CYCLONE SHELTER ASSESSMENT

NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

UN HABITAT
FOR A BETTER URBAN FUTURE

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future strategic plan of actions for shelter in high risk areas and to make the right kind of investments that minimize future disaster losses.

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Executive Summary

The devastating effects of Cyclone Nargis in May of 2008, brought about the integration of cyclone shelters into the action plans of many NGOs, INGOs and the Government of Myanmar. At the time of survey, a total of 356 cyclone shelters were identified in the eight townships under study while more shelters were being planned for or in the early stages of construction.

The most common type of cyclone shelter found in the study areas were structures built exclusively as cyclone shelters but which are presently being used as schools during peace times. Newly constructed school buildings that could also be used as cyclone shelters, monasteries, community buildings, and health centers were the other common types of cyclone shelters seen in the surveyed areas.

From discussions with community members, it was apparent that people were conscious of the need and importance of cyclone shelters as a means of mitigating losses to life and property during emergencies. A majority of the newly constructed shelters were centrally located within the village, and built on high ground. Respondents expressed satisfaction over the location of the cyclone shelters and ease of accessibility to all households within the community. However in the face of possible future disasters, some communities voiced concerns about seeking refuge in cyclone shelters within their villages that were built close to the sea or in low-lying areas.

During the course of the study, participants and respondents shared their concerns about all-year accessibility to the cyclone shelters. Participants mentioned that during the dry season, cyclone shelters were easily reached within 20 minutes by households within the village. However, in the monsoon season, it was felt that the situation

would be entirely different. Community members explained that in the aftermath of Cyclone Nargis, many access bridges, culverts and roads were badly damaged or completely destroyed. Some of these damaged infrastructures were repaired or newly built. It was widely felt that during heavy rains or storms, weak infrastructure would hamper evacuation efforts and result in delays in reaching cyclone shelters, this, in spite of having more cyclone shelters and an improved early warning system.

While communities expressed satisfaction regarding construction of cyclone shelters in their villages, they voiced concerns on the capacity of the shelters. More than half of the respondents felt that the cyclone shelters were not large enough for all people within a community to seek refuge in the event of a disaster. The study recorded only a few cyclone shelters that were three-storey's high, which could accommodate people from more than one village.

Discussions with respondents and participants revealed that seeking refuge in a cyclone shelter depended on other factors such as availability of ramps for the disabled, resting space for pregnant women and elderly, and presence of toilets within the facility. In some cases, people mentioned reluctance in leaving livestock and assets behind to seek refuge in the cyclone shelter. Communities were wary of problems due to overcrowding in cyclone shelters and about a quarter of the respondents mentioned that they would prefer to stay back home in the face of another Nargis-like disaster.

According to the communities in the target areas, cyclone shelters with reinforced concrete walls, floor and roof were felt to be 'safer' than other structures as it was considered to be resilient against storm surges, and gale-like situations. In some villages where buildings that had been damaged during Nargis were retrofitted to serve as cyclone shelters, residents felt them "unsafe" and mentioned that they would not seek refuge in a "repaired" structure in case of a similar emergency.

Almost all cyclone shelters were equipped with DRR materials, pamphlets about emergencies and evacuation, emergency power kits, first-aid kits, radio, life jackets, and loudspeakers. Some cyclone structures had water supplies for both drinking and washing; others had water for washing only. Water harvesting systems such as large storage tanks were seen in cyclone shelters constructed by the Government.

Youth rescue teams, and teams to care for the vulnerable were trained by aid-agencies in about a quarter of the villages surveyed. Volunteer teams were given training on early warning systems in a third of the target villages, to be able to reach out to remote communities and be able to assist in evacuation efforts in any future disaster.

More than half of the respondents mentioned participation in selection of site for the

construction of the cyclone shelter in their villages. However, they were unclear about management and maintenance of the cyclone shelters. School cum cyclone shelters were self-managed as students and village members were involved in the maintenance and upkeep of the shelters, on a voluntary basis. In the case of Government built cyclone shelters, the structures were handed over by the Ministry of Construction to the Ministry of Education, who was responsible for the management and maintenance of cyclone shelters.

Village authorities revealed that most communities were very poor to contribute any cash towards the maintenance of the cyclone shelters in their communities. Small cash was contributed by well-off farmers or dealers for repairs, but, in most cases, local carpenters, masons and labor offered their services voluntarily.

The study concluded that location, structure, accessibility and capacity were the core criteria for people to seek refuge in any cyclone shelter during an emergency.

I.Background:

Myanmar is exposed to multiple hazards such as cyclone, storm surge, floods, tsunamis, earthquakes, landslides and fire. As per the data from 1998 to 2007, fires constituted about 71% of reported disaster events, followed by storms (11%), floods (10%), and others (8%) including earthquakes, tsunami and landslides (MAPDRR 2009-2015). Over the past four decades, six major cyclones hit Myanmar; 1968 (Sittwe cyclone), 1975 (Pathein cyclone), 1982 (Gwa cyclone), 1994 (Maundaw cyclone), 2006 (Mala cyclone) and 2008 (Nargis cyclone). The Sittwe cyclone led to a loss of 1037 lives, Pathein cyclone claimed 304 lives and Cyclone Nargis (2008) which claimed 138,373 lives (90% of death directly due to storm surge) was the worst natural disaster in the living memory of Myanmar. Millions of people were left homeless and livelihood activities in ruins. While the region has borne the brunt of many tropical storms, recurring floods, fires, Cyclone Nargis was estimated to be the most devastating in terms of losses to life, property, livelihoods and community resources.

II.Rationale for study:

Three years have since passed, and Cyclone Nargis recovery has been slow and painstaking, with various local NGOs, INGOs, UN and other agencies playing diverse roles in restoring the livelihoods and economy of the Delta. Post-Nargis field surveys undertaken by various NGOs, INGOs and UN agencies indicate that the majority of populations living in these areas are poor households, “landless”, relatively asset-poor, deriving their livelihood mainly as casual labor, and seasonal fishing, shrimp and salt farming in the region.

A total of 358 cyclone- resistant community buildings (includes completed, under construction and planned), in 8 townships were listed according to data collected by UN-Habitat (23rd February, 2010). These include stand-alone cyclone shelters,

Given the exposure to future cyclone events, an important aspect of cyclone risk reduction and mitigating losses of life, in the Delta regions during the recovery was to protect the lives and livelihoods of people by construction of cyclone resistant housing/buildings and construction of cyclone shelters with complementary disaster risk reduction activities such as CBDRR, Early Warning Dissemination mechanisms and mitigation activities. Thus the process of integrating and incorporating disaster risk reduction in the implementation programs of various organizations has become an essential component in addressing recovery of the Delta region.

While there is little information on the availability of cyclone shelters prior to cyclone Nargis (refer Box 1 below), a total of 358 cyclone-resistant community buildings (includes completed, under construction and planned), in 8 townships in the region were listed according to the data collected by UN-Habitat through the Shelter Working Group (23rd February, 2010) with support from the DRR Working Group members. These shelters include: stand-alone cyclone shelters, school cum shelters, hospitals cum shelters, monasteries cum shelters, government shelters, etc. either through renovating and retrofitting existing structures but primarily through building new shelters in vulnerable areas. Over the past three years, the Government, together with the humanitarian and development aid community has sought to invest in disaster risk reduction and disaster preparedness measures and programs in support to com

Box 1: Pre Nargis Situation:
There is no readily available data on designated cyclone shelters before cyclone Nargis. According to the study team survey in 72 villages covering 8 townships, there were no pre designated shelters to take refuge at the time of cyclone. According to the study, majority of the people have taken shelter at home /neighbor's /friends / r elative's house followed by monasteries, schools, and other structures such as church, health center and other places / structures which were deemed safe. People found Monastery, neighbor's / friends home and schools as an important structure for protection.

munities, in order to reduce their vulnerability and increase their readiness in case of disasters.

The purpose of this study was to document a technical assessment of a sample of these existing shelters on their functionality, accessibility, operation and management, community perspectives; identify gaps, needs and further the linkages with community-based disaster risk reduction (CDBRR) activities. The study also aims at a wider assessment: looking at broader recovery in terms of shelter and livelihood aspects with clear linkages and strategic direction for future cyclone shelter support activities.

III.Aims and Objectives of the Study

The study aims to find out how cyclone shelters are affectively used in terms of disaster risk reduction aspect.
Specific objectives are follows:

1	**GIS mapping with population density and number of existing cyclone shelters**
2	**To categorize building types and find out location and accessibility to the buildings**
3	**To evaluate the community's feeling of safety**
4	**To assess community's feeling of ownership**
5	**To find out utilization of these buildings during peace time**
6	**To assess the quality of buildings and their life spans before retrofitting them if initial construction is not fit enough**
7	**To assess effective management on operation and current practice of maintenance plan**
8	**To identify gaps and opportunities for future cyclone shelter needs**
9	**To use the findings from the survey as an effective planning tool for future cyclone shelter construction practices**
10	**To set up maintenance strategy in order to meet cyclone shelter standard, that is yet to be formulized**
11	**To integrate disaster-resilient shelters into township disaster management plans**
12	**To provide guidelines for future action plans for disaster risk reduction at community level**

Within the objectives defined above, the study will focus on developing a cyclone shelter study questionnaire and conduct a survey at communities whose members have access to cyclone shelters. All documents and data collected from interviews will be treated as confidential and used solely to facilitate analysis. The lessons learnt, replication on efforts and good practices for integrating disaster risk reduction with specific reference to cyclone resistant community cyclone shelters constructed after Cyclone Nargis will be documented.

IV.Methodology:

The core of the evaluation includes a survey and technical assessment of the existing shelters in relation with location, household size, ownership, safety, management options, identify gaps, needs, inputs for development of future cyclone shelter strategy

and its standardization in Myanmar. For the purpose of the study, 20% (72) of the total number of shelters (356 shelters in 8 townships) was considered. However during the study process, the team identified 9 more shelters from the original 72 as one village had more than one type of designated cyclone shelter thus adding to a total of total of 81 shelters. Shelter selection was based on two important criteria:

- Geographically representative sample / shelter
- Samples from each shelter type selected for disaggregated analysis.

In addition other variables such as proximity to sea / river or creeks, type, etc were considered.

Based on the above criteria, 81 cyclone resistant community buildings located in 72 villages were identified in 8 townships which includes stand-alone cyclone shelters, school cum shelters, hospitals cum shelters, monasteries cum shelters, government shelter, etc. Box below shows the location and type of cyclone shelters in 8 townships of the Delta region.

Township	Church cum Cyclone shelter	Community Building Rehabilitation	Cyclone Shelter	Government Proposed Cyclone shelter	Monastery cum Cyclone shelter	Multipurpose Building	School cum Cyclone Shelter	Strom and Flood Resistant building	Total by location
Ngapudaw	-	-	-	-	-	-	5	-	5
Labutta	2	2	9 (2)	11(3)	8 (2)	-	71 (14)	-	103 (21)
Mawlamyinegyun	-	-	2	-	-	-	49 (10)	-	51 (10)
Pyapon	-	-	-	5 (1)	-	-	27 (4)	5(3)	37(8)
Bogale	-	8 (2)	4 (1)	2	-	1	71 (14)	18 (4)	104(21)
Kyaiklat	-	-	-	-	-	-	11 (4)	-	11 (4)
Dedaye	-	1	4 (1)	1	-	-	13 (3)	-	19 (4)
Twantay	-	-	-	-	-	-	4	-	4
Kawhmu	-	-	-	-	-	-	7	-	7
Kungyangon	-	5 (2)	-	1	-	-	9 (2)	-	15(4)
Total by type	2	16 (4)	19 (4)	20 (4)	8 (2)	1	267 (51)	23 (7)	356 (72)

Note: " ()"no of shelters identified by location and type for proposed study in parenthesis

Table 1. Total Number of Cyclone Shelters and identified for survey by townshTip and type Blue dots in figure 1 indicate all the villages in the 8 townships and yellow dots indicate all 356 existing cyclone shelters and red circles indicate sampled cyclone shelters for the purpose of the study.

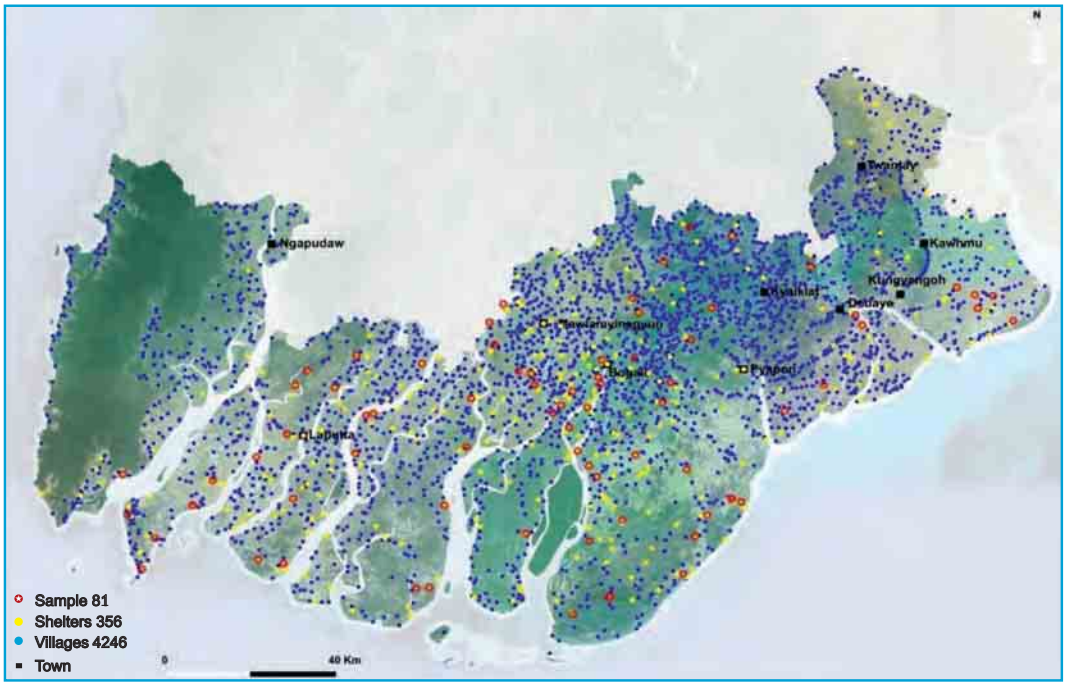


Figure 1: Location of villages, cyclone shelters and identified sample cyclone shelters.

Figure 2 below highlights the sample shelters randomly selected for the study. From the 81 cyclone shelters studied for the project:

- 69 or 85% were schools cum cyclone shelters
- 3 or 3.7% were monasteries cum cyclone shelters
- 9 or 11% were cyclone shelters cum schools

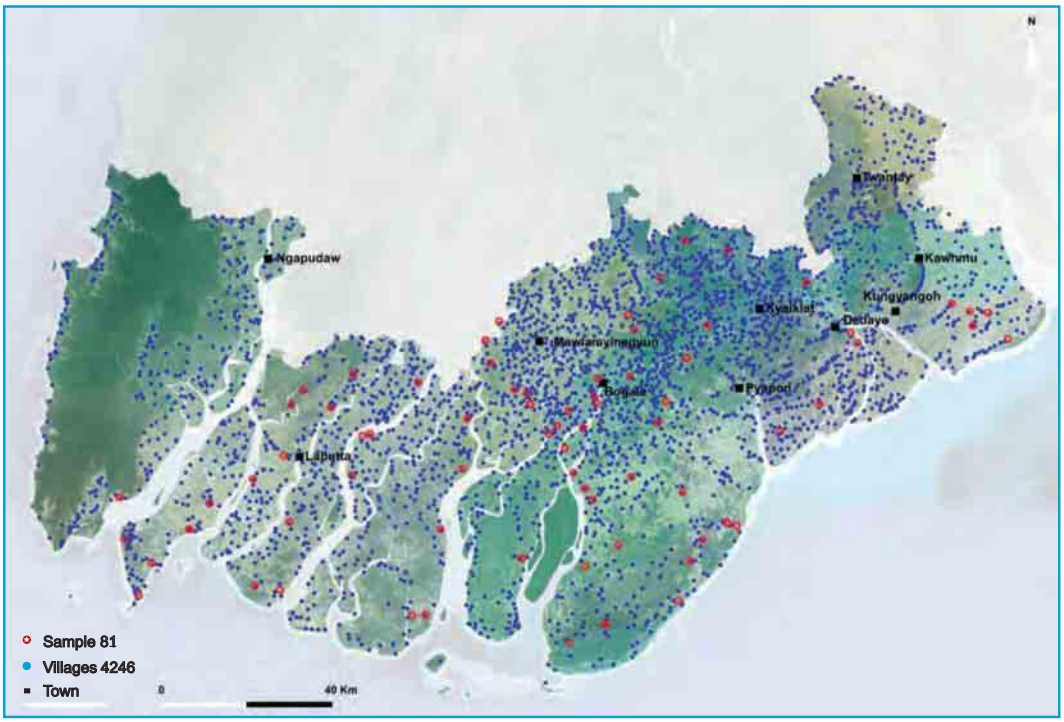


Figure 2: Location of Sample Cyclone Shelters

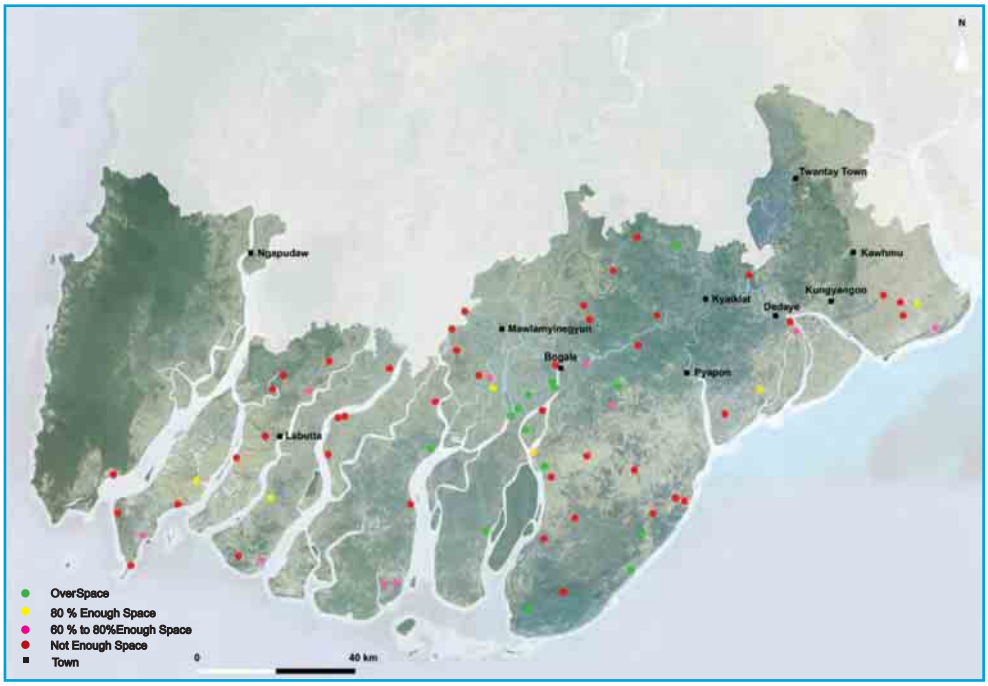


Figure 3: Representation of the Capacity of Sampled Cyclone Shelters

Capacity of the sample cyclone shelters are indicated in the map (figure 3). These shelters have been classified as:

- Shelters can accommodate more than the village population (shown in green)
- Shelters that can accommodate up to 80% of the village population (shown in yellow)
- Shelters that can accommodate 60-80% of the village population (shown in pink)
- Shelters that are too small to accommodate village population (shown in red)

Questionnaire Development:

Questionnaire for the study was developed with experts from UN-Habitat and Myanmar Survey Research for documenting technical information on existing cyclone shelters on their resilience to various disasters, needs and community-based disaster risk management in the Delta areas. In addition specific type of questionnaires were developed for: household head, children aged 8-14 years / household, key informants, focus group discussions, and observation check lists. The questionnaire prepared and used for field survey is presented in Annex 3.

Data Collection

Desktop Research:

Desktop research was carried out to get a good idea on the different aspects of the study. Current documents such as the Post-Nargis Shelter Sector Assessment Re-

port-2010, MAPDRR (2009-2015), Multi-Hazard Risk Assessment in Nargis-affected areas (Ayeyarwaddy, Bago, Yangon), Lessons Learnt and way forward for resilient shelter interventions, among others, were studied. Documents and reports on the experience of neighboring countries such as Bangladesh and India were extensively studied. Internet research on articles and documents relevant to the study was carried out.

Tools:

Five sets of comprehensive questionnaire for the study purpose was developed with experts from Myanmar Survey Research (MSR)and UN-Habitat which included:

1. Observation check lists
2. Household
3. Children aged 8-14 years / household,
4. Key Informant Interview (KII), and
5. Focus Group Discussions (FGD).

Observation of the cyclone shelters and their surrounding areas:

The field team visited 72 villages (81 shelters in all, some villages had more than cyclone shelter) as mentioned in the sampling frame, and made observations on the present status of the shelter, its functionality, accessibility to villages and condition of the roads leading to the shelter, type and size of the structure, facilities available at the shelter, current status of the shelter among other specific observations. Field teams were equipped with GPS monitoring systems to record the exact location of the cyclone shelters.

Household Interviews

From the 72 villages, random selection of 10 HHs / village was done. Household head (female or male) was interviewed. A child from each selected HH aged 8-13 years of age was also interviewed using a short structured questionnaire. In all, 729 HHs were interviewed, and 1440 interviews conducted. Awareness of cyclone shelter, location, accessibility, safety, facilities, willingness to take refuge in the shelters during emergency, were among the questions targeted towards households in the target areas.

Key Informant Interviews

KII's were conducted at two levels: village level and township level. A total of 216

key informant interviews were conducted with 3 KII's / village. The key people in the village included village disaster management committee members, and village elders. Information gathered included but not limited to the following: basic information about cyclone shelters, year of establishment, donor, participation of community in management, decision making, and maintenance, utilization of the building during peace times, village level DRR plans and exercises, capacity of the shelter, facilities available at the shelter for women and disables, among other questions.
At the township level, officials from the township disaster management committees were interviewed for information pertaining to township disaster management plans and activities, number of cyclone shelters in the township and location of each, role of shelters in the townships DRR plans, management and maintenance of shelters.

Focus Group Discussions

A total of 24 FGDs were conducted covering a broad range of topics such as usefulness of the shelter during peace times, sense of belonging of the shelters among others. Each FGD comprised 8-12 participants. FGDs were conducted with the general population of the village. Emphasis was on the perception, and attitude of the community towards the importance and usefulness of the shelter, feeling of safety amongst the community, feeling of ownership, and the willingness of the community to participate in the maintenance of the cyclone shelter.

Pre-testing

Field teams were deployed for the assessment covering 8 townships, spanning over 18 days, between 15th October and 12th November 2011 (including travel time). Field staff received intensive training on selection of respondents, all aspects of the questionnaire, FGD topics, social skills and research ethics. Pre-testing of the research tools was done in Kungyangon Township in Yangon Division. Debriefing and modifications to the questionnaire was done, before finalizing all research tools. In addition, MSR field teams were equipped with GPS monitoring systems to record the exact location of the cyclone shelters.

Box 2: Study Sample

- *81 shelters in 72 locations (as some villages had more than one designated cyclone shelter)*
- *720 HH Interviewed and 1440 Interviews (10 House Hold and one child per household / Village)*
- *78 Key Informant Interview*
- *24 Focus Group Discussion*

Data from completely filled-out and coded quantitative questionnaires were assembled and analyzed using CS Pro Version 4.0.004 (Census and Survey Processing System), SPSS Version 13.0 and qualitative research data using Atlas Vesion 4.0. Manifold System 8.0 software was used for GIS mapping.

V.Profile of cyclone shelters villages in the delta

Villages identified as part of the study had population varying from a minimum of 42 HH to a maximum of 2382 HH. Also the livelihood profile of the villages varied distinctly. Table 2 below provides the profile of the villages. Study found that there were no predestinated cyclone shelter at the time of cyclone Nargis and majority of the people have taken shelter at home /neighbor's /friends / relative's house followed by monastery, schools, and other structures such as church, health center and other places / structures which were deemed safe. Majority of the villages experienced storm surges over 4-5 feet and the death toll varied between distinctly.

Description		Minimum	Maximum	Total
Number of Households (HH) / Village		42	2,382	-
Population / Village		81 (M)/		
87 (F)168 (T)		4,386 (M)/		
4,776 (F)9162 (T)		54,538(M)		
				55,320 (F)
				109,858 (T)
Livelihood				
	Paddy cultivation	3	303	5,864
	Gardening	-	150	979
	Fishing	-	477	2733
	Aquaculture	-	105	241
	Handicraft	-	102	331
	Trading	-	277	1631
	Casual Labour	13	862	13,650
	Others	-	182	221

Table 2: Profile of villages identified where cyclone shelters are located.

VI. Study Findings as per objectives

Methodological triangulation involving direct observation, key informant interview, interviews, and questionnaires was done to obtain an all-inclusive and balanced picture of the current situation of cyclone shelters in the target areas. Discussions and interviews around the specific objectives of the survey were conducted, and a summary of the results is presented below.

a. To identify GIS mapping with population density and number of existing cyclone shelters

UN-Habitat study on cyclone shelters in Delta region categorized 356 cyclone shelters into stand-alone cyclone shelters, school cum shelters, hospitals cum shelters, monasteries cum shelters, government shelter, etc (February, 2010). Table_ provides the summary of type of shelters in eight townships in the Delta region.

The current study identified a total of 81 cyclone shelters in 78 locations for the assessment (November, 2011). According to the assessment findings of the 81 cyclone shelters, 58 (74.4%) of cyclone shelters were constructed in 2009 and 19 (24.4%) in 2010 and 1 in 2011 and rest were under various stages of construction. In addition to the government executed cyclone shelters, most cyclone shelters were funded by Red Cross, INGO's, and UN agencies built by the contractors.

Population varies across villages from 168 people to 9162. And total population of villages identified for the study is 109,858 which average to 1525/ village.

b. To categorize building types and find out location and accessibility to the buildings

Building Type:

As indicated in the previous section, majority of shelter identified under UN-Habitat study in the region were school-cum cyclone shelter 257 (356) and the study took a balanced approach on the type and distribution of the bshelter for the assessment

Figure 2 provides the type of cyclone shelters surveyed which includes 68 (85.95%) School cum shelter, 8 (9.88%), Cyclone shelter-stand alone, 3 (3.70%) Monastery cum shelter and 1 (1.23%) Health cum shelter and multipurpose community building respectively.

Among the 81 cyclone shelters, around 61 (75.3%) of the shelters were 1 storey structures, and 17 (21.0%) two storey and 3 (3.7%) are 3 storey structures which are built by the government

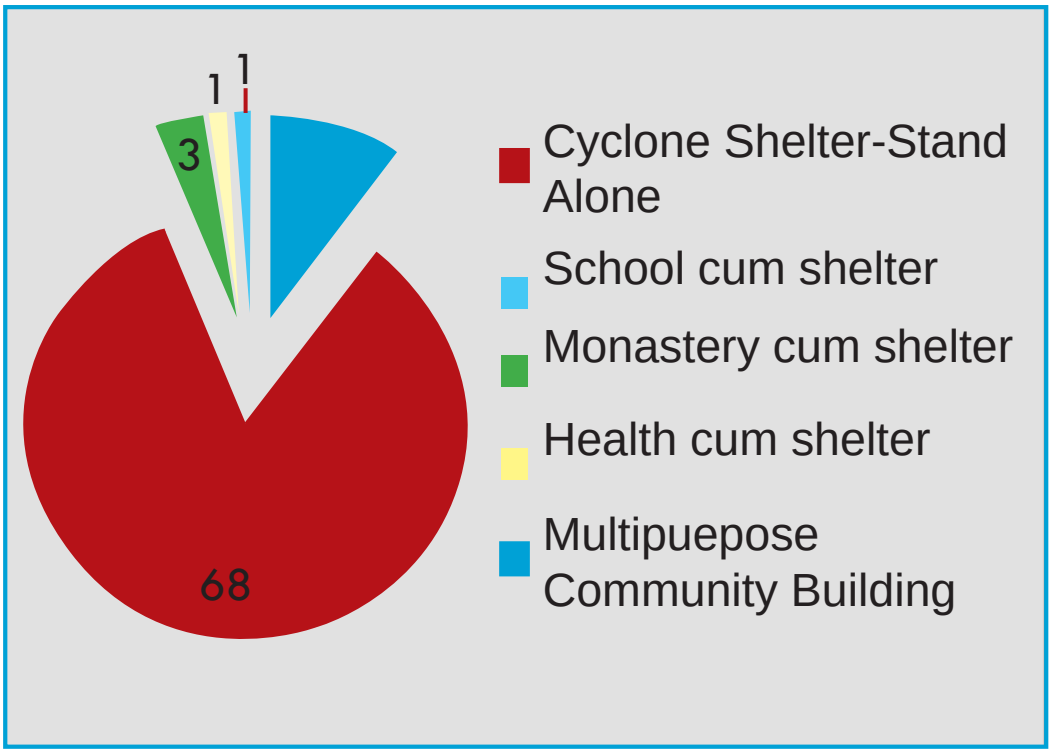


Figure 2: Type of Cyclone Shelters classified in 8 townships as part of the tudy

Shelter type: School cum cyclone shelter type

Township: Laputta
Area: 18496 sq ft

Village: Pyin Kh)a Yaing
Year of Construction: 2009

Shelter type: Monastery sum cyclone shelter type

Township: Laputta
Area: 1600 sq ft

Village: Kyun Chaung
Year of Construction: 2009

Shelter type: School cum cyclone shelter type

Township: Mawlyamyinegyun Village: Sein Pan

Area: 2400 sq ft Year of Construction: 2010

Shelter type: School cum cyclone shelter type

Township: Pyapon Village: Tei Pin Seik

Area: 5376 sq ft Year of Construction: 2009

Shelter type: School cum cyclone shelter

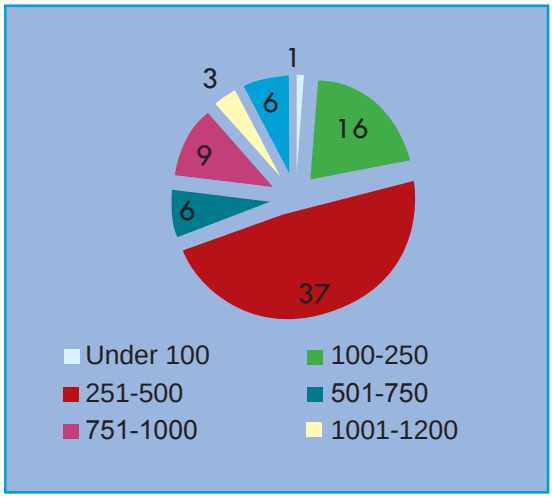
Township: Pyapon
Area: 1800 sq ft

Village: Chaung Wa
Year of Construction: 2009

Shelter type: School cum cyclone shelter

Township: Pyapon
Area: 2304 sq ft

Village: Bo Su Chaung
Year of Construction: 2010



Around 53 (65.4%) of the shelters are with a floor area of 1800-3000sq ft, 24 (29.6%) are 3001 sq ft and above and 4 (4.9%) under 1800 sq ft. Figure 3 below provides the capacity in terms of occupancy level of cyclone shelters during time of emergency. Around 37 (45%) of the shelter has the capacity to accommodate between 251-500 people and there are very few shelters with large capacity in relation to the population of the village.

According to the Key Informant Interview, around 83.3% of cyclone shelter has been planned to cover 1 village and 16.7% of the shelters cover over 2 or more villages.

While the size of the structures in terms of area and occupancy varies considerably (refer to previous section) around 47 (58.0%) of the shelters are of room type and while the rest 34 (42.0%) are of hall type. Number of rooms vary from 1 to 20 rooms and only 18 (22.2%) of the shelters have separate space for women and the rest 63 (77.8%) of the shelters does not have space provision for women. Below table shows number of rooms available in the cyclone shelter.

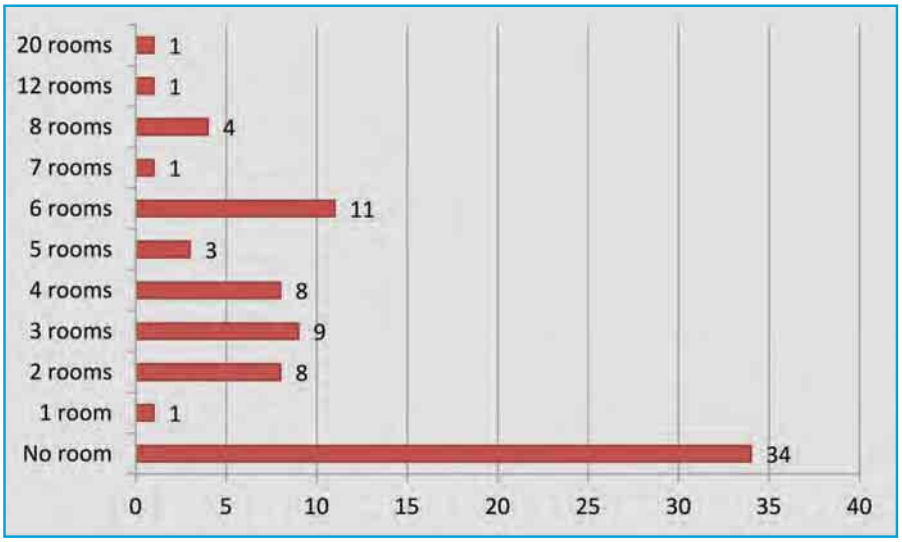


Figure 4 : Cyclone shelter classified based on number of rooms.

Study found that capacity of the shelters was a big concern. About three quarters of the school cum shelters were single storied structures, either a single room or comprising 1-6 rooms. It was apparent from the discussions and interviews that each shelter, on an average, ranged between 1800-3000 square feet, and could accommodate between 250 and 400 people. However, it was felt that shelters would be overcrowded in the event of a natural disaster. In the wake of a storm surge or cyclone,

HH's feel that each cyclone shelter would bring in people from an average of 7 nearby villages (minimum 2 and maximum of 10 villages). For example, in Myo Kone village, Pyapon, the shelter was constructed to accommodate 500 people, whereas villagers felt that it should have 3000 capacity. Potential overcrowding of the shelter was a concern. Space availability for the elderly, disabled and pregnant women would be compromised.

The knowledge and awareness of the households regarding the actual capacity of the shelter and the scenario of overcrowding is suggestive that few were actually involved in decision making.

Structural Elements:

Most structural elements, 71 (87.7%) Post / Column, 74 (91.4%) Floors were made of Reinforced Concrete while few made of Wood and Brick. Walls are predominantly made of Brick 48 (59.3%), followed by Reinforced Concrete 27 (33.3%) and by wood 5 (6.2%). Roofing for the super structures are predominantly sheets /tiles 62 (76.5%) and Reinforced Concrete 19 (23.5%).

Structural Element / Material	Reinforced Concrete	Wood	Brick	Others	Total
Post / Colum	71(87.7%)	5(6.2%)	4 (4.9%)	1 (1.2%)	81 (100%)
Wall	27 (33.3)	5 (6.2%)	48 (59.3%)	1 (1.2%)	81 (100%)
Floor	74 (91.4)	6 (7.4%)	-	1 (1.2%)	81 (100%)
Roof	19 (23.5%)	-	-	62 (76.5%)	81 (100%)

A striking observation was that only 19 (23.5%) of the shelters had reinforced concrete roofing and rest were made of GI Sheets/ tiles etc. According to the respondents, metal sheet roofing and / or tiled roofs were likely to be blown away in the event of gale-like situations and cyclones, where wind speed could exceed 200 km/hour.

Foundation aspects was not covered as part of the survey however it is an very important issue in hazard-safety in relation to floods or tsunami.

Location:

Of the surveyed cyclone shelters, around 47 (58%) cyclone shelters were located in middle of the village, 22 (27%) on the fringe of the village, while the 12 shelters (15%) outside the village. Around 55 (67.9%) cyclone shelters were located in open

space while 24 (29.6%) and 2 (2.5%) located inside and outside the embankment.

Schools cum cyclone shelters and monasteries cum shelters were mostly located in the center of the village, on high ground. The location of the shelter on high ground was more obvious with the school shelters than any other types of shelters.

Of the 720 households interviewed for the study, 610 (85%) of the respondents were aware of the existence of cyclone shelter in their village and more than three quarters of the HH interviewed mentioned the presence of a school cum cyclone shelter or monastery cum cyclone shelter in their community. As they had contributed their labor towards building the school or monastery cum shelters, that they attend regular school meetings there, “it is the only tallest building in the village”,” only highest building in the village”, “only strongest building that can withstand high winds and cyclonic situations”.

Around 40 (51.3%), 69 (88.5%), 43 (55.1%) of the cyclone shelters were located near the sea, river and creek respectively. Shelters located closer to the sea were deemed unsafe by village authorities and by interview respondents. It was noted that community members would seek refuge in another shelter rather than seeking refuge in the shelters near the sea. Some of the shelters were located at the fringe of the village which made access a problem to villagers.

About 62 (79.5%) of the shelters plinth level were built above storm surge level. In a few cases, cyclone shelters were built over 5 feet of compacted sand, to raise the height of the shelter higher than the storm surges witnessed during cyclone Nargis. Safety of the structure itself was questionable, as respondents and participants felts that the foundation could get washed away by floods and storm surges, and the protection it would offer to community members was doubtful.

Access:

Around, 630 (87.5%) of respondents feel that they can access the cyclone shelter all year round and 90 (12.5%) of respondents will not be able to access mainly due to flooding, roads being damaged and lack of bridges across the creek. Concerning with disabled people only 9 (11.5%) of the cyclone shelters have access provision for disabled people.

Time taken to reach the shelter varied based on the distance of the HH to the cyclone shelter and also the prevailing weather condition and time of the day. Majority of the households can move to cyclone shelters during day and night time with their family during the peace time. 538 (75%) of the interviewed HH informed that could reach the

shelter by foot within 20 minutes in normal times, where as 342 (47.5%) can reach the shelter within 20 minutes time during rain or storm due to accessibility problems. In addition to access problems, households are concerned about sick / elderly people, lack of lighting facilities during night.

It was highlighted that an early warning of at least 6 hrs before a storm or flood would give them sufficient time to reach the shelter. For others, a 6-hour advance warning would help them prepare boats, schooners or bullock carts to reach the shelter areas. Based on the grouping of the road access, three types of roads 1) NRC- Road linking Nearby rural communities, 2) MS- Main seasonal Road, 3) RT- Road Linking Town, the study found that there is a need to improve the road links.

Figure 5,

below shows the potential response of different households during the time of heavy rain/ floods. Study shows that majority 560 (78%) of interviewed HH's will move to school/ monastery Cum Cyclone Shelters etc which shows increased awareness on the safety during the onset of hazards.

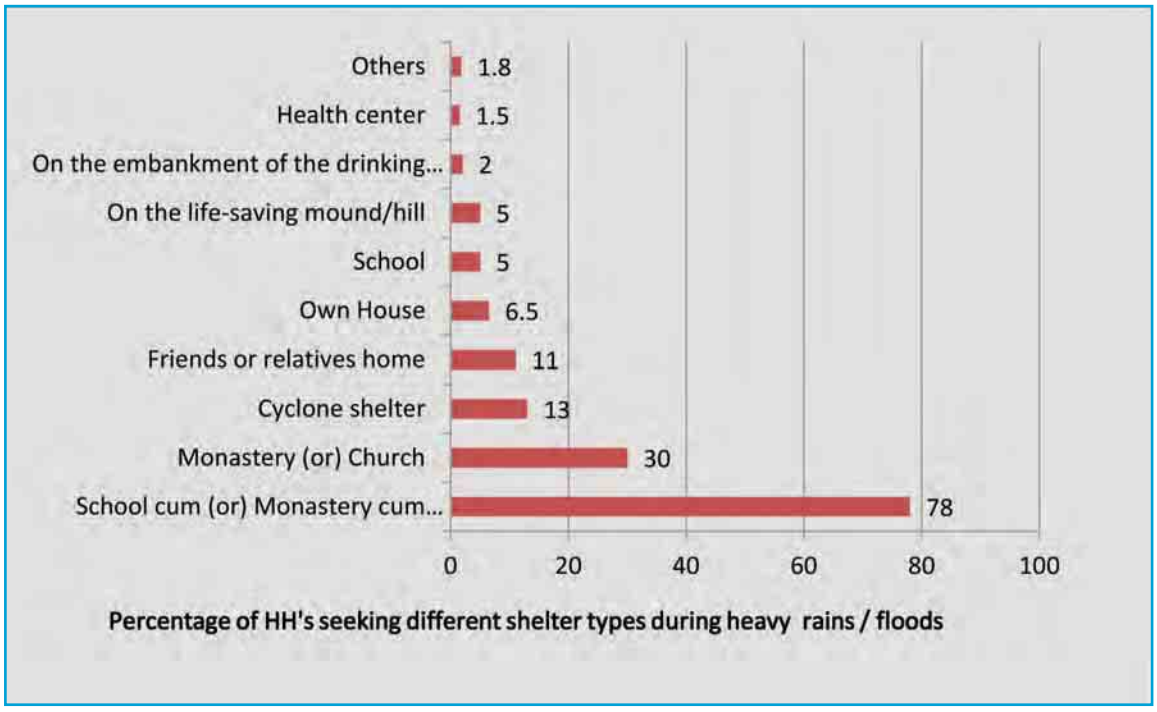


Figure 5: Shelter Types Sought by HHs During Heavy Rains/Floods

Facilities:

In addition to the rooms in the shelter, only 10 (12.3%) of the shelters had toilet facility inside the shelter while the majority of the shelters had toilet facility within the compound. Only 6 shelters of 10 which has toilet inside the shelter had separate toilet for women. Total number of toilets inside the cyclone shelter varied between 1 and 6. Lack of adequate toilet facility will be a major issue during the time of cyclone when the communities have to stay for longer duration. Further, 31 (38.27%) cyclone shelter had provision for drinking water and 26 (32.10%) for domestic use which are provided by tube well, rain water stored in containers and rest are open pond and well. Water available from open pond and well might get contaminated in case if the area is inundated during cyclone or storm surge and will not be safe to use. Some of the facilities such as drinking water, sanitation and kitchen must be there and to be in functional condition, however close to 40% of cyclone shelters had such facility. Without these, there could be a crisis within crisis in post cyclone and flood.

Most of the cyclone structures mainly catered to providing shelter for people; however it does not address protecting the livestock or assets. Government built cyclone shelters which are three storied buildings can accommodate people as well as livestock and assets.

Below Figure 6,
shows the type of additional facilities available in the cyclone shelters assessed as part of the study.

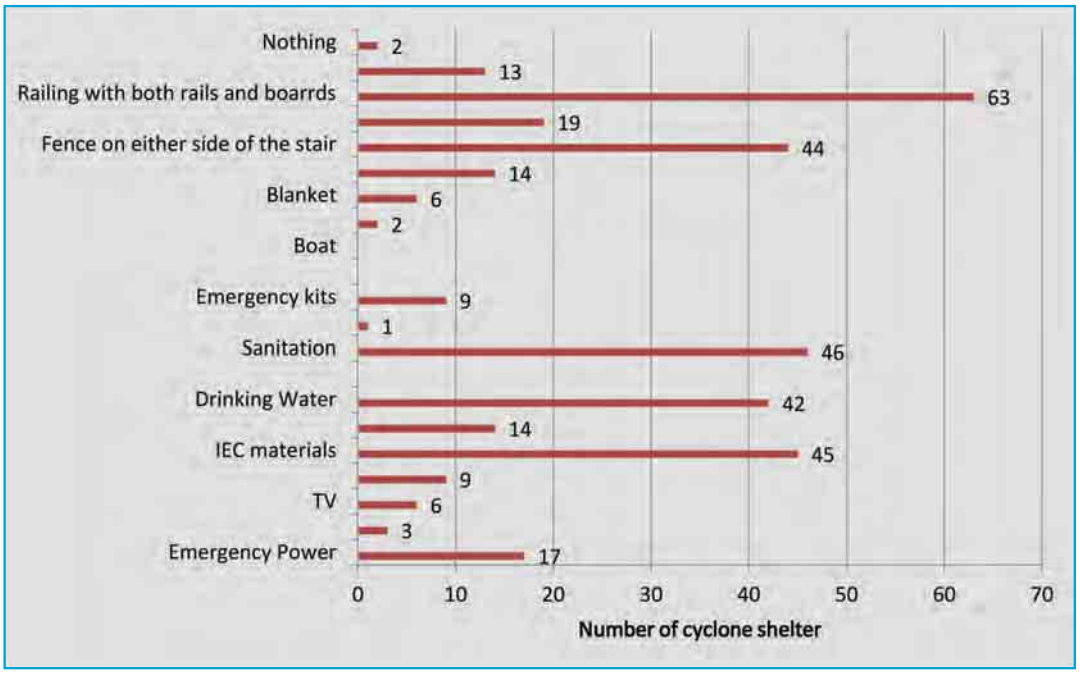


Figure 6: Facility available in the cyclone shelters

Most of the CSs do not have notice boards. While this may appear to be a minor issue, notice board is a good medium of public communication and education. It does not cost much to supply one and hence, this part of the facility could be retrofitted without much effort and cost. Fence Gates issue has both psychological as well physical needs - to protect the campus from unwanted trespassers (animals, etc.)

Cost

Cost of constructing cyclone shelter (core building cost) varies significantly based on the structural elements, size, and other facilities provided in the shelter. According to the data provided during the Key Informant Interview the minimum and maximum cost for constructing the cyclone is around 4,000,000 Kyat to 2,200,000,000 Kyat.

Below Figure 7,
provides the core cost of construction of assessed cyclone shelters.

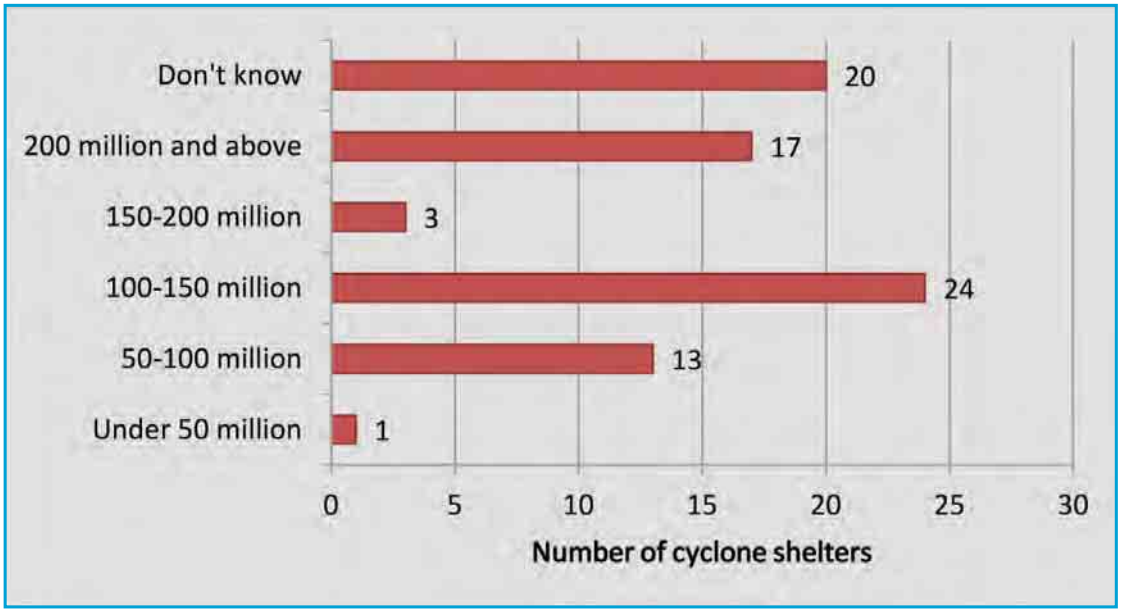


Figure 7: Cyclone shelters classified based on the cost of construction (core cost) in Kyats.

c. To evaluate the community's feeling of safety

Households' perception of a cyclone shelter basically lays in the strength of the structure itself, distance from the sea and river, height of the structure and its ability to shield people in the eventuality of a natural disaster such as floods or cyclones.

Figure 8,
highlights the community feeling of safety while at cyclone shelters during cyclones and storm surges. Around 305 (42.4%) of the HH interviewed felt that its totally safe and 337 (46.8%) felt somewhat safe and 62 (8.6%) and 16 (2.2%) somewhat not safe and totally not safe.

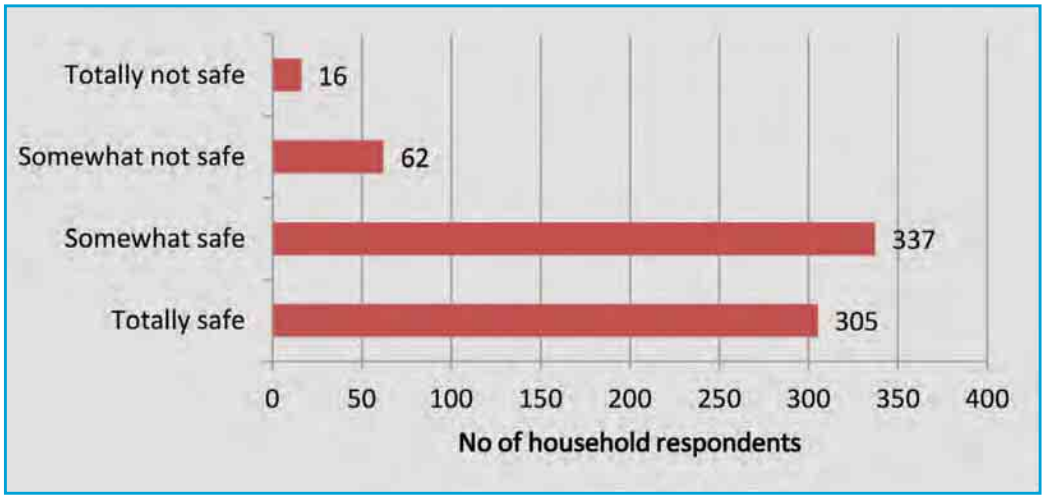


Figure 8: Feeling of safety while at cyclone shelters during cyclones and storm surges.

Around 560 (77.8 %)of respondents mentioned school cum cyclone shelter to be the safest compared to other shelters followed by Monastery / Church, Cyclone Shelter, friends or relative house etc in response to where they would take shelter in the event of another cyclone. Similarly when asked about where others in the community might take shelter in the event of another cyclone, 578 (80.3%) of the respondents mentioned school / monastery cum cyclone shelter followed by Monastery etc. The results of the study show that an overwhelming majority of households feel schools or monastery cum cyclone shelters meet the needs of the household and the community to a large extent it will mitigating losses to life during any natural calamity.

Below Figure 9,

highlights the reason for seeking shelter at school or monastery during the time of emergency.

It was evident from the interview and results that people preferred the safety of a school cum shelter over other buildings, simply because the structure appeared strong, the location was higher than most places, and the architecture provided protection to the building against storm surges and floods. Monastery cum shelters were rated safe, but “not as safe” as a school cum shelter, as the “structure” did not appear as strong, neither was the location on “higher ground”.

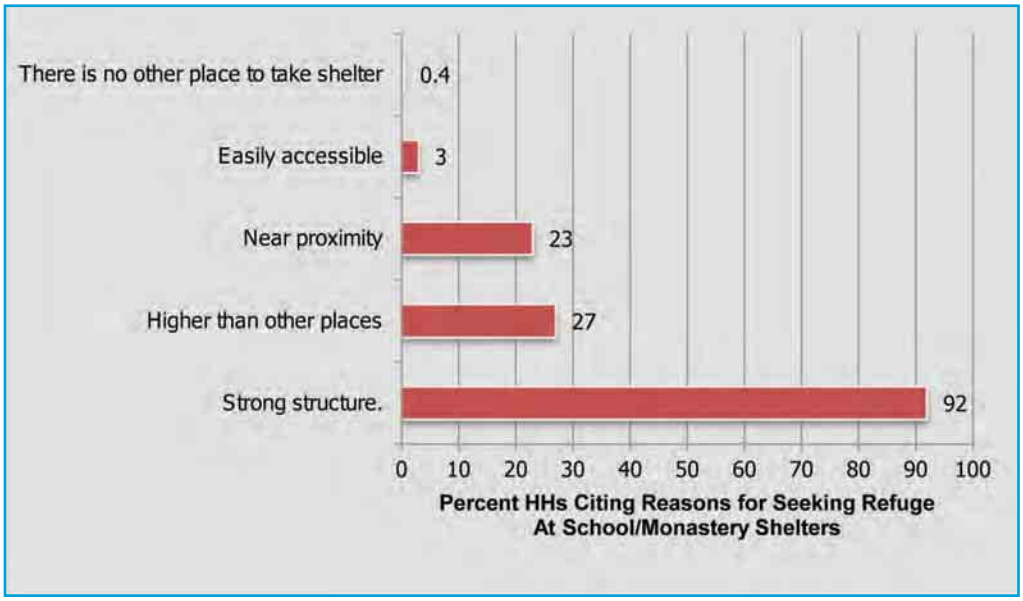


Figure 9: Reasons for Seeking Shelter at School or Monastery cum Cyclone Shelter

d. To assess community's feeling of ownership

While most cyclone shelters 73 (90%) were constructed by aid agencies and 8(10%) by government through contractors, study reveals that community had greater participation in site selection for the cyclone shelters. According to the Key Informant Interview, community members were closely involved in selection of 59 (76.6%.) cyclone shelters and HH interview revealed around 672 (93.3%) of the interviewed HH interview were involved / participated during the site selection process and the community response to move to cyclone shelter during the time of emergency an feeling of safety.

Post construction, around 63 (80.8%) of the cyclone shelters have been transferred to relevant ministry and 10 (12.8%) to local authorities and 3 (3.8%) to community based organization and rest unaware of whom it has been trusted with.

e. To find out utilization of these buildings during peace time

Study found that 77 of 78 shelters (98.7%) of cyclone shelters are currently being used normally and 74 (96.1%) are being used as School and 4 (4.9%) as Monastery. All KIs mentioned that the existing cyclone shelters are being used for school purposes during normal times and will serve as a cyclone shelter during emergencies. Monasteries served as centres for religious education and training during peace times as well as cyclone shelters during any emergency / natural disaster.

According to information, all community members were aware of the "persons" who keep the building keys and how to contact the person in emergencies.

f. To assess the quality of buildings and their life spans before retrofitting them if initial construction is not fit enough

Study found that all the completed shelters are in usable condition and 59 (72.8%) are in good condition and 21 (25.9%) of in average condition and one shelter needed repair for use. Cracks noticeable in structural elements such as walls, roof etc and there is loss of plasters in wall, ceiling etc. Since most shelters have constructed since 2009, it is too early to assess the quality of the structures.

In some villages, a 5 meter high sand-compacted foundation was raised and the shelter constructed over the raised land. Participants noted that sand compacting was done to raise the building higher than the highest storm surge from Cyclone Nargis, almost 7 mts in height and repeated surge can wash / scour away the raised land.

g. To assess effective management on operation and current practice of maintenance plan

According to the Key Informant Interview, 15 (19.2%) of the cyclone shelters has established shelter/ school/ building management committee and 7 (9.0%) of shelters have schedule for regular maintenance work such as cleaning, termite prevention, reinforcing mounds between the buildings. About 179 (24.9%) of the households were aware of the management committee. In addition, 176 (98.0%) of the respondent who are aware of the management committee are aware of scheduled regular maintenance work being carried out in the shelters.

It can be ascertained that school cum cyclone shelters are maintained by school committees. School cum shelters pay for their own maintenance, through regular use and any small fees collected. Replacing broken glass windows, plugging holes in roofs, weeding and cleaning of the shelter was done on a regular basis by families from the community.

Aid agencies and monks helped in the maintenance of monastery cum cyclone shelters. Overall monastery maintenance was much lower and poor compared with the school cum cyclone shelters. Training was received by members of 2 communities in

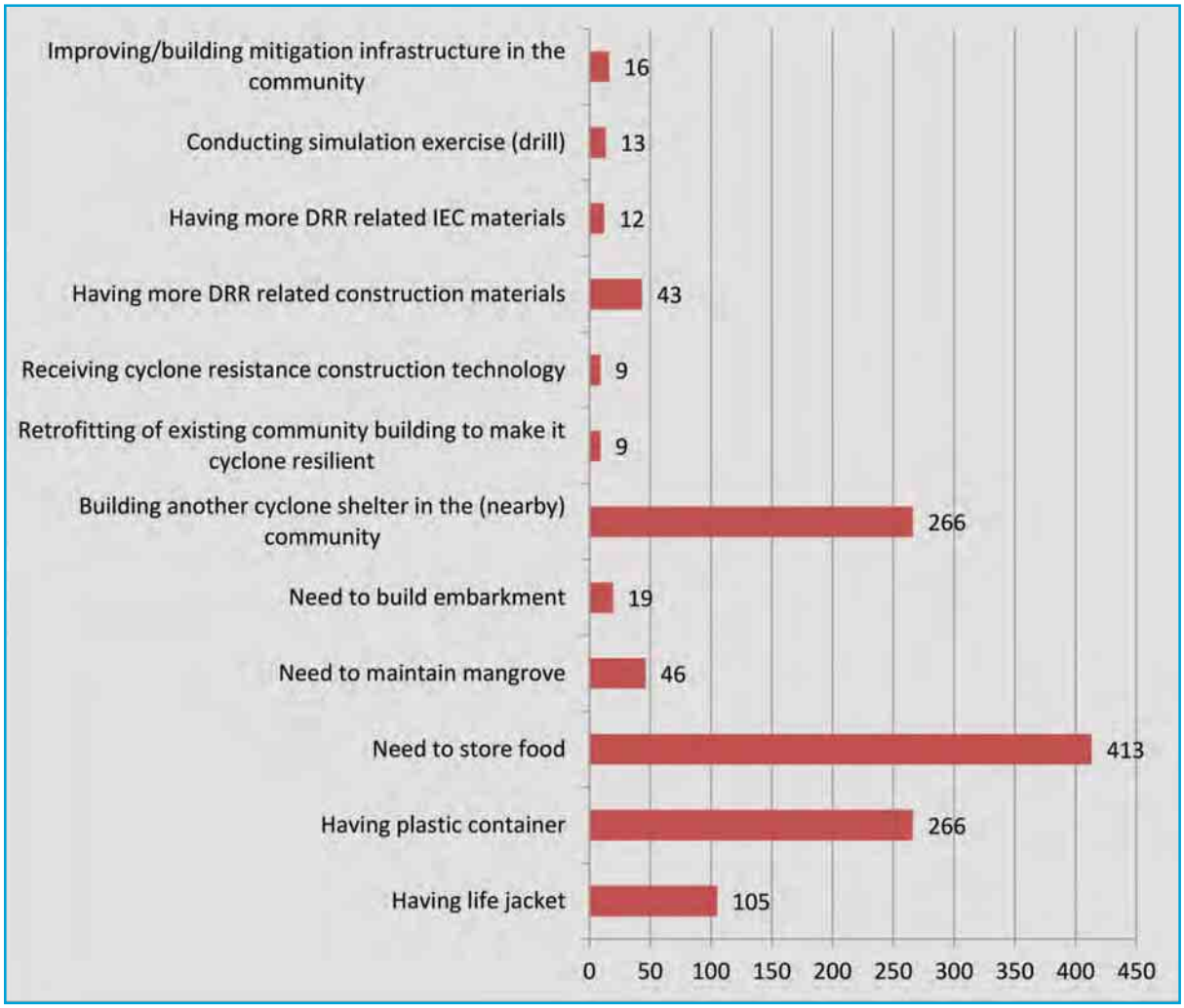
[1] *3 were under various stages of construction*

activities like plumbing, fixing roofs, and other small repairs. Planting trees to act as natural wind barriers was taken up in one of the communities.

Community Contribution: All participants expressed their desire to be able to contribute to the maintenance of shelters within their community. All were willing to provide labor for rebuilding, undertaking repairs, building access roads, cleaning premise, basically as one participant put it “we can provide unlimited labor, but not money as we are very poor”.

h. Unmet / future needs:

Household interview reveals that community recognizes the importance of cyclone shelters to protect their lives during the time of emergency. While agencies which constructed the shelters have provided basic infrastructure there are many unmet / future needs to protect and provide a sense of security while they are in the shelters. In addition to the adequate toilet, water availability, adequate space for women, disability friendly, space for livestock and their valuables discussed in the previous section, other concerns of the households include adequate facility to store their food, need for provision of water storage facility, new cyclone shelter as the shelter will be overcrowded during the time of emergency. Figure below illustrates few of activities that are needed based on household ranking. There is also increasing recognition for other measures such as availability of adequate life jackets, protecting mangrove, know how on disaster resistant construction techniques to strengthen their homes, protect the cyclone shelter by constructing embankment as many of the shelters are one storey structures which can be affected during the storm surges. In addition the village level disaster management institutions (VDMC’s), CBDRR interventions need to be strengthened and establish operational linkages with Township Disaster Management Committees and plans.



VII. Study findings for effective planning tool for future cyclone shelter construction practices

In general the assessment undertook in identifying and classifying types of cyclone shelters constructed in the Delta by various agencies. In addition, the study was able to evaluate existing cyclones both quantitatively and qualitatively on various structural and non- structural aspects and use of cyclone shelters and most importantly the community perspectives who are the real users of such structures at the time of emergency. Further, the study was able to document good practice, gaps and unmet community needs in those shelters. Below is the summary of key findings and recommendations for future cyclone construction practices.

1.Type of Structure

Post Nargis, designated cyclone shelter in Delta region exists in various forms such as standalone cyclone shelters, school cum shelters, hospitals cum shelters, monasteries cum shel-

ters, government shelter, around 267 / 356 (75%) of the shelters constructed are school cum cyclone shelter followed by government constructed stand alone cyclone shelters and monastery cum cyclone shelters etc.

Based on the assessment, school cum cyclone shelters is currently the preferred approach as they serve dual purpose both as school in peace time and also as an emergency support function for evacuation. In addition most schools are located in the middle of the village and it is easy for access during the time of emergency. Among other socio-economic benefits, investing in schools with disaster resistant features as school cum cyclone shelters has many positive benefits such as, optimal resource utilization, critical infrastructure such as schools can be operational immediately after the event, enhancing awareness among the children's on disaster preparedness.

2.Building Materials

Majority of the shelters are made of reinforced concrete structure with brick wall which can withstand strong winds. However except few shelters majority of the roofing for the cyclone shelters are made of sheets/ tiles which might not withstand heavy winds.

While past experience shows that structural elements such as roofs made of sheets / tiles can be damaged extensively in case of storms, there is a need to look into viable options depending on the design life of the structure and resource available.

3.Location

It is important to identify safe and suitable land for construction of cyclone shelter (irrespective of type of structure) to ensure safe and quicker access to the people. While the study did not assess the location of cyclone shelter with respect to tsunami run height and inundation, it is important to consider during the site selection process as the coastal zones of Myanmar are also prone to tsunamis.

It was observed that communities feel it is unsafe to move into a cyclone shelter close to sea or river even if the shelter is designed to withstand cyclone wind speeds or storm surge.

In general study shows that school cum cyclone shelters which are located in the center of the village are easily accessible, whereas the new shelters which were constructed on the periphery village is not favored because of the distance. Further community participation in selection of land for cyclone shelter not only increases the awareness on the availability of cyclone shelter in their location but also to ways and time taken to move in case of emergency. In addition it not only enhances the ownership (as the were part of decision making) but also their willingness to contribute their labour and mobilize resources in maintenance of shelter.

4.Access

Study reveals that access to cyclone shelter during the time of emergency is an im-

portant criterion on which communities react. According to the assessment access to existing shelter for disabled people and also to move disabled (as many respondents prefer to stay back at home due to disabled or sick people in their family) needs improvement especially roads, bridges etc so that travel time to the cyclone shelter is reduced.

5.Facilities

It is evident from the study that mere having cyclone shelter (structure) is not adequate for the communities to get the sense of safety when they move to cyclone shelter during the emergency. There is a need for adequate space / rooms, toilet facilities inside the shelter including for women, water supply both drinking space for livestock and assets, emergency power, emergency and first aid kits, adequate protection around the shelter embankment. Only few shelters have such provision and hence future shelter planning should take into above considerations.

6.Community Participation

Assessment shows the participation of community in site selection process enhances their awareness and importance of cyclone shelter and also the sense of safety and security when they are in the shelter. While very few cyclone shelters have management committee there is a need to establish similar committees with community participation to maintain the shelter. In addition linking the cyclone shelter construction activities with ongoing CBDRR work in the coastal villages will enhance their response and preparedness measures.

7.Management

While majority of the cyclone shelters are built by aid agencies and transferred to the Ministries, management of cyclone shelter exists in few schools cum cyclone shelters, however it is not widely being practiced. Further, findings from those shelters with management committee show that the committees are active in maintaining their shelter and they are willing to contribute resources both human and monetary to maintain the cyclone shelter. Hence further options need to be explored to establish appropriate management committee based on community participation in the existing ones and such systems need to inbuilt within the new cyclone shelter programming starting from initial consultations.

8.Complementary DRR activities

Post Nargis, many development partners and NGOs have worked with communities to “Build Back Better” and also to enhance their capacities and resilience through disaster resilient housing, improving early warning dissemination systems, awareness programmes, CBDRR interventions, emergency and first aid kits, trainings and also through support of small scale mitigation activities. The impacts of such interventions are quite noticeable in terms of community’s knowledge and attitude on natural haz-

ards and their associated risk and their sense of safety measures to move to safe shelter on receipt of warning.
Such complementary interventions need to be supported and sustained in order to enhance their resilience in all existing cyclone shelter areas and also to be programmed as part of the new cyclone shelter interventions. Further, the efforts at the community level need to be consolidated and linked with the Township Disaster Management Committees and Plans which the Government has identified as one of the priority activity under the MAPDRR.

VII. Gaps and opportunities for future cyclone shelter needs

According to the UN-Habitat study as of 23rd February, 2010, there are a total of 358 cyclone-resistant community buildings (includes completed, under construction and planned), spread over 4246 villages, in 8 townships in the delta which is approximately 1 shelter for 11.8 villages in average.

Study also shows that 83.3% of cyclone shelter has been planned to cover 1 village and 16.7% of the shelters cover over 2 or more villages and their occupancy capacity varies from <100/ shelter to 1000-1200 / shelter.

Household interview highlights people prefer to go to cyclone shelter in case of emergency as they consider it as a safe place as compared to the pre-Nargis situation where people took shelter in various locations. Communities are very much aware of the importance of cyclone shelters to protect their lives. However, the current distribution of cyclone shelter is grossly inadequate covering <10% of the villages in the delta region. Further household interview reveals that cyclone will be overcrowded in case of existing shelters and it will be a major concern at the time of emergency. For e.g. In the wake of a storm surge or cyclone, HH's feel that each cyclone shelter would bring in people from an average of 7 nearby villages (minimum 2 and maximum of 10 villages). 49 of 78(62.8%) respondents felt the need to have another cyclone shelter in the nearby community so that people are encouraged to move to cyclone shelter in case of emergency.

Hence it is important to identify and prioritize vulnerable communities, which do not have access / adequate shelters, construct new cyclone shelters, identify any strong and safe community buildings in those villages and assess their safety and if required retrofit strengthen existing structures to act as cyclone shelters not only in delta region but also in other States and Regions which face higher frequency of cyclone and storm

surges. It is also important to consider hazards such as Tsunami which have longer return period during the future cyclone shelter programming process as the costal areas are also prone to Tsunami. Investment in cyclone shelter will have a tangible impact in saving lives when complemented with sustained DRR initiatives undertaken by various NGO's and development agencies and also link with broader development initiatives such as school, infrastructure programs such as roads, water supply, sanitation etc.

VIII. CONCLUSIONS

Methodological triangulation involving the use of interviews, questionnaires and observations was done to obtain an all-inclusive and balanced picture of the current situation of cyclone shelters in the target areas. Discussions and interviews around the specific objectives of the survey were conducted, and a summary of the results is presented. Concurring opinions regarding facilities were voiced by interview respondents, FGD participants, and key informants. The technical assessment of existing shelters on their resiliency to various disasters are identified and presented. The gaps, needs and linkages to community-based disaster risk management are also explored in the report.

ANNEX 1:

LIST OF CYCLONE SHELTERS BY TYPES AND VILLAGES VISITED AS PART OF THE ASSESSMENT

Township	Village Name	Cyclone Shelter-Stand Alone	School cum shelter	Monastery cum shelter	Health cum shelter	Multi purpose Comunity Building	Total
Bogale	(Kyun Nyo Gyi) Kyun Hteik		2				2
Bogale	Aye		1				1
Bogale	Hpa Yar Thone Su		1				1
Bogale	Kha Naung		1				1
Bogale	Kwin Gyi		1				1
Bogale	Kyein Chaung Gyi		1				1
Bogale	Ma Gu		2				2
Bogale	Nyi Naung Wa		2				2
Bogale	Pan Be Su		1				1
Bogale	Phoe Yaung		1				1
Bogale	Pyin Boe Gyi	1	1				2
Bogale	Pyu Sa Khan		1				1
Bogale	Set San		1		1	1	3
Bogale	Thar Paung		1				1
Bogale	Wea Gyi		1				1
Deadye	Thauk Kyar		1				1
Deadye	Kyon Chin		1				1
Deadye	Htaung Hmu Chaung		1				1
Deadye	Than Di Thea Kone Lay		1				1
Kungyan-gon	Nget Gyi Taung			1			1
Kungyan-gon	Hmaw Bi		1				1
Kungyan-gon	Kawt Dun		1				1

Kungyan-gon	Wet Kaik		1				1
Kungyan-gon	Kyun Chaung		1				1
Kyaiklatt	Ein Yar Gyi		1				1
Kyaiklatt	Da Yin Kauk		1				1
Kyaiklatt	Ah Shey Sin Ku		1				1
Kyaiklatt	Kyon Ma Ngeit		1				1
Labutta	Baing Daunt Chaung (Pyinsalu Sub-township)		1				1
Labutta	Bi Tut	1	1	1			3
Labutta	Bone Gyi Kone			1			1
Labutta	Dee Du Kone (Hainggyikyun Sub-township)		1				1
Labutta	Gant Eik (Pyinsalu Sub-township)		1				1
Labutta	Kyar Kan 2		1				1
Labutta	Kyauk Hpyu Pein Hne Taung		1				1
Labutta	Kyauk Tan Gyi		1				1
Labutta	Kyu Taw		2				2
Labutta	Mway Hauk		2				2
Labutta	Myo Thit (Haing-gyikyun Sub-town-ship)		2				2
Labutta	Oke Twin (Haing-gyikyun Sub-town-ship)		1				1
Labutta	Pyin Ah Lan (Pyin-salu Sub-township)		2				2
Labutta	Pyin Kha Yaing (Hainggyikyun Sub-township)						
Labutta	Sa Lu Seik (Pyin-salu Sub-township)	1	1				2
Labutta	Sar Kyin		1				1
Labutta	Thin Gan Kone	1					1

Ngapudaw	Thet Kei Thaung (Hainggyikyun Sub-township)	1	1				2
Mawlamy-inegyun	Aung Hlaing		1				1
Mawlamy-inegyun	Ga Yan		1				1
Mawlamy-inegyun	Hpa Yar Chaung Ta Khun Taing		2				2
Mawlamy-inegyun	Ka Zaung		1				1
Mawlamy-inegyun	Kyar Hone	1	1				2
Mawlamy-inegyun	Kyun Chaung		1				1
Mawlamy-inegyun	Ma Bay		1				1
Mawlamy-inegyun	Shauk Chaung		2				2
Mawlamy-inegyun	Yae Twin Kone		1				1
Pyapon	Ba Wa Thit (Ah Mar Sub-township)		1				1
Pyapon	Day Da Lu (Ah Mar Sub-township)	1	3				4
Pyapon	Kha Naung Shan Kwin		1				1
Pyapon	Myo Kone (Ah Mar Sub-township)		1				1
Pyapon	Seik Ma (Ah Mar Sub-township)		1				1
Pyapon	Tei Pin Seik (Ah Mar Sub-township)	1	1				2
	Total	**8**	**68**	**3**	**1**	**1**	**81**

Annex 2:

Tabulation Data for households Place

	Count	Percent
Rural	720	100.0%
Urban		
Total	720	100.0%

Q1. Are you aware of the cyclone shelter in your community?

	Count	Percent
Yes	610	84.7%
No	110	15.3%
Total	720	100.0%

Q2. Where is it?

	Count	Percent
Within village	521	72.4%
At the fringe of the village	134	18.6%
Outside village (Near)	52	7.2%
Outside village (Far)	13	1.8%
Outside village (Another village)	0	0.0%
Total	720	100.0%

Q3. How far is it from your house?

	Count	Percent
Within 500 ft	132	18.3%
Between 501 ft and 1000 ft	134	18.6%
Between 10001 ft and 1500 ft	142	19.7%
Between 1501 ft and 2000 ft	94	13.1%
Between 2001 ft and 3000 ft	89	12.4%
Between 30001 ft and 45000 ft	62	8.6%
above 45001 ft	67	9.3%
Total	720	100.0%

Q4. Were you involved in the decision making of the location of this shelter?

	Count	Percent
Yes	672	93.3%
No	48	6.7%
Total	720	100.0%

Q5. Do you know how to get there?

	Count	Percent
Yes	720	100.0%
No		
Total	720	100.0%

Q6. How you will go there?

	Count	Percent
On foot	651	90.4%
By bicycle	10	1.4%
By motorbike	7	1.0%
By bullock cart		
By boat	52	7.2%
Other (Specify)		
Total	720	100.0%

Q7. How long does it take from your house to this cyclone shelter on foot during normal time? How long it will take when it is most difficult to access? (during heaviest rains/strong winds) Normal time

	Count	Percent
Less than 5 mins	144	20.0%
Between 5 and 10 mins	179	24.9%
Between 10 and 20 mins	215	29.9%
Between 20 and 30 mins	120	16.7%
Between 30 and 60 mins	47	6.5%
More than 60 mins	15	2.1%
Total	720	100.0%

Q8. During heaviest rains/strong winds

	Count	Percent
Less than 5 mins	68	9.4%
Between 5 and 10 mins	104	14.4%
Between 10 and 20 mins	170	23.6%
Between 20 and 30 mins	189	26.2%
Between 30 and 60 mins	137	19.0%
More than 60 mins	52	7.2%
Total	720	100.0%

Q9. Do you think you can access to the cyclone shelter all year round?

	Count	Percent
Yes	630	87.5%
No	90	12.5%
Total	720	100.0%

Q10. If your answer is 'No,' when do you think it is not accessible?

N=90	Count	Percent
Summer	13	14.4%
Rainny	90	100.0%
Winter	16	17.8%

Q11. Why?

	Count	Percent
Flooding	19	21.1%
Road is destroyed	58	64.4%
No bridge across the creek	13	14.4%
Total	90	100.0%

Q12. Is it easy for you and your family to get this cyclone shelter from your house during daytime and night time?

N=720	Count	Percent
Daytime	709	98.5%
Night Time	707	98.2%
Not Easy	11	1.5%

Q13. Day time

	Count	Percent
All family members	671	94.6%
Only some family members	38	5.4%
Total	709	100.0%

Q14. Why is it not easy for you and your family to get this cyclone in day time?

N=38	Count	Percent
Road is bad/destroyed	3	7.9%
No vehicle available for transport		
Can't leave chronic (or) disabled (or) elder person	31	81.6%
Have to guard the properties	2	5.3%
Because of young children (under 10)	2	5.3%

Q15. Night time

	Count	Percent
All family members	607	85.9%
Only some family members	100	14.1%
Total	709	100.0%

Q16. Why is it not easy for you and your family to get this cyclone in night time?

N= 100	Count	Percent
Road is bad/destroyed	28	28.0%
No vehicle available for transport	1	1.0%
Don't have light	21	21.0%
Can't leave chronic (or) disabled (or) elder person	48	48.0%
Have to guard the properties		
Others (Specify)	2	2.0%

Q17. If a strong cyclone occurs again, where would you go to make you and your family safe from its danger?

N=720	Count	Percent
Own House	47	6.5%
Friends or relatives home	81	11.2%
Cyclone shelter	98	13.6%
School cum (or) Monastery cum Cyclone shelter	560	77.8%
School	38	5.3%
Monastery (or) Church	217	30.1%
Health center	11	1.5%
Community building	4	0.6%
On the embankment of the drinking water pond	15	2.1%
On the life-saving mound/hill	36	5.0%
To the shelter in nearby village	4	0.6%
To the monastery in town	3	0.4%
In the granary	1	0.1%
Will cling to a tree	1	0.1%

Q17. If a strong cyclone occurs again, where would you go to make you and your family safe from its danger? (Priority)

N=720	First Important		Second Important		Third Important	
	Count	Percent	Count	Percent	Count	Percent
Own house	25	3.5%	18	5.4%	4	6.9%
Friends or relatives home	22	3.1%	43	13.0%	15	25.9%
Cyclone shelter	92	12.8%	4	1.2%	2	3.4%
School cum (or) Monastery cum Cyclone shelter	483	67.1%	70	21.1%	7	12.1%
School	9	1.2%	21	6.3%	5	8.6%
Monastery (or) Church	54	7.5%	144	43.4%	18	31.0%
Health center	2	0.3%	4	1.2%	4	6.9%
Community building			3	0.9%	1	1.7%
On the embankment of the drinking water pond	7	1.0%	8	1.1%		
On the life-saving mound/hill	22	3.1%	14	1.9%		
To the shelter in nearby village	2	0.3%	2	0.3%		
To the monastery in town	2	0.3%			1	0.1%
In the granary					1	0.1%
Will cling to a tree			1	0.1%		

Q18. Please give reasons for going there.

N=720	Count	Percent
Strong structure	662	91.9%
Easily accessible	21	2.9%
Near proximity	168	23.3%
Higher than other places	195	27.1%
There is no other place to take shelter (Other buildings may also collapse.)	3	0.4%

Q18. Please give reasons for going there. (Important)

N=720	First Important		Second Important		Third Important	
	Count	Percent	Count	Percent	Count	Percent
Strong structure	596	82.8%	65	22.1%	1	3.2%
Easily accessible	1	0.1%	10	3.4%	6	19.4%
Near proximity	62	8.6%	93	31.6%	13	41.9%
Higher than other places	59	8.2%	126	42.9%	10	32.3%
There is no other place to take shelter (Other buildings may also collapse.)	2	0.3%			1	3.2%

Q19. Where do you think other people would take refuge if the cyclone occurs again?

N=720	Count	Percent
At Home	20	2.8%
Neighbour/Friends/Relative's House	113	15.7%
Cyclone Shelter-stand alone	98	13.6%
School building, Monastery, Health centre for Cyclone shelter	578	80.3%
School building	38	5.3%
Monastery/Church building	233	32.4%
Health centre building	12	1.7%
Multi-purpose community building	6	0.8%
On the embankment of the drinking water pond	10	1.4%
In the granary	4	0.6%
On the embankment of the feeder creek of the dam	2	0.3%
On the life-saving mound/hill	35	4.9%
To the shelter in nearby village	5	0.7%
To the monastery in town	2	0.3%
Don't Know	1	0.1%

Q20. Where do you think other people would take refuge if the cyclone occurs again?

N=720	Count	Percent
Cyclone shelter -stand alone		
School cum cyclone shelter	651	90.4%
Monastery cum cyclone shelter	34	4.7%
Health centre (hospital) cum cyclone shelter		
Multi-purpose community building	35	4.9%
Other (specify)		

Q21. What do you think are available in the shelter ?

N=720	Count	Percent
Drinking water	551	91.5%
Food	1	0.2%
Life Jecket	15	2.5%
Blanket	47	7.8%
Emergency Power	75	12.5%
Phone	24	4.0%
TV	29	4.8%
Radio	27	4.5%
IEC Material	201	33.4%
First and kit	48	8.0%
Sanitation Kit	143	23.8%
Kitchen items	6	1.0%
Emergency kits	25	4.2%
Signal light	1	0.2%
Boat		
Others	26	4.4%

Q22. Do you know there is a shelter management committee?

	Count	Percent
Yes	179	24.9%
No	429	59.6%
Don't know	112	15.6%
Total	720	100.0%

Q23. Do you know there is a schedule for regular maintenance work?

	Count	Percent
Yes	176	24.4%
No	426	59.2%
Don't know	118	16.4%
Total	720	100.0%

Q23.a. Would you be willing to contribute for regular maintenance of the shelter?

	Count	Percent
Yes	709	98.5%
No	11	1.5%
Total	720	100.0%

Q24. Would you be willing to contribute for regular maintenance of the shelter?

N=709	Count	Percent
Money	220	31.0%
Labour	700	98.7%
Materials	16	2.3%

Q25. Please describe your feeling of safety from cyclones and storm surges

	Count	Percent
Totally safe	305	42.4%
Somewhat safe	337	46.8%
Somewhat not safe	62	8.6%
Totally not safe	16	2.2%
Total	720	100.0%

Q26. Please mention any of your household members' participation and having access to the following.

N=720	Count	Percent
How to build safer house or DRR related construction materials.	39	8.8%
DRR related IEC materials	379	85.4%
Emergency rescue and life saving training	61	13.7%
First aid training	52	11.7%
Community drills	83	18.7%
Others	30	6.8%

Q27. What activities woultd make you feel safer from a disaster?

N=720	Count	Percent
Having life jacket	105	14.6%
Having plastic container	266	36.9%
Need to store food	413	57.4%
Need to maintain mangrove	46	6.4%
Need to build embarkment	19	2.6%
Building another cyclone shelter in the (nearby) community	266	36.9%
Retrofitting of existing community building to make it cyclone resilient	9	1.2%
Receiving cyclone resistance construction technology	9	1.2%
Having more DRR related construction materials	43	6.0%
Having more DRR related IEC materials	12	1.7%
Conducting simulation exercise (drill)	13	1.8%
Improving/building mitigation infrastructure in the community	16	2.2%
Others	266	37.9%

Tabulation for KII

1.4 No of houses

N=78	No of House
Minimum	42
Maximum	2260
Mean	304
Median	222
Mode	63

1.5 No of households

N=78	No of House
Minimum	42
Maximum	2382
Mean	329
Median	244
Mode	110

1.6 Main livelihoods of the community

N=78	Minimum	Maximum	Mean	Median	Mode	Sum
Livelihood (Paddy cultivation)	3	303	75	58	11	5864
Gardening		150	13			979
Fishing		477	35	12		2733
Aquaculture		105	3			241
Handicraft		102	4			331
Trading		277	21	6		1631
Casual Labour	13	862	175	114	75	13650
Others		182	3			221

D2 Population

N=78	Male	Female	Total
Minimum	81	87	168
Maximum	4386	4776	9162
Mean	708	718	1427
Median	499	500	992
Mode	81	259	523
Sum	54538	55320	109858

D2 Population

N=78	Under 18	18 and 18+	Total
Minimum	52	86	168
Maximum	2866	6296	9162
Mean	574	878	1454
Median	367	616	1006
Mode	102	294	924
Sum	41319	63224	106125

Q1. What were the main buildings that the people took refuge during the past cyclone? (Please rank them)

N=78	Count	Percent
At Home	22	28.2%
Neighbour/ Friend/ Relatives" house	54	69.2%
Cyclone Shelter- Stand Alone		
School	25	32.1%
Monastery	48	61.5%
Church	4	5.1%
Health center	3	3.8%
Multipurpose Community Building	3	3.8%
Others	27	34.6%
Total	78	100.0%

	Other Specify	
	Count	Percent
Granary	7	25.9%
On the embankment of the drinking water pond	2	7.4%
On the Main Link Road	1	3.7%
Trees in the compound (Bamboo trees, Swelwe tree, coconut palm	8	29.6%
In the large motorboat	1	3.7%
In the temple at the pagoda	2	7.4%
In the village market building	1	3.7%
On the hill where there is a pagoda	3	11.1%
Office of the Agricultural Mechanization Dept	1	3.7%
On the hill stack	1	3.7%
Total	**27**	**100.0%**

Q1. Important

	First important		Second Important		Third Important	
	Count	Percent	Count	Percent	Count	Percent
At Home	10	12.8%	5	7.1%	7	23.3%
Neighbour/ Friend/ Rela-tives" house	15	19.2%	28	40.0%	9	30.0%
Cyclone Shelter- Stand Alone						
School	6	7.7%	13	18.6%	5	16.7%
Monastery	31	39.7%	12	17.1%	3	10.0%
Church	2	2.6%	2	2.9%		
Health center			1	1.4%	1	3.3%
Multipurpose Community Building			2	2.9%	1	3.3%
Others	14	17.9%	7	10.0%	4	13.3%
Total	78	100.0%	70	100.0%	30	100.0%

Q2. Maximum surge height

	Count	Percent
0 Feet	12	15.40%
1 Feet	4	5.10%
2 Feet	8	10.30%
3 Feet	12	15.40%
4 Feet	14	17.90%
5 Feet and above	28	35.90%
Total	**78**	**100.00%**

Q3. How many people died?

	Count	Percent
No death	31	39.74%
1-50	26	33.33%
51-100	9	11.54%
101 and above	12	15.38%
Total	**78**	**100.00%**

Q4. Do you have any community buildings where people can take refuge during a cyclone?

	Count	Percent
No		
Yes	78	100.0%
Total	78	100.0%

Q5. What are they? (Click all appropriate)

N=78	Count	Percent
Cyclone Shelter- Stand Alone	9	11.5%
School cum shelter	68	85.9%
Monastery cum shelter	3	3.8%
Church cum shelter		
Health cum shelter		
Multipurpose Community Building		
Sports stadium		
Other	27	35%

	Other specify	
	Count	Percent
Clinic	1	3.70%
on the embankment of drinking water pond	2	7.41%
Monastery	19	70.37%
strong houses	1	3.70%
life-saving mount	1	3.70%
Church	1	3.70%
Communication building	2	7.41%
Total	**27**	**100.00%**

Q6. (a) Is it easy or convenient for all villagers (community members) to get to the cyclone shelter from their houses? (the distance is safe for all villagers)

	Count	Percent
Yes	25	32.1%
No	53	67.9%
Total	78	100.0%

Q6.b. 1. Average time a villager could take to reach the shelter (Time)

	Count	Percent
3 Mins	1	1.3%
5 Mins	6	7.7%
6 Mins	3	3.8%
8 Mins	1	1.3%
10 Mins	22	28.2%
12 Mins	2	2.6%
15 Mins	21	26.9%
16 Mins	2	2.6%
18 Mins	1	1.3%
20 Mins	12	15.4%
23 Mins	1	1.3%
30 Mins	4	5.1%
40 Mins	2	2.6%
Total	78	100.0%

Q6.b.2. Shortest time a villager could take to reach the shelter

	Count	Percent
Less than 1 min	2	2.6%
1 Min	2	2.6%
2 Mins	26	33.3%
3 Mins	14	17.9%
4 Mins	1	1.3%
5 Mins	29	37.2%
7 Mins	1	1.3%
10 Mins	1	1.3%
15 Mins	2	2.6%
Total	**78**	**100.0%**

Q6.b.3. Longest time a village could take to reach the shelter

	Count	Percent
6 Mins	1	1.3%
10 Mins	7	9.0%
15 Mins	7	9.0%
20 Mins	16	20.5%
25 Mins	7	9.0%
30 Mins	24	30.8%
40 Mins	4	5.1%
45 Mins	2	2.6%
60 Mins	6	7.7%
90 Mins	**3**	**3.8%**
120 Mins	**1**	**1.3%**
Total	**78**	**100.0%**

Q7. A. Construction information (for each cyclone shelter) Constructed by:

N=78	Count	Percent
Dynamic	8	10.30%
BAJ	7	9.00%
GIIC	6	7.70%
Pacific Asia	6	7.70%
Civil Tech	5	6.40%
Myanmar Ahla	4	5.10%
Anawrahta Min	3	3.80%
Mya Nanda	3	3.80%
AMURT	2	2.60%
La Pyay Wun	**2**	**2.60%**
Mandala Swan	**2**	**2.60%**
Min Lwin Construction	**2**	**2.60%**
PEMCO	2	2.60%
Service Engineering Construction	2	2.60%

Taw Win Thitsa	2	2.60%
Three Friend	2	2.60%
Village Carpenter	2	2.60%
Aryonoo	1	1.30%
Care M'ar and Villager	1	1.30%
CECC Construction	1	1.30%
Dagon Construction	1	1.30%
Fire Fly Mission	1	1.30%
Ganawin nandaw	1	1.30%
Hobby and Haribdden Construction	1	1.30%
Htat Plan Construction	1	1.30%
MBE/CSC/Mg Tin	1	1.30%
Moe Thauk Pan	1	1.30%
MTO Construction	1	1.30%
Myanmar Engineering Association	1	1.30%
Pyay Phyo Kyaw	1	1.30%
S & A	1	1.30%
Shwe Moe	1	1.30%
Shwe Than Lwin	1	1.30%
Wah Wah Win	1	1.30%
Wind and Moe	1	1.30%

Q7. B Construction information (for each cyclone shelter) Funded by

	Count	Percent
MRCS	14	17.90%
UNICEF	8	10.30%
World Vision	7	9.00%
Government	7	9.00%
BAJ	7	9.00%
Red Cross and La Chan Ni	5	6.40%
SDC	5	6.40%
NRC	4	5.10%
GAA	3	3.80%
Care	3	3.80%
Mercy Corps	2	2.60%
Melta Development Foundation	2	2.60%
UNDP	1	1.30%
JEN	1	1.30%
CDN	2	2.60%
Kinder not Hilfe	1	1.30%
JICA	1	1.30%
PCF	1	1.30%
Moe Star Sin	1	1.30%
SRCS	1	1.30%
MBE/CSC/Mg Tin	1	1.30%
SRCS/MOE/Ministry of Energy	1	1.30%

Q7. C Construction information (for each cyclone shelter) Year of construction:

	Count	Percent
2009	58	74.4%
2010	19	24.4%
2011	1	1.3%
Total	78	100.0%

Q8. 1. Distance from sea, Distance from nearest river, Distance from nearest creek

N=78	Count	Percent
Near by sea	40	51.3%
Near by river	69	88.5%
Near by creek	43	55.1%
Total	78	100.0%

Q9. Please explain why do you think those buildings survived the strong winds and storm surge? (multiple response)

N=78						
	Count	Percent	Count	Percent	Count	Percent
Cyclone Shelter-Stand Alone	8	9.9%	9	11.1%	8	9.9%
School cum Cyclone Shelter	67	82.7%	20	24.7%	20	24.7%
Monastery cum Cyclone Shelter	2	2.5%	2	2.5%	1	1.2%
Church cum Cyclone Shleter						
Health center cum Cyclone Shelter						
Multipurpose Commnuity Building						
Sports stadium						

Q10. What is/are the salient safety features of the cyclone shelter?

	Count	Percent
Earthquake safety	42	53.8%
Flood safety	61	78.2%
Wind safety	69	88.5%
Fire safety	20	25.6%
None	1	1.3%
Total	78	100.0%

Q11. Location of this shelter is selected by

N=78	Count	Percent
Government	14	18.2%
Constructed by/organization	17	22.1%
Community	59	76.6%
Fund by/organization	37	48.1%

Q12. How many people can take refuge in this shelter?

	Count	Percent
Under 100	1	1.3%
100-250	16	20.5%
251-500	37	47.4%
501-750	6	7.7%
751-1000	9	11.5%
1001-1200	3	3.8%
1201 and above	6	7.7%
Total	**78**	**100.0%**

Q13. The number of villages covered by this shelter

	Count	Percent
1-village	65	83.3%
2 villages and above	13	16.7%
Total	**78**	**100.0%**

Q14. Estimated life span of the buildings

	Count	Percent
Under 20	7	9.0%
20-39 years	19	24.4%
40-59 years	**24**	**30.8%**
60-79 years	**11**	**14.1%**
80 and above	**17**	**21.8%**
Total	**78**	**100.0%**

Q15. Who designed the shelter?

N=78	Count	Percent
MOH		
MOC	4	5.2%
MOE	2	2.6%
MOS/WRR		
Local Authority		
Fund/organization	53	67.5%
Constructed by/organization	44	57.1%
Rebuilt in the same model beofre being destoryed	2	2.6%

Q16. Is the engineering design or blue print of this shelter kept in site location?

	Count	Percent
Yes	3	3.8%
No	75	96.2%
Total	78	100.0%

Q16.A. If “Yes”, where is it kept?

N=3	Count	Percent
Locker		
On notice board	3	75.0%
Showcase		
Others	1	25.0%

Q17. How much is construction cost for this shelter? (Core building cost only)

	How much is construction cost for this shelter? (Core building cost only)
Minimum	4000,000
Maximum	2200,000,000
Mean	280,331,034
Median	100,000,000
Mode	100,000,000

How much is construction cost for this shelter? (Core building cost only)

	Count	Percent
Under 50 million	1	1.3%
50-100 million	13	16.7%
100-150 million	**24**	**30.8%**
150-200 million	**3**	**3.8%**
200 million and above	**17**	**21.8%**
Don't know	20	25.6%
Total	78	100.0%

Q18. Is water available?

	Count	Percent
Drinking Water	24	30.8%
Domestic use	12	15.4%
Both Drinking and Domestic use	**24**	**30.8%**
Can't available both	**18**	**23.1%**
Total	**78**	**100.0%**

Q19. If “Yes”, please describe how? What are the sources of water?

	Count	Percent
Tube well	21	36.2%
Rain water stored in container	49	84.5%
Well	**6**	**10.3%**
Pond	**12**	**20.7%**

Q20. Storage facilities for valuables?

	Count	Percent
Yes	2	2.6%
No	76	97.4%
Total	**78**	**100.0%**

Q21. Is the cyclone shelter accessible to the disabled?

	Count	Percent
Yes	9	11.5%
No	69	88.5%
Total	**78**	**100.0%**

Q21.A. If yes, how does it make the shelter accessible? e.g, ramps, etc?

N=9	Count	Percent
There is a slope for the ascent of wheelchairs	6	66.7%
There is an upright toilet bowl for the aged/disabled	1	11.1%
The toilets are linked with building on the same level	**1**	**11.1%**
There are toilets for emergency use	2	22.2%
Drinking water is easily available in the building	1	11.1%

Q22. Do you think the plinth of the shelter is higher than the height of the heavy wave of the cyclone?

N=9	Count	Percent
No	16	20.5%
Yes	62	79.5%
Total	**78**	**100.0%**

Q23. The estimated number of people who might be taking refuge in cyclone shelter if another cyclone occurs again.

	Count	Percent
500 and under	25	32.1%
501-1000	29	37.2%
1001-1500	**8**	**10.3%**
1501-2000	8	10.3%
2001 and above	8	10.3%
Total	78	100.0%

Q24. People from which areas/communities are coming to this shelter?

	Count	Percent
People from which areas/communities are coming to this shelter	17	21.8%
Other villages (How many)	60	76.9%
Other	**3**	**3.8%**
Total	78	100.0%

Q25. Road linkage to:

N=78	Count	Percent
This village	78	100.0%
Nearby villages	70	89.7%
Seasonal road to nearby townships/ subtownships	**12**	**15.4%**
Road available to nearby townships/ subtownships in any season	51	65.4%

Q26. Distances (in miles) from: This Village

	Count	Percent
0 furlong	43	55.1%
0.1-8 furlong	27	34.6%
9 furlong and above	**8**	**10.3%**
Total	78	100.0%

Q26. Distances (in miles) from: Nearest Town

	Count	Percent
5 miles and under	17	21.8%
6-10 miles	23	29.5%
11-15 miles	**14**	**17.9%**
16-20 miles	13	16.7%
21-25 miles	6	7.7%
26 miles and above	5	6.4%
Total	78	100.0%

Q26. Distances (in miles) from: Nearest Hospital or Clini where there is a doctor

	Count	Percent
5 miles and under	33	42.3%
6-10 miles	30	38.5%
11-15 miles	**11**	**14.1%**
16-20 miles	2	2.6%
21-25 miles	1	1.3%
26 miles and above	1	1.3%
Total	78	100.0%

Q27. Is the building in (or intended to) use normally?

	Count	Percent
Yes	77	98.7%
No	1	1.3%
Total	**78**	**100.0%**

Q28. If yes, for what is it used?

	Count	Percent
School	74	96.1%
Monastery	4	4.9%
Church		
Health center		
Community building		
Total	78	100.0%

Q29. If “No”, is the building locked-down?

	Count	Percent
Yes	1	100.0%
No		
Total	1	100.0%

Q30. If “Yes”, everybody knows who keeps the building keys and how to contact?

	Count	Percent
Yes	1	100.0%
No		
Total	**1**	**100.0%**

Q31. Is there Shelter/School/Building Management Committee?

	Count	Percent
Yes	15	19.2%
No	63	80.8%
Total	**78**	**100.0%**

Q32. Is there any schedule for regular maintenance works? What kind of maintenance work?

	Count	Percent
Yes	7	9.0%
No	71	91.0%
Total	**78**	**100.0%**

Q33. Who is responsible for maintenance (if any)

	Count	Percent
Reinforcing the life-saving mound between the two buildings yearly		1
To apply crude oil to the walls once in every three years (against termites)	1	14.3%
Have plans to repaint the building and repair doors and veranda with income from the school-owned farm	2	28.6%
Plan to do regular cleaning (once a week/10 days)		
Do cleaning, repair and painting with interest money from loans disbursed to people from a fund of K 300,000, donated by MRCS	1	14.3%
MBE said it will donate money. If the donation is received, it will be lent and the interest money will be used for cleaning, painting and maintenance.	1	14.3%
Do cleaning	1	14.3%
Total	7	100.0%

Q34. Is he/are they paid?

	Count	Percent
Yes		
No	78	100.0%
Total	**78**	**100.0%**

Q35. Is there cash contribution from community?

	Count	Percent
Yes	3	3.8%
No	75	96.2%
Total	**78**	**100.0%**

Q35C. If yes, when was it the last time

	Count	Percent
2011 July	1	33.33%
2011 September	2	66.67%
Total	**3**	**100.0%**

Q35C How often was the contribution?

	Count	Percent
1 Year	2	66.67%
2 Year	1	33.33%
Total	**3**	**100.0%**

Q36. And how much was the total contributed amount from the community in last 12 months?

	Count	Percent
50000	1	33.3%
100000	2	66.7%
Total	**3**	**100.0%**

Q37. Ownership of this shelter being transferred to

	Count	Percent
Local Authorities	10	12.8%
Relevant Ministry	63	80.8%
CBO	**3**	**3.8%**
Do not know whom it has been trusted with	5	6.4%
Total	78	100.0%

Q38. Community participation in maintenance?

	Count	Percent
Yes	56	71.8%
No	22	28.2%
Total	78	100.0%

Q39. If 'yes' how?

	Count	Percent
Money	7	12.5%
Labour	55	98.2%
Material	5	8.9%
Others		
Total	56	100.0%

Q40. Is there any annual budget for maintenance (Y/N): If Yes, Amount (Kyat)

	Count	Percent
Yes	12	15.4%
No	66	84.6%
Total	**78**	**100.0%**

If yes, How Much

	If Yes, Amount (Kyat)	Percent
Minimum	100000	12.8%
Maximum	2100000	80.8%
Mean	**437500**	**3.8%**
Median	300000	6.4%
Mode	150000	100.0%

Q41. What is the source(s) of the budget for maintenance?

	Count	Percent
GAA	3	27.3%
Red Cross and Red Crescent	1	9.1%
GTTC	**1**	**9.1%**
Myanmar Red Cross and Japanese Red Cross Societies	2	18.2%
From the school-owned farmland	2	18.2%
MRCS	1	9.1%
Myitta (Metta)	1	9.1%

Q42. What activities would make you feel safer from a disaster for this community?

N=78	Count	Percent
Building another cyclone shelter in the (nearby) community	49	62.8%
Retrofitting of existing community building to make it cyclone resilient	6	7.7%
Acquring DRR related construccction technology	1	1.3%
Having more DRR related IEC materials	5	6.4%
Having more DRR related construction materials	35	44.9%
Condutcing simulation exercise (drill)	8	10.3%
Improving/building mitigation infrastructure in the community	12	15.4%
Other	74	94.90%

Other Specify

	Count	Percent
Embankment round the village is needed to prevent easy flooding	2	3.6%
Need to hold talks/training on natural disaster reduction	9	10.7%
To grow trees by the river and in the village to break wind and water	14	25.0%
Need telephone for receiving weather forecast/precise information about storm	1	1.8%
Need to build a life-saving mound	28	42.8%
Want weather news to be broadcast timely	2	3.6%
To form committees related to natural disaster reduction	2	3.6%
To keep life-jackets, buoys, and buckets ready	4	3.6%
To open clinics	5	1.8%
To store drinking water in the shelter	1	1.8%
To store food in the shelter	2	1.8%

Q43. Please add any other information related to the cyclone shelter

N=78	Count	Per-cent
To build fences with doors to prevent cattle from entering	4	8.7%
As the shelter has been built in the open, its roofs might be blown off in case of strong winds like Nargis	2	4.3%
To sink a tube well to make water from drinking/domestic use available	2	4.3%
Because the shelter is low, it can be submerged if water rolls in as in Nargis	4	8.7%
To install lightning conductors on the building	1	2.2%
To build a brick wall round the shelter because it is lowly built	1	2.2%
There should be rooms exclusively for the vulnerable (the aged, the in-firm, the disabled, the pregnant and the children)	3	6.5%
There should be toilets together with the shelter	3	6.5%
Because beams and rafters and walls are built with swelling wood, they are decaying now	2	4.3%
The life-saving mound between the two buildings should be protected with a brick fence built round it	2	4.3%
Electricity is needed for persons who take shelter	4	8.7%
Electricity is needed for persons who take shelter	5	10.9%
There are holes and cracks on the floor and walls in the shelter	4	8.7%
Because window panes are glass, it is dangerous to the people who seek shelter	1	2.2%
The current shelter is too small to provide space for the village population	14	30.4%

Water is leaking from the roofs of the shelter	2	4.3%
Because the base of the shelter is water-logged in the rainy season, it is difficult to move	1	2.2%
Toilets in the shelter are in ruins	1	2.2%
There should be space for animals in the shelter	2	4.3%

Tabulation for Observation

Q1. Where is the cyclone shelter situated in this village/ town?

	Count	Percent
Middle	47	58.0%
Fringe	22	27.2%
Outside (<0.6 mile)	11	13.6%
Outside	1	1.2%
Outside (Other village)		
Total	81	100.0%

Q2. The shelter is served for

	Count	Percent
Only people	63	77.8%
Both people and livestock	18	22.2%
Total	81	100.0%

Q3. Is layout diagram of shelter showing on notice board?

	Count	Percent
Yes	2	2.5%
No	79	97.5%
Total	81	100.0%

Q4. Is building protected by fence/gate?

	Count	Percent
Yes	45	55.6%
No	36	44.4%
Total	81	100.0%

Q5. Is there any permanent display board?

	Count	Percent
Yes		
No	81	100.0%
Total	81	100.0%

Q6. Are there any signage of the following:

N=81	Count	Percent
Location map of the shelter	3	4%
Limitation within shelter		
Maximum occupancy of the shelter		
Emergency exit		
Escape route		
Access of disabilities		
Other (emergency contacts)		
Other Specify		

Q7. What type of facilities (resources) available in the shelter?

N=81	Count	Percent
Emergency Power	17	21.0%
Phone	3	3.7%
TV	6	7.4%
Radio	9	11.1%
IEC materials	45	55.6%
First Aid	14	17.3%
Drinking Water	42	51.9%
Food stuff		
Sanitation	46	56.8%
Kitchen	1	1.2%
Emergency kits	9	11.1%
Signal light		
Boat		
Life Jacket	2	2.5%
Blanket	6	7.4%
Hand rails	14	17.3%
Fence on either side of the stair	44	54.3%
Balustrades	19	23.5%
Railing with both rails and boarrds	63	77.8%
Others	13	16.0%
Nothing	2	2.5%

Q8. What type of construction material: (Tick on only one appropriate box)

Post/Column

	Count	Percent
RC	71	87.7%
Wood	5	6.2%
Brick	4	4.9%
Other	1	1.2%
Total	81	100.0%

Wall

	Count	Percent
RC	27	33.3%
Wood	5	6.2%
Brick	48	59.3%
Other	1	1.2%
Total	81	100.0%

Floor

	Count	Percent
RC	74	91.4%
Wood	6	7.4%
Brick		
Other	1	1.2%
Total	81	100.0%

Roof

	Count	Percent
RC	19	23.5%
Wood		
Brick		
Other	62	76.5%
Total	81	100.0%

Q9. How many stories in this shelter?

	Count	Percent
1 Stories	61	75.3%
2 Stories	17	21.0%
3 Stories	3	3.7%
Total	81	100.0%

Q10. Area of this shelter? (Square feet)

	Count	Percent
under 1800	4	4.9%
1800 -3000	53	65.4%
3001 and above	24	29.6%
Total	81	100.0%

Q11. Room type or Hall type?

	Count	Percent
Yes	47	58.0%
No	34	42.0%
Total	81	100.0%

Q12. How many rooms?

	Count	Percent
1 room	1	2.1%
2 rooms	8	17.0%
3 rooms	9	19.1%
4 rooms	8	17.0%
5 rooms	3	6.4%
6 rooms	11	23.4%
7 rooms	1	2.1%
8 rooms	4	8.5%
12 rooms	1	2.1%
20 rooms	1	2.1%
Total	47	100.0%

Q14. Are there toilets in this cyclone shelter?

	Count	Percent
Yes	10	12.3%
No	71	87.7%
Total	81	100.0%

Q14. If yes, How many toilets? And how many total units in these toilets?

	Count	Percent
1	2	20.0%
2	1	10.0%
3	1	10.0%
4	5	50.0%
6	1	10.0%
Total	10	100.0%

Q15. Separate toilet for women

	Count	Percent
Yes	6	60.0%
No	4	40.0%
Total	10	100.0%

Q16. Separate space for women

	Count	Percent
Yes	18	22.2%
No	63	77.8%
Total	81	100.0%

Q17. Water supply availability

N=78	Drinking water		Domestic use	
	Count	Percent	Count	Percent
Yes	31	38.27%	26	32.10%
No	50	61.73%	55	67.90%
Total	81	100.00%	81	100.00%

Q18. Please describe the current condition of the shelter

	Count	Percent
	Count	Percent
Usable	80	98.8%
Usable only in some section of the shelter		
Need repairs for use	1	1.2%
Under construction		
Total	81	100.0%

Q19. Current condition of the Shelter Cleanliness

	Count	Percent
Satisfactory	79	97.5%
Not Satisfactory	2	2.5%
Total	81	100.0%

Q21. Cracks

N=81	Count	Percent
Celling	3	4%
Wall	24	30%
Column	2	2%
Beam	1	1%
Roof	10	12%
Others	14	17%

Q21. Losing Plaster

N=81	Count	Percent
Celling	7	9%
Wall	9	11%
Column	2	2%
Beam	3	4%
Roof	2	2%
Others	11	14%

Q21. Condition of road from community to shelter

	Count	Percent
Good	43	53.1%
Average	33	40.7%
Poor	5	6.2%
Total	81	100.0%

Q22. Maintenance condition of the shelter

	Count	Percent
Good	59	72.8%
Average	21	25.9%
Poor	1	1.2%
Total	81	100.0%

Q23. Shelter Height (Feet) , Height of lowest floor where people can take refuge

	Count	Percent
Under 5 ft	29	35.8%
5-9 feet	34	42.0%
9.5-15 ft	13	16.0%
16 ft and above	5	6.2%
Total	81	100.0%

Q23. Shelter Height (Feet) , Height of lowest floor where people can take refuge

	Count	Percent
Under 12 ft	2	10.0%
12-17 ft	5	25.0%
18-23 ft	1	5.0%
24-29 ft	6	30.0%
30-35 ft	6	30.0%
Total	20	100.0%

Q24. Position of the shelter

	Count	Percent
Inside embankment	24	29.6%
Outside embankment	2	2.5%
Open space	55	67.9%
Total	81	100.0%

Q25. The shelter is safe for people to take refuge in the wake of strong winds/ storm surge

	Count	Percent
Yes	61	75.3%
No	20	24.7%
Total	81	100.0%

Tabulation for Child

Place

	Count	Percent
Rural	600	100.0%
Urban		
Total	600	100.0%

Q1. Do you go to school?

	Count	Percent
Yes	582	97.0%
No	18	3.0%
Total	600	100.0%

Q2. If “yes”, which standard are you now?

	Count	Percent
Primary School	398	68.4%
Middle School	184	31.6%
Total	582	100.0%

Q3. Are you aware of the cyclone shelter in your community?

	Count	Percent
Yes	481	80.2%
No	119	19.8%
Total	600	100.0%

Q4. Where is it?

	Count	Percent
Middle	450	75.0%
Fringe	105	17.5%
Outside (<0.6 mile)	34	5.7%
Outside	11	1.8%
Outside (Other village)		
Total	600	100.0%

Q5. How you will go there?

	Count	Percent
On foot	559	93.2%
By bicycle	6	1.0%
By motorbike	2	0.3%
By bullock cart		
By boat	33	5.5%
Total	600	100.0%

Q6. If a strong cyclone occurs again, where would you go to make you and your family safe from its danger?

N=600	Count	Percent
If a strong cyclone occurs again, where would you go to make you and your family safe from its danger?	52	8.7%
Friends or relatives home	89	14.8%
Cyclone shelter	70	11.7%
School cum (or) Monastery cum Cyclone shelter	444	74.0%
School	22	3.7%
Monastery (or) Church	153	25.5%
Health center	6	1.0%
Community building	2	0.3%
Other	40	6.7%

	Other Specify	
	Count	Percent
On the embankment of the drinking water pond	12	30.0%
On the life-saving mound/hill	18	45.0%
To go after the parents	6	15.0%
To the monastery in town	1	2.5%
On the large motorboat	1	2.5%
In the communications building	1	2.5%
In the Village Administration Office	1	2.5%
Do not know where to go		
Total	40	100.0%

Important

N=600	First Important		Second Important		Third Important	
	Count	Percent	Count	Percent	Count	Percent
School cum (or) Monastery cum Cyclone shelter	382	63.70%	57	24.30%	5	11.90%
Monastery (or) Church	58	9.70%	85	36.20%	10	23.80%
Friends or relatives home	35	5.80%	45	19.10%	8	19.00%
Cyclone shelter	65	10.80%	2	0.90%	3	7.10%
Own house	29	4.80%	13	5.50%	10	23.80%
School	10	1.70%	10	4.30%	2	4.80%
On the life-saving mound/hill	10	50.00%	6	37.50%	2	50.00%
On the embankment of the drinking water pond	5	25.00%	7	43.80%		
Health center			6	2.60%		
To go after the parents	4	20.00%	2	12.50%		
Community building	1	0.20%	1	0.40%		
To the monastery in town	1	5.00%				
On the large motorboat					1	25.00%
In the communications building					1	25.00%
In the Village Administration Office			1	6.20%		

Q7. Please give reasons for going there.

	Count	Percent
Strong structure	511	85.2%
Easily accessible	6	1.0%
Near proximity	100	16.7%
Higher than other places	66	11.0%
Do not know how to go to other places	10	1.7%
Total	600	100.0%

Important

	First Important		Second Important		Third Important	
	Count	Percent	Count	Percent	Count	Percent
Strong structure	492	82.00%	19	21.10%		
Near proximity	69	11.50%	29	32.20%	2	66.70%
Higher than other places	26	4.30%	39	43.30%	1	33.30%
Do not know how to go to other places	10	100.00%				
Easily accessible	3	0.50%	3	3.30%		

Q8. Please describe your feeling of safety from cyclones and storm surges

	Count	Percent
Totally safe	411	68.5%
Somewhat safe	149	24.8%
Somewhat not safe	33	5.5%
Totally not safe	7	1.2%
Total	600	100.0%

Q9. Please mention any of your household members' participation and having access to the following.

	Count	Percent
How to build safer house or DRR related construction materials.	20	3.3%
DRR related IEC materials	244	40.7%
Emergency rescue and life saving training	**25**	**4.2%**
First aid training	27	4.5%
Community drills	81	13.5%
Others	7	1.2%
Don't know	296	49.3%
Total	600	100.0%

Others specify: Talks on natural disaster alleviation, Training on conservation of mangroves

ANNEX 3:
Questionnaires

UN HABITAT

Impact Study on Disaster Resilient Cyclone Shelter

FOCUS GROUP DISCUSSION	
Village	
Ward /Village-tract	
Township	
Date	
Venue of FGD	

Start time	
End time	

➢ Moderator	
➢ Facilitator	
➢ Note-taker	

FGD Participants

Sr.	Name	Age	Sex	Status in community/ occupation
1.				
2.				
3.				
4.				
5.				
6.				
7.				

[2]Priority should be given to community members who are not village authorities, village elders or members of the shelter management committee.

8.				
9.				
10.				

	Awareness of Cyclone shelter
1.	Do you have community buildings where people can take refuge during cyclone? How many?
2.	What are they? And where are they?
3.	Do you believe majority of the community members are aware of them? Why can you say that?
4.	Do you believe people know how to get there in time of emergency, when a disaster comes? Why do you think this?
5.	Is there any disaster management plan or activities in this community? If your answer is 'yes,' please explain. (Who, when and how was it formulated?)
6.	If your community has a disaster management plan how much do you think people feel safer for having formulated it? Why?
7.	If your answer is 'no', do you believe it is necessary to have any disaster management plan activities in this community. Why? Please explain.

	Capacity
8.	People from which villages/area do you think would come to seek refuge shelter in the wake of a cyclone/storm surge? (also ask the name of these villages)
9.	What would be the total number of people who might be seeking refuge at the cyclone shelter?
10.	If the shelter cannot accommodate all those who would want to seek refuge there, what is the plan of the community? What would happen to those who do not have a chance to seek refuge there?

	Accessibility
11.	How easy or difficult is it for people to have access to this cyclone shelter in times of emergency? (If you have time for 6 hours) Why?
12.	How do you feel about the location of this shelter? Is it within your reach all year round? Why?
13.	If people cannot have access to the shelter in certain months of the year, what are the barriers and how should they be overcome or Is there no way to overcome these barriers? Why?
14.	Do you think the shelter is also accessible to vulnerable populations such as children, elderly and the persons with disability? (If you have time for 6 hours) Why?

	Perception
15.	How important is this cyclone shelter for you and local people (in times of emergency and normal time)? Why?
16.	How much do you feel safer for having this cyclone shelter in your village? Why or why not? What about for children, elderly and the persons with disability?
17.	How do you describe the current maintenance condition of this cyclone shelter? How could it be improved?
18.	Are you willing to contribute to the maintenance of this cyclone shelter? How?
19.	What other (community) buildings do you think could be turned into cyclone-resilient structure? Why? How? How much do you think will it cost?
20.	What do you suggest for making your community more disaster resilient? Or what do you think should be done to improve the community's feeling of safety?
21.	What are the lessons learnt from having this cyclone built in your community?

HOUSEHOLD QUESTIONNAIRE: CHLDREN

id 1	Questionnaire No		
id 2	Respondent		
id 3	Village		|__||__||__||__|
id 4	Ward/Village-tract		|__||__||__||__|
id 5	Township		|__||__||__||__|
id 6	State/Region		|__||__||__||__|

Place	Urban	1	|__|
	Rural	1	
Date	DD/MM/YYYY: ___/___/2011		|__|__|/|__|__|/|2|0|1|1|
Time of enumeration	Start time (HH:MM)	_____:_____	Use the 24-hour digits
	End time (HH:MM)	_____:_____	

	Enumerator	Field supervisor	Editor
Signature Name	_____	_____	_____
Code No	|___|	|___|	|___|

Awareness of cyclone shelter

1	Do you go to school?			
	Yes	1		|_____|
	No	2		
2	If "yes", which standard are you now?			
	Primary school	1		|_____|
	Middle school	2		

4	Where is it?			
	Within village	1		|_____|
	At the fringe of the village	2		
	Outside village (Near)	3		
	Outside village (Far)	4		
	Outside village (Another village)	5		

5	How you will go there?			
	On foot	1		|_____|
	By bicycle	2		
	By motorbike	3		
	By bullock cart	4		
	By boat	5		
	Other (Specify)	6		

6	If a strong cyclone occurs again, where would you go to make you and your family safe from its danger?		
	Own house	1	
	Friends or relatives home	2	
	Cyclone shelter	3	
	School cum (or) Monastery cum Cyclone shelter	4	
	School	5	|_____|
	Monastery (or) Church	6	
	Health center	7	
	Community building	8	
	Other (Specify)	9	

	Please give reasons for going there.			
			Priority	
7	Strong structure	1		|_____|
	Easily accessible	2		
	Near proximity	3		|_____|
	Higher than other places	4		
	Others (Specify)	5		|_____|

8	Please describe your feeling of safety from cyclones and storm surges		
	Totally safe	1	
	Somewhat safe	2	|_____|
	Somewhat not safe	3	
	Totally not safe	4	

9	Please mention any of your household members' participation and having access to the following.			
	How to build safer house or DRR related construction materials	1	2	|_____|
	DRR related IEC materials	1	2	|_____|
	First aid training	1	2	|_____|
	Community drills	1	2	|_____|
	Others (specify) ----------			|_____|

HOUSEHOLD QUESTIONNAIRE: PARENTS / ADULTS

id 1	Questionnaire No	
id 2	Respondent	
id 3	Village	|__|__|__|__|__|
id 4	Ward/Village-tract	|__|__|__|__|__|
id 5	Township	|__|__|__|__|__|
id 6	State/Region	|__|__|__|__|__|

Place	Urban	1	|__|
	Rural	2	
Date	DD/MM/YYYY: ___/___/2011		|__|__|/|__|__|/|2|0|1|1|
Time of enumeration	Start time (HH:MM)	_____:_____	Use the 24-hour digits
	End time (HH:MM)	_____:_____	

	Enumerator	Field supervisor	Editor
Signature Name	_____	_____	_____
Code No	|___|	|___|	|___|

Awareness of cyclone shelter

1	Are you aware of the cyclone shelter in your community?			
	Yes	1		|_____|
	No	2		
2	Where is it?			
	Within village	1		
	At the fringe of the village	2		|_____|
	Outside village (Near)	3		
	Outside village (Far)	4		
	Outside village (Another village)	5		
3	How far is it from your house?			
	Within 500 ft	1		
	Between 501 ft and 1500 ft	2		
	Between 1501 ft and 3000 ft	3		|_____|
	Between 3001 ft and 4500 ft	4		
	Between 4500-6000 ft	5		
	More than 6000 ft	6		

4	Do you know how to get there?			
	Yes	1		|_____|
	No	2		
5	How you will go there?			
	On foot	1		
	By bicycle	2		
	By motorbike	3		|_____|
	By bullock cart	4		
	By boat	5		
	Other (Specify)	6		

	How long does it take from your house to this cyclone shelter on foot during normal time? How long it will take when it is most difficult to access? (during heaviest rains/strong winds)			
6	Normal time	Less than 5 mins	1	|_____|
		Between 5 and 10 mins	2	
		Between 10 and 20 mins	3	
		Between 20 and 30 mins	4	
		Between 30 and 60 mins	5	
		More than 60 mins	6	
		Less than 5 mins	1	
7	During heaviest rains/strong winds	Between 5 and 10 mins	2	|_____|
		Between 10 and 20 mins	3	
		Between 20 and 30 mins	4	
		Between 30 and 60 mins	5	
		More than 60 mins		

8	Do you think you can access to the cyclone shelter all year round?			
	Yes	1		|_____|
	No	2		
9	If your answer is 'No,' when do you think it is not accessible?			
	Summer	1		|_____|
	Rainy	2		|_____|
	Winter	3		|_____|
	Why?			
10	Flooding	1		
	Road is destroyed	2		|_____|
	Other (Specify)	3		
	Is it easy for you and your family to get this cyclone shelter from your house during daytime and night time?			
11	Day time	1		|_____|

	Night time	2	>>16	|_____|
	Not easy	3		|_____|
12	Day time			
	All family members	1	>>14	|_____|
	Only some family members	2		
13	Why is it not easy for you and your family to get this cyclone in day time?			
	Road is bad/destroyed	1		
	No vehicle available for transport	2		
	Can't leave chronic (or) disabled (or) elder person	3		
	Have to guard the properties	4		
	Others (Specify)	5		
14	Night time			
	All family members	1	>>14	|_____|
	Only some family members	2		
15	Why is it not easy for you and your family to get this cyclone in night time?			
	Road is bad/destroyed	1		
	No vehicle available for transport	2		
	Can't leave chronic (or) disabled (or) elder person	3		
	Have to guard the properties	4		
	Others (Specify)	5		
16	If a strong cyclone occurs again, where would you go to make you and your family safe from its danger?			
	Own house	1		
	Friends or relatives home	2		
	Cyclone shelter	3		|_____|
	School cum (or) Monastery cum Cyclone shelter	4		

	School	5		
	Monastery (or) Church	6		

	Health center	7		
	Community building	8		
	Other (Specify)	9		
17	Please give reasons for going there.			
				Priority
	Strong structure	1		|_____|
	Easily accessible	2		
	Near proximity	3		|_____|
	Higher than other places	4		
	Others (Specify)	5		|_____|

18	Where do you think other people would take refuge if the cyclone occurs again?		
	At home	1	|_____|
	Neighbour/Friends/Relative's House	2	|_____|
	Cyclone Shelter-stand alone	3	|_____|
	School building	4	|_____|
	Monastery/Church building	5	|_____|
	Health centre building	6	|_____|
	Multi-purpose community building	7	|_____|
	Other (specify) ----------	8	|_____|

19	Please describe the use of cyclone shelter during normal time.		
	Cyclone shelter –stand alone	1	|_____|
	School cum cyclone shelter	2	|_____|
	Monastery cum cyclone shelter	3	|_____|
	Health centre (hospital) cum cyclone shelter	4	|_____|

	Multi-purpose community building	5	|_____|
	Other (specify) ----------	6	|_____|

20	What do you think are available in the shelter		
	Drinking water	1	|_____|
	Food	2	|_____|
	Emergency power	1	|_____|
	Phone	2	|_____|
	TV	3	|_____|
	Radio	4	
	IEC material	5	|_____|
	First aid kit	6	|_____|
	Drinking water	7	|_____|
	Food stuff	8	|_____|
	Sanitation kit	9	|_____|
	Kitchen items	10	|_____|
	Emergency kits	11	|_____|
	Signal light	12	|_____|
	Boats	13	|_____|
	Life jackets	14	|_____|
	Blankets	15	|_____|
	Others ----------	16	|_____|

21	Do you know there is a shelter management committee?		
	Yes	1	|_____|
	No	2	
	Don't know	3	
22	Do you know there is a schedule for regular maintenance work?		
	Yes	1	|_____|
	No	2	
	Don't know	3	
23a	Would you be willing to contribute for regular maintenance of the shelter?		
	Yes	1	|_____|
	No	2	
23b	If your answer is 'Yes," how?		

24	Would you be willing to contribute for regular maintenance of the shelter?		
	Money	1	|_____|
	Labor	2	|_____|
	Material	3	|_____|
	Other (Specify)	4	|_____|

25	Please describe your feeling of safety from cyclones and storm surges		
	Totally safe	1	|_____|
	Somewhat safe	2	
	Somewhat not safe	3	
	Totally not safe	4	

26	Please mention any of your household members' participation and having access to the following.			
	How to build safer house or DRR related construction materials	1	2	|_____|
	DRR related IEC materials	1	2	|_____|
	First aid training	1	2	|_____|
	Community drills	1	2	|_____|
	Others (specify) ----------			|_____|

27	What activities would make you feel safer from a disaster?		
	Having life jacket	1	
	Having plastic container	2	
	Need to store food	3	
	Need to maintain mangrove	4	
	Need to build embankment	5	
	Building another cyclone shelter in the (nearby) community	6	|_____|
	Retrofitting of existing community building to make it cyclone resilient	7	
	Having more DRR related construction materials	8	
	Having more DRR related IEC materials	9	
	Conducting simulation exercise (drill)	10	
	Improving/building mitigation infrastructure in the community	11	
	Others (specify)	12	

KEY INFORMANT INTERVIEW

id 1	Questionnaire No		
		Name	Designation
id 2.A	Respondent—1		
id 2.B	Respondent—2		
id 2.C	Respondent—3		
id 8	Telephone number for contact with the ward/village		

Place	Urban	1	|__|
	Rural	2	
Date	DD/MM/YYYY: ___/___/2011		|__|__|/|__|__|/|2|0|1|1|
Time of enumeration	Start time (HH:MM)	_____:_____	Use the 24-hour digits
	End time (HH:MM)	_____:_____	

	Enumerator	Field supervisor	Editor
Signature Name	_____	_____	_____
Code No	|___|	|___|	|___|

Criteria of the respondent	One or more members of the Village PDC or community elders who can provide basic data about the village.

Basic Information

D1 Sample ward/village

1.1 Township		|___|
1.2 Village-tract/Ward		|___|
1.3 Village		|___|
1.4 No of houses		|___|
1.5 No of households		|___|

1.6 Main livelihoods of the community

Livelihood	Number of households
Paddy cultivation	
Gardening	
Fishing	
Aquaculture	
Livestock	
Handicraft	
Trading	
Others-1 (please specify)	
Others-2	
Total	

D2 Population

Male	Female	Total

Under 18	18 and 18+	Total

Cyclone shelter information

1	What were the main buildings that the people took refuge during the past cyclone? (Please rank them)	
a.	At home	
b.	Neighbour/ Friend/ Relatives" house	
c.	Cyclone Shelter- Stand Alone	

[3]Check 1.5 and 1.6 Total

a.	School		
b.	Monastery		
c.	Church		
d.	Health center		
e.	Multipurpose Community Building		
f.	Others……		
2	Maximum surge height		---------- Feet
3	How many people died?	----------	

4	Do you have any community buildings where people can take refuge during a cyclone?		
	Yes	1	|_____|
	No	2	
5	What are they? (Click all appropriate)		
a.	Cyclone Shelter- Stand Alone		|_____|
b.	School cum Cyclone Shelter		|_____|
c.	Monastery cum Cyclone shelter		|_____|
d.	Church cum Cyclone shelter		|_____|
e.	Health center cum Cyclone shelter		|_____|
f.	Multipurpose Community Building		|_____|
g.	Sports stadium		|_____|
h.	Oth-er_____		|_____|

6.a	Is it easy or convenient for all villagers (community members) to get to the cyclone shelter from their houses? (the distance is safe for all villagers)			
	Yes	1		|_____|
	No	2		
6.b	Average time a villager could take to reach the shelter			|_____| min
	Shortest time a villager could take to reach the shelter			|_____| min
	Longest time a village could take to reach the shelter			|_____| min
7	Construction information (for each cyclone shelter)			
a.	Constructed by:			
b.	Funded by:			
c.	Year of construction:			

8		Yes.....1	
		No.....0	
	Distance from sea	1	|_____|
	Distance from nearest river	2	|_____|
	Distance from nearest creek	3	|_____|

9	Please explain why do you think those buildings survived the strong winds and storm surge? (multiple response)	
a.	Strong structure	
b.	Location	
c.	Architectural design	1
d.	Other _____	2
10	What is/are the salient safety features of the cyclone shelter?	
a.	Earthquake safety	|_____|
b.	Flood safety	|_____|
c.	Wind safety	|_____|
d.	Fire safety	|_____|
e.	None	|_____|

11	Location of this shelter is selected by	
a.	Government	|_____|
b.	Village authority (specify)……..	|_____|
c.	Community	|_____|
d.	Others (Specify)	|_____|
12	How many people can take refuge in this shelter?	
13	The number of villages covered by this shelter	|_____|
14	Estimated life span of the buildings	---------- years
15	Who designed the shelter?	
a.	MOE	|_____|
b.	MOC	|_____|
c.	MOSWRR	|_____|
d.	MOH	|_____|
e.	Local authorities	|_____|
f.	Self Design	|_____|
g.	Implementing Agency	
h.	Other _____	|_____|

Technical Design and related information

16	Is the engineering design or blue print of this shelter kept in site location?	
	Yes = 0, No = 1	|_____|
	If "Yes", where is it kept?	
a.	Locker	|_____|
b.	On notice board	|_____|
c.	Showcase	|_____|
d.	Other _____	|_____|
17	How much is construction cost for this shelter? (Core building cost only)	
18	Is water available?	

	Yes	1		|_____|
	No	2		
19	If "Yes", please describe how? What are the sources of water?			
	Tube well	1		|_____|
	Rain water stored in container	2		|_____|
	Well	3		|_____|
	Pond	4		|_____|
	Other (Specify)	5		|_____|

20	Storage facilities for valuables?			
	Yes	1		|_____|
	No	2		
21	Is the cyclone shelter accessible to the disabled?			
	Yes	1		|_____|
	No	2		
	If yes, how does it make the shelter accessible? e.g, ramps, etc?			

22	Do you think the plinth of the shelter is higher than he height of the heavy wave of the cyclone?			
	Yes	1		|_____|
	No	2		

23	The estimated number of people who might be taking refuge in cyclone shelter if another cyclone occurs again	
	---------- people	|_____|

Accessibility

24	People from which areas/communities are coming to this shelter?			
	This village only	1		|_____|
	Other villages (How many)	2		|_____|
	Other (Specify)	3		|_____|
25	Road linkage to:			
	This village	1		|_____|
	Nearby villages	2		|_____|
	Seasonal road to nearby townships/subtownships	3		|_____|
	Road available to nearby townships/subtownships in any season	4		|_____|

26	Distances (in miles) from:	
a.	This village	|_____|
b.	Nearest town	|_____|
c.	Nearest Hospital or Clinic where there is a doctor	|_____|

27	Is the building in (or intended to) use normally?			
	Yes	1		|_____|
	No	2		

28	If yes, for what is it used?			
	School	1		
	Monastery	2		
	Church	3		|_____|
	Health center	4		
	Community building	5		
	Other (Specify)	6		
29	If "No", is the building locked-down?			
	Yes	1		|_____|
	No	2		
30	If "Yes", everybody knows who keeps the building keys and how to contact?			
	Yes	1		|_____|
	No	2		

Management Information

31	Is there Shelter/School/Building Management Committee?			
	Yes	1		|_____|
	No	2		
32	Is there any schedule for regular maintenance works? What kind of maintenance work?			
	Yes	1		|_____|
	No	2		
	.....			
33	Who is responsible for maintenance (if any):			
a.				|_____|
b.				|_____|

c.				|_____|
34	Is he/are they paid?			|_____|
	If 'yes' how is he/are they paid?			
	Per month			--------- kyat

35	Is there cash contribution from community?			
a.	Yes		1	|_____|
b.	No		2	|_____|
c.	If yes, when was it the last time How often was the contribution?		------ month/year ------- month/yea	|_____|
36	And how much was the total contributed amount from the community in last 12 months?		---------- kyat	|_____|

37	Ownership of this shelter being transferred to:	
a.	Local authorities	|_____|
b.	Relevant Ministry	|_____|
c.	CBO	|_____|
d.	Others _____	|_____|

38	Community participation in maintenance?			
	Yes	1		|_____|
	No	2		

39	If 'yes' how?			
	Money			|_____|
	Labour			|_____|
	Material			|_____|
	Other (Specify)			|_____|

40	Is there any annual budget for maintenance (Y/N): If Yes, Amount (Kyat):			
	Yes	1	----------	|_____|
	No	2		
41	What is the source(s) of the budget for maintenance?			|_____|

42	What activities would make you feel safer from a disaster for this community?		
	Having life jacket	1	|_____|
	Having plastic container	2	
	Need to store food	3	
	Need to maintain mangrove	4	
	Need to build embankment	5	
	Building another cyclone shelter in the (nearby) community	6	
	Retrofitting of existing community building to make it cyclone resilient	7	
	Having more DRR related construction materials	8	
	Having more DRR related IEC materials	9	
	Conducting simulation exercise (drill)	10	
	Improving/building mitigation infrastructure in the community	11	
	Others (specify)	12	

43 Please add any other information related to the cyclone shelter

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ANNEX 4:
Observation checklists

UN HABITAT

Impact Study on Disaster Resilient Cyclone Shelter

OBSERVATION CHECKLIST

id1	Location of cyclone shelter _____ Latitude (Y): ---------- Longitude (X): ----------	
id2	Village _____	
id6	Ward/Village-tract _____	
id7	Township _____	
id8	State/Region _____	

	Observation time:	Date (DD/MM/YY) ____/____/2011
		Start time (HH:MM) ____:____
		End time (HH:MM) ____:____

Enumerator		Field Supervisor		Editor	
Signature:		Signature:		Signature:	
Name: |__|		Name: |__|		Name: |__|	

Cyclone shelter information

1	Where is the cyclone shelter situated in this village/ town?			
	Middle	1		|_____|
	Fringe	2		
	Outside (<0.6 mile)	3		
	Outside	4		
	Outside (Other village)	5		
2	The shelter is served for			
	Only people	1		|___|
	Both people and livestock	2		
3	Is layout diagram of shelter showing on notice board?	1	2	|___|
4	Is building protected by fence/gate?	1	2	|___|
5	Is there any permanent display board?	1	2	|___|
	If 'yes,' are there any emergency contacts of the following?			
a.	Village leader	1	2	|___|
b.	Police station	1	2	|___|
c.	Hospital	1	2	|___|
d.	Fire brigade	1	2	|___|
e.	Township authorities	1	2	|___|
f.	Village/Ward Red Cross	1	2	|___|
g.	Shelter care taker	1	2	|___|
h	Other (specify)			
6.	Are there any signage of the following:			
	Location map of the shelter	Yes	No	
	Limitation within shelter	1	2	|____|
	Maximum occupancy of the shelter	1	2	|____|
	Emergency exit	1	2	|____|

	Escape route	1	2	
	Access of disabilities	1	2	
	Hand rails	1	2	
	Balustrades	1	2	
	Other (emergency contacts)	1	2	
7	Are there any signage of the following:			
	What type of facilities (resources) available in the shelter?			
a.	Emergency Power			
b.	Phone			
c.	TV			
d.	Radio			
e.	IEC materials			
f.	First Aid			
g.	Drinking Water			
h.	Food stuff			
i.	Sanitation			
j.	Kitchen			
k.	Emergency kits			
l.	Signal light			
m.	Boat			
n.	Life Jacket			
o.	Blanket			
p.	Hand rails			
q.	Balustrades			
r.	Other_____			
8	What type of construction material: (Tick on only one appropriate box)			

Post/Column	RC	Wood	Brick	Other_____
Wall	RC	Wood	Brick	Other_____
Floor	RC	Wood	Brick	Other_____
Roof	RC	Wood	Tiles or Asbestos	Other_____

9	How many stories in this shelter?			
10	Area of this shelter? (Square feet)			
11	Room type or Hall type?			
12	How many rooms?			
13	Room width and length (In feet)?			
14	Are there toilets in this cyclone shelter?			
	Yes	1		|_____|
	No	2		
	If yes, How many toilets? And how many total units in these toilets?			
	Number of toilets ……			
	Total number of units ……			
15	Separate toilet for women			
16	Separate toilet for women			
	Yes	1		|_____|
	No	2		
17	Water supply availability			
	Yes	1		|_____|
	No	2		
18	Please describe the current condition of the shelter			
	Usable	1		|_____|
	Usable only in some section of the shelter	2		
	Need repairs for use	3		
	Under construction	4		

19	Current condition of the Shelter Cleanliness			
	Satisfactory	1		|_____|
	Not Satisfactory	2		|_____|
20	Door/Window Status			

	Total no.	Need repair
Doors		
Windows		

21	Cracks/Losing Plaster					
		Ceiling	Wall	Column	Beam	Other
	Crack					
	Losing Plaster					

21	Condition of road from community to shelter		
	Good	1	|_____|
	Average	2	|_____|
	Poor	3	|_____|
22	Maintenance condition of the shelter		
	Good	1	|_____|
	Average	2	|_____|
	Poor	3	|_____|
23	Shelter Height (Feet)		
	Height of lowest floor where people can take refuge		|_____|
	Height of the highest floor where people can take refuge		|_____|
24	Position of the shelter		
a.	Position with respect to flood protection:		
	Inside embankment		|_____|
	Outside embankment		
	Open space		

25	The shelter is safe for people to take refuge in the wake of strong winds/storm su rge		
	Yes	1	
	No	2	|_____|
	I'm not so sure	3