Subject: Evaluation of "Cyclone Mora - Workshop on Shelter Resilience"
Date: 18 July 2017
From: Alex van Leersum (IFRC / SC technical coordinator)

Date of workshop:	Saturday 15 July 2017, full day
Location:	Cox's Bazaar – Kutupalong SHED Distribution Facility in the KMS village
Facilitators:	Alex van Leersum and Razib HASIBUL BARI; IFRC-Shelter Cluster Technical Coördinators
Support from:	IOM for facilitation of location etc.; IFRC/BDRCS for materials etc.

Objective of the workshop 'Improving Shelter resilience'

The objective was to:

1. Increase knowledge / experience of key principles to increase shelter resilience
2. Increase understanding why certain principles do/don't work
3. Validate the effectiveness / clearity of message of (draft) shelter IEC materials

Approach of the workshop

The approach was:

1. Start with joint discussion on Key principles for Shelter resilience
    a. IEC material 1-pager + draft Emergency Shelter
    b. Discussion of key messages, as to 'test' if they work in practice
2. Hands-on exercises, construction (in parallel groups) of:
    a. Group 1: Anchoring
    b. Group 2 & 3: Timber structure exercise
    c. Group 4 & 5: Bamboo structure exercise
    d. Group 6: Explore bamboo – earth construction (with soil-cement stabilization)
3. Plenary:
    a. Each group to explain they key concepts of shelter resilience include in their exercise
    b. Feedback on IEC materials.

Results

A total of 28 participants joined the workshop. This consisted of a combination of project managers/team members for various cluster partners, volunteers, local community members and artisans (carpenter and masons). The following organisations / groups were present: IOM, Save the Children, UNDP, Practical Action, Caritas Bangladesh, BDRCS, Christian Aid, Rover Scouts, Laskmipur, community members of KMS.

For an impression of the exercises, see the attached picture report.

Recommendations

Recommendations for future trainings, based on feedback and facilitators experience:

1. In case an organisation wants to give the **training truly within the community**, including open for spectators, than please consider:
    a. The **majority (80-90%)** of the participants should be active **artisans (masons, carpenters).** That is, the vast majority should be willing + able to actively build during the exercises. If not, keeping the attention and continuous engagement of the participants is very difficult in an open space, with curious by-standers.
    b. The duration of **trainings within communities** is advised to be kept short, e.g. **½ day**. Possibly combined with a **community walk** (how can shelters in the community be **retrofitted**?).
    c. An effective exercise is the '**anchoring options' + 'break point testing'**. It's a very simple and very engaging exercise. Participants see and feel the different strengths of anchoring methods. Very well received by participants and a quick win for (capacity building of) shelter resilience.
    d. Generic discussion of principles for Shelter Resilience (IEC materials) can discussed with a printed **IEC version on a banner, e.g. 3' x 4'**.

   e. Any 'theory' preferably to be discussed in an enclosed space. This 'theory' can include key **principles of working with earth construction** including the necessity + way to conduct soil testing.

2. Options for **additional hands-on exercises**:
   a. Plinth protection → simulate / build the **soil-cement stabilized capping** of the plinth, based on soil composition testing from the locality.
   b. Plinth protection → build a **small 'retaining' walls to protect the plinth** from erosion because of the drainages next to the house. Wall from can be made of i) bamboo post/sticks + bamboo matting or ii) timber sticks and sand bags or iii) sticks and (salvaged) iron sheets.
3. Explore / **improve training based on the locality**, other districts with their predominant construction styles and shelter responses.
4. Explore ways to **link field trainings** with '**approximate engineering'**, e.g. how many ground achors are required with what kind of uplift resistance per anchor point? What will be the next 'weak' link? How ca we improve that and how strong should that be, etc.?
5. Make **cost estimates for a 'retrofitting' package** for e.g. dwellers in (in)formal settlements. This help Shelter Partners in the programming options.

Annex

1. Picture report of the workshop
2. Agenda
3. Sketch of the timber structure and calculation for the BoQ
4. BoQ with cost estimates
5. Participants list

Picture report: Workshop Shelter Resilience, Cox's Bazaar, 15 July 2017

Discussing & validating Shelter IEC materials.

Hands-on exercises.

Exploring different anchoring options.

Testing the strength of the anchors.

Working, discussing principles of bamboo construction.

Bamboo structure.

Discussing principles of timber construction.

Connections reinforced with salvaged CGI sheets.

Exploring bamboo earth construction with soil-cement stabilization.

Cyclone Mora - Workshop on 'improving Shelter Resilience

AGENDA (final)

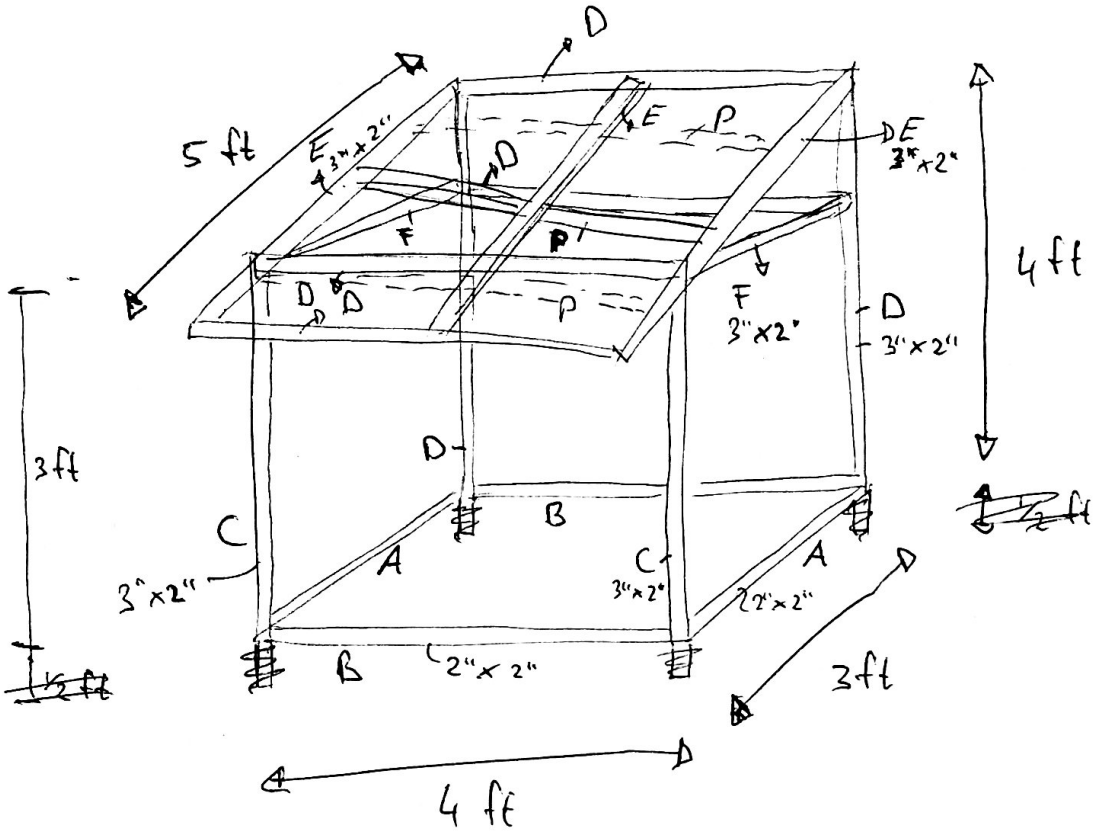
Date:	Saturday 15 July 2017
Time:	Arrive 8.30 for a prompt 9.00 start Finish 16.00
Location:	Cox's Bazaar – Kutupalong settlement Note: meeting point = SHED Distribution Facility in the KMS village
Purpose:	• Increase knowledge / experience of key principles to increase shelter resilience • Increase understanding why certain principles do/don't work • Validate the effectiveness / clearity of message of (draft) shelter IEC materials
Profile of participants:	Project members (technical, craftsman, foreman, carpenters, artisans) of Shelter Partners; • If possible participants with DRR or PASSA-like experience (e.g. for response in Bandarban, Rangamati, Chittagong); • Local volunteers if relevant, e.g. from a Scouting Club.
Number of participants:	Max. 20 to 25 persons
Workshop delivery style:	1) Hands on, participatory exercises for principles to increase Shelter Resilience 2) Discussing / validating effectiveness and clarity of message of IEC materials relevant for the cyclone Mora response.
Language:	Language spoken in English + Bangla
Support from:	IOM for facilitation of location etc.; IFRC/BDRCS for materials etc.

Draft Agenda

8:30	**Meet-up at KMS**	Meet at the SHED Distribution Facility in the KMS village, jointly walk to the settlement & workshop location
9:00	**Plenary start**	**Key principles for Shelter resilience** • IEC material 1-pager + draft Emergency Shelter (if ready) • Discussion of key messages, as to 'test' if they work in practice.
9:30	**Parallel group exercises**	**Group 1: Anchoring & plinth exercise** • Ground anchors, make anchors of: ○ Peg's; rod; sand bag on top of the soil + buried; bamboo or timber buried; CGI sheet with timber frame underneath. • Making of a 'pulling' stand, to imitate the angle of the pull-force. • Pulling of anchors (Note = PLENARY)
		Group 2 & 3: Timber structure exercise • Make frame with bracing (4"x4" frame) and withouth bracing (3"x4" frame) • Test rigidness of frames (Note = PLENARY) • Make rest of test structure (see 'drawing' of BoQ) • Strengthen connections and joints, e.g.: ○ Nailing techniques; fishplate/cleats/straps; guesset plate; tie-down techniques; use of salvaged CGI sheets.

		Group 4 & 5: Bamboo structure exercise • Make frame with bracing (4"x4" frame) and withouth bracing (3"x4" frame) • Test rigidness of frames (Note = PLENARY) • Make rest of test structure (see 'drawing' of BoQ) • Strengthen connections and joints, e.g.: ○ Nailing techniques; fishplate/cleats/straps; guesset plate; tie-down techniques; use of salvaged CGI sheets.
		Group 6: Bamboo frame with earth construction • Made a bamboo frame, post and 'fence' which can be plastered with earth. One model should have a double layer of bamboo 'fence', the earth can than be hold together by this double bamboo 'fance'. • Make a earth-cement stabalization mixture, with 5 to 10% cement (based on the soil test conducted the preceding day)
12.30	**Snack / lunch**	
13: 00	**Experience Sharing, Plenary**	Per group: • Explain key concepts, learning points & experience of the exercise • EXTRA = experience sharing regarding the 'earth construction' field visit ○ PLENARAY: example how to test the soil + what to do next.
14:30	**IEC feedback**	**Feedback on IEC materials, per group:** • IEC emergency shelter (if final draft is ready) • IEC 1-pager with tips for Shelter Resilience • IEC reference book with 8 key principles to increase Shelter resilience
15:30	Closing	Round-up & feedback
		Note: OPTIONAL in case of extra time / group dynamic preference: community walk. Analyse the structures & look for retrofitting improvements.

Field Shelter training (BoQ)



Size	length = 8 ft	Number
3" x 2"	C C — 3 ft, 3 ft, 2 ft	1 x
3" x 2"	D D — 4 ft, 4 ft	3x
3" x 2"	E F — 5 ft, 3 ft	3x, F spare
2" x 2"	B B — 4 ft, 4 ft	1 x
2" x 2"	A A — 3 ft, 3 ft, 2 ft	1x
2" x 2"	P P — 4 ft, 4 ft	2x
2 x 2"	8 ft (bracing)	2x
3" x 2"	3 ft, 3 ft achoring rod	1x for achoring rod excercise

Bamboo structure

Similar but with 10 ft long

13 pieces bamboo of 10'

Timber structure

Total for structure:

- 7 pieces of 3"x2". 8 ft long
- 6 pieces of 2"x2" 8 ft long

Subject: Bill of Quanties for 1 day workshop on Shelter resilience
Date: 15-7-2017
Version: 1.0

Participant =	28	# persons	Conversion rate:	
Group size is 5 per/group =	5,6	# groups	1 BDT =	0,012 USD
Timber 'model'/ test structures	2	# timber structures		
Bamboo 'model'/ test structures	2	# bamboo structures		
Group working on Achoring + Protection of Plinth	1	# BoQ / items for Achoring + Plinth excercise		
Group working on bamboo & earth construction	1	# Bamboo + earth		

Items	Description	cost per unit		Number	unit	Total	Currency	Remark
Timber structure								
Timber	2"x2"x 12 foot	600	BDT	14	no.	8400	BDT	Note: excercise = without roofing
Timber	2"x3"x 12 foot	450	BDT	12	no.	5400	BDT	
Local transportation costs		700	BDT	1	no.	700	BDT	
nails 4"	4"	620	BDT	1	kg	620	BDT	Note: should also cover nails for other activities (see below)
nails 3"	3"	620	BDT	1	kg	620	BDT	
nails 2"	2"	620	BDT	1	kg	620	BDT	
scrap steel sheet	couple of scrap sheets	80	BDT	1	no.	80	BDT	
Bamboo structure								
Big Bamboo (sheel borak?), suited for shelter construction	40 foot long, circumference circa11-10'' to 5-6''	300	BDT	4	no.	1200	BDT	
Small bamboo, for, support members, stick, lats, etc.	30 foot long, circumference circa 7-8'' to 4-5''	120	BDT	4	no.	480	BDT	
Transportation costs of bamboo		100	BDT	1	no.	100	BDT	
Rope 'big'	1 bundel of 3 kg	450	BDT	3	kg	1350	BDT	
Rope 'small'	1 bundel of 2 kg	500	BDT	2	kg	1000	BDT	CHECK: what is common in the local market?
Iron wire	1 bundel of 2,5 kg	310	BDT	2,5	kg	775	BDT	
scrap steel sheet	couple of scrap sheets	0	BDT	1	no.	0	BDT	included in timber exercise
Achoring Excercise								
Timber for achoring excercise	2"x3"x 8 foot	0	BDT	4	no.	0	BDT	included in timber exercise
Rope 'big'	1 bundel of 1 kg	450	BDT	1	kg	450	BDT	

Sandbags	5 to 10 pieces	20	BDT	10	no.	200	BDT	
scrap steel sheet	couple piece of	0	BDT	1	no.	0	BDT	included in timber exercise
Bamboo & earth construction								
Bamboo poles + bamboo for lats	10 foot long, diameter circa 9'' - 2,5''	0	BDT	0	no.	0	BDT	Materials are included in other exercises
Eearth	locally available	0	BDT	0	no.	0	BDT	
Cement	little bit from a regular bag, locally available	1	BDT	0	no.	0	BDT	
Used engine oil	small containe	50	BDT	1	no.	50	BDT	Used engine oil for protection of bamboo against moist
~~**Protection of Plinth excercise**~~								
~~Timber (or sticks)~~	~~2"x2"x 8 foot~~	0	BDT	1	no.	0	BDT	Not included in this exercise
~~scrap steel sheet~~	~~circa 2x2 foot~~	0	BDT	8	no.	0	BDT	
~~Bamboo sticks/poles~~	~~10 foot long, diameter circa 9'' - 2,5''~~	0	BDT	1	no.	0	BDT	
~~Bamboo matting~~	~~circa 3x3 foot~~	0		6	no.	0	BDT	
~~Sand bags~~	~~regular size~~	0		6	no.	0	BDT	
Miscelenious								
Food, drinks	snack and lunch	300	BDT	35	no.	10500	BDT	30 participants + 5 for facilitators/drivers
Shelter IEC colour prints: IEC emergency shelter; IEC 1 pager tip for shelter resilience; draft reference book for shelter resilience.		1500	BDT	1	no.	1500	BDT	
					Total	**34.045**	**BDT**	
						409	**USD**	

One-off costs

Gloves		100	BDT	16	no.	1600	BDT
CGI Cutter		300	BDT	2	no.	600	BDT
Hammer		320	BDT	12	no.	3840	BDT
Hand Saw		200	BDT	12	no.	2400	BDT
Iron rod to dig into ground		450	BDT	2	no.	900	BDT
Spade		250	BDT	2	no.	500	BDT
Hand drill (?)		350	BDT	2	no.	700	BDT
Plier, including cutting section (to cut rope)		270	BDT	3	no.	810	BDT
Tape-measure	Measure lint is also good (chea	100	BDT	5	no.	500	BDT
Plastic containers for soil tests		70	BDT	4	no.	280	BDT
					Total	**12.130**	**BDT**
						146	**USD**

Assumptions

No cost for venue - organised by IOM

There is no need for projector, possibly 25 colour prints of IEC materials

Participants arrange there own travel

No 'class room' training. I.e. no need for flip chart / board, projector, A5 papers, markers, pens, etc.

Workshop on Improving Shelter Resilience

Date : 15 July 2017

Venue : SHED, Cox's Bazar

Shelter Cluster Bangladesh
ShelterCluster.org
Coordinating Humanitarian Shelter

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Workshop on Improving Shelter Resilience

Date : 15 July 2017

Venue : SHED, Cox's Bazar

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