Management Issues in Kedarnath Tragedy

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Abstract

This article aims to develop an in-depth perspective on management issues in Kedarnath tragedy that led to increase of death toll, loss of manpower and financial loss. Disasters cannot be avoided but the aftermath of disaster can be mitigated through effective disaster management by proper implementation of technology, contributing to disaster prevention and disaster preparedness in the concerned area. A massive devastation occurred in the Kedarnath town that led to the abjection of holy pilgrimage site due to combination of early rainfall, movement of southwest monsoon winds, and the excessive increase of water level in the Chorabari glacier on 15th and 16thJune 2013 due to heavy rainfall which devastated the town on 17thJune 2013 due to moraine dammed lake failure. Most of the agencies responsible for conducting research, and scholars who did research on Kedarnath tragedy, stated only scientific factors related to unusual weather condition near Kedarnath town responsible for devastation of holy town. There is abundance of technology available with government of India to make the pre-forecast for any flash food by flood forecasting stations governed by Central Water Commission (CWC), to detect the gathering of clouds in an area by Doppler Weather Radar which is capable enough to predict any cloudburst-like situation, and many more sophisticated methods to predict any disaster-like situation. The issue which arises over here is as to why India suffered to such a large extent in terms of loss of property, manpower and livestock in Kedarnath town even after it is fully equipped with flood forecasting methods and flood preparedness measures. The major issue that resulted in brutal effects of flash flood in Kedarnath was ineffective implementation of technology by inefficacious management.

Keywords: Disaster, Prevention, Preparedness, Doppler weather radar, Livestock, Forecasting.

Introduction

Fragile Himalayas are extremely prone to floods and landslides, and due to various hydroelectric projects under commission or already installed have increased the fragility of Himalayas to a large extent. This negligence of the administration was majorly responsible to increase the aftermath of the lake outburst that caused flood in Kedarnath town of Uttarakhand on 17thJune 2013. According to Dobhal et al.,[3] Kedarnath tragedy took place due to failure of a moraine dammed lake known as Gandhi Sarovar lake or Chorabari lake on 16th and 17th June 2013 as heavy rains together with moraine dammed lake (Chorabari Lake) burst leading to flooding of Saraswati and Mandakini rivers in Rudraprayag district of Uttarakhand. According to Dobhal et al.,[3] heavy rain on 16th and 17th June 2013 which resembled a 'cloud burst' (when amount of precipitation reaches beyond 100 mm/h) type event in the Kedarnath valley and surrounding areas which damaged the 18-km river bank of Mandakini between Kedarnath and Sonprayag, and completely washed away Gaurikund, Rambara and Kedarnath towns but they did not mention about managerial causes of Kedarnath tragedy as though the tragedy occurred due to flooding of Mandakini and Saraswati rivers accompanied by massive mud and debris flow along. This debris and mud flow was carried by rivers due to construction of various hydroelectric dams; also unplanned infrastructure and promotion of tourism are greatly responsible for brutal aftermath of Kedarnath tragedy.

Aftermaths of Kedarnath Tragedy

According to the Uttarakhand state government, an estimated 6074 people are reported dead in Kedarnath tragedy. Ravaging of bridges and roads left about 100,000 pilgrims and tourists stranded in the valleys that were saved by Indian Army, NDRF and Air Force. This event was considered as India's deadliest natural disaster since December 2004 Indian Ocean tsunami Dubey et al. (2013). Army got involved in rescue and relief operation after four days of the disaster from 21st June 2013. Army deployed 10,000 soldiers and 11 helicopters, Indian Navy sent 45 naval divers, and 43 aircraft including 36 helicopters were deployed by the Air Force for rescue and relief operation. From 17th June to 30thJune 2013, a total of 18,424 people were airlifted by the IAF-flying a total of 2137 sorties and dropping or landing relief material and equipment a total of 336,930 kg.

The Prime Minister of India undertook an aerial survey of the affected areas and announced a Rs. 1000-crore (US$ 160-million) aid package. Many state governments announced financial assistance such as Uttar Pradesh government Rs. 25 crore, governments of Haryana, Maharashtra and Delhi Rs. 10 crore each, governments of Tamil Nadu, Madhya Pradesh, Odisha, Gujarat and Chhattisgarh Rs. 5 crore each.

The US Ambassador to India also extended a financial help of US$ 150,000 for the tragedy through the United States Agency; also the US announced that it will provide further financial aid of US$ 75,000. In this tragedy 2232 houses and 154 bridges were fully damaged and 1520 roads got damaged, the government also announced compensation of Rs. 2 lakh for each damaged house in the affected area.

Managerial Issues of the KedarnathTragedy

Table 1.Managerial Issues of the Kedarnath Tragedy

S. No.	Before the Tragedy	After the Tragedy
1.	Improper planning for promotion of tourism	Golden hours failure
2.	Poor capacity building of stakeholders	Poor coordination between various agencies
3.	No disaster management plan	Logistics management issue
4.	Early warning failure	Communication channel Failure
5.	Rampant construction of dams	

Issues before the Tragedy

Improper Planning for Promotion of Tourism

Excessive influx of tourists/ pilgrims has led to development of increase in infrastructure in river basins-roads, lodges, buildings, hotels, roadside kiosks and bridges-that led to increased traffic. The rapid increase in building activity-preceded by loss of forest cover-is a clear cut compromise on the natural systems of water management. Plus, these concrete structures being on the roadside or the river flood plains pose a double hazard-first, it obstructs flow of water/ river, and then faces danger of being washed away by floods. By the time of Kedarnath tragedy, roads constructed in the mountains to promote tourism led to the major cause of landslide triggered during flash flood, and evidently the river which carries silt and heavy boulders during flood was nothing else than this landslide debris. It can be seen on YouTube that several of videos are available which show the clear picture of destruction of houses or hotels constructed close to the river or on the riverbed being washed away due to flood in the river during Kedarnath tragedy. It is the duty of government to take a keen notice of impacts of developments being done in their state, especially in a state like Uttarakhand to promote tourism.

Also hotels and guest houses are made on the riverbeds in Uttarakhand which have changed their course of flow few decades ago based on the belief that river will never ever restore its course of flow. There is a myth among public that when disaster will strike then one thinks that nothing will happen to oneself and rest all may get affected, this thought leads to the ignorance of disaster mitigation and preparedness.

Whenever flood comes then river restores its old course of flow due to which various houses and hotels get drowned in the water thereby weakening their foundations and leads to liquefaction of the buildings. The same thing happened in Kedarnath tragedy when the river adopted its old channel due to flash flood where buildings were either partially damaged or were submerged completely inside the river.

Poor Capacity Building of Stakeholders

It is the local people who are immediate responders but in Kedarnath tragedy, locals were not trained to save themselves and their community. Indian defense was deployed to mitigate the aftermaths of disaster but due to unawareness about the local routes of Kedarnath by the army and due to misguidance by the local people, army's relief and rescue operations in Kedarnath tragedy were delayed and the losses increased substantially.

No Disaster Management Plan

According to the Comptroller and Auditor General (CAG) report released on 23rd April 2013, the State Disaster Management Authority of Uttarakhand which was formed in October 2007 had neither met till date nor has it made any "rules, regulations, policies or guidelines", a preliminary step for administration to perform and come into action during pre-and post-disaster stage. The CAG report said that no disaster management plan had been prepared for any early warnings. According to the report, the communication system was inadequate in regard to any immediate disaster strike.

Early Warning Failure

According to Sridharan et al.,[8] there is a dire need for close coordination between IMD and local state authorities. The Indian Meteorological Centre had issued warning for extremely heavy rains (more than 244.5 mm) in higher regions of Uttarakhand on 13th June 2013. On 15th and 16thJune 2013, Uttarkashi and Chamoli district witnessed maximum rains that resulted in the tragedy. Though IMD did not specify clearly the areas that would be affected due to heavy rains by that time but a senior IMD official said that it is an inherently natural fact that the most affected areas of Uttarakhand due to rain are Uttarkashi, Chamoli and Rudraprayag, but the state administration ignored the warning proclaiming that this much heavy amount of rainfall was not expected. Now, the question arises why the IMD warning was not clear or even approximate about the areas that would be affected due to heavy rains by that time in the Uttarakhand when technology is available quite easily to predict or forecast any condition of heavy rain in any region in the form of Doppler weather radar (DWR). Another question that arises is what amount of rainfall should be considered as 'heavy rainfall' by the state administration on the warning of IMD so as to immediately evacuate the areas that are expected to be affected due to heavy rain.

Rampant Construction of Dams

According to Maharaj et al. (2012), who highlighted the colossal impacts of hydro power development in the Himalayas on terrestrial diversity, forest cover and rates of species' extinctions and their shattering findings are that, "if 292 proposed and under construction dams in Himalayas are built, then Ganga basin would have the highest number of dams (1/18 km of river channel dammed) in the world, followed by the Brahmaputra (1/35 km) and the Indus (1/36 km)".

According to Valdiya,[9] a total of 98 dams (mini and macro) are in working condition in Uttarakhand and according to UJVNL at the time of tragedy a total of 244 dams were under construction in Uttarakhand. The Supreme Court has banned the ongoing construction work of many dams and many proposed dams in Uttarakhand for indefinite period of time as scientifically dams in hilly areas are the major cause of triggering landslides in hilly areas.

Hydroelectric dams have extremely negative impact on Himalayan geology and when it comes to Uttarakhand then the impact increases multiple folds because the numbers of dams in Uttarakhand that are proposed and already commissioned are probably beyond the carrying capacity of the ecosystem.

Every dynamite blast done for tunnel making and for clearing the stretch of 5-25 km for dam construction generates an earthquake of 4 magnitude on Richter scale which is sufficient enough to trigger landslide or to decrease the resisting force upto the limit which when disturbed can easily generate landslide, and this disturbance was done by flooding in Mandakini and Saraswati rivers in Kedarnath tragedy.

An effective implementation of the law should be carried out to check whether the construction of dams is done in an effective way or not as there are ways to stabilize the disturbed mountains after dynamite blast carried out for dam making such as grouting in the mountains and many other ways that could reduce the rampant construction of dams. According to Section 135 of Leveraging Company Act 2013, it is the work of Dam Corporation to build dams according to proposed mitigation methods and take care of the nearby areas in regard to any disaster caused due to dams so as to reduce the vulnerability of the community.

Issues after Tragedy

Golden Hour's Failure

Whenever any high-magnitude calamity like that of Kedarnath tragedy occurs in any geographical area then immediate relief is required to be sent to the affected place within the minimum time of 2–3 days (golden hours) but in India immediate relief to the affected place is sent after golden hours' failure because togetherness with close coordination among army and NDRF in India is needed to carry out effective relief operation in affected community and that is out of the basic structure of NDMA.

Army was sent for rescue and relief operation after four days of the occurrence of tragedy even after the fact that Indian Defence has got the maximum coping capacity to deal with any heavy disaster-like situation.

Poor Coordination between Various Agencies

Though the armed forces and National Disaster Relief Force worked on war footing in the flood-ravaged Kedarnath and nearby areas of pilgrimage town, rescue operations got delayed due to poor coordination among the rescue teams and in between the rescue teams and local officials. When enquired from local sources, it was reported that much of the food was wasted due to poor coordination between rescue teams and NGOs responsible for supplying food to the affected region due to non-availability of transport with NGOs in the affected areas as most of the transport in hilly terrains of Kedarnath was vested in the hands of rescue teams.

Figure 1.Relief Material Lying at Govind Ghat [After Hindustan Times 2013]

Logistics Management Issue

Hilly terrains of Uttarakhand are having mostly single way to reach and return from any source and these roads were mostly jammed due to heavy traffic movements which happened after the occurrence of tragedy. After the disaster had struck, numerous agencies got involved in supplying relief material in the disaster-affected area due to which common routes were jammed frequently, even vehicles responsible for delivering medical aid to the affected community were delayed many a time due to various insignificant or lesser important vehicles on the same route due to the dearth of framework for logistic management in any disaster-like situation in the city on hilly terrain.

Communication Channel Failure

The state government was so ill informed about the mass destruction in Kedarnath tragedy that even three days had passed after the tragedy when the army came into picture; then also, it was sent to the other disaster affected areas at Chamoli and Uttarkashi whereas Indo-Tibetan Border Police (ITBP) and National Disaster Response Force (NDRF) were assigned to handle situation in Kedarnath. This shows that when huge amount of loss had already occurred

in initial phase of tragedy then the rescue team and relief material started reaching the affected community after four days of tragedy had passed.

This misguidance of army created by the state government shows the communication channel failure between the state government officials and local authorities of the disaster-affected community of hilly areas. This also depicts improper and ineffective analysis done to evaluate the loss and damage caused due to tragedy.

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