

Design and Planning of Cost Effective Houses for Rehabilitation of Irshalwadi Landslide Affected People

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ABSTRACT

Last year a huge landslide occurred in irshalwadi village. A great amount of obstruction was faced by villagers. This is one of the largest landslide tragedy occurred in 2023. The numbers of collateral found were 109. It is very necessary to take precautions to avoid such a calamity from occurring again. So we visited Chowk village in raigad district, where the survivors are provided with container houses, at nanivali village a 6.5 acre plot was allotted for construction of houses. Homes are to be planned in minimal cost from the funds given by government authorities and NGOs. These homes will be under low cost housing scheme and the design will be such that in situations like these, destruction will be minimised. This research also emphasis in cost effective construction materials. We are planning to provide a houses for the poor villagers where a sense of stability of elementary values of protection exist and gave better livelihood. To develop a framework within design where incremental physical development can take place within the settlement. This paper presents and applies a conceptual framework to deal with Nature's vulnerability actions such as landslides, earthquakes, floods, cyclones etc. Drawing upon Construction Materials and Management based approaches, the conceptual agenda provides a unifying lens to examine links between knowledge, implementation and construction along with managerial techniques. The outcome is an integrated approach to provide a dwelling for the poor villagers where a sense of stability of elementary values of protection exist and gave better livelihood and to increase the opportunities for sustainable development.

Keywords: Low cost housing scheme, Construction Materials, Framework, Landslides, Rehabilitation.

INTRODUCTION

On 19th July 2023, heavy landslides due to torrential rainfall caused extensive damage to life and property across the hills, with Irshalwadi registering 109 deaths in the Raigad district of Maharashtra. Majority of the villagers are from the Thakur Adivasi community and have been residing in this region for many generations. Over 98 people were rescued, and 26 bodies had been recovered. Nine members of a family died. Maharashtra's deputy chief minister, Devendra Fadnavis, told the state assembly that an estimated 225 people lived in the hamlet.

Debris was, in some places, 10–29 feet (3.0–8.8 m) deep. At least 109 people were left missing under the debris. Seventeen out of 50 houses in the hamlet were damaged.

The National Disaster Response Force, police and medical teams were involved in relief efforts, which resumed on the morning of 21 July 2023 after being halted on late 20 July 2023 due to heavy rainfall. Excavators were airlifted to the site, and rescuers had to travel 1.5 miles (2.4 km) from the nearest highway to reach the site.

STUDY AREA

The Irshalwadi village is located in the remote mountain hamlet of Sahyadri, Raigad district. It is approximately 60 kilometres (37 mi) from Mumbai, the capital of Maharashtra. The village resides close to Irshalgad fort, which is a popular weekend trekking spot.

Irshalwadi was a picturesque village at around 3,700 feet (about 1,128 metres) above sea level, deep inside the Sahyadri forest range (Western Ghats) near the famous Irshalgad Fort in Raigad district of Maharashtra.



OBJECTIVES

- To design the houses in LGS(Light gauge Steel).
- To analyze and discuss with villagers to know the problems they are facing and to identify the requirements of population i.e. facilities to provide.
- Planning of the village as an ideal solution for rehabilitation.
- To estimate the overall budget coming to developing the houses and the village.
- To prepare a data of village to design like a (no. of house, total population of village as per they need).
- To provide an affordable housing module for the villagers.

LITERATURE REVIEW

[1] Review on Disaster Management

As mentioned above on research article written by **Pande**, (2007) emphasis in his research study about Uttaranchal's disaster management mechanism for reduction of effects of disaster, i.e. damage to property and loss of life and the rapid and effective rescue, relief and rehabilitation of the victims. Uttaranchal has no resettlement and rehabilitation policy. In India only three States, Maharashtra, Madhya Pradesh and Punjab, have state-wide resettlement and rehabilitation (R&R) policies.

[2] Another study by **Murao**, (2008) considered a different approach towards this problem where he did a case study of architecture and urban design on the disaster life cycle in Japan which acknowledge the fact that spatial design is an essential component of disaster management, the inter-relationships between these fields have rarely been considered in literature. The purpose describes a scheme for integrating the areas of spatial design and disaster management based on architectural, urban design, and landscape design case studies one of the most disaster-prone countries in the world, Japan. This paper describes the significance of these developments from the viewpoints of the location and social background, and a variety of historical and regional examples related to disaster management are also introduced within this context. The examples are classified into four categories with regards to the purpose for which they were implemented (mitigation, preparedness, response, and recovery) and are defined by the theoretical notion of Disaster Life Cycle for disaster management.

[3] **S. S. Thigale** et.al, (2007) Considered a field investigation in his research to study the physical framework covering climatic, geologic, geomorphologic and seismologic information on disastrous landslide episode of July 2005 that killed 190 people and gave rise to hydrothermal anomaly. Structured interviews through an appropriately designed

questionnaire were also conducted to collect first-hand information from the people who had witnessed the events and those who were involved in rescue operation to throw light on the causative factors responsible for the landslides and generation of hydrothermal anomaly.

METHODOLOGY



5.1 SITE VISIT

We visited Chowk Village on 8th apr2024. The site visit was for survey purpose and data collecting. After visiting the site we saw there was hardly any village left ,we saw there were only remains of trees and ruins of houses, Only visual scenario gave us idea about the impact of disaster ,all we can see was land with hardly any human habilitation During site visit we met the Tahsildar and NaibTahsildar of GhodegaonTaluka and Sarpanch of MalinVillage ,they were of immense help to us , they provided the necessary information related to disaster, they gave us the required permissions for carrying out surveying and data collection. 2023. The site visit was for survey purpose and data collecting. After visiting the site we saw there was hardly any village left ,we saw there were only remains of trees and ruins of houses, Only visual scenario gave us idea about the impact of disaster ,all we can see was land with hardly any human habilitation During site visit we met the victims of disaster, after talking to them we realize how big was there problems, they were of immense help to us , they provided the necessary information related to disaster, they gave us the required permissions for carrying out surveying and data collection.



5.2 DESIGN

After the analysis of collected data, we will come to know is the site suitable for rehabilitation. So for the proposal of houses we are going to design the plan of houses. The houses which will fit in the budget given by government and NGOs for the affected people, such houses will be designed. These houses will be low cost houses but also strong and durable this will be given due attention.

5.3 ANALYSIS

Light Gauge Steel Technology

Light Gauge Framing System (LGFS) or Light gauge Steel framing (LGSF) is a construction technology using cold-formed steel as the construction material. It can be used for roof systems, floor systems, wall systems, roof panels, decks, or the entire buildings.



The LGS wall system comprises of a network of steel members connected to form a frame. The studs are connected to a top and bottom track to form a framed may depending on the load conditions, may also have bracing.

LGSF construction technology is more sustainable than RCC construction methods. Nest-In's LGSF buildings are constructed at 2x faster pace than RCC buildings, as all the LGSF construction components are manufactured in a factory-controlled environment off-site, and are transported to the site only for final assembly.

5.3 Advantages of LGFS

1. Strength and Durability: One of the most significant advantages of LGSF building is its strength and durability. Light gauge steel framing is made using high-quality galvanized steel, making it resistant to rust, corrosion, and pests like termites. This material also has a higher strength-to-weight ratio than traditional wood framing.

2. Speed and Efficiency: Construction of the LGSF building is quick and efficient, which is still another benefit. Due to their lightweight characteristics, these materials require less labour to process. Prefabrication is advantageous because it facilitates speedier on-site assembly than more conventional approaches.

3. Cost-effectiveness: LGSF buildings are cost-effective due to their quick assembly time, reduced labour costs, low maintenance requirements, and long-term durability.

4. Design Flexibility: Light gauge steel framing allows for greater design flexibility as it can be custom-made according to specific project needs. It can be easily modified or adjusted on-site without compromising its structural integrity.

5. Sustainability and Environmental Benefits: LGSF buildings offer sustainability benefits by being recyclable at end-of-life stages while reducing carbon footprint through material transportation optimization.

- Lightweight leading to reduced foundation time and cost
- Very fast speed of erection and less susceptible to inclement weather build delays
- Fewer site operatives building superstructure with Covid-19 distancing benefits
- Follow on trades can begin sooner if programmed correctly
- Less waste leaving site
- Much higher level of recyclable material at end of building life

CONCLUSION

Based on survey and studies in guidance of concerned authorities and experts, analysis of collected data is being done and low cost housing will be proposed for the rehabilitation of people of Irshalwadi village.

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