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Nepali Army in Climate-Induced Security Challenges

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Abstract

In the interconnected world today, the connection between climate change, peace, and security has gained significant recognition. Security actors, including the armed forces, are increasingly confronted with extreme weather events demanding for assistance both at home and abroad. Their military assets and ability to operate are affected by changing weather patterns, rising sea levels, and other climate impacts. Climate change is transforming the way we think about security. As climate change intensifies, its impacts risk exacerbating existing social, economic, and environmental drivers of insecurity at local levels (where communities struggle to cope with converging pressures) and globally (when resources and ecosystems are shared across national borders). Climate insecurity hinders the adaptation efforts, and risks leaving already vulnerable communities even poorer and less resilient to interlinked climate and security crises. As the global temperature is rising, climate and disaster risks in Nepal are affecting people, the environment, the economy, development gains, and overall security of the country. This article begins by briefly highlighting the climate-induced insecurity to Nepal and efforts made to minimize its impacts. Then the article endeavors to present a comparative overview of the leading greenhouse gas (GHG) emitting nations including Nepal followed by the analytical examination of climate change impacts on states and armed forces. Finally, the article concludes by presenting suitable recommendations to the NA in responding the climate-induced security challenges. The article is subjectively prepared by analytically reviewing various literatures on climate-induced security challenges in the world today.

Keywords: Nepali Army, climate-induced security challenges, interconnected world, adaptation measures, socio-economic development

Introduction

Climate change is one of the most pressing challenges of the present and the future. Increased attention to the climate change-security nexus is visible both at the national and the international levels. Rising temperatures and sea levels, as well as extreme weather events such as high frequency of flooding, landslide, disease, and famine; migration on an unprecedented scale;

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drought and crop failure; intensified competition for food, water, and energy in regions where resources are already stretched to the limit; and economic disruption are the most visible outcomes of changing climate that also influence military capabilities. Climate change is a real and undeniable threat to our entire civilization. The effects are already visible and will be catastrophic unless we act now with priority.

Climate change impacts can exacerbate the instability in the international security environment, with the potential to trigger or escalate armed conflicts over limited resources (Parry, 2007, pp.1-2). The Covid-19 pandemic and big powers' conflict of interests in the Ukraine and Hamas-Israel war, Indo-Pacific and West Africa (Benin, Burkina Faso, Gambia, Guinea, Mali, Niger...) have weakened the economic capacities of nations and the desire to act collectively against this undeniable threat. This means global efforts towards climate change mitigation are not sufficient to limit the pace of global warming. States should increase their adaptation capacities within which military forces can play crucial roles in crisis management and humanitarian assistance and disaster relief (HADR) operations (Gulenc, 12 Sept 2022, pp.2-4). It has become a critical issue in security policy, and military organizations are ever more involved in handling it. Given its transnational nature, governments around the world have a shared responsibility to prepare for / mitigate climate change impacts.

The United States (US) is at the forefront of recognizing climate change as a national security threat. The US published its climate change National Security Strategy Act 2022 to ensure that climate-induced security challenges are fully incorporated into its national security policies, doctrine, and plans. The UK Ministry of Defense (MOD) has acknowledged the need for a coherent climate change policy with a key role in the defense (Cox, Knack, Robson, Adger, and Freeman, 2020). Similarly, the Australian Defense Force is integrating climate risk into its defense strategy such as Operations "Bushfire Assist 2019/20" and other climate disasters in the country as well as in the Pacific island nations. Canadian Chief of Defense Staff Gen Wayne Eyre argues that "he needs more men and women to handle these crises and his soldiers need more training to deal with fires and floods".

Military and defense systems cannot be untouched by the impacts of climate change. For example, the US Marine Corps Camp Lejeune (North Carolina) and Tyndall Air Force Base (Florida) were hammered by Hurricane Florence and Hurricane Michael in Sept and Oct 2018 destroying the defense properties of approx \$3.6 billion and \$4.5 billion respectively (Bultman, 2020). In the UK, rising sea levels and coastal erosion have threatened military installations along the coast, leading to the need for expensive renovations and protection measures. Earthquakes and typhoons have caused significant damage to military bases, forcing the military to redirect resources toward relief and recovery efforts in Japan. Typhoon Doksuri originated on the southern China's coast resulted in the torrential rainfall of 745 millimeters in less than 40 hours during the recent Beijing flooding with a heavy toll on lives and properties with the rapid deployment of armed forces in the rescue, relief, and rehabilitation operations (Conroy, 3 Aug 2023). Thus, military and climate-induced security challenges are closely interlinked and its role is ever expanding with heavy strain on the readiness of fighting forces and diverting resources away from the primary responsibilities. Climate change is no longer a problem for future defense leaders; it is an immediate challenge now.

Climate change in the SAARC region is impacting the environment, and socio-economic

and geopolitical realities. The melting of glaciers and the glacial lake outburst floods (GLOFs) in the Third Pole (Himalayas) are leading to floods, landslides and competition for water resources in the region. This is already seen in Kashmir where the sharing of water (including other factors) is a key driver of Indo-Pak conflicts. In India and Pakistan, extreme weather events like floods, inundation, landslides, and droughts are causing crop failures and food insecurity leading to migration and resources scarcity. Similarly, the degradation of mangrove forests and coral reefs due to rising sea levels in Bangladesh, Sri Lanka and The Maldives are threatening coastal fishing communities and exacerbating poverty and food insecurity. In Bhutan and Nepal, the melting of mountains and glaciers is causing GLOFs and landslides by threatening communities living downstream exacerbating food shortages, violence, and migration (Vespertino, 2022). Studies have also shown that water scarcity, extreme weather conditions, and ecosystem degradation due to climate change have resulted in communal and local conflict, as seen in Afghanistan and Syria (Clionadh, 2007). Such low-level violence resulting from climate change can turn into intra-state or inter-state conflicts, mass migration, and state failure. Countries are also likely to face pandemics or large-scale outbreaks of diseases due to climate change effects. Hence, almost all the countries in the world are relying on their armed forces against all forms of climate-induced insecurities (Rawal, 2021).

But focused attention on the climate-induced security challenges has been missing in South Asia including Nepal (Global Climate Risk Index, 2019). Our regional associations - the SAARC and BIMSTEC - also overlooked this important matter. For example, the 18th SAARCC summit and 4th BIMSTEC summit (Kathmandu in 2014 and 2018 respectively) expressed serious concern over environmental degradation in the fragile Himalayan and mountain eco-systems but left behind of fully acknowledging climate change as a security challenge (Bhattarai, 2020).

Climate change has significantly impacted the economy, environment, and ecosystem of Nepal, which is a major concern for Nepal's national security. The national security policy, NSP (2017) broadly acknowledges climate change as the national security threat but it fails to specifically identify likely measures to mitigate it holistically. The inclusion of climate change as a national security threat in the NSP seems only to be generic.

Statement of the Problem

Nepal ranks 4th in terms of changing climate vulnerability. Its adaptation capacity is even lower (World Bank 2021). It is estimated that Nepal will lose at least 3.5 % of its annual GDP by 2050 due to climate insecurity (ADB, Feb 2021). Climate change affects the ecosystem, bio-diversity, socio-economic development, human health, energy, and relations with neighboring countries. Political instability, weak economic status, unique geography, and geostrategic position are hindering the timely adaptation measures to mitigate climate change impacts. Though Nepal has a negligible amount of GHG emission, its overall security is being threatened much more by demanding greater roles of the Nepali Army (NA) to prevent / mitigate the impacts of climate change. Not like in the armed forces of the US, UK and Japan, adequate research have not yet been carried out about the NA's roles in climate-induced security challenges. Therefore, the research endeavors to objectively answer the following questions:-

1. What are the climate-induced security challenges to Nepal?
2. What inferences can be drawn by the comparative study of the efforts made by the

Armed Forces of the leading GHG-emitting countries?

3. What are the appropriate measures for the NA in responding climate-induced security challenges?

Research Methodology

In the context of analyzing climate change, security, and military organizations, scholars like Jayaram and Brisbois (2021) confirm that the military is an actor in its jurisdiction. The NSP has identified climate change as the emerging security threat that challenges the country's ability to protect its citizens in the short and long term (NSP, 2017). Given that it is a subject of contestation between actors with different notions of what climate change means and how best to deal with it, the NA's organizational structure provides an exceptional framework for military approaches to climate change. Since armed forces' assets and skilled manpower are often deployed in climate governance, it is important to also examine how relatively small states' military institutions like the NA approach the issue. Thus, this article endeavors to explore whether the NA's present organizational structure is suitable to meet those challenges at home as well as in the deployed UNPKOs.

To carry out a logical inquiry into the roles of the NA in climate-induced security challenges, this article has mostly depended on secondary data collected from publicly available documents such as Nepal's NSP, defense policy, military doctrine, SOPs, special reports, short-term orientations (seminars, workshops, symposium, etc.), assessments of conducted activities and guidelines (after action reviews), NA's website and public information channels (national and international). Primary data were collected through informal interactions/statements by NA's senior officials. Qualitative analysis of retrieved data was done to establish a relationship between the anticipated roles of NA in climate-induced security challenges. The results of the analysis were finally verified against information provided by the NA's officials in semi-structured interviews.

Military Institutions in Climate Change

Armed forces around the world have acknowledged climate change has security implications for nations and societies. Researches on the subject justify that climate change is recognized as an important factor in military strategy (Brzoska, 2015) where militaries are ever more involved in mitigation and adaptation. It can be argued that military institutions emerge as instruments in three discussions within the literature of climate change-security nexus. The first discussion is based on the perspectives of future uncertainty resulting by climate change demanding the mobilization of military assets for the protection of people and states. A greater need for military means is well justified when dangers such as conflicts and human security issues, fears of interstate wars, catastrophic humanitarian disasters, etc. seem imminent. Climate change and armed forces are inextricably interlinked (Jayaram and Brisbois, 2021).

The second discussion relates to the influence of military institutions on climate policy discourses. According to Melton (2018), climate change is challenging the military in two ways. First, it directly threatens military readiness, capacity, and infrastructure since extreme weather events, rising sea levels, and global warming among other things, harm military equipment, installations, and personnel (La Shier and Stanish, 2019; Hayden, 2018; and Brzoska, 2012). Second, it indirectly influences geopolitical and global economic risks which, in turn affects

militaries' battlefield operating system and roles. Analysis shows that climate change has significant implications for military strategies and operations (Briggs, 2012; O'Lear, 2013; and Smith 2007, 2011). Therefore, climate change consideration is vital in the formulation of the security and defense policy of the nations (Brzoska, 2015 and Holland and Vagg, 2013).

The third discussion outlined by Brzoska (2015, p.175) argues whether climate-induced insecurity is best handled by military means. Within this discussion, climate change has increasingly contributed unpredictable risks and "require broad sets of measures, such as the prevention and strengthening of the resilience of potentially affected people and communities". The focus of the debate has thus shifted from the domain of militarization to the wider dimensions of securitization (Corry, 2012 and Oels, 2012).

The three discussions taken together demonstrate that the relationship between climate change and security often implies attention to military institutions. Thomas (2015 and 2017) claims that the US Armed Forces and the Australian Defense Forces started addressing climate-related issues in the mid-2000s. But while the former continued to implement measures to increase resilience, secure energy supplies and improve its competitiveness, the latter withdrew most climate-related initiatives as the new government changed focus. However, the extensive 2019/20 bushfires in Australia triggered public and political debate in the country about climate change and security. The Australian government since then has emphasized a potentially significant role for the defense and military sectors in addressing the security implications of climate change (McDonald 2021, p.12). Jayaram (2020) argues that the Indian Armed Forces, in contrast, is engaged in HADR operations, but it neither has declared climate change critical to its operations, strategies, and survival nor integrated it into its policies.

More recently, military organizations have been frequently discussed about the climate governance literature. According to Jayaram and Brisbois (2021, pp.1-3), "military organizations have become increasingly influential in climate mitigation and adaptation, especially for climate extremes, because of their inbuilt capacity to handle crises". Based on these factors, this article endeavors to find the gap in the wider contributions of the NA in climate-induced security challenges in the country.

Climate-Induced Security Challenges to Nepal

Nepal is one of the most disaster-prone countries in the world. Besides earthquakes, all of the major disaster risks it faces are linked to the climate. Environmental disasters are the most prominent aspects of climate change as regards to national security of Nepal (Gulenc, 24 Oct 2022). Climate change has already started to cause economic and security problems that demands greater involvement of the military forces. The ongoing and probable climate-induced security challenges are enumerated as under:-

- Reductions in agricultural production, food insecurity, strained water resources as well as damage to infrastructures such as health, transportation, etc.
- Humanitarian disasters (extreme weather events such as intense droughts, catastrophic storms, monsoons, flooding, landslides, land degradation/erosion, severe fires, deforestation, epidemics, melting of Himalayan ice/glaciers resulting in avalanches and GLOFs, and a rapidly declining biodiversity/ecosystem).
- Climate mass displacement, migration, and radicalization contributing to social imbalance, criminal activities, terrorism, etc.

- Energy insecurity.
- Regional conflicts caused by scarcity of resources (such as the sharing of water resources between Nepal and India, India and Pakistan in Kashmir, etc...)

Nepal's Efforts in Climate Change Control

Nepal became the signatory to the Ramsar convention on 17 April 1988. The Ramsar Convention held in Ramsar, Iran in 1971 is an intergovernmental treaty with 169 member countries to protect and maintain the ecological character of their wetlands. Among 2,222 wetlands globally, the 10 wetlands (lakes/marshes) from Nepal are included in the index of global Ramsar sites (Ministry of Forest and Environment- MOFE, Feb 2024).

World leaders during the Rio Earth Summit agreed to establish the international environmental and development instrument, the United Nations Framework Convention on Climate Change (UNFCCC) to guide international cooperation and development policy for all countries (United Nations, 3-14 June 1992). Nepal has been a Party to the UNFCCC since 12 Jun 1994 and its subsequent instruments such as the Paris Agreement. Nepal has been utilizing the opportunities created in the international platform as per the national needs. The MOFE acts as the focal point to coordinate with the UNFCCC (National Climate Change Policy, 2019, pp.2-7).

The Paris Agreement adopted by 196 parties at the UNFCCC Conference of Parties (COP21) in Paris on 12 Dec 2015 is a legally binding latest international treaty on climate change. Its overarching goal is to hold “the increase in the global average temperature to well below 2°C pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels (Carl-Friedrich, 29 Jan 2022). Prime Minister Puspa Kamal Dahal during his address to the 78th session of the UNGA (18-26 Sept) has re-iterated Nepal’s firm commitment to achieve net zero emissions by 2045.

The GoN has developed institutional mechanisms to implement long-term goals as agreed in the Paris Agreements. The national instruments such as Environment Protection Act (2019), National Climate Change Policy (2019), Climate Change Strategy and Action Plan (2019), DRR and Management Act (2017) and Regulation (2019), National Adaptation Programme of Action (NAPA), National Strategy for Reducing Emissions from Deforestation and Forest Degradation (2018), Sectoral Policies, the first and second Nationally Determined Commitments (NDCs), SDGs Strategy, National Energy Efficiency Strategy (2018), Green, Resilient and Inclusive Development (GRID) strategy, the Solid Waste Management Policy (2022), the Forest Regulation (2022), the Land Use Regulation (2022) and the 15th five-year plan collectively provide policy directives for Nepal to enhance resilience and adopt low-carbon development measures. The Climate Change Management Division in the MOPE is the focal point to coordinate with different levels and sectors in the country (GoN, Oct 2021).

NA in Climate-Induced Security Challenges

Department of National Parks and Wildlife Conservation (DNPWC) was established in 2037 BS (1980 AD) to support wildlife and biodiversity conservation. Nepal has established a very good network of protected areas with 12 National Parks, 3 Wildlife Reserve, 1 Hunting Reserve, 6 Conservation Areas, and 13 Buffer Zones. These areas extend from lowland Terai to high mountains, covering 23.39 % of the country’s geographical area to contribute to the conservation of ecosystems and biodiversity (GoN, 7 May 2023).

The NA began its conservation duties by deploying in Chitwan National Park prior to the establishment of DNPWC in 1975. The NA is at the forefront in conservation works having deployed in 12 national parks, 3 wildlife reserves, and 1 hunting reserve (8 Battalions, 7 Independent Companies, and 1 Nature Conservation School, altogether in 208 locations in 33 districts with 8136 troops with 116 fatalities, approx 8.5 % of its total strength (Nepali Army, Directorate of National Parks and Wildlife Conservation, Feb 2024). The NA is also involved in tracking down wildlife smuggling, controlling poaching, encroachment, and deforestation; supporting the rehabilitation of wild species; civil-military relations; eco-tourism; and many more. The results are visible by achieving zero poaching years of rhinos and other endangered species. The NA has thereby provided great conservation services to contribute to national as well as global efforts to minimize/control climate change.

The NA is also contributing in the protection of five wetlands (out of 10 Ramsar sites) such as Gokyo, Gosaikunda, Rara and Shey Phoksundo lakes in the Himalayan region and Koshi Tappu in the Tarai region. These deployments have resulted positive impacts in the ecological conservation.

The NA is the first responder against all forms of climate-induced disasters in the country. The NA's contribution during 2015's devastating earthquakes is self-explanatory. The mitigation efforts by establishing holding centers, treatment of victims and dead bodies management during COVID-19; reconstruction and handing over of 869 houses in the storm-affected communities in Bara and Parsa districts in May 2019; and The Melamchi flood disaster in Aug 2021 are some of the recent and notable contribution of the NA against climate-induced security challenges (ICIMOD, 4 Aug 2021). It is expected that the NA will be frequently deployed if the current trends of climate change continue in the future.

The Third Pole remains the largest ice mass outside the Polar Regions. Out of 1089 GLOFs globally, the Third Pole consists of many GLOFs (17 in Bhutan, 21 in Nepal, 25 in India and 33 in Pakistan) and these can be released at any time as a result of global warming with devastating impacts to lowland communities (UNDP, 26 Oct 2022). The NA was deployed to lower the water level of Imja Tsho glacial lake in 2016, into which the risk of bursting was reduced by lowering the water level of Glacier Lake by 3.4 meters (Adhikari and Baral, 17 Dec 2016). As the global temperature rises, the NA would be frequently asked to deploy to prevent GLOFs.

With the aviation support from the NA, Prime Minister Madhav Kumar Nepal conducted a cabinet meeting at the Kalapathar plateau (5250 meters, near to Mt Everest base camp) on 4 Dec 2009. Nepal has drawn the attention of the industrialized countries to how their activities are contributing to global warming that could cause devastating impacts in the Himalayan region. The unique meeting came after the Maldives underwater cabinet meeting in Oct in a bid to draw global attention towards the rising sea levels that threaten the existence of the island country (Parasar, 4 Dec 2009).

The NA is in the process of inducting renewable energy sources and electric vehicles in the institution. Its annual nationwide plantation program will give rich dividends in biodiversity conservation in the long run. Similarly, the institution is taking part in national development activities by taking environmental impact assessment (EIA) into full consideration.

The NA has integrated climate change into its strategy, doctrine, SOP, and career courses to enhance institutional capacity in responding climate-induced security challenges.

The NA is conducting regular workshops/seminars/symposiums on climate change and security with national as well as international actors. The NA's collaboration with these actors is expected to enhance the overall adaptation and resilience capacity of the Nepali society.

Comparative Study of the Leading GHG-Emitting Countries

The GHG emissions in the atmosphere are threatening environment, lives, health, food and economies across the world. Mitigation opportunities exist but continuous rise in GHG emissions is choking our world and the earth is becoming a sick planet. To limit global temperature rise to below 2°C aiming for 1.5°C as promised in the Paris Agreement, the world is required to cut at least 30 gigatonnes (45 percent) of GHG emissions annually by 2030 (UN Environment Programme, UNEP, 9 Nov 2021).

If this trend continues, global temperatures can rise up to 2.8°C by the end of the century (UNEP, 27 Oct 2022). Under-mentioned table justifies that more emissions are currently entering the atmosphere making it harder to keep the planet safe. The situation is alarming.

Ser. No. based on GHG Emissions	Country	Annual GHG Emission (million tons)	Global Emission Percentage
1	China	13,740	27.8
2	United States	6,298	12.7
3	India	3,620	7.3
4	Russian Federation	2,314	4.7
5	Japan	1,270	2.6
6	Brazil	1,260	2.5
7	Indonesia	1,074	2.2
8	Iran	926	1.9
9	Germany	874	1.8
10	Mexico	801	1.6
...	Nepal	51	0.1

Table 1: Top 10 GHG Emitting Countries in 2023

Chinese Armed Forces

China is the world's top emitter, producing more than a quarter of the world's annual GHG emissions. It has acknowledged that climate change may have security implications and pledged to cut emissions under the Paris Agreement, reduce coal use, and invest in renewable energy. But little is known as to how the Chinese government perceives the roles of the military in climate change control. China seems to pursue a strategy of resisting to connect climate change with the military. These reasons may be explained by several factors: 1) the deep ties between Chinese Armed Forces and the Chinese fossil industries; 2) Chinese policymakers may

view climate change through the lens of Sino-US competition; 3) a fear of projecting strategic weaknesses because of the effects of climate change on military capabilities and infrastructures; and 4) BRI's over-reliance on coal-fired power plants (Stoetman, Zandee, Dams, Drost, and van Schaik, Jan 2023, pp.17-20).

Defense strategies only address climate issues in a very limited manner, and these strategies do not elucidate any role of the military. Its military's role in climate change issues is largely limited to mass tree plantation and HADR operations. Perhaps, the Chinese government might have taken climate security very seriously, but it vigilantly denies any information leaking to its strategic adversaries (Brzoska, 2012, pp.50-52).

US Armed Forces

The US has the most proactive approach toward addressing the security dimension of climate change, both nationally and internationally. The challenges resulting from climate change are structurally embedded in the US' strategy, policies, and actions. The US released a new National Defense Strategy in 2022 by recognizing climate change as a destabilizing and potentially catastrophic trans-boundary challenge (De La Garza, 17 Feb 2022).

Similarly, the American military has a very consistent approach to addressing the impact of climate change. This proactive approach is the result of the practical experiences of the US military. The US Armed Forces' deployment for humanitarian assistance and disaster relief operations, both nationally and internationally is growing (Sikorsky, 19 Nov 2022).

The US climate strategy sets out ambitious goals: carbon-free electricity for installations by 2030. Net zero emissions from Army installations by 2045. An increasingly electrified vehicle fleet, including developing electric tactical vehicles - the ones that drive out into combat - by 2050. Micro-grid installations on all Army posts by 2035 paving the way for increased renewable energy. It is thinking more about climate issues while managing its vast land holdings and reducing its carbon footprint during military exercises (Birnbaum and Root, 10 Feb 2022).

Indian Armed Forces

The Joint Doctrine 2017 of the Indian Armed Forces acknowledges the environment as a critical area of the security paradigm. It has looked more closely at the impact of environmental change on its strategy, operations, and actics. The Indian military is contributing to increase the country's renewable energy generation capacity by allowing defense lands to host solar energy installations. Its Navy is in the process of upgrading its blue-water capabilities to achieve a zero carbon footprint. The armed forces remain at the forefront during HADR responses (Jayaram, 20 Jan 2018).

Similarly, Ecological Task Force (ETF) battalions are carrying out mass tree plantation in the defense and degraded lands every year (Sharma, 21 May 2023). The paramilitary National Disaster Response Force (NDRF)—a specialized disaster response force', was also established in 2006 under the Ministry of Home Affairs (Jayaram, 2021).

Russian Armed Forces

Russia is aware of the potential security implications of climate change as acknowledged in various strategy documents. However, Moscow is not eager to securitize the issue internationally, rather takes these problems as they occur on a national level. National Security Strategy 2021

has recognized climate change as a threat to national security – which could materialize in the form of wildfires, floods, infectious diseases, or the deterioration of infrastructures (Presidential Executive Office, 2 July 2021).

Although climate change is perceived as a threat to national security, none of the strategic documents has established a connection between climate change and the Russian military, nor stipulated specific responsibilities for the armed forces in mitigating the climate change effects (Ibid., 31 Dec 2015). So far, Russia has made no serious efforts to develop green energy sources or to reduce the emissions of its armed forces, while simultaneously strengthening its fossil fuel industries. Hence, there is no indication that Russia will make a serious attempt at greenifying its armed forces. One of the primary reasons for this is that the Russian economy is too reliant on fossil fuels (Ministry of Finance of Russia, 5 March 2020).

Most lately, climate change impacts have been noticed in the Russian invasion of Ukraine also. Over the past three years, the ground in southern Ukraine has not frozen, and a continuation of this would be more challenging for the movements of military vehicles across the muddy terrain (Schwartz, Politi, and Srivastava, 5 Oct 2022).

Japanese Armed Forces

Japan aims to reduce its GHG emissions by 46 percent by 2030 (baseline 2013) and has set an ambitious target that is aligned with the long-term goal of achieving net-zero emissions by 2050. This bold pledge sets Japan on a course to become Carbon Neutral in 30 years (Uiko, 2020).

The Armed Forces will continue to contribute to the reduction of GHG emissions toward the government's goal of achieving carbon neutrality by 2050 by making bases and other facilities, defense equipment, and operations more efficient, effective, robust, and resilient. Similarly, the Armed Forces stand as the first responder against climate-induced disasters across the country.

Analytical Discussion

During the recent 78th Session of the UNGA, the UN Secretary-General Antonio Guterres chaired the Climate Ambition Summit to speed up climate change policy, climate justice, and decarbonization through collective efforts to phase out of fossil fuels and scale up a just transition to a more equitable renewable-energy based climate-resilient global economy. But, climate change is hitting the developing world the hardest, and the Global North (big polluters, the G20 countries) is mostly to blame for not doing more to tackle global warming. The Global North lacks commitment to honestly implementing international instruments in controlling climate change.

Climate change has security implications. The EU Strategic document mentions that climate change, environmental degradation, and natural disasters will impact their security spectrum and are proven drivers for instability and conflict around the globe (The European External Action Service, March 2022, p.22). NATO (June 2022, p.6) recognizes that climate change is a defining challenge of our time, with a profound impact on allied security. It is a crisis and threat multiplier. In addition, the UNEP (2022) describes climate change as the ultimate threat multiplier worsens[ing] existing social, economic and environmental risks that can fuel unrest and potentially result in violent conflict. These are some of the examples only.

Given its transnational nature, countries around the world have a shared responsibility to face climate change. It is however questionable whether the global powers' interests align. They differ in their approaches to addressing climate change, and even more so in their views on how it affects the armed forces. China and Russia are reluctant to accept climate change as a matter of international security. This is for example visible in international forums, such as the UN Security Council. In contrast, India, Japan, Nepal, the US, and the EU, ... support for climate action is subject to political preferences and its risks are widely recognized within their defense establishment (Stoetman, Zandee, Dams, Drost and van Schaik, Jan 2023).

Climate change has become increasingly politicized over the years, meaning that the issue is a part of public policy, requiring government decisions and resource allocations. The politicization of climate change implies that the highest political levels pay attention to the matter when it comes to addressing its impacts. However, how the climate change-security nexus is treated in the strategy documents of the most GHG-emitting countries is quite different. What these countries have in common is that they have all indicated that climate change has security implications. The degree of perception varies, however (Buzan, Wæver, Ole, and de Wilde, 1998, p.23).

Beijing's and Moscow's positions are significantly different from those of the West, and they express their opposition to the Western perspectives. This will continue to form a hurdle at the international level in linking climate change and security. Political dialogue between Russia and the US and between China and the US is currently absent. This is the result of three particular developments: the Russian invasion of Ukraine, adverse Sino-US relations following Nancy Pelosi's visit to Taiwan (Financial Times, 4 Aug 2022), and the Hamas-Israel war. Having no political dialogue even on such serious global security matters means that it is rarely possible to gain an insight into the strategic choices of these countries in the near term.

The defense sector is experiencing the impact of climate change in multiple ways. The armed forces will increasingly have to operate in a changing environment such as in struggling resources, new conditions of intervention, and new types of missions (HADR operations, deployment in the Arctic, ...) along with the need for the greenification of the defense sectors (van Schaik, Zandee, von Lossow, Dekker, van der Maas and Halima, March 2020, p.38). Extreme weather events can lead to rising sea levels, flooding, and landslides posing a long-term risk to military operations and bases/installations (Corbett and Singer, 18 Jan 2022).

Climate change and the armed forces are associated as the latter actively contribute to the former. The armed forces are among the biggest polluters of the environment. This is primarily the result of the militaries' heavy reliance on fossil fuels (IMCCS, June 2022). For example, a Watson Institute Report 2019 found that the US DOD was the world's largest GHG emitter based on its degree of petroleum consumption, which was more than some countries in their entirety (Crawford, 13 Nov 2019).

The armed forces will likely have to be deployed to areas where circumstances are extremely challenging. For example, deployment in the Arctic region might become more likely as rapidly melting ice is paving the way for increased economic activities along with geopolitical and military activities. Similarly, deployment to the Middle East, and Africa might be the result of climate change exacerbating existing conflict dynamics, leading to a potential rise in the demand for crisis management and stabilization operations which is already seen in the form of the UNPKOs in the DR Congo, Libya, Mali, Sudan, etc. (Zandee, Kruijver

and Stoetman, Apr 2020). The military being self-sufficient and multifaceted is viewed as an instrument that could lead environmental stewardship in its domain as well as in coordination with civil actors, thereby becoming a part of the solution.

If the demand for military deployment increases in the future, this also implies that military emissions will increase. Therefore, militaries across the world need to take necessary measures to contribute to the greenification of the armed forces (van Schaik, Zandee, von Lossow, Dekker, van der Maas, and Halima, March 2020, p.33). An additional benefit of reducing the dependency on fossil fuels would reduce the costs and help ease in safeguarding of supply lines, of which the current situation as a result of the Ukraine war is an example. Shifting away from fossil fuels towards more renewable energy sources would thus have advantages beyond the reduction of emissions.

The Arctic and the Third Pole are the principal regions affected by climate change. Global powers have expressed their interest in the region, ranging from economic, political, and military interests. Considering that these interests may not align with each other, this brings about a risk of escalating pre-existing geopolitical tensions between China, Russia, and the US. Due to rising tensions between the three global powers, there is a risk of the absence of political dialogue on the need to decarbonize their defense sector as part of the overall effort to combat climate change or risks related to geoengineering (Paris Peace Forum, 6 Oct 2021).

The armed forces can be expected to see increased deployments for HADR operations. However, we do see a difference between the three global powers: whereas the US explicitly acknowledges the potential increase in demand for HADR operations following climate change in their strategy documents, this is not as clear-cut for Russia and China. It nevertheless remains likely that the latter two will also have to deal with an increased call for such types of operations.

The US, and in particular the US military, is experiencing the effects of climate change more severely than any other country in the world. As a result, the US has had to take the necessary steps to address those effects, which has given it an advantage in terms of knowledge and expertise. The US has set specific targets to transform its armed forces towards a greener defense with GHG emission reductions. In doing so, Washington has embarked on a process of electrification of the armed forces, in particular within the US Army and the land component of the US Navy. This offers an opportunity to seek cooperation. SAARC countries including Nepal can learn from how the US approaches the climate change-security nexus and embeds it into its defense policies.

Small states like Nepal have negligible amounts of GHG emissions to global warming but are more sufferers as compared to bigger and industrialized nations that have a larger amount of emissions. It is also noticed that small states are demonstrating more commitments as compared to larger nations in reducing the level of emission as agreed upon in the Paris agreement and other climate-related international instruments. In this context, Nepal projected its grievances on economic and social impacts as a result of climate change during the UN Secretary General Antonio Guterres' visit (29 Oct – 01 Nov 2023) in Nepal.

The Third Pole and the countries associated with it will be more affected by climate change as a result of global warming. Internal displacement, migration, internal conflict with

the scarcity of resources, criminal activities, and even the terrorism-related security risks shall be the common outcomes of the climate change effects. This will surely impact the tourism industry, economy as well as overall development activities of Nepal.

Taken together with the responsibilities carried out in the past, the NA repeatedly states its likelihood of more engagement in HADR crises. Importantly, the government policies on climate change adaptation and the NA's policy to adapt its institution following a changing climate demonstrate that the organization intends to further its emphasis on climate insecurities. Perhaps, it is the time to vigorously sensitize its forces and their families on climate-induced security challenges.

Climate challenges are often transnational in character. SAARC nations are much vulnerable to the melting of ice from the Third Pole and the rising sea level in the Indian Ocean Region (IOR). These nations often raise the climate change issues during their summit meetings but no concrete regional actions have been taken on the ground. There is a dire need for an integrated approach in the prevention and mitigation of climate-induced security challenges from the regional perspectives.

Findings

The world by acknowledging climate change as the global security threat has formulated several climate-related international instruments (UNFCCC, Paris Agreement, COPs, etc.) to control the key drivers of climate change. However, the world community lacks universal consensus to implement these instruments with honesty and integrity. In reality, the world is losing the war against climate change, and we still do not seem to be prepared for it nor consider it as a serious threat. The research shows that industrialized countries are mainly responsible for climate change.

Most of the victims of climate change are among the LDCs. This might be the reason for the reluctance of most of the GHG-emitting nations towards universal consensus and preparing their armed forces for possible climate-induced conflicts and humanitarian disasters.

Climate-induced threats may contribute to uncontrolled population displacement, migration, radicalization, and even refugees creating an additional burden on the global economy for humanitarian responses. Climate migrants are not protected under international refugee law leaving them without legal protections. Such migrations may lead to conflict among nations with open borders. The sensitivity of the unregulated, porous, and open Indo-Nepal border in the context of Bhutanese refugees can be taken as an example.

Climate Change is not simply an environmental problem; it is increasingly being recognized as an international security challenge that impacts a nations' military tactically, operationally, and strategically. However, the military-climate security interface is neither straightforwardly explained nor diversely represented. As the climate-security nexus itself is conceived and approached diversely by different states, the practical implications of involving the military in climate-related issues are being debated in many contexts.

Climate change and environmental degradation will have significant implications for national, regional as well as global security and development. The security policy/strategy, geostrategic/geopolitical interests, patterns of conflicts, availability/mobilization of resources, and operational environments are affected by the changing climate. This influences the armed

forces' roles and tasks, both nationally, regionally, and globally. If we look at the economic dimension, Nepal is losing 3.5% of GDP annually to control and mitigate the climate-induced security challenges in the country.

Why militaries care or need to care about climate change has been enunciated by making a case for potential large-scale deployment for HADR operations, humanitarian interventions, and even its impacts on military readiness, assets, operations, and installations. For example, the NA's bases (in Dolpa, Humla, Mustang, even in Rasuwa, ...) and national parks (in Chitawan, Bardiya, Langtang, Sagarmatha, ...) are vulnerable to climate-induced landslides, flooding, and even the GLOFs also. It is very important to note that the NA's military bases and installations are established without taking climate-induced threats into the consideration.

The NA is committed to Nepal's environmental commitments and is cautious about reducing the organization's adverse impacts on the environment. The institution has conceptualized the relationship between climate change and security (NSP, 2017), and has perceived the requirement of contingency planning in case of climate-induced security catastrophes. However, it is unlikely to become a major issue in the near term for the institution as the extent of the NA's environmental and climate change commitment so far is limited only to HADR operations.

The NA believes climate-related security issues could be best handled through general societal preparedness/adaptation and general resilience-building, where the armed forces could be one of the instruments to assist. The NA visualizes that the relationship between climate change and security is complex and needs to be handled with a holistic approach.

The above analysis justifies that climate-induced security challenge will demand the greater needs of conventional military capabilities at national, regional, and global levels. Hence, the controversial issue of the need for downsizing the Nepali Army proves to be a baseless criticism in Nepali society.

The National Trust for Nature Conservation in Nepal is implementing global research initiatives such as 'Kyoto: Think global, act local', in the long march for climate control. Therefore, awareness-raising and enabling activities for capacity building at the national to local levels are crucial in interfacing global policy with local conservation and development activities.

Conclusion

Climate Change has made our earth as a Sick Planet. It is a defining challenge of our time, with a profound impact on national security and armed forces. It has to be understood in wider perspectives that demands holistic approach to prevent and mitigate its impact on national security and development. Yet, nations cannot find a common ground to act collectively and enhance the climate adaptation capacity of their armed forces. However, armed forces will be involved more frequently with strength in the future if the current trends exist. Hence, the NA has institutionalized climate-induced security challenges as envisioned by the NSP in the organization and doctrinally prepared with contingency planning to meet unforeseen eventualities at home as well as in the deployed UNPKOs. The NA's roles in climate-induced security challenges are commendable but these are so far limited to HADR dimensions only.

Therefore, this research is expected to contribute significantly both to research on climate change, security and military organizations; and wider climate governance literature. Previous

researches on militaries in climate change have mostly focused on powerful armed forces; this article provides significant insights into the contribution of relatively small armed forces in climate governance. This will, in turn, help us better understand the dynamics of climate and security in small states like Nepal and its military. In essence, though the military is the biggest polluters, the solution to climate Change is not the demilitarization.

Recommendations

Climate-induced security challenges are national security problems. It has to be handled from the highest political leadership to ensure that resources are allocated properly without the duplication of efforts.

Nepal using climate diplomacy should demonstrate its firm commitment through actions on climate-related regional and international instruments.

Consistent and holistic approach between three tiers of the government, armed forces, citizens, private sectors, and the international community is essential to strengthen and build synergies in meeting the climate-related challenges in the country.

The impacts of climate change exacerbate threats to the national economy, social harmony, biodiversity, health, food, water, and energy which impacts society at both micro and macro levels. These societal impacts interact to affect national security. Therefore, these impacts need to be quantified for national security where the NA is one of the main pillars.

The NA has proved itself as an integral national constituent in controlling changing climate through its deployments in biodiversity conservation and HADR operations. Therefore, it will be appropriate to include senior army officials into the high level entourages during climate-related regional and global level conferences such as COPs and others. Such practices exist in the US and Chinese Armed Forces.

The practice of military diplomacy to include high-level visits, joint training, exercises, seminars, workshops, etc. with the regional militaries is equally important to share best practice knowledge on climate challenges.

The NA's Directorate of National Parks and Wildlife Conservation in the Army HQ acts as the focal point of coordination between the army and the MOFE. Since the NA's conservation duties are immensely contributing to bio-diversity conservation and climate control, it is recommended to rename the "Directorate of National Parks and Wildlife Conservation" as the "Directorate of Climate Control and Bio-diversity Conservation". There is also a need to designate one senior officer as the "Climate Officer" under the Operations Branch of each Division Headquarters. By doing so, it will further justify the fact of NA's undisputed commitment towards its responsibilities in climate and biodiversity conservation.

The NA has two Disaster Management Battalions along with a Directorate headed by a Brigadier General. The current trend of NA's wider deployments in climate-induced HADR operations demands at least one fully equipped Disaster Management Battalion in each Province/Divisional AOR. In this context, India's NFDR Battalions for HADR operations can furnish best practice lessons to Nepal and the NA.

There is an urgent need to establish climate and disaster-resistant military infrastructures and bases in the NA. Since the armed forces are the biggest GHG emitters in the world today, the NA should also move forward toward renewable energy sources to transform itself into a greener defense institution. The same applies to the government, other security organizations,

public services, citizens and development agencies also.

Plants and trees as the important constituents of biodiversity are the lungs of animals. With its nationwide deployments in 974 locations, the NA along with the three tiers of government and local communities can immensely contribute to the national campaign of plantation every year (Directorate General of Military Operations, Feb 2024). The NA can also draw best practices lessons from the Chinese and Indian Armed Forces' mechanism of mass tree plantation, protection and handing over to the local administrations.

The Chure and Bhabar regions are being eroded rapidly due to the uncontrolled supply of construction materials locally as well as across the southern border. This situation demands the NA's additional deployments to control the desertification and deforestation of Terai and Madhesh regions.

In a rapidly accelerating changing climatic environment, the NA needs a dedicated budget for specialized equipments so that the organization as the first responder can carry out nationwide HADR operations effectively.

There is a need for integration of climate security more precisely in the NA's military strategy, doctrine, SOPs, career training and operations at various levels of the institution.

More investment should also be made in floods, landslide, heavy rainfall and GLOFs warning systems to minimize possible losses and damages. With its nationwide deployment in 974 locations, the NA can be an effective instrument for the changing climate early warning (EW) system. Effective coordination on EW matters with the neighboring countries is also important.

The US takes the lead in preparing for and mitigating the impacts of climate change for its military, including its infrastructures, bases, and operations. The best practices lessons from the US and its military would be helpful to Nepal and the NA while responding the climate-induced security challenges.

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