Web Based Landslide Monitoring & Controlling System

Deore Nilima[1], Pagar Harshal[2], Pawar Rohit[3]

[1]_Department of computer engineering, SNJB'KBJ COE, Chandwad, nilsdeore@gmail.com_
[2]_Gilbarco Veeder-Root, India , harshalpagar7@gmail.com_
[3]_Department of computer engineering, SNJB'KBJ COE, Chandwad, rupawar11@gmail.com_

Abstract: In this paper we have proposed a Landslide Monitoring and Controlling system based on a laser transmitter receiver system. This approach is based on two concepts. Firstly, the system uses a specialized approach to prevent the landslide by using the metallic barracks that will pop up when landslide will occur. Secondly, we will blow the siren at the village place to alert people that the landslide has occurred. The system server is also related with the Administrator System that also keeps watch on the victim area.

This project continuously monitors and protects people from landslides. It provides people with the facility to know different landslide zones and the particular areas in which landslides occur frequently. Also the details of the landslides occurred and its total damages etc. But it does not allow people to modify a particular part of it.

Keywords: Landslide, hazards, LDR, Parabolic Mirror, Interface card, Laser

1. INTRODUCTION

The prevention of loss to life and property due to natural calamities is being viewed very seriously by the Government of India. In the past, the main role played by the Government in the case of various disasters was confined mainly to post-disaster activities that included providing relief and organizing rehabilitation. The Different Earthquakes are acted as an eye-opener for the management. The need was felt for a practical approach rather than waiting for a disaster to occur. As a part of this strategy, the Government decided to institute task forces for landslide hazard locations, geotechnical investigations, and land use locations and regulation.

Figure 1: Landslide

Landslide disasters have both short-term and long-term impact on society and the environment. The short-term impact accounts for loss of life and property at the site and the long-term impact includes changes in the landscape that can be permanent including the loss of cultivable land and the environmental impact in terms of erosion and soil loss, population shift and relocation of populations and establishments.

II. RELEVENCE OF WORK

To develop a system that will help us to monitor and control the landslide activities and thus minimize the risks and hazards to people's life.Landslides occur when a large amount of astound, ground, or fragments shift down a hill. It may be very miniature or very huge, and can shift at minimum to very maximum speeds. Many landslides have been occurrence in the same areas since ancient times. New landslides are caused by number of natural disasters and/or various human activities. We have proposed a Web based Landslide Monitoring and controlling system based on a laser transmitter receiver system. Our approach is based on two concepts. Firstly, the system uses a specialized approach to prevent the landslide by using the metallic barracks that will pop up when landslide will occur. Secondly, we will blow the siren at the village place and send SMS to people that the landslide has occurred. The system server is also related with the Administrator system that also keeps watch on the sufferer area.
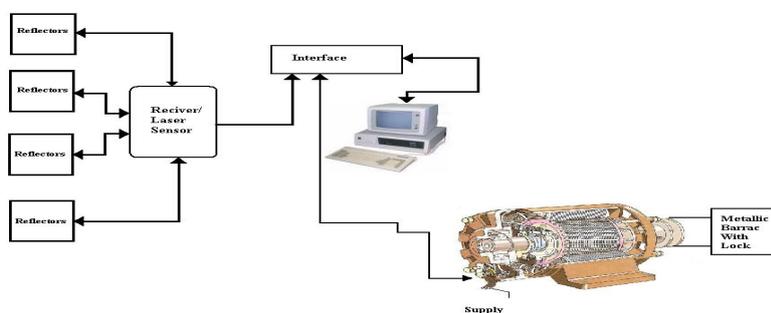
III. SYSTEM MODEL

Figure.2: Block Diagram

For the transmitter purpose we use Laser with high range, that laser beam incident on reflectors which are of parabolic mirror get reflected by it one after another sequentially. This all construction placed on hills & after reflecting them it passes to the Receiver. These both Transmitter & Receiver are synchronized with each other. If interruption occurred in laser beam then this is received by server through interface card. This is actually being a converter which converts electrical signal into the digital signal that will be
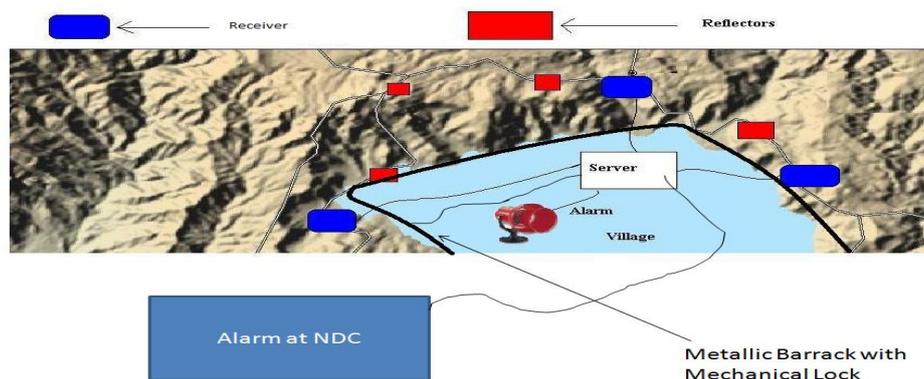

Fig.3: Metallic Barrack working

Understood by server computer. It checks by giving 10ms timer on action stared, if it exceed timer then store information in DB as well as send information to Administrator System. On the response of Administrator System, it will do following work:

- Popup Barracks

- Bluster siren
- Inform to Rescue team
- Inform to Hospital Ambulance
- If it is a railway track or road then show signal to stop
- Moment.

3.1 Laser

A laser is a device that emits light (electromagnetic radiation) through a process of optical amplification based on the stimulated emission of photons. The term "laser" originated as an acronym for Light Amplification by Stimulated Emission of Radiation.
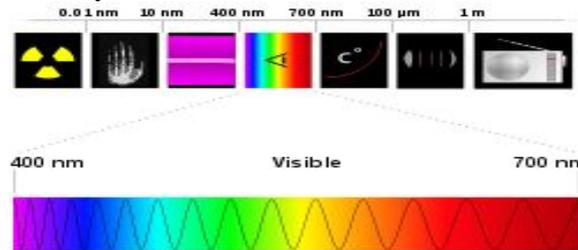

Fig. 4: Laser Ranges

3.2 Parabolic Mirror

A parabolic reflector (or dish or mirror) is a reflective device used to collect or project energy such as light, sound, or radio waves. Since the principles of reflection are position changeable, this can also be used to project energy of a source at its focus outward in a parallel beam.
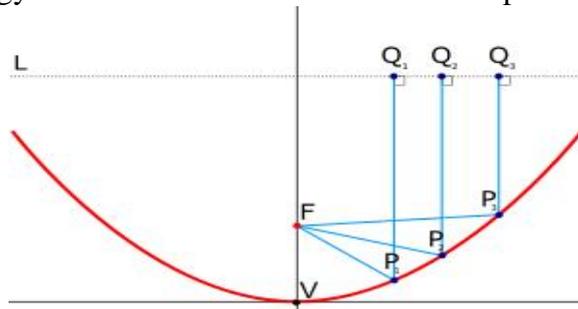
Fig 5: Parabolic Mirror

In this system we use parabolic mirror because, a perfect parabolic mirror will bring parallel rays to a focus at a particular point. Conversely, a position basis at the focus of a parabolic mirror will produce a beam of collimated light. Spherical mirrors are easier to make than parabolic mirrors and they are often used to produce approximately collimated light. Laser diodes emit less collimated light due to their small hollow space, and therefore higher collimation requires a collimating lens.

3.3 LPT Port:

Fig. 6: LPT Port

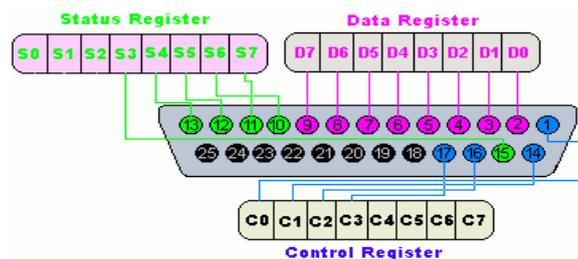Parallel port is a simple and inexpensive tool for building computer controlled devices and different processes. The straightforwardness and ease of encoding makes parallel port popular in electronics world. The parallel port is often used in Computer controlled robots, Atmel/PIC programmers, home systems etc.

3.4 LDR

Fig. 7: Light Dependent Resister

LDRs or Light Dependent Resistors are very useful especially in light/dark antenna circuits. Generally the resistance of Light Dependent Resistors is very high, Most of the time it may be as high as 100000 ohms, but when they are throughout with light resistance drops considerably.

IV. IMPLEMENTATION CONSTRAINTS

-Test the user id & password; if valid then monitoring panel will be opened otherwise it will give an error message.
-Verify that the landslide occurs or not by testing receiver signal, if occurred then make entry to database &send data to Administrator System**.**
-It is assumed that the constant power supply is provided to the laser ray and motors.
-The motors will explode up the barracks inside seconds in case of landslide. The warning systems are developed such that they will immediately reply to sudden changes.
-The internet connection is used for the communication between the server at site and at the Administrator System
-System Design will require for Backend Design: SQL server.
-For Front Design: VB.net.

V. MONITORING SYSTEM

The system server is also related with the Administrator system that also keeps watch on the sufferer area. There will be one website developed at server site which continuously monitor by system administrator. The authentication is only provided to the system administrator, who is responsible to continuously monitor the system for desired area.
The login page is for authentication, manual maintenance webpage is for manually pop the barracks & blow the siren if necessary & the monitoring form in which two colours are provided & if colour get changed that means there is same risk at desired landslide area & history webpage is use to store the all database which contain the landslide hazard locations & time which will be automatically updated to each second.

Fig. 8: Login Webpage

Fig. 9: Manual Maintenance

Fig. 10: Login Webpage

Fig. 11: Login Webpage

CONCLUSION

Using this system, it will be possible to protect people and their lives from the hazards of landslides. This system will help to prevent casualties of life and damages to property as well as bring down losses of our country.

REFRENCES

1] National Disaster Management Guidelines-Management of Landslides and Snow Avalanches, 2009. (A publication of the National Disaster Management Authority, Government of India. June 2009, New Delhi).

2] Draft—Guidelines for assessing planning policy and consent requirements for landslide prone land, Compiled by Saunders, W & P. Glassey, GNS Science Miscellaneous Series 7, 2007

3] Bhasin, R., Grimstad, E., Larsen, J.O., Dhawan, A.K., Singh, R., Verma, S.K and Venkatachalam, K. (2002)Landslide hazards and mitigation measures at Gangtok, Sikkim Himalaya, Engg. Geology, 64, 351–368.

4] National Landslide Information Centre, U.S. Geological Survey, Landslide hazards and factsheets

5] http://landslides.usgs.gov.