

Joshimath Crises: Warning of Nature

Ankush Sharma*

Department of Environmental Sciences, Mohanlal Sukhadia University, Udaipur, India

ABSTRACT

Anthropogenic activities have been playing a major role in the destabilization of Joshimath. The possibility of a land subsidence incident happening in the region was first highlighted around 50 years by the MC Mishra Committee report. The unplanned construction of buildings, the Tapovan Vishnugad Hydro Project and the Char Dham Road Project that is being implemented in the Uttarakhand is contributing to the recent subsidence in Joshimath. Thousands of lives are at a greater risk of getting endangered due to such large-scale infrastructural activities. For instance, the Joshimath subsidence has traumatised the lives of around 3000 people.

Keywords: Joshimath; Land Subsidence; Construction; Hydro-power projects; Sustainable development

INTRODUCTION

Joshimath, which houses the Adi Shankaracharya Monastery and serves as the entrance to the Badrinath temple, was constructed on the landslide deposits that happened years ago, making the slopes susceptible to destabilization from even minor triggers. The town is also in India's seismic zonation scheme's Zone V, which denotes the highest danger. The town began to undergo sudden land-sinking in huge areas and several residences started witnessing significant cracking in October 2021, but the situation only worsened around the end of 2022 and the beginning of 2023.

LITERATURE REVIEW

Major causes

Hydro power projects: Numerous hydropower projects have been proposed and worked upon close to the sinking town.

Tapovan vishnugad hydro power project: It is NTPC's second hydropower project, constructed in the year 2006. During its working, the head race tunnel was dug out using a Tunnel Boring Machine (TBM) as a result of which on December 24, 2009, it punctured a stratum containing water about 3 kilometers inside the left bank of the Alaknanda, close to the town of Shelong. According to the project's administrators, the site was located more than a kilometre below the surface, somewhere below Auli. According to reports, the water discharge was between 700 and 800 litres per second and about 60–70 million litres per day, or enough water to support 2-3 million people, was discharged from the aquifer. The aquifer was not drained out even after a month.

Such a waste of a precious resource! Multiple adverse effects would result from an aquifer suddenly releasing water, but it would be premature to consider all of them at the present time. The nearby springs have been reported to dry up because of the water pouring out via the tunnel. This would lead to a drinking water deficit in the neighbourhood surrounding Joshimath during the summer [1].

Char dham project: Char Dham Project is a project that was inaugurated in 2016 by Prime Minister Modi at a cost of around 120 billion crore rupees. It was taken up to link all the four major pilgrimage sites namely Badrinath, Kedarnath, Gangotri and Yamunotri. Helong Marwari Bypass Road which is around 6 km in length is a part of the 800 km long 'Char Dham' project which has led to the weakening of the slopes and has contributed to upsetting the topographical stability.

Tourism destination: Joshimath has become a gateway for famous treks and religious sites, attracting tourists and pilgrims from all over the world. This has led to the establishment of many hotels, restaurants in the town. The soil beneath may not be able to carry the load of the never ending infrastructure developments in the region.

Random urbanization: Unplanned construction in the region without any detailed check regarding the soil type, habit, topography may also have contributed in the present crises.

Seismic V zone: Joshimath is an earthquake prone zone falling under Zone V category, therefore construction, developments of any kind are harmful to the region and the people residing in that region.

Mishra committee report: The problem of land subsidence

Correspondence to: Ankush Sharma, Department of Environmental Sciences, Mohanlal Sukhadia University, Udaipur, India, E-mail: sharmaanku9909@gmail.com

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in Joshimath was identified nearly 50 years ago. MC Mishra Committee was formed in 1976, that identified the reasons behind this phenomenon. They published their report in 'The Mishra Committee Report of 1976'. It is the oldest report on Joshimath's land subsidence problem. According to the report submitted by the Mishra committee, Joshimath is a deposit of sand and stone, hence it was not a suitable place for the coming up of a township. The report warned against signing up for heavy construction without checking the soil loading capacity of the region and also advised not to remove boulders by digging or blasting the hillside. The reports even pointed out that the drainage facilities in the city wasn't proper. Despite the warnings provided by the committee, various projects were taken up in the region whose construction involved blasting leading to instability in the topography of the region.

Ground water removal: Subsidence happens when a great volume of groundwater is withdrawn from specific types of rocks, such as fine-grained sediments. The water helps to keep the ground in place but when the ground water is removed, the rocks collapse, crumble and start sinking.

Ministry of Environment, Forest and Climate Change (MoEFCC):

On December 5, 2014, a "concerned" Ministry of Environment, Forest and Climate Change (MoEFCC) filed an affidavit in the Supreme Court stating that "any decision on developmental projects, especially hydropower projects, should be on very strong and sound footings with scientific back up. But on August 17, 2021, the MoEFCC filed an application with the Supreme Court claiming that in a sharp departure from 2014, an agreement had been made between the MoEFCC, the power ministry, the Jal Shakti ministry, and the Uttarakhand government to continue development on seven hydroelectric projects:

- Tehri II (1,000 MW)
- Tapovan Vishnugad (520 MW)
- Vishnugad Pipalkoti (444 MW)
- Singoli Bhatwari (99 MW)
- Phata Byung (76 MW)
- Madmaheshwar (15 MW), and
- Kaliganga II (4.5 MW)

This was followed by another report published in 2006 by Wadia Institute of Himalayan Geology (WIHG) which stated that there might be an eventual collapse of the entire city and that the drainage services in the region needed repairs. In 2013 a committee appointed by the Supreme Court, identified the hydro-power projects in Uttarakhand, as a significant hazard to the area, the construction of hydropower projects, but the said report fell on deaf ears as no action was taken by the government at the needed time [2].

DISCUSSION

Joshimath is a town situated in Uttarakhand's Chamoli district having a population of about 23000. Apart from being a pilgrimage site as well as a gateway for various renowned treks, the town is famous for the Auli skiing centre which is promoted as an international skiing centre by the Government. The India-China border is also near to the town. The region serves as a major base

camp for the Indian army and the road structure passing through the Joshimath is of great strategic importance. Joshimath due to an attractive tourist destination has led to many hotels, restaurants, and other establishments that in turn have resulted in construction activities that might have contributed greatly towards the present situation as shown in Figure 1.



Figure 1: A woman sits beside a cracked wall of her house at Joshimath in Chamoli district (AFP).

Reports reveal that the city was developed and established about 100 years ago and that it witnessed an earthquake in the nearby valley that resulted in the rocks coming down and settling in the area upon which the Joshimath is established [3]. This is one of the many reasons why the land is not suitable for heavy construction, especially for the roads as well as the hydropower developmental activities, reason being that these types of high-level developmental activities need heavy explosives and drilling and thus by explosion these slopes may lose their holdings [4].

According to the Seismic zone map of India the area of Joshimath falls in the zone 5, which is the highest risk zone for earthquakes. The cracks on the walls of the houses are not a new story. In October 2021, the Gandhinagar area of Joshimath witnessed slight cracks on the walls. In September 2022, Uttarakhand State Disaster Management Authority published a report and blamed that the improper and unplanned construction are the major causes. But the question is who is to be blamed? According to TV reporters, the people of Joshimath are responsible for the crises because they were not supposed to construct heavy buildings in this zone and that they should have not engaged in the unplanned constructions. The public however blames the Government for the havoc; the government on the other hand contends that the builders/contractors are at fault whereas the builders place the blame squarely on the nature [5].

CONCLUSION

Land subsidence phenomenon is irreversible as said by ISRO. The Joshimath crises speaks volumes of our failure to respect the special characteristics and features of the Himalayan mountainous system in our pursuit of economic development. Overall, the problem can simply be classified as the problem of sustainable development. After the evacuation, the drainage system, rainwater outlets need to be re-planned and there should be a rock strength assessment, to determine the sustainability and strength of these rocks. All the construction activities should be banned in risk prone areas, so that another crises like Joshimath does not happen.

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