



CARE International Indonesia

Rapid Shelter assessment (Remote and Rural areas)

West Sumatra Earthquake of 30 Sept 2009



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This qualitative assessment (technical in nature) has been created to share CARE International Indonesia's observations within the first week post-earthquake. It has been created for the aim of sharing information within CARE organisations, cluster members and the wider humanitarian community as a sample of one of the most affected areas.

Executive summary

CARE's emergency response team has observed some of the devastating effects of the West Sumatra earthquake of 30th Sept 2009. 135,333 houses have been rendered un-inhabitable. Much of the structural failure has been due to the magnitude of the 7.6 earth quake combined with unsafe construction practices. Observations within the first week post disaster reports impressive local culture to self-help, and put together makeshift shelters from salvaged material. However the fact remains that affected populations have lost their homes, water and sanitation facilities, assets and in some cases their livelihoods (land, shops etc). A portion of the affected have been seen living in collective centres and some in government IDP camps.

The rapid assessment has found that the affected population needs of shelter from the elements and support to clear dangerous structures. Also to reduce the risk of water born diseases and maintain health essential household items and hygiene material will contribute to the relief.

The damage experienced is over-whelming it must be highlighted that efforts to aid building back safer must be the highest priority to limit the impact of any future disasters.

01 Back ground;

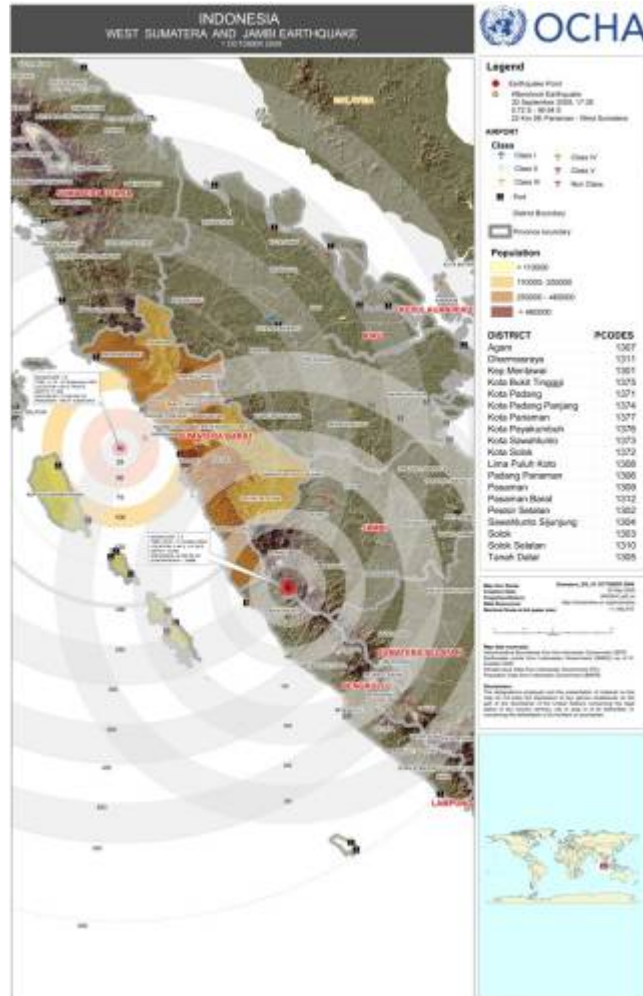
Wednesday 30th September 2009 at 17:16 hrs an earthquake Richter scale 7.6, struck West Sumatra, Indonesia. The epicenter 57 km southwest of the district of Pariaman was followed by an aftershock 22 minutes later, with an epicenter located 22km southeast of Pariaman.

Affected populations have reported that there were lateral thrusts followed by a strong vertical movement which maybe the reason for the large scale of destruction. In the mountainous areas of Pariaman landslides were experienced and in one sub-district of Sungai Geringging within the district of Padang Pariaman, a landslide claimed three villages and its inhabitants.

A sample of affected communities was visited within days of the earthquake.

The visits saw the strength of the

affected to make make-shift shelters. As of 12th October, Large numbers of affected people continue to sleep outside due to the worries of another earthquake collapsing the damaged house. The majority of water and electricity systems have been destroyed. Initial CARE field assessments have reported an increase of diarrhea in 4 villages post-earthquake.



02 Rapid field assessment methodology

This technical assessment is to compliment other ongoing assessments such as the ECB and DaLa. This assessment presents a sample of affected rural districts of Pandang Pariaman where the damage has been severe, official District level data indicates that an 95% of the houses are severely or moderately damaged rendering the house unsafe to occupy. This assessment is reliant upon first hand observations and interviews with the affected households, combined with data and information available at cluster, district and village level.

03 Data analysis

Government figures estimate a total of **135,333¹** houses were severely damaged and **62,882** houses moderately damaged. This is a total of **198,215** houses made un-inhabitable and potentially requiring emergency relief items. This earthquake has left all buildings in the region more vulnerable to future natural disasters than before.



This assessment concentrates on the most affected Padang Pariaman district as indicated on the map above. The district of Padang Pariaman has approx 400,000 inhabitants and has 18 sub-districts. Estimated damage in the district of Padang Pariaman according to local government indicates 87,682 houses were (11th October 2009);

¹ Indonesian government figures dated 11-Oct-2009
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According to statistics gathered by the field team, numbers of effected household appear to be higher than of the reported figures (as above) it is envisaged that the numbers will keep fluctuating until government inspections and verifications are complete.

Government statistics (11th October 2009) for earthquake damage in Padan Pariaman district.						
	House			Schools		
Level of damage	Severely	Moderate	Slightly	Severely	Moderate	Slightly
No.	70,608	12,631	4,443	257	87	31
Total damaged	8,3239 houses Un-inhabitable		87,682 houses damaged	344 schools unsafe to occupy		375 schools damaged

04 Rural specificity

This assessment concentrates on the remote rural areas. The conditions in rural areas are different to those in urban areas for the following key reasons:

- Limited transport access
- Predominantly agricultural based livelihoods
- Predominantly single storey buildings
- Most villages without piped water
- Most villages located in mountainous land
- Some areas affected by landslides

These differences should affect response strategies and the implementation of support programmes.

05 Human settlement

Un-inhabitable houses are currently estimated at **198,215** houses. The majority of affected populations tend remain on or near their plot of land. Sleeping under makeshift shelters made with salvaged material. Initial observations have seen some living, or just sleep in collective centres such as mosques. Other visits have seen affected populations in government IDP camps, figure yet to be confirmed by IOM or ECB assessment. A villager told that they might take a host family option soon, however as in that village 95% of houses were damaged it may be a challenge.

06 Shelter visual assessments

Housing

Houses in the rural area are predominantly one story; the affected areas have seen a devastating amount of damage. The following photos illustrate some of the typical housing damages. As one can see from the photos above severely and moderately damaged houses are un-inhabitable.

Severely damaged house

Four walls destroyed and roof collapsed to the ground. All household goods and assets are damaged or destroyed.



Internal of damaged house

Severely weakened structure, structural cracks in the walls. Brick walls failed damaging household furniture.



Partially damaged house

House still standing however major structural failure. The house rendered unsafe for habitation.



07 Construction techniques

There are four common types of building techniques in the affected rural areas; Structural Brick walls, Concrete column with brick in fill, Stone with clay and lime mortar and Timber frame, all of which has been damaged to different degrees.

Brick walls

Brick wall construction is common in the region, however without reinforcement brick walls just crumbled and peeled away. This is a very hazardous construction technique as the wall collapse and roof cave in or the wall falls in on top of the people inside.



Concrete column with brick infill

Slender concrete columns failed. Brick infill walls peeled off the columns as there were no ties between column and wall.



Stone with clay and lime mortar

In some areas the use of local stone with clay and lime mortar have been seen, however much of them have been damaged.



Timber frame

Timber frame houses are present in the area although brick building are more common as it is seen as “*permanent*”. In the same village, timber frame houses generally have seen less damage. This photo shows a undamaged timber house and next to this house a totally destroyed brick house.



Lack of reinforcement connecting the column to the foundations.
No ring beam (sloth)



Traditional Padang roof structures are heavy and in this instance structural columns failed.



Land movement, causing sedimentation to the foundations, relocation and tenure issues may become important.



Lack of lateral bracing, dangerous structure.



Size of structural columns too small and low quality of re-enforcement bars.



Dangerous structures left and owners put supports to avoid collapse.



Entire ground floor collapsed.



Weakness in corners without structural columns

09 Schools

Schools buildings have seen a large scale of damage; In the district of Padang Pariaman 257 severely damaged, 87 moderately damaged and 31 lightly damaged (local government figures 11-Oct-2009). On the date of the Earthquake, schools were on holiday, and as a result casualties within schools were limited. On 5th of October School, had started throughout Indonesia. On the 8th of October affected schools in West Sumatra which had slight damage schools started schooling after clear-up efforts. However the severely affected schools face the challenge in re-commencing. The damaged schools present immediate damage to pupils and teachers and should not be asked to hold classes under unstable and insecure buildings. Safe and secure temporary school facilities are required until permanent rehabilitations and reconstruction starts.

Weak structural columns

The low quality of the structural design can be clearly seen by the damage. Where there are no steel reinforcements at the beam to column connection the structure failed.



Ceiling caved into class room

This photo shows one of the external walls have collapsed and then the ceiling dropped.



No connection from the Ring beam to the foundations

This detail shows the ring beam was not anchored to the foundations. Thus the building collapsed.



10 Hospitals/ Health centres

Central hospital in the sub-district have been heavily damaged and hospitals operate under tents.



11 Religious buildings

Some Religious buildings have collapsed also, destroying community space.



12 Self – made emergency shelter solutions (observations from 5-11th October 2009)

Below are some examples of ways in which the affected have coped with their own means. Since the 30th September the region has seen periodic heavy rains, however the rainy seas ion will be coming soon. It is necessary to assist those to have cover and be off the ground.



Temporary shelters built next to their damaged house made from reclaimed material.



Temporary shelter made on the side of the street



Living under damaged veranda



Tents made next to the damaged house



Living in former shop-huts



Living in borrowed tents from local school

13 Self recovery

Visits to the sites 3-7 days post-earthquake has seen the determination of the affected community to piece together their lives. Many of the households have started clearing the rubble, sorting materials; the conditions are not like tsunami cyclones or flooding building destroyed, but materials salvageable.



Households clearing up rubble



Households salvaging re-useable material



Community start constructing



14 Strong Community structures

Goto Ryongu translated “team work” is a form of community work. According to the villagers prior to the Earthquake and still now there is a strong community tie within Padang Pariaman. In the Korong (village) of Sungai Rantai within the Sungai Geringging sub-district there is a community structure called “Julo Julo” This is a grouping of approximate 30 people who support any of the other members who need to build or repair a house. The support would be either finance or labour and skills.

15 Collective centres

The photo shows an example of a collective centre; a mosque is used as an earthquake centre. In this place 120 people sleep at night. Local groups support this facility and they make food together from donations.



16 Barracks

11th October we have observed a national NGO starting to construct a barrack. This complex will house one household in a 2.5mx 4m space and will have 100 units within a former football pitch. Latrines and a temporary school had been planned.



17 Landslides

The area of Pariaman have experienced many landslides. This photo is from a village in Patamuar where three complete villages (300 households) were claimed by the landslide, only 4 survived.

Specific concerns for the survivors and neighbouring communities are;



- Weakened soil, higher risk of further landslides
- Risk of mud slides in heavy rain
- Loss of agricultural land
- Potential re-location and related tenure issues

Further assessments

A further in-depth needs and vulnerability assessment will be required this should target the following groups:

- Landslide affected
- Newly handicapped
- Single parent households
- Renters and non-landowners
- The poor
- Minority groups

19 Conclusion

Long term need to cultivate safer building practice and associated Disaster Risk Reduction in the multiple hazard environment.

Emergency Shelter needs;

Need cover from rain and sun especially as the rainy session is approaching.

Need basic non food items such as blankets cloth cooking equipment as most household assets have been lost under the rubble.

Need tool kits, in order to clear the dangerous structures and to salvage materials before they are spoilt.

Emergency WASH needs;

Basic hygiene item are needed as the affected population have limited means to purchase materials.

Emergency sanitation relief is required in areas which as increased rate of water-borne diseases.