could exponentially worsen the avalanche challenge. The Indian Army particularly is vulnerable to this, due to its extensive deployment in the Himalayas and logistical operations it has to undertake on a regular basis. For managing this, the Indian Army could look into practices like controlled avalanches used by countries like Sweden for disaster prevention and risk mitigation.²⁹

Similarly, due to the severity of weather patterns, extreme heat and cold could put unaccounted stress on military equipment. In the US, work on vehicles with higher

heat tolerance levels is a common practice. India therefore, need to account for these changes for national security purposes.

- **Disaster Games.** The best way to prepare for the impact of climate change on the military is to conduct disaster games along the line of war games and military exercises. Such games are to be conducted to analyse the potential implications of increasing number and severity of disasters on military operations, the possible gaps in strategies and infrastructure as well as possible actions of adversaries during and after major disasters to secure an advantage in ongoing disputes. This can be particularly complex for India given the multiple conflict environments existing within the country, mainly with its borders.

The Swedish Defence Research Agency organised the North Atlantic Treaty Organisation (NATO) Advanced Research Workshop in 2018 to analyse the disaster risks posed and possible responses in the conflict-ridden areas of West Africa.³⁰ While these were mere simulations, it was found that the opposing teams could manage to exploit disasters, among other things forcing refugee flows.

Conclusion

The evidence surrounding climate change and its impact is becoming more assertive. Its impact on human life is not restricted to just the economic aspect but extends to physical security as well. Militaries all around the world will be facing the climate change challenge. How well they cope with these inevitable changes will depend on how soon climate change is seen as a real threat to traditional and non-traditional security.

India faces multiple exacerbated challenges like resource crunch in terms of food and water, health insecurity and the potentiality of deteriorating law and order situation as a result of climate change. On the more traditional security front, the biggest challenge for the Indian military, in the face of active borders on both its flanks, is to secure its numerous bases with sizeable manpower along the Himalayas which are increasingly vulnerable to natural disasters like floods, landslides and avalanches. Similarly, the frequent cyclones and rising sea levels will hamper the Indian Military's operations. The appropriate measures must begin with a psychological overhaul and the securitisation of climate change. The Indian Military must start planning for the potential impact, it might have to face across the entire spectrum— whether they are related to deployment locations and risks associated to those locations, equipment used or logistical operations. The key to managing this threat is sincere and timely movement towards comprehensive risk assessment and risk reduction.



End Notes

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