

LANDSLIDE AND MANAGEMENT OF LANDSLIDE IN KURSEONG, DARJEELING: A CASE STUDY OF LIMBUGAON LANDSLIDE

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ABSTRACT:

Landslide is one of the most common natural that takes place not only in Kurseong subdivision of Darjeeling district but the whole of Darjeeling Himalayan Region. The major cause behind the constant occurrences of landslides and the vast magnitude of landslide is due to the torrential rainfall that occurs in the region especially during the season of monsoon, the fragile topography of the region and various developmental and constructional activities that is taking place in the region. Like other places of Darjeeling Hills the village of Limbugaon which comes under the jurisdiction of Tingling Tea Estate, Kurseong subdivision of Darjeeling district of the state of West Bengal, India also had to face a major landslide. The landslide occurred on 1st July, 2015 at around 3 AM. This landslide caused a tremendous loss of property as well as loss of life to the villagers. Hence, based upon the landslide that occurred in Limbugaon this paper is a humble attempt to throw some light on the causes and effects of the landslide as well as the disaster management strategies adopted by the local government and local communities to minimize the effects of the landslide. The paper is based upon both primary information gathered from the victims of the landslide and also various secondary sources like newspaper reports, reports from websites etc.

Keyword: Landslide, disaster, disaster management, Limbugaon

1.0 INTRODUCTION

The rapid movement of large volumes of surface materials under gravitational influences adds considerably to the range of hazards found in mountainous terrains (Nad, 2015).

A landslide occurs when stability conditions of the slope is disturbed either by the increase of stress imposed on the slope and / or by the decrease in strength of the earth material building up the slope and it involves enmass downward movement of earth material under the influence of gravity. It is important to determine the causes of the landslides, as this will help in formulating effective remedial measures. Determination of causative factors of landslide in any given area will also help in demarcating the landslide prone zones (Prasad, 1995).

1.0 CONCEPTUAL FRAMEWORK

The study will be based upon the following concepts and issues:

2.1 Disaster

A Disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins.

2.2 Natural Disaster

A natural disaster is defined by the UN as, "the consequences of events triggered by natural hazards that overwhelm local response capacity and seriously affect the social and economic development of the region". There are basically two types of natural disasters namely, major natural disasters and minor natural disasters. Major natural disasters include disasters like landslide, flood, cyclone, earthquake droughts etc., while minor natural disasters include cold waves, thunderstorms, heat waves, mudslides, storms etc.

2.3 Man-Made Disaster

Man-made disasters, also known as anthropogenic disasters are influenced by humans and they often occur as a result of negligence and human error among other factors. Man-made disasters are also divided into major man-made disasters and minor man-made disasters. Major man-made disasters include disasters like setting of fires, epidemics, deforestation, pollution etc. Minor man-made disasters include road/train accident, food poisoning, industrial disaster/crisis, environmental pollution etc.

2.4 Disaster Management

Disaster management is a strategic planning and procedure that is administered and employed to protect critical infrastructures as well as human life from severe damages when natural or human made calamities and catastrophic events occur.

2.5 Disaster Mitigation

Disaster mitigation includes all those measures which enable the people to cope with the adverse situations created by disasters.

The term is also used to refer to all actions to reduce the impact of a disaster that can be taken prior to its occurrence, including preparedness and long-term risk reduction measures (Naidu, 2013).

Disaster mitigation focuses on the following two major objectives:

- i. To minimize the disruptive forces of disasters, and reduce the magnitude of disasters.

- ii. To lessen the adverse impacts of disasters.

2.6 Top-Down Approach

The top-down approach of disaster mitigation entirely depends on different measures of disaster management initiated by the government establishments at different hierarchical order such as at national, state, tehsil, block levels etc. (Singh, 1991)

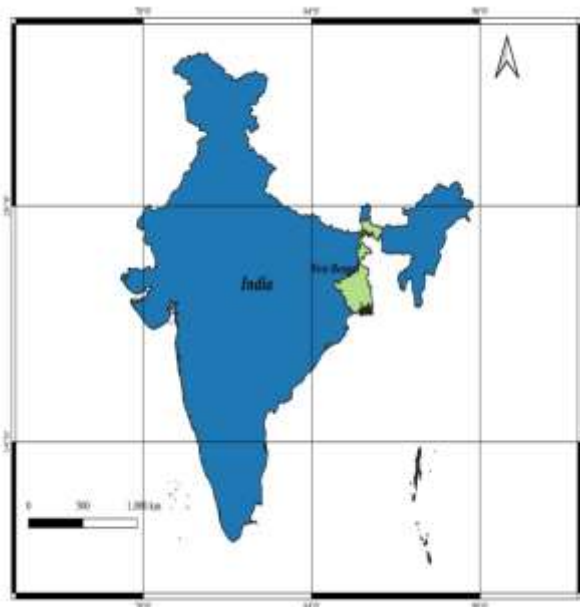
2.7 Community Based Bottom-up Approach

In community based bottom-up approach there is direct involvement of local people who participate in disaster mitigation mission. The community participation involves from local community to world community as follows:

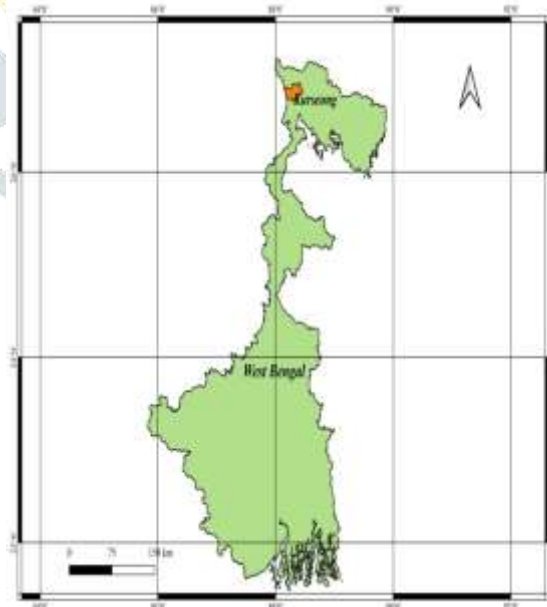
- Local community level participation
- Non-governmental organization (NGOs)
- Gram panchayat and block level participation
- State-level participation
- Central government level participation
- World community level participation (Singh, 1991)

3.0 ABOUT STUDY AREA

LOCATION MAP SHOWING THE STUDY AREA



Map showing the state of West Bengal



Map showing the Kurseong subdivision



Map showing the Limbugaon (study area)

Limbugaon is a small village located in Tingling Tea Estate of Kurseong. The name of the village is derived from 'Limbu', a tribe of Darjeeling Hills and Nepal and 'Gaon' meaning village. The village is located under Soureni I Gram Pachayat which comes under Mirik Teshsil of Darjeeling district, West Bengal. The headquarters for both police station and block office for the village is Mirik.

The approximate elevation of the village is 4431 ft. and the approximate latitude and longitude of the region is 26.5158° N and 88.1146° E. The village is surrounded by different tea gardens such as Tingling Tea Estate, Paschim Phuguri Tea Garden and Purba Phuguri Tea Garden.

According to one of the respondents the village consisted of 35 to 40 houses but in the year 2015 when a landslide destructed the village half of the village was relocated or was rehabilitated to a nearby area.

The people of the village are dependent on Tingling Tea Garden for their source of income. Most of the population is engaged as laborers in the tea garden. Few of the villagers also practice agriculture and animal husbandry to earn their income.

About the educational status of the area there are no schools in the village though only a few kilometers away there is one government primary school and one private school. To acquire their higher education the students travel to the a school named Rabindranath High School located in Soureni Bazar which is around 4 kms. from the village. For the college education the students have to travel to Mirik College which is located in Mirik around 9 kms. away from the village. For medical purpose there are no health centres in the village. The villagers have to either travel to Soureni town or Mirk for medical emergencies.

4.0 OBJECTIVES OF THE STUDY

The objectives of this project will orient under the following headings:

- The first objective of this project is to investigate about the landslide that occurred in Limbugaon on 1st July, 2015
- The other objective is to find out the approaches adopted by the local community and the local government for the management of the landslide

5.0 METHODOLOGY

To fulfill the above mentioned objectives the data for this study was collected through both primary as well as secondary data.

For the collection of primary data the area where landslide took place was visited and heterogeneous purposive sampling was used to conduct the interview with the victims of the landslide

The secondary data was collected from various newspapers, reports and articles and e-articles from various websites. For the preparation of maps QGIS 3.12 was used and to locate the landslide prone areas on the map Google Earth Application was used. Finally, the collected data was processed and analyzed to prepare this research paper.

6.0 FINDINGS

The findings of this paper are divided into two parts. The first part will give a detailed account of the landslide that took place in Limbugaon on 1st July, 2015. The second part will discuss about the disaster management approaches adopted by the local community and the the approaches adopted by the government to manage the landslide and the victims of the landslide.

6.1 LANDSLIDE OF LIMBUGAON

Limbugaon as mentioned above is located in an area surrounded by beautiful tea gardens but it lies also in a very vulnerable zone. The village is situated below the main road that connects Siliguri with Darjeeling via Mirik. Though the road condition is good but the drainage condition is very poor. Sue to this reason the village was suffering various problems from many years. Due to its location and the condition of the village the disaster was waiting to happen. Below provided is the details of the landslide that swept the village.

6.1.1 Details of the Landslide

On 1st July, 2015 at around 3 A.M. the village of Limbugaon, Tingling Tea Estate had to face the tremendous wrath of landslide. This landslide swept a major portion of the village thus affecting the area and the villagers.



Plate 1: Destruction caused by the 2015 landslide in Limbugaon

6.1.2 Causes of the Landslide

On the basis of the interview with the respondents, group discussion with the villagers and observation of the landslide zone the causes of the landslide can be several; some of which are mentioned below:

- The first major cause of the landslide is due to the torrential rainfall that was taking place in the region since last few days but on the night of 1st July, 2015 the rainfall increased tremendously due to cloud burst thus the disaster took place.
- The second cause is the location of the village. The village as mentioned above is located below the main road that connects Siliguri with Darjeeling via Mirik. The road condition is proper but the drainage condition of the road is very poor. So, since it was raining for last three days before the landslide took place so due to the lack of proper drainage facility the overflowed water was pouring down the village. Due to this reason the overflowed water mixed with the torrential rainfall was making the already fragile area more fragile. This, this could be also a major reason behind the landslide that occurred in the village.
- The other major cause is the fragile topography of the village. Since the whole of Darjeeling hills is situated in a very fragile geological condition because of its composition of rocks and minerals like shale, quartzite, mica schist and sandstone the village is also no exception. Apart from this the village is located in a very steep slope with no protection wall. So the fragile topography combined with the location of the area is also one of the major reasons behind the landslide.

6.1.3 Effects of the Landslide

Due to the landslide the villagers had to face major loss of both life and property. The effects of the landslide are mentioned below. These effects are traced after interview with the villagers as well as victims of the landslide.

- Due to the landslide a total of 19 lives were lost and several people were injured. Out of the 19 lives that were lost the dead bodies of 3 people were still to be recovered during the time of this survey.
- A major section of the whole village was swept away due to the landslide. During the survey and after interview with the victims a total of around twelve (12) to fifteen (15) houses were completely damaged and several houses were partially damaged.
- Since the villagers are dependent on subsistence agriculture and animal husbandry as their source of living but the landslide swept away major portion of their agricultural lands and many villagers also lost their domesticated animals like cow, goat, hen etc.
- The damage caused by the landslide is of incredible capacity. Due to which it will take a lot of time to repair the village thus making the village inhabitable for the time being.

6.2 MANAGEMENT OF THE LANDSLIDE

To manage the landslide various approaches were adopted by the local communities and the local government. Though before the disaster took place no disaster mitigation strategies were adopted by during and post the landslide various measures were adopted to secure the victims of the landslides. Below mentioned are the strategies adopted as stated by the respondents during the field work and the various reports available in the newspapers and internet sources.

6.2.1 Role of the Local Government

Since, the disaster took place at around 3 AM in the morning so the local government was unable to secure the place or the victims during the landslide but they played a very important role to rehabilitate the villagers and treat the victims post-disaster. Below mentioned are the strategies adopted by the local government to manage the landslide.

- First and foremost the villagers were shifted to a very secure location. Since, the village was almost totally damaged and it became dangerous to stay the so the local government rehabilitated the villagers to the nearby Tingling Primary School till a proper area was identified to shift the villagers permanently.
- Apart from Tingling Primary School relief camps were also set up at the tea garden's hospital, crèche, tea garden office, assistant manager's bungalow and also at Soureni Community hall not only for the villagers of the Limbugaon village but also the secure the people of other villages located near Limbugaon.
- According to the villagers, the Sashastra Seema Bal (SSB) which is a border guarding force and a part of Central Armed Police Force helped a lot to secure the vulnerable people, the victims of the

landslide and to identify the dead bodies. They also helped to clear the mess which was created by the destruction of houses and the natural vegetation due to the landslide.

- Apart from local government and SSB; various other agencies such as National Disaster Response Force (NDRF), District Magistrate (DM) Office and various Non-Governmental Organizations (NGOs) like distributed relief such as tarpaulin, food, medicines, drinking water to the victims of the landslides and the people who were temporarily rehabilitated to the rescue camps.
- Prime Minister Shri. Narendra Modi had announced a compensation of 2 Lakh Rupees for the family member of the death and also the then Chief Executive of Gorkha Territorial Administration (GTA), an autonomous district council for the Darjeeling and Kalimpong areas of the West Bengal state in India Shri Bimal Gurung announced compensation of 2 Lakh Rupees for the kin of those who was killed and Rs. 50,000 to those injured (Gazmer, 2015).

6.2.2 Role of the Local Communities

In most of the cases of disasters whether it may be natural or manmade the first people to help the victims are people from their own locality. It was similar in case of the landslide that occurred in Limbugaon. Although they cannot help by adopting scientific approaches like the trained personals implement but they help in their best way possible to help the victims. Below mentioned are the measures adopted by the local people to manage the landslide. These measures are based upon the interviews conducted during the field wok.

- The role of local community is most important during the disaster but sometimes it is not possible for the local government to reach the disaster spot on time. It was similar in case of Limbugaon landslide too. Since it was 3 AM when the landslide occurred the government officials or the trained personals could not reach the spot on time. During this period the local community or the villagers were the first to take action during the rescue operation.
- The villagers also transported the identified victims to a safe and secure spot and provided the best possible medications.
- The local communities helped the rescue personals from the local DM office, the SSB and the NDRF during the search and rescue operations.
- Till the relief arrived in the rescue camps food, water and medicines were provided by the communities from the village as well as communities from neighboring villages too.
- Apart from village communities relief materials were also provided by different organizations such as universities, colleges, clubs etc.



Plate 2: Interview with victims at the landslide area and relief camp

7.0 CONCLUSION

Since, the year 2015 when the landslide took place and the year the field survey was conducted the area has gone a vast change. Once when the village was adorned with several houses is only left is a rough patch of land. They are promised to get rehabilitated to a near plot in Singbuli Tea Garden, Tingling Block 10 by the local government authorities.

Due to the landslide the villagers were robbed off their lands, houses, properties, livestock and some even lost their loved ones. The problem lies in the fact that there is very less knowledge regarding disasters and disaster management techniques among the people of rural areas of Darjeeling hills. During the survey it was found that among the 25 respondents only 3 people had knowledge about disaster management techniques.

Apart from the above mentioned problem there is also a huge communication gap between the local residents and government officials. Some of the respondents during the interview said that they were aware of the dangers that they could face in the future hence they had informed the government officials and also had filed a petition to build a protection wall for the safety of their village but their petition went unheard.

So, in conclusion it is fair to mention that both the local residents and government officials not only of Limbugaon but also of similar vulnerable areas should take some very important preventive measures for the management of such kind of disasters. Some of the areas locating in the vicinity of Limbugaon and well as different disaster prone areas of Darjeeling hill are in a verge of a major and destructive landslides and it is a high time that everyone should be in high alert.

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