

LEH Flash Floods 2010

Emergency Rapid assessment report

for **Oxfam** India

for

WASH & SHELTER sectors



Assessment during 11th -15th August 2010

Report by

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Executive Summary

Massive flash floods triggered by an unprecedented cloudburst on the early morning of August 6th 2010 near the town of Leh in Ladakh region of Kashmir caught the residents unawares resulting in huge casualties. The flash floods that carried muddy water from uphill in 3 different routes devastated the settlements by burying most of the houses and washing away everything on the course of the running water and leaving deep silt deposits and huge boulders. Such a major disaster was caused in just 38 minutes of rainfall as a result of the cloudburst which damaged houses, agricultural land, food grains, household assets, water supply systems, roads and basic infrastructure besides claiming human lives. The floods have affected huge number of population in the 32 Villages out of which 6 villages are the worst hit. The floods so far have claimed 247 of lives and more than one thousand houses washed away. The agricultural crop damage is phenomenal (estimated to be in billions of Rupees in economic terms) and people have lost their livelihoods. A team comprising 2 RedR members (Rahul & Sriraman) conducted an emergency rapid assessment of the flood situation in Leh district. The objective of this assessment is to enable Oxfam India to chalk out a response strategy and an action plan for meeting the prioritized and unmet needs of the affected families.

Thanks to the cohesiveness of the community, significant proportion, about 30%, of affected families has taken shelter with their relatives and friends (host families). Those who could not join host families moved to safe places where the district administration with the help of the army have erected temporary tents on a war footing. Such camps were seen at village Choglumsur and at the site of project Himank about 4 km away from Choglumsur. Assessment team visited these camps. Other villages that were believed to be affected though not significantly could not be reached as the roads were damaged and required debris clearance. The NDRF/ ARMY played a vital role in the search and rescue operations that also retrieved the bodies from the debris.

The district administration was able to provide drinking water supply through tankers and communal cooking facilities were established at Leh town and village Choglumsur. Food was basically taken care of the government.

Drinking water was found to be available in most of the places though there is a shortage of water for domestic use due to the absence of appropriate storage & distribution facilities. PHED department has been tankering water in the affected areas but certainly it is not adequate. Drinking water quality will soon become an issue due to the debris lying in the villages and unhygienic handling of water by the users. There seems to be a chance of outbreak of water related epidemic soon due to non availability of sufficient water and poor quality of water. Intervention for WASH should be undertaken on a priority basis. Government is looking for support from agencies for WASH & Shelters as food and health services are taken care of district administration. There is a need for capacity building of local NGOs, volunteers and the government officials, as the emergency of this scale is faced for the first time.

The immediate relief which needs to be carried out on war footing include tankering of treated water, install water storage tanks, efficient distribution, water quality monitoring, erection of washing cubicles, temporary latrines, temporary bathing cubicles, health and hygiene promotion through visual media and campaigns.

Housing will be a major as well as an urgent need as the winter is fast approaching. Leh district located in the trans-Himalayan range at a altitude of over 4000 m experiences extreme cold weather with mercury dropping below minus 35 degree Celsius. Therefore there will soon be a need for temporary shelters (winterized) or *pucca* construction of core shelter based on traditional building construction materials and systems. This requirement is however for the mid-term rehabilitation phase for the period from October onwards. However, this also needs to be handled before the end of September as it is almost impossible to undertake any construction work once winter sets in. Housing support should be extended through distribution of bamboos, timber poles, mud bricks & other construction material and promotion of family latrines in most vulnerable communities. This will be most pragmatic approach considering the limited time available for construction and the fact that local skills and resources for construction is available.

Long term rehabilitation should cover permanent shelter that are resistant to natural hazards by building back better and the rehabilitation be linked up with community based disaster preparedness and livelihoods programme.

Over and above all these interventions, a robust coordination mechanism and a monitoring and evaluation system need to be put in place to ensure effective delivery of relief and rehabilitation services that is equitable and sustainable.

1.0 Background:

Massive flash floods triggered by an unprecedented cloudburst on the early morning of August 6th 2010 near the town of Leh in Ladakh region of Kashmir caught the residents unaware resulting in huge casualties. The flash floods that carried muddy water from uphill in 3 different routes devastated the settlements by burying most of the houses and washing away everything on the course of the running water and leaving deep silt deposits and huge boulders. Leh town, villages Choglumsur and Saboo villages were worst hit causing mass destruction of house and property, besides claiming lives.

Overall flash flood situation in Leh is getting grimmer with increasing number of affected population. Over two hundred people lost their lives. More than ten thousand people are affected and displaced and most of the *kutch*a shelters are washed away. Huge loss of agricultural crops due to deposition of mud and silt over the fields along the hills and the lower plains has resulted in loss of livelihoods, besides food grains and livestock.

Oxfam conducted an emergency rapid assessment of flood-hit Leh district of Ladakh with support from RedR. A team comprising 2 staff members of RedR (Sriraman Varadarajan & Rahul Pathak) conducted the assessment during 11th to 15th August 2010 which included visits to affected areas, both in outskirts of Leh town such as Saboo & Choglumsur Villages and far off places like village Phyang,. As part of assessment, the team also held discussions with the affected community, government



officials Special District magistrate for floods, Executive engineer of Public Health Engineering Department (PHED), Leh. The minutes of meeting are furnished in **chapter 7.1**. NGO partner of Oxfam India, Rural Development and You (RDY) assisted assessment team in field visits. It was in the considered opinion of the team that the trends in the flood situation in Leh will be representative of the state. The team confirmed with other assessment teams that situation in all affected villages are more or less similar in terms of substantive damage and the needs. The numbers however was not agreed upon for village wise damage data due to paucity in information both with the district administration and the NGOs who conducted assessment. **It is important to note that the major chunk of the washed away shelters were constructed on encroached civil land for which records were not there, making the task of estimation of damaged houses difficult.**

This assessment report provides the observations, key issues to be addressed, recommended action both for immediate response (time frame starting from immediate till end September 2010) and mid-term rehabilitation (commencing October 2010 till March 2011) and the implementation strategy with human resources requirement. An indicative action plan for water, sanitation and shelter components is also prepared and attached in chapter 5.2. Oxfam may further fine tune this based on detailed assessment. Due to the forthcoming winter season from October, it is to be noted that the response for both the phases need to be completed before September 2010.

2.0 Assessment team and methodology:

2.1 Assessment team

Assessment team comprised primarily of a Shelter expert, WASH expert and local partner. Additional members from RedR India and Aquaplus were engaged occasionally for some interviews with community.

Primary assessment team:

Mr.Sriraman Varadarajan Shelter expert

Mr.Rahul Pathak WASH expert

Mr.Padma from Rural Development and You (RDY), local partner of Oxfam India

Secondary resources:

Miss Katrice King (resource person)

Mr Parameshwar Patil (Watsan Assistant)



2.2 Assessment Methodology:

A variety of methods and tools were employed for rapid assessment of damages and priority needs of the community post flash floods in Leh.

2.2.1 Interviews with Government officials

Deputy Commissioner for Leh district and the Executive Engineer for Public Health Engineering department were the main government officials contacted for information gathering.

2.2.2 Focused group discussion with community

Assessment team gathered specific information about the major needs of the affected families through focused group discussion with the community in general in the worst hit village Choglumsur and women in particular. Many of the women specific needs such as privacy issues, water supply and sanitation came up through this discussion.

2.2.3 Field visit observations (transect walk)

The severity of damage could be assessed mostly by direct field observations through transect walk in the affected areas.

2.2.4 Discussion with Oxfam staff and partner

Initial discussion with Oxfam staff and their partner provided the report on current situation, mainly in terms of village location and scale of damage.

2.2.5 Pilot tests on water quality

During assessment water quality that was made available to the affected families was also assessed using field test kits.

2.3 Assessment location:

Assessment of the damages and needs was not conducted in the entire district as the comprehensive list of villages damaged and the scale of damage was not available, even in the government list. Coordination meetings projected a wide variance in the reports of damages and the villages.

The assessment team therefore focused on the worst affected villages Choglumsur, Saboo and partly Leh town. Lack of accessibility to many villages that were presumed to be affected posed a major challenge during the period of this assessment. In order to cross check some information, the team also visited faraway villages like Phyan where the damages to basic facilities like shelter and water supply was minimal.

3. Overall situation

By and large, people were resorted to move from their villages to safe places, as the shelters and the entire settlement have been washed away in the worst hit Choglumsur and Saboo villages. Significant proportion of families has joined host families and those who could not join with their relatives and friends have been accommodated in tents erected by the district administration with the help of the army. In the Himank camp there are ~40 tents (each tent having a space of ~120 Sq ft) hosting 100 families & Choglumsur camp having 10 camps are hosting 40 families increasing the chances of WASH related diseases.

Drinking water is available in most places. Even in cutoff areas, one could spot hand pumps. In totally cutoff and inaccessible places, there could be a problem of inadequate water supply. Though PHED has initiated supply of water by tankering, there have been issues about storage capacity & distribution and as a result the affected



people are receiving water only once in 4 days. The executive engineer reported that PHED has now resumed access to the damaged water filling point in Choglumsur area and as on 15.08.2010 date, water could be filled & distributed from choglumsur village itself. **However, water quality will become an issue very soon as the water samples tested at site show bacteriological contamination.** The water quality needs to be continuously monitored. PHED executive engineer in Leh assured that water quality surveillance would be initiated soon. **Water quality surveillance is a must and action based on surveillance reports must be ensured.**

Results of Water Testing

| Location | TDS | Ph | Turbidity | H2s Test Vial |
|-------------------------|----------------|----------------|-------------------|-----------------|
| Standards | <500 | 6.0-8.0 | < 5 NTU | Negative |
| Stream Choglumsur | 85 | 7.8 | 621 | Positive |
| Bore well Choglumsur | 57 | 7.6 | 20 | Positive |

As per the above tests Water Treatment & disinfection of bore wells is a priority.

People have been using dry pit compost latrines (Ecosan) traditionally. The latrine coverage was almost 100% prior to the disaster. As there are no or only a few latrines in the camps, the affected people have to resort to open defecation which is resulting into privacy issues especially for the women.

Peoples' needs are expected to be mounting when they return back to their villages. **A detailed assessment of needs at that point of time will have to be undertaken.** Broadly, people will need rehabilitation support in all technical sectors including livelihoods. Drinking water supply needs to be ensured. Construction and promotion of temporary shelters (winterized) & family latrine would be on the highest priority. Health and hygiene promotion will be very crucial, as material inputs alone will not ensure environmental health. Water quality surveillance and disease surveillance will have to be carried out continuously to monitor the health of people, especially children.



Housing support will be a major need once people move from camps. It will also take a lot of time for implementation as the 'sand and clay' deposits (of 4-5 feet height) need to be cleared. With most families having lost their *kutchas* homes, supply of building materials will be very useful. Housing support packages consisting of bamboos mud bricks with other building materials will enable rehabilitation of affected population.

Loss of livelihoods will be a major issue in the mid-term rehabilitation phase. Government programmes and schemes like Indra Awas Yojna, Jawahar Rojgar Yojna and National employment guarantee can be tailored to fulfill the needs of the population. Oxfam could facilitate and encourage Government to compensate for the loss of livelihoods using such schemes. This is also an opportunity for working towards community based disaster preparedness. Using government schemes, raised mounds can be constructed within the villages to serve as flood shelter. As a preparedness measure, hand pumps and toilets can also be provided in those shelters beforehand.

4.0 Observations and key issues

4.1.WASH before the disaster.

Water Supply: The traditional water Supply is through pipelines as well as deep bore wells in and around Leh. The village of Choglumsur partly has the piped water supply whereas the upper town is dependent on tanker water. The far off areas are dependant mainly on streams and deep bore wells. The hand pumps are without the aprons.

Hygiene: Bathing practice is widely dependant on the climatic condition. For example in winters the people are not habituated to take bath regularly whereas in summers it could be once in a day to once in a week. Hand washing art critical times of the day

is not a common practice. The use of disposable sanitary napkin is 70% whereas 30% are using the reusable sanitary napkin/cloths.

Sanitation

Ladakhi people use dry compost latrines which do not require water for flushing. Toilet seat is provided by means of wooden planks on the raised floor or in the upper storey and faecal matter is allowed to drop down to a chamber which has a door at the bottom. After defecation ash or mud is thrown on the faecal matter which then gets converted into manure over a period of one year. In order to ensure that toilet is functional all the time, twin chambers are constructed so that family can use the second chamber once the first one is full. By practice, Ladakhi people are not habituated to use water for anal cleansing, they use old newspaper. This practice fits well with the appropriate use of dry compost latrine which is more ecological than any other excreta disposal system, as it preserves water, prevents contamination of water sources beside yielding valuable natural manure.

4.1.1 WASH after the disaster

Water Supply: After the disaster the piped water distribution system in parts of Leh, Choglumsur are completely damaged. The water treatment and pumping station which supplies water to Choglumsur and nearby areas have been completely damaged as well. People are dependent on the tankered water which is not adequate. There is a shortage of water storage tanks as well which is resulting in a shortage of domestic water supply. The hand pumps do not have concrete aprons and the water tests show bacteriological contamination.

Hygiene: Community has not been taking bath for several days due to the lack of the utility water as well as absence of bathing cubicles. The chance of outbreak of water related diseases is high as a result. There is availability of disposable sanitary napkins in the market but there is difficulty in using the same due to lack of privacy resulting in poor hygienic practices.

Sanitation: As the latrines have also been washed away people are resorted to defecate in the open. There have been privacy issues especially for the women. The numbers of toilets in the camps is inadequate as well and have no hand washing facilities. Vector breeding sites may be resulted due to poor drainage facilities and lack of effective solid waste management systems.

4.2 Shelters Before disaster

Shelter construction practices:

The traditional architecture of Leh in Ladakhi regions is characterized by predominant use of mud and wood in house construction. Sundried bricks made of sandy loam soil, known as adobe blocks, are the most common walling material. Finely cut pieces of biomass (*Bhusa*) are mixed with mud to prevent shrinkage of blocks. Quarried stones of size ranging from 15cm x 15 cm x 15 cm to 20 cm x 20 cm x 20 cm are also used as walling material, besides foundations. Some houses are constructed with stone masonry up to sill level and thereafter adobe block masonry. The mortar used in masonry is usually made of only mud. Openings for windows and doors are spanned by wooden members made from local timber (Budlu). Windows and doors are made of the same wood. Windows have glazed openings to allow sunlight inside the shelter during winter. Windows are made large up to a size of 1.50 m x 2 m. Roof is usually made flat to enable expansion of shelter by additional storey. Flat roof is constructed again by predominant use of mud and wood. Timber

poles or bamboo are used as the main load bearing structure. Poles of size 90-120 mm are supported on end walls at a spacing of 45 cm to 60 cm. On these poles, laid are smaller poles/twigs known as 'talbo' in the transverse direction and this makes the bed for the roof. A thick layer of mud approximately 15 cm to 30 cm is laid on top of this bed. This thick mud layer serves the purpose of insulation which is a must during winter when mercury drops below minus 15 degree Celsius. Finishes are rendered by means of plastering in mud called as 'lipai' both for floors and walls. In Leh town and nearby areas framed construction is getting popular where the RCC columns and beams are cast and the walls become 'infill' with adobe blocks. Roof is cast in RCC. Other items such as windows and doors are done in the same usual traditional manner. In Leh town use of Corrugated Galvanized Iron sheets are also common, especially in commercial and industrial construction.

4.2.1 Shelters after disasters:

The massive impact of flash floods has even crushed some of the RCC framed buildings in the town of Leh. The shelters in rural areas that are constructed with local adobe bricks made of mud, understandable could not resist the huge impact for flood water. Due to the non resistance of the mud houses to water the houses which were in the direct impact of the disaster have been completely washed away. Other households which have been partly damaged pose a risk of collapsing. A large number of partially damaged houses have debris and mud filling up to the lintel level thus rendering them unusable.

5.0 Recommended Action points:

Though emergency response need is everywhere, probably in all the affected areas, it is recommended to assign priority to families with completely damaged houses especially in the areas of Leh town and villages Choglumsur and Saboo. Among the affected population, the most vulnerable sections such as extreme poor, children and aged, specially challenged and sick people should be given priority in the response strategy. Women needs should be considered in sanitation and hygiene responses. Children below 5 years being more vulnerable to diarrhoea and other diseases are at high risk. Health services and hygiene promotion in addition to supply of hygiene kits, ORS, halogen tablets etc should assume top priority,

The recommended action is divided into two phases, emergency response which is immediate in nature that would last up to end of September and midterm rehabilitation phase which would begin from October till March 2010 (the construction work, however should be completed before September itself). A long-term phase for strengthening community based disaster preparedness is also worthwhile to include in the response as a part of DRR, besides working out shelter strategies to build back better.

5.1 Immediate:

Field assessment clearly indicates that the key issue to be tackled is the prevention of outbreak of epidemics. Though diarrhoea has not been reported so far in the camps, health centre staff and government officials however, anticipate outbreak of

water borne diseases in a period of 7-10 days from the date of the assessment. The recommended response strategies are:

1. Disinfection all the Bore wells installed by PHED. Adequate supply of bleaching powder needs to be ensured.
2. Distribution of ORS, halogen tablets, PUR etc to the families and train them how to use the supplies.
3. Distribution of household storage containers to protect water from secondary contamination.
4. Distribution of plastic sheets to the most vulnerable population
5. Promotion of hygiene practices using visuals like posters and other media such as radio programmes, combined with promotion campaigns.
6. Provision of adequate Bulk water storage facilities at temporary camps
7. Erection of Latrines on the camps sites
8. Erection of Washing Cubicles on the camps sites
9. Erection of Bathing Facilities (For Women) on camp sites
10. Installation of Bulk water Treatment Unit with Tankering facility
11. Provision of Tents to avoid the overcrowding.

5.2 Mid term rehabilitation:

Families will need to move to either core (permanent in nature) shelters once the winter sets in. Housing support will be a key and large input to the affected families, as most of them have lost their houses. It will be pragmatic and useful if housing support is extended by packages of building materials such as bamboos, locally available mud bricks and other building materials.

The key strategies, in the mid-term rehabilitation phase (from October 2010 to March 2011) recommended are:

Extending housing support to affected families for rebuilding their houses. Packages of bamboos, locally available mud Bricks and other building materials.

1. Disinfection of all the tube wells
2. Construction and promotion of family latrines of appropriate design (eco-san Dry Pit Compost type).
3. Livelihood support by dovetailing government programmes and schemes such as Indra Awas Yojna, National Rural employment guarantee scheme etc.