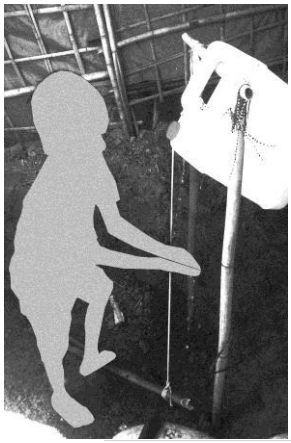
Technical data sheets of sanitation facilities

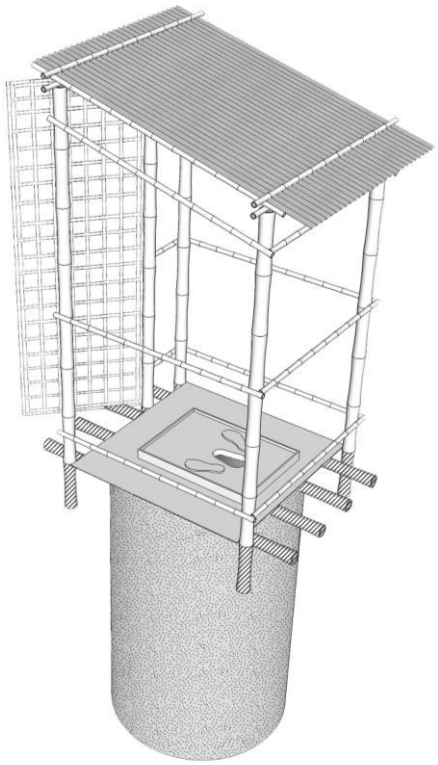
1- **Emergency latrine**
2- **Double pit latrines**
3- **Latrine decommissioning**
4- **Female washing point (bamboo)**
5- **Female washing point (tent)**
6- **Waste pit**
7- **Maintenance - Improvement**

EMERGENCY PLASTIC SLAB LATRINE

BUILDING MATERIALS				TOOLS	
Latrine		Tippy tap			
· Borak bamboo (ø8 cm | 2.20m)	6 pcs	· Wire	1 roll	· Crowbars	2 units
· Molly bamboo (ø3 cm | 8m)	10 pcs	· Jerrycan	1 unit	· Machete	2 units
· Tarpaulin	0.5 units	· Soap	1 unit	· Pliers	2 units
· Roof sheets	3 units	· Net	0.5 m2	· Bucket	1 unit
· Slab	1 unit			· Hoe	2 units
· Sandbags	10 units			· Rope	5 m.
· Door	1 unit			· Hammer	1 unit
				· Saw	1 unit
				· Spade	1 unit
Total cost 1 unit: US dollars		80.8 $		Total cost 1 unit: Takka	6628 ¥

*N: for a team of **4 workers** to build **1 latrine per day.** Constructions were done with local materials and techniques. Trainings were provided to improve workers' skills.*





Light materials simplify logistics, transport and construction.

Pre-assembled door reduces installation time.

Reusable cabin after latrine decommissioning.

Circular 2m3 pit. Could be reinforced in case of collapsing risk.

Easily replicable structures

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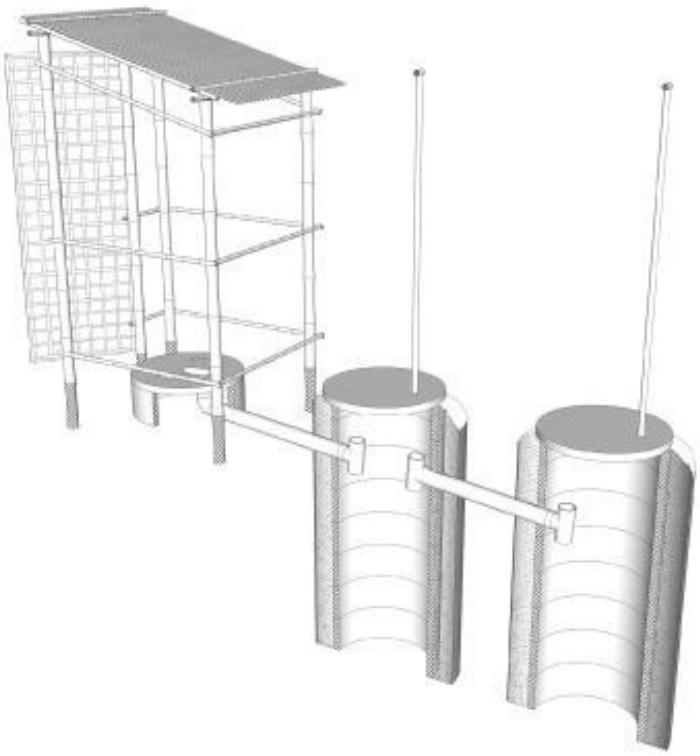
DOUBLE PIT LATRINE

BUILDING MATERIALS				TOOLS	
Latrine		Tippy tap			
· Borak bamboo (ø8 cm | 2.20m)	6 pcs	· Wire	1 roll	· Crowbars	2 units
· Molly bamboo (ø3 cm | 8m)	10 pcs	· Jerrycan	1 unit	· Machete	2 units
· Tarpaulin	0.5 units	· Soap	1 unit	· Pliers	2 units
· Roof sheets	3 units	· Net	0.5 m2	· Bucket	1 unit
· Slab	1 unit			· Hoe	2 units
· Sandbags	10 units			· Rope	5 m.
· Door	1 unit			· Hammer	1 unit
· Concrete rings	17 units			· Saw	1 unit
· Concrete cover	2 units			· Spade	1 unit
· PVC pipe + elbows + Ts (82mm)	2 units each			· Wire	2 rolls
· Mosquito net	0.5 m2				
Total cost 1 unit: US dollars		254 $		Total cost 1 unit: Takka	20846 ¥

*N: for a team of **6 workers** to build **1 latrine in 2 days, using prefabricated concrete rings or bamboo.** Constructions were done with local materials and techniques. Trainings were provided to improve workers' skills.*



Light materials simplify logistics, transport and construction.

Pre-assembled door reduces installation time.

Reusable cabin after latrine decommissioning.

Circular reinforced concrete 2m3 pit

VIP Latrine (ventilated improved pit)

Fly screen vector control

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LATRINES DECOMISSIONING

Objective
Establish safe action guidelines for the closure and decommissioning of emergency (non sustainable) latrines for utility, hygienic, environmental or any other reason that may be considered necessary.

Scope
Full, abandoned or non-maintained latrines (XX sector, Mainnerghona camp, Cox Bazar District) in the context of the emergency response.

Actions
Stabilize the excreta at the point of collection including pathogen reduction or disinfection, elimination of offensive odours and a general improvement of aesthetics and minimization in the potential of putrefaction.

Main methods used can be divided among:

- ***Physical Methods*** will include: gravity filtering, thermal and heat treatment, pasteurization, heat and air drying, gamma ray, electron beam, microwaves, homogenization and ultrasonic.
- ***Biological Methods*** will include: aerobic and anaerobic digestion and composting.
- ***Chemical Methods*** will include: alkaline treatment, lime stabilization, ferrate oxidation, ozone, chlorine dioxide, hydrogen peroxide and acid-liming (Bioset).

In the case of an emergency context as the present the following actions will be recommended:

1. Fence the working area.
2. Clean and disinfect the structure and slab or seats by dissolving chlorine in 3% water and applying with a manual pressure backpack sprayer.
3. Remove the structure so if possible, it could be used on another location or latrine. It would helpful if during the assembly of the structures re-utilisation had been considered.
4. Remove the slab and disinfect so it can possibly be used again in another location.
5. Apply any stabilization methods available, the following order of priority any of these stabilizers:
    - Calcium Oxide (Lime or quicklime)
    - Calcium Hydroxide (hydrated lime or lime paste)
    - Wood ashes.
    - Excreta from ruminants (sheep, cows, buffalo)

6. Throw inside the pit earth extracted from the vicinity mixed with one of the stabilizers. Add a lightweight layer every 30-cm alternating with a layer of the stabilizer itself. Continue to add layers of earth mixed with one of the stabilizers up to about 8 cm from the surface.

7. To close the latrine the following solutions can be applied:

   - Cover the pit with a concrete lid, making sure it is not easily removable.
   - Cover the pit with a tarpaulin with a wooden lid over it and protected by a surface fence. The slab would be easily recognized by the community as the place of a latrine, avowing future excavation or cropping around. It is precise to make sure the slab is properly closing the pit and it is not collapsible. **This is the preferred solution for Mainnerghona.**
   - Cover the pit with a latrine slab with a red X drawn on it.
   - Check the area after 7 days to assess whether it is necessary to perform any further action.
   - After 8 months, cover could be opened and manure generated by the biodegradation removed. The place could be used for a new latrine or simply left as natural soil.

Risks, Precautions and Personal Protection Equipment (PPE)

It's important to consider the lack of oxygen (concentration less than 21%) and the presence of toxic gases (hydrogen sulphide, methane, carbon monoxide) inside the pit and the possible risk of fire and explosion (natural gas, ammonia, carbon monoxide, methane).

As main precautions never enter a septic tank, use a toxic gas measuring equipment, have a safe source of water for washing eyes and mucous membranes, as well as for basic hygiene, do not smoke and avoid the use of any device that generates sparks or fire and always work in ventilated spaces.

Special attention must be paid when handling quicklime, as mixed with water generates a reaction which raises its temperature up to 90ºC / 194ºF.

All these activities must always be carried out by **TWO** or more people with mandatory use of individual protection equipment: gloves, masks, safety goggles and overall / boiler suits and a first aid kit nearby. Surrounding area should be marked so it is fully visible to vehicles and people, thus avoiding them driving or stepping on over the pit.

BAMBOO FEMALE WASHING POINT

BUILDING MATERIALS		TOOLS	
· Borak bamboo: ⌀8 cm | 2.20m · Molly bamboo: ⌀3 cm | 8m · Tarpaulin · Roof sheets · PVC board (1.20x1.20m) · 3'' o PVC pipe · 3'' o PVC elbow · Sandbags · Wire roll	10 units 15 units 1 unit 3 units 2 units 2 units 2 units 16 units 2 rolls	· spade · hoe · bucket · rope · hammer · pliers · saw · machete	1 unit 2 units 2 units 1 units 1 unit 2 units 1 unit 2 units
Total cost 1 unit: US dollars	126 $	Total cost 1 unit: Takka	10391 ¥

*N: for a team of **4 workers** to build **1 double female washing points per day.** Constructions were done with local materials and techniques. Trainings were provided to improve workers' skills.*

Light materials simplify logistics, transport and construction.

Pre-assembled door reduces installation time.

Reusable cabin after latrine decommissioning.

Adaptable to narrow spaces.

Easily replicable structures

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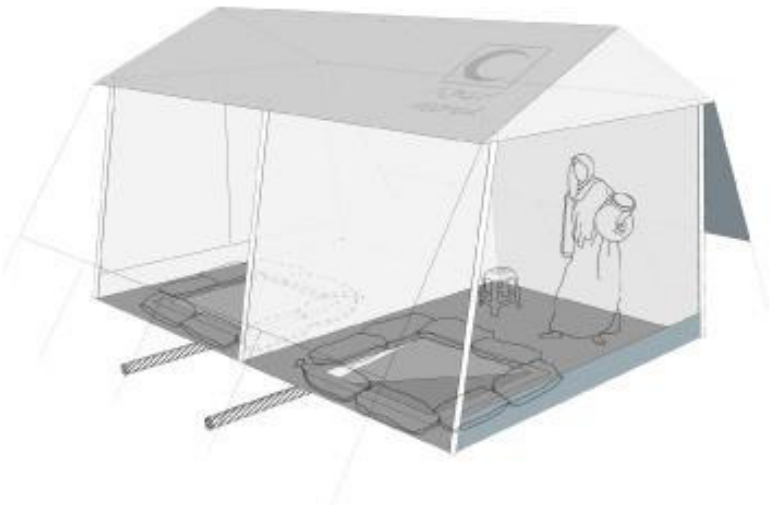
TENTED FEMALE WASHING POINT

BUILDING MATERIALS		TOOLS	
· Tent: 4.00 x 2.80m · Tarpaulin · PVC board: 1.20x1.20m · 3'' o PVC pipe · 3'' o PVC elbow · sandbags · wire roll	1 tent 0.5 units 2 units 2 units 2 units 20 units 2 units	· Machete · Pliers · Bucket · Hoe · Hammer · Saw · Spade	1 unit 1 unit 1 unit 2 units 1 unit 1 unit 1 unit
Total cost 1 unit: US dollars	60 $	Total cost 1 unit: Takka	4912 ¥

*N: for a team of **4 workers** to build **2 double female washing points per day.** Constructions were done with local materials and techniques. Trainings were provided to improve workers' skills.*



Light materials simplify logistics, transport and construction.

Tent frame reduces installation time.

Generous washing space.

Two female washing point per tent.

Plastic surface easily cleanable.

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INORGANIC WASTE PIT

BUILDING MATERIALS		TOOLS	
· Borak bamboo: ⌀8 cm | 2.20m · Molly bamboo: ⌀3 cm | 8m · Water tank 500 liters · Sandbags · Wire roll	4 units 4 units 1 unit 20 units 2 units	· Crowbars · Machete · Pliers · Bucket · Hoe · Rope · Hammer · Saw · Spade	2 units 2 units 2 units 1 unit 2 units 5 m. 1 unit 1 unit 1 unit
Total cost 1 unit: US dollars	87.16 $	Total cost 1 unit: Takka	7146 ¥

*N: for a team of **4 workers** to build **1 inorganic waste pit per day.** Constructions were done with local materials and techniques. Trainings were provided to improve workers' skills.*

Light materials simplify logistics, transport and construction.

Prefabricated tank reduces installation time.

Adaptable to narrow spaces.

Easily replicable structures

Easily identified by the community

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MONITORING AND MAINTENANCE SCHEME FOR SANITATION FACILITIES

PMO, Cox´s Bazar, December 2017

Objective

The monitoring, maintenance and improvement of sanitation facilities (excreta disposal, washing points, waste pits and drainages) implemented by ERU MSM20 is a key issue to ensure the impact, acceptance and sustainability of the intervention and the appropriate condition of the structures.

Monitoring and maintenance encompass not only technical issues, but also managerial, social and institutional. Thus, a properly monitored and maintained set of facilities are indeed the most visible evidence of ERU (and by extension of IFRC) commitment to the community and the best way of gather feedback about the satisfaction, needs and operational challenges.

The ERU MSM20 has set in action a monitoring and maintenance scheme in the intervention area (Balukhali 2, zone XX) targeted to the **221** facilities installed. The overall aim of this scheme is to ensure the effectiveness, to improve the quality and to facilitate the handover of the facilities.

Scope

Structures built in the XX sector, Mainnerghona camp, Cox Bazar District in the context of the emergency response. Improvement is considered as a step towards more sustainable solutions, to have a greater impact in the response.

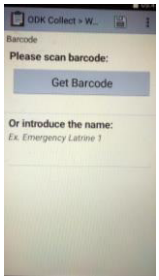
Monitoring

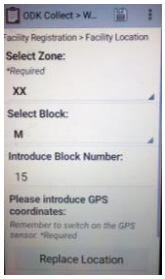
The monitoring process is based on Open Data Kit (ODK), a free and open-source set of tools that helps to get and manage data collected via Android devices. The procedure begins with the unambiguous identification of each facility by means of QR codes labels.

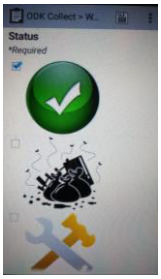
Through the QR recognition with the scan App of ODK, it is possible to create a specific data sheet for each facility, that includes:

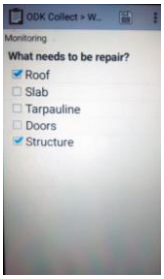
- Geo-location data
- picture
- status
- maintenance needed

At 23rd December, **167** facilities (> **80** %) have been already registered in the system. The monitoring system allows a simple and easy method for checking and report the condition of infrastructures using a smartphone, leading to an efficient planning and prioritization.









Maintenance

Maintenance works can be classified as follows:

- **Preventive maintenance**: includes work that is planned and carried out to strengthen or improve structures on a regular basis (e.g. changes of latrine/wash points roofs to avoid risks linked to corrugated metal or adjustments of bamboo framework joints) to maintain and keep the infrastructure in good condition.

- **Corrective maintenance:** minor repairs, generally doors and plastic sheeting replacements. In the future the decommissioning of latrines, when full, should be considered.

Every structure should be checked at least once every four weeks; two in the cyclone and heavy rain seasons.

At 23rd December, 23 reparations have been registered.

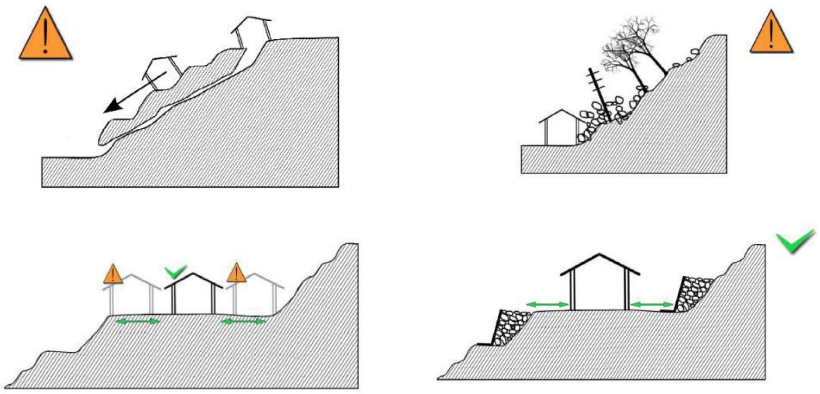
For capacity building purposes in proper maintenance works, a technical fact sheet has been designed.

Improvement actions and Recommendations

This section aims to raise awareness on the relevance of local knowledge and its potential to improve living conditions through technical solutions details developed to the best use of local resources and knowledge.

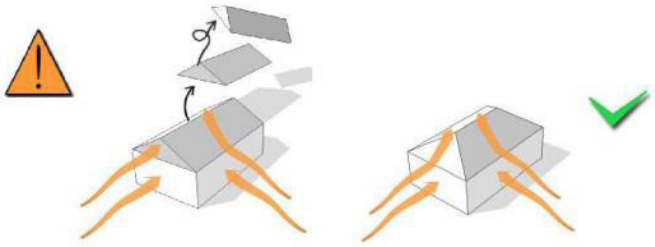
General

Site



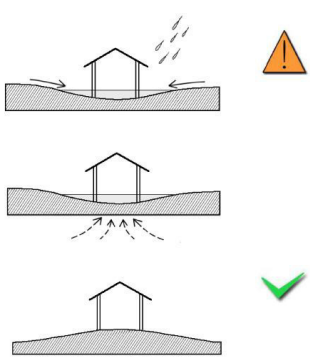
- Avoid construction in open areas not sheltered from the wind.
- Avoid locations close to surface water sources like rivers or lagoons.
- Stabilization of the land using plants to stabilize the soil.
- Give enough space to avoid risks of partial landslides and the collapse of nearby elements (poles, electrical wires, surrounding buildings, etc.)

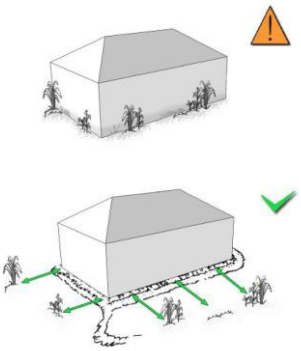
Wind



- Roof with 4 slopes are recommend to prevent wind hazards.
- Low houses prevent cyclone risks.

Floods

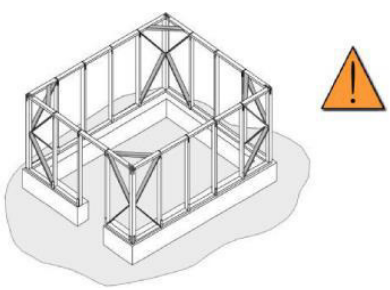


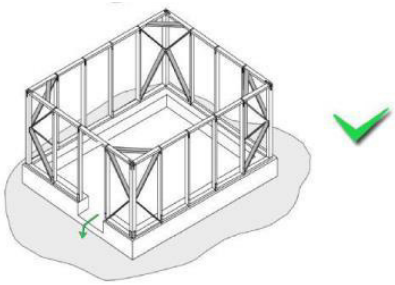


- Select always high grounds or raise the construction
- Construct drainages around the building to avoid flooding inside the house.

Construction

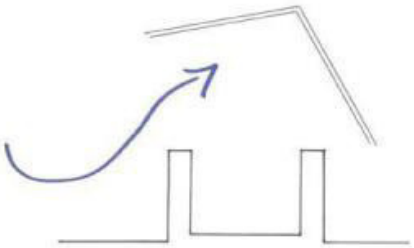
Structures





- *Diagonals on roof and walls*
- *Bamboo posts anchored in the ground at least ¼ of its length.*

Roofs



- *Plastic sheets instead of zinc sheets. Change*
- *Use always plaited wire*

Slab

- *Reinforce bamboo structure*

Tarpaulin

- *Use auxiliary bamboo structure*
- *Fold edges and corners*

Doors

- *Interior and exterior lock*
- *Use always plaited wire*
- *Use hollow bamboo as a hinge*

Odours

- *Turn into VIP latrines*