

Preliminary Field Report: Rapid Damage Assessment Following the M6.3 Earthquake on October 3, 2023 in Bajhang, Nepal



Prepared by:



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1 GENERAL

Earthquake Safety Solutions (ESS) deployed its team of engineers to the damaged part of Bajhang district on 9th October 2023. The damage was due to M6.3 earthquake on October 3, 2023, and subsequent aftershocks. This is the preliminary report on the rapid damage assessment carried out by the team. The team visited Jayaprithvi Municipality, Thalara Rural Municipality and Kedarsuin Rural Municipality.

Bajhang district is accessible currently from Dhangadhi only. It takes almost 8-9hr drive from Dhangadhi. There is an airport in Bajhang district which can be good capacity for current and future responding disasters in this region.

IMPACT OF EARTHQUAKE

One person was killed due to the landslide after earthquake. The rescue team could recover only few parts of body as the slide was very big. 2 students were injured during way back to home from school due to rock fall followed by the trigger. They were taken to Kathmandu for medical care. While other injured were cured in district hospital Bajhang [as per discussion during field visit].

Jayaprithvi Municipality needs 202 classroom and 12 toilets reconstructed while Thalara Rural Municipality needs 80 classrooms reconstruction support.

Human		Housing Damage			Health Centers	
Death	Injured	Complete	Partial	Minor	Complete	Partial
1	21	2119	6183	3468	8	33



Classes are being run out of classroom



Childbirth is being carried out openly as the health center is damaged

3 BUILDING TYPOLOGY

The general building typology in the district is stone in mud with flexible floors. The roof is pitched roof with slate stone. Recent constructed buildings are of stone masonry walls in mud mortar with poorly built rigid Reinforced Concrete (RC) floors (local word for RC concrete floor is “Lenter”). Also, we could see buildings with RCC frame structures in Chainpur, urban area of Bajhang District. The infill walls in these RCC frame structure buildings are mostly stone in cement and some cement blocks and brick are also observed.



Stone in mud with pitched roof with slate stone



Stone Masonry with RC Rigid Floor (local word for “Linter”)



RCC Frame structure with stone infill walls



RCC Frame structure with block infill walls

4 OBSERVED DAMAGES

- Most damages are seen in stone masonry with mud mortar buildings. The damages are delamination of the stone layers in the wall due to poor bonding and interconnection between layers of stone. Some buildings seem fine from outer side but while observing from inside, the building is not habitable due to the delamination of the masonry walls. The other damages observe are corner separation, slate stones in the roof are displaced or fell.
- Stone masonry in mud mortar with timber bands performed well in the earthquake. Schools and health centers are also damaged due to the earthquake. The school
- building of unreinforced stone masonry walls got severe damage while even poorly built RCC frame buildings did not have damage. One RCC frame building with stone masonry infill got damages in infill walls and the stone masonry building with RC floor and RC staircase got damages in load bearing walls.
- Stones from the wall at roof level where timber beams are resting found to be dropped due to lack of proper connection between timber beam at roof edge and wall.
- Racks with book in a library was found to be toppled due to the earthquake.
- In Thalara Rural Municipality 18 houses in Biskhet ward # 8 would require relocation and 80 houses in ward #7 are completely damaged. Reconstruction in the same location is not possible due to potential hazards. Therefore, it requires relocation while doing reconstruction. 4-5 drinking water sources are also damaged.

5 GOOD PRACTICES

The oldest building in Satyabadi Secondary School (Established in 1963 BS) found to perform well. These building are also made up of stone masonry in mud mortar. Earthquake resistant element such as horizontal timber band, wooden pegs at beam joints to restraint horizontal movement and corner stones were observed. Traditional building technology in this region were also found to be earthquake resistant. We shall promote these traditional technology with additional knowledge gained from research for further reconstruction, recovery as well as in new constructions.



Corner stones are placed in traditional construction technology



Wooden pegs in beam and wall connection to restrain the horizontal movement



Buildings with timber bands performed well

6 NEED

6.1 Short and medium term

- Immediate relief is being carried out by humanitarian aid agencies in coordination with DDMC and municipalities.
- The general perception of the public is that they will not get housing support as happened after Doti Earthquake last year. Therefore, we need to respond collectively to these earthquakes as Sudurpaschim earthquake response and recovery program.
- The building reconstruction must be supported by technical assistance for “build-back- better”. Need of capacity building among masons working in this area as well as the engineers and sub-engineers working in the municipalities and rural municipalities in earthquake resistant construction technologies.
- Some communities need to be relocated due to existing hazards such as landslides during reconstruction phase.
- Schools and health centers that are damaged by earthquake must retrofitted/reconstructed. For this detailed assessment with support for construction is to be carried out as soon as possible.

6.2 Long term

- In the municipalities, they don't have building permit system. It is a general understanding that the building code is for RCC frame structures only. They don't even know that the stone masonry is also covered by building code. Because of this understanding, they think implementing building code is not possible due to the economic status of the public.
- Another misconception in public due to this earthquake is that cement-based construction is good for earthquake resistant as no damages observed in those buildings. In fact, they are poorly built and do not follow the requirements of the building code.
- It is paramount that these municipalities need support in building code implementation for long term risk reduction. For this secondment of engineers with activities learnt from implementing building code support program is necessary.



Meeting at Jayaprithvi Municipality



Meeting at Thalara Rural Municipality

PHOTOGRAPHS

