Fallouts of the Uttarakhand Disaster in India: a Critical Appraisal

DHANASREE JAYARAM
India

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Author Background

Ms. Dhanasree Jayaram is a Ph. D. candidate at the Department of Geopolitics and International Relations, Manipal University. She is a researcher (Energy, Environment and Resource Optimization Program) at the Centre for Air Power Studies (CAPS), New Delhi. She has been working on environmental security, politics, diplomacy and sustainability for the past two years and she has authored a book on these issues, providing an Indian perspective (Breaking out of the Green House: Indian Leadership in Times of Environmental Change: http://www.aerospaceindia.org/New%20-%20Breaking%20Out.htm). She has also published several articles, papers and opinion pieces in reputed forums as well as presented papers and lectures in various international conferences (including one organized by Dickinson College, Carlisle, Pennsylvania, and the Strategic Studies Institute of the United States Army War College in 2013). Ms. Jayaram received a scholarship at the International Summer School, University of Exeter, UK, in which she pursued the Global Climate Change: Environment, Technology and Society pathway. She is also an analyst at Wikistrat and the Climate/Environment Editor at e-International Relations.

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Introduction by Dr. Ivan Welch, FMSO

The role of national militaries in the recovery from natural disaster is a common reality all across the world. In the region of Indo-Asia Pacific, both objective environmental dangers and the central role of national militaries as a central national institution are ubiquitous. As the United States moves greater focus to this world region, the US military is a lead element of that engagement. An obvious interface amongst these modern militaries is through mutual concern and common capability regarding natural disasters. The tragedy that occurred in Uttarakhand, India in May of 2013, due to the inevitable confluence of man's changes to the landscape and the irresistible forces of nature, provides a sample of problems and participants in this struggle for sustainable development and the consequences of failure. The role of the Indian Army in this emergency response situation is a primer for US military engagement in the region. This sector of governmental concern is a promising entry point into nation-to-nation interaction. The communications, coordination, and capabilities needed to prepare for and recover from natural disaster are perhaps the best place to begin an "all of government" approach to partnerships.

Ms.Dhanasree Jayaram's article is a concise presentation of the critical importance of environmental concerns to political leaders and military forces serving their national interests. This disaster in Uttarakhand brings into discussion strategic borders, sustainable national development, increasing environmental degradation, and the role of national power. All of this is germane to US military plans of engagement within the Indo-Asia Pacific realm.

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By Dhanasree Jayaram

Uttarakhand is a northern state of India located on the slopes of the Himalayas. The state is famous for its shrines and temples that draw tourists and pilgrims. In June of 2013 a heavy period of monsoonal rainfall created massive flash-floods that swept down the narrow valleys causing tremendous destruction. Thousands were killed and tens of thousands had to be evacuated by the Indian Army.

Introduction

The Uttarakhand disaster, in which the death toll is estimated to be about 10,000 as per Adhikari, is a case of environmental security. Developmental activities, illegal encroachments, sand mining in the rivers, unlawful deforestation and indiscriminate damming of rivers have led

Map of India showing the Province of Uttarakhand.
Source: http://en.wikipedia.org/wiki/File:India_Uttarakhand_locator_map.svg

“The Indian establishment believes that fulfillment of developmental requirements should be a bigger priority at this stage than environment protection.”

to this disaster as much as the cloudburst. There is an external angle to the Uttarakhand disaster as well. The state government of Uttarakhand, on two counts, rejected the proposal of the central government to declare the region affected by floods an ‘eco-sensitive zone’ in May 2013, barely a month before the disaster struck. First, such a move would prevent development in the region and affect the state’s economy. Second, the region borders China and is therefore strategically important for the movement of armed forces personnel and supplies, which entails construction of roads.

The ‘Environment versus Development’ debate has always influenced environmental policies across the globe, particularly in India. The Indian establishment believes that fulfillment of developmental requirements should be a bigger priority at this stage than environment protection. At the same time, it also strongly contends that sustainable development is entrenched in the Indian ethos. India has to grapple with the consequences of environmental change on the one hand and the probable socio-economic ‘costs’ of mitigation and adaptation on the other. This paper argues that it is not a question of either-or; the need of the hour is to synchronize developmental requirements including alleviation/reduction of poverty and prevention of environmental degradation while regarding development as the most important adaptation strategy as has been reiterated by many Indian leaders. This could happen only if development is sustainable and not unsystematic and uncontrolled.

Also, with a spurt in the number of extreme weather-related disasters coupled by the incompetence of the civil administration in the country, there is perhaps a need for defining a clear role for the military in disaster management in particular and environmental security policy and panning in general. In the Uttarakhand tragedy, it is the country’s armed forces that emerged as heroes. At a time when the civil administration failed to implement some of the most

basic disaster management policies, the armed forces that is usually 'summoned' only as a last resort, came to its aid by carrying out rescue and relief efficiently and effectively. Therefore, this paper analyzes the Uttarakhand disaster by focusing on the convergence of larger issues of environmental change, development, national security and the role of armed forces.

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Climate Change and the Indian Monsoon

The 'unpredictability' factor associated with India's summer monsoon is not a new phenomenon; however, it is the scale of unpredictability with rising temperatures that has now become a major concern. A World Bank report prepared by the Potsdam Institute of Climate Research and Climate Analytics suggests that an extreme wet monsoon that was estimated to occur only once in 100 years, is now projected to happen every ten years by the end of this century. Due to increase in moisture availability, an increase in annual mean precipitation has been predicted. Variability in the monsoon system including intra-seasonal variability in precipitation and extreme precipitation events will undoubtedly increase the risk of flooding and droughts (114-116). Another study by the Indian Institute of Tropical Meteorology in 2006 also states that while there was an increasing trend in the frequency and intensity of heavy and very heavy rain events between 1951 and 2000, the frequency of moderate events during the period were on the decline (Goswami, et al. 1442-1444). Such variations in the rainfall pattern are capable of causing flash floods, mudslides, large-scale crop failure and loss of life and property.

The government, however, has denied linkages between climate change and extreme precipitation events, even in the case of heavy rainfall witnessed by North India in 2013. Despite the fact that studies have revealed that heavy precipitation events have resulted in many severely

damaging floods in India in the past few years, the government sources suggest that there was "nothing unusual" about the heavy rainfall events and that those were just "isolated events" that had nothing to do with climate change or extreme weather events as reported by Bose.

At the same time, it has to be noted that the scientific and environmental causes for the Uttarakhand disaster are not restricted to climate change only as analyzed by Singh. Initially thought of as a glacial lake outburst flood (GLOF), reports now claim that a multitude of factors led to the 'Himalayan Tsunami'. A small lake is said to have formed due to a huge landslide coupled with heavy rainfall upstream. A breach in the boundary of the lake resulted in a large amount of water surging as well as in another rock to flow away, thus creating a new stream in addition to the existing two streams. The monsoon had reached Uttarakhand almost two weeks in advance due to "low pressure in north-western region" (Rajasthan), "easterly winds from the Bay of Bengal that came along the foothills of Himalayas" and "westerly winds that crossed Uttar Pradesh and Bihar, creating a trough". Moreover, rains had hit Uttarakhand when the rivers already had a heavier flow due to seasonal glacial melting. As a result, the rivers swelled up further. When water falls on ice in general or glaciers, it melts faster. It might not be possible to prevent such an unpredictable sequence of events although early warning systems and timely and precise meteorological data could have salvaged many lives that were lost in the disaster

This was not the first time a disaster of such a massive scale had struck the nation. Cities such as Mumbai and Kolkata are among the top ten most vulnerable cities in the world in the climate change vulnerable index of Maplecroft – Global Risks Analytics as given in "Cities of Dhaka". They could be affected severely by long-term changes in temperature and rainfall patterns. As a case in point, in July, 2005, in a single day, Mumbai received 28.9 inches of rain in the city center and 37.2 inches in the surrounding suburban areas. The entire city came to a standstill with telecommunications, transportation, power and financial services coming to a halt (Stecko and Nicole 3). The Mumbai floods brought to light the country's vulnerabilities and several gaping holes in its urban planning and most importantly disaster management policies.

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The State of Disaster Management in India

The four-phase approach towards "modern disaster management" involves the following (Coppola, 9-10):

1. ***Mitigation:*** Reducing or eliminating the likelihood or the consequences of a hazard, or both. Mitigation seeks to "treat" the hazard such that it impacts society to a lesser degree.

2. ***Preparedness:*** Equipping people who may be impacted by a disaster or who may be able to help those impacted with the tools to increase their chance of survival and to minimize their financial and other losses.

3. ***Response:*** Taking action to reduce or eliminate the impact of disasters that have occurred or currently occurring, in order to prevent further suffering, financial loss, or a combination of both. Relief, a term commonly used in international disaster management, is one component of response.

4. ***Recovery:*** Returning victims' lives back to a normal state following the impact of disaster consequences. The recovery phase generally begins after the immediate response has ended, and can persist for months or years thereafter.

Similarly, India's National Policy on Disaster Management lays down seven elements that constitute disaster management: prevention, mitigation and preparedness (pre-disaster phase); and response, rehabilitation, reconstruction and recovery (post-disaster phase) (National Policy on Disaster Management, 7). However, despite the fact that the National Disaster Management Authority (NDMA) was formed in 2006 to carry out the above-mentioned tasks, the disaster management policies and strategies of India have been largely defunct. The authority was constituted under the Disaster Management Act of 2005 in the light of the various earthquakes, cyclones, tsunami and floods among other disasters that India had suffered in recent years. It established a three-tiered disaster management construct that is at the national, state and district levels. However, the authority has been hampered by a host of inadequacies and loopholes.

> *"Instead of a proactive approach, the Indian disaster management agencies have been practicing a more-or-less reactive approach."*

A report of the Comptroller and Auditor General (CAG) of India on "Performance Audit of Disaster Preparedness in India" criticizes the NDMA for its lack of information and control as well as for failing to implement several projects. It exposed the following details (vi-ix):

- The National Executive Committee had not met after May 2008, although the country faced many disasters since that date. This had affected the evaluation of the disaster preparedness at all levels of government.
- The National Plan for Disaster Management had not been formulated even after six years of the enactment of the Disaster Management Act.
- None of the major projects taken up by NDMA was completed. Due to improper planning, either the projects were abandoned midway or were still incomplete after lapse of a considerable period.
- The National Disaster Mitigation Fund was yet to be established.

- The National Database for Emergency Management, which was to be completed by August 2011, was yet to be operationalized.
- Effectiveness of the National Disaster Response Force (NDRF) was hampered by a shortage of trained manpower, absence of required training facilities, infrastructure and equipment. India's Disaster Resource Network project, to build an organized information system of specialist equipment and expertise for disaster response, was operational only on ad-hoc basis.
- As of September 2011, Only eight states had prepared Emergency Action Plans for 192 large dams against the targeted 4278 dams in 29 states.

In short, the country's disaster management mechanisms require drastic refurbishment and consolidation. The roles of the NDMA, state disaster management authorities, district disaster management authorities and other local authorities need to be defined clearly to avoid duplication and overlaps. Although the Disaster Management Act 2005, as well as the National Policy on Disaster Management, gives an exhaustive description of the various agencies involved in disaster management and their specific roles and functions, it is very clear that there is a lack of coordination and cooperation between different agencies until the disaster actually strikes or even just after. There must be more clarity on whether the NDMA could legally issue directions to the state authorities (e.g., would that lead to a violation of the federal structure?).

In fact, in Uttarakhand, a state that has confronted regular floods in the past has a state disaster management authority that is relief-centric rather than focusing on preparedness. Instead of a proactive approach, the Indian disaster management agencies have been practicing a more-or-less reactive approach. Also, the bane of bureaucracy seems to be affecting the disaster management machinery of India as well. There is a need to integrate various sectors of the society, including non-governmental organizations and the civil society at large.

The immediate reaction of the NDMA in the aftermath of the Uttarakhand disaster was to pass the buck to the Indian Meteorological Department (IMD) for not providing accurate weather warning as reported by Menon. The blame game continued when the IMD claimed that it had issued a warning, to which the NDMA reacted by stating that no special forecast was issued to the NDMA and therefore, it was caught unaware by the sudden heavy rainfall. No agency was prepared and no efforts were made to evacuate the people. More importantly, pilgrims constituted a large part of the victims; an early warning to not flock to the pilgrim spots/sites in Uttarakhand could have saved their lives. Unfortunately, the Central Water Commission (CWC) that forecasts floods in India has no forecasting station in Uttarakhand. Despite sanctioning of funds for installing Doppler radars -- which can detect precipitation intensity, wind direction and speed in Uttarakhand -- no action has been taken. The Doppler radar would have helped in issuing advance and accurate warnings of heavy rainfall. Raju reports that a proposal to modernize IMD has been forwarded by the NDMA in which heavy emphasis has been laid on procuring "various weather radars, micro-rain radars, GPS-based upper air system, surface observation equipment and lightning detection system" besides a "heliport automated weather observation system" which is in the pipeline.

The paucity of a robust communication network along with ill-functioning or outdated equipment has been heavily impeding the efforts of the NDRF on the ground. Empowering the NDRF with the latest technologies and logistical support is crucial for all four phases of disaster management. It is also important to sensitize them to the local surroundings and communities of the region affected by disasters, for appropriate rehabilitation. Instead of calling upon the armed forces every time, the NDRF -- constituted specifically for disaster management -- should be given a boost by imparting requisite training.

> *"In this context, India needs to realize that environmental security should find its rightful place in the country's national security policy and strategy."*

The Kedarnath Temple (C, foreground) is pictured amid flood destruction in Kedarnath, located in Rudraprayag, Uttarakhand.

Consequences of Developmental Activities in the Himalayas

The disaster in Uttarakhand was compounded by geological disturbances caused by poorly planned, unchecked developmental activities in the Himalayas. For example, despite a 2002 ban on building infrastructure within 100 meters of the river bed, a number of encroachments have taken place. The ban was opposed and overlooked by the locals who needed development and infrastructure. Tourism is a flourishing industry in the state and in order to fulfill its requirements, many hotels and guest houses had been erected in danger areas, as reported by Rawat. The disaster was aggravated by unhindered damming of rivers that triggered flash floods. Environmentalists blame the state and the central governments for falling short in this respect and claim that this was a man-made disaster waiting to happen. The counter-argument states that

in Uttarakhand, 40 percent of the villages reportedly do not have roads and 1,200 villages do not have electric poles. There are a number of groups that are fighting environmentalists' attempts to cancel several projects in the state. Pro-development lobbies contend that dams neither affect the flow of rivers nor require any blasting to create tunnels.

Conversely, construction of innumerable dams on the Ganga and its tributaries involved large-scale deforestation. This led to soil erosion, which eventually made the terrain highly vulnerable to landslides. In fact, the authorities have proposed 70 dams on the Ganga, without really taking into consideration their impact on the local environment. The state has hydroelectric capacity of 3,426 MW and another 95 projects with a total capacity of 12.235 MW are in different stages of development, according to Mishra. He gives details of a study that reveals that "89 percent of all hydropower plans are operating below their optimum level and 50 percent are operating at less than 50 percent of their optimum level." In fact, sustainability of large dams in the Himalayas has always been questioned due to three factors: displacement of people and the lack of proper rehabilitation; heavy sedimentation due to "geological and climatic peculiarities" of the Himalayas, which reduce economic performance of the dams over time; and seismicity that threatens dam safety (Bandyopadhyay 2367-2370). These figures very clearly state that the need of the hour is not to build new dams excessively but to improve the efficiency of the existing ones. Risk and impact assessments, and environmental monitoring for disaster potential and climate change, become crucial.

An initiative taken by the central government to declare the 100 kilometers stretch along River Bhagirathi (extending from Gangotri to Uttarkashi) an "Eco-Sensitive Zone", that would not permit development in the area, was struck down by successive state governments in the name of development, tourism and the Chinese threat from the other side of the border. The Ministry of Environment and Forests (MoEF), after having issued draft guidelines for approval of proposals for eco-sensitive zones, communicated the final guidelines to the states only in December 2012. Initially, the deadline was set for February 2013 and later it was extended to March 2013. Also,

> *"Therefore, there is a critical need to build energy and technological efficiency in the military sector not only to tackle external aggression but also to address challenges like environmental security"*

as accounted by Dutta, several experts have criticized it for its poor enforceability and for the size of the monitoring authority, which according to them is too smallfor such a huge area in Uttarakhand. Moreover, the eco-sensitive zone proposal in its present form allegedly does not substantially involve the local people and local authorities in the decision-making mechanisms and processes. This is an irony in itself, as they are affected by developmental projects most. There have also been concerns with respect to clearances for hydel power projects in eco-sensitive zones, even if they are at a capacity of less than 2 MW.

One of the missions under the National Action Plan on Climate Change (NAPCC) – the National Mission for Sustaining the Himalayan Ecosystem (NMSHE) – launched by the Prime Minister of the country in 2008 has also failed to achieve its goals. This mission was earmarked especially due to the "fragile" and "diverse" nature of the Himalayan ecosystem that is home to 51 million people, as reported by Pandey. The reason for its inefficacy could be attributed to the lack of coordination between different government ministries, departments and agencies with regard to capacity building, research and enforcement/implementation. The coordinating agency for the mission is the Department of Science and Technology (DST) and it was in a position to start the program in 2010. As stated in the "PM's climate mission", it received funds only in 2011. However, it is not responsible for implementation of the program. Uttarakhand paid a heavy price for such delays in implementing a mission.

Environmental Security and the Armed Forces

In this context, India needs to realize that environmental security should find its rightful place in the country's national security policy and strategy. In many countries, to provide a sense of urgency, the military has taken the lead by minimizing the impact of military activities on

environment, providing support to environmental protection activities and assisting in disaster relief and humanitarian assistance in places struck by environmental crises. The Indian military has been playing its part as well, but the general trend has been to maintain strict bureaucratic control (not just financial) over the military. This diminishes its ability to take initiatives in environmental security comprehensively. Shukla writes that the role of military-to-military cooperation at the regional level and civil-military cooperation at the domestic level is crucial as evidenced by the Gujarat earthquake in 2001, the Indian Ocean Tsunami in 2004, the Kashmir Earthquake in 2005, the Ladakh flash floods in 2010 or the Sikkim earthquake in 2011.

Environmental threats to the military are immense. For example, the Siachen Glacier, the world's highest battlefield, has been melting at an accelerated pace according to Misra. If demilitarization is not an option, then the Indian armed forces have to devise a new deployment plan. Similarly, environmental change could affect critical infrastructure including military and energy infrastructure as well as various population centers of India. India comprises a long coastline, low-lying areas including flood plains and deltas, fragile mountainous terrain and seismic zones that are susceptible to several vulnerabilities. There is a dire need to conduct a futuristic risk assessment; in this exercise the military is yet again expected to step up as it has the best available expertise in disaster prevention, mitigation, preparedness, response, relief and recovery in the country as of now.

The military's vulnerability could also arise from energy security that is closely linked to environmental change as well as the lack of appropriate equipment. Therefore, there is a critical need to build energy and technological efficiency in the military sector not only to tackle external aggression but also to address challenges like environmental security and to build self-sufficiency in the long run. This is true especially in the case of the Indian military, which is dependent exceedingly on external energy sources. It would be worthwhile to enforce a national legislation that would require every government agency/department including the armed forces to conform to a carbon budget. Such an initiative will improve efficiency of the existing hardware, in

addition to making use of renewable energy technologies a regular practice in the armed forces, helping them adapt to the changing environment as well to reduce their environmental footprint.

In fact, defense is not even earmarked as one of the sectors in the list of emissions inventory in India, despite the fact that the armed forces have been identified as one of the biggest energy consumers in the world. Some countries have already begun focusing on reducing emissions from defense entities. In India, the Ministry of Defence (MoD) does not even have an environmental policy for the country's armed forces in place.

India's Future

If hazards are mostly natural, disasters are mostly human-induced. Between 1986 and 2006, India borrowed $8,257 million in the form of 43 loans for the purpose of disaster relief and rehabilitation. It was well ahead of China (32), Bangladesh (28) and Brazil (27), as reported by Aiyar. Therefore, if an analysis of the costs and benefits is carried out, one would conclude that prevention is better than the cure. The reason why India's damage costs skyrocketed in comparison to countries such as China and Brazil -- which are larger in area -- is population pressure. As the population rises, risks increase and thus the government's challenge to secure human lives becomes immense. It is imperative for the government of India to ensure that as an adaptation strategy, it must prevent people from moving into natural disaster prone areas. Critical infrastructure should be designed in such a manner that it is either disaster-resistant or easily manageable/rectifiable in case of a disaster; alternatively, it could be built in safer locations. The role of the Environmental Impact Assessment (EIA) becomes crucial in this respect.

When it comes to achievement of long-term sustainable development, one has to remember that benefits of adaptation and mitigation -- not only in terms of climate change but environmental degradation in general -- far outweigh the costs. Relocation of a nation state's critical infrastructure itself could ad infinitum exhaust its financial reserves, leaving other development programs unfinished or crippled. India must also remove itself from the labyrinth of

perceptions and misperceptions surrounding the global climate change debate in order to boost its environmental security policy and planning . . . rather than replicating the Western model of blindly developing the economy.

Instead of restricting the military's role regarding "Aid to Civil Authorities", which is part of the official plan of every military unit in India, it could now be nurtured to become an advisory and enforcing body for policy development related to environmental security, without shaking the pillars of the Indian democracy. Instead of continuing to relate to the country's armed forces as the 'sacred cow', they should be made accountable environmentally. The central government needs to identify those areas in which the military can be given considerable autonomy such as in 'greening' its forces; i.e., those elements with which the civil agencies could cooperate and coordinate disaster management, and others over which there should be strict civil control such as with domestic or regional conflicts.

The growing challenges from environmental change are immense and the scientific predictions are not positive. The pressure on India is rising to adopt internationally, legally binding emissions cuts. Domestically, the establishment is realizing the relevance of addressing climate change and of an international treaty that would facilitate free flow of adaptation and mitigation resources into India. On the other hand, a significant population of the country still subsists below the poverty line and thus, the rich-poor divide needs to be bridged. The middle class is growing at a rapid pace and their energy demands are escalating at an even faster pace. The so-called "bane of democracy", or "realpolitik", compels the political class to be more concerned about the fulfillment of immediate needs than the consequences of current policies capable of catastrophe much later. Therefore, the country requires a leadership that has a long-term vision and is not shackled by vote-bank politics.

The government should learn its lessons from the Uttarakhand tragedy and take appropriate measures. Every disaster is multi-pronged and there are no simple solutions to completely

avert the type of disaster that struck Uttarakhand in 2013. It will take months -- perhaps years -- to facilitate Uttarakhand's recovery. Uttarakhand should be a wake-up call for India to place environmental security at the forefront of its national security policy and strategy.

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Images

1. A submerged idol of Shiva stands in the flooded river Ganga in Rishikesh, Uttarakhand. Image: AP Photo
   Source: http://static.ibnlive.in.com/pix/slideshow/06-2013/photos-uttarakhand-battered/flood_monsoon_ukhand_pti5.jpg
2. Photo: (AFP) Source: http://www.hindustantimes.com/India-news/NorthIndiaRainFury2013/Uttarakhand-Death-toll-rising-after-rain-hunger-begins-to-kill/Article1-1080073.aspx