

# Tip sheets for shelter reinforcements and rainy season preparedness

North-East Nigeria

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## Contents:

- 1. Plastic Sheeting / Coverings: make it last longer**
- 2. Structural reinforcements** (incl. bracing, joints, foundations)
- 3. Protection from rains/winds and flood mitigation**

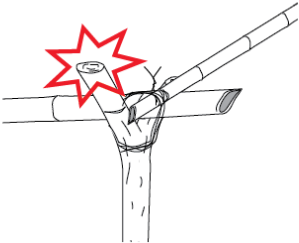
*Disclaimer: These tip sheets are intended to promote good building practices to repair, upgrade or prepare emergency and makeshift shelters to withstand strong winds and mitigate the risk of (localised) flooding. They should be used to aid the sensitisation conducted by site facilitators or site committees to raise awareness of displaced individuals and contractors, and shall not be simply distributed without adequate sensitisation.*



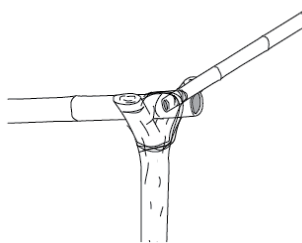
# Plastic sheeting

Ensure no sharp points damage the plastic sheet.

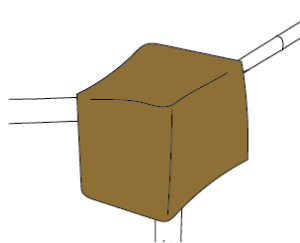
✗ Bad



✓ Better

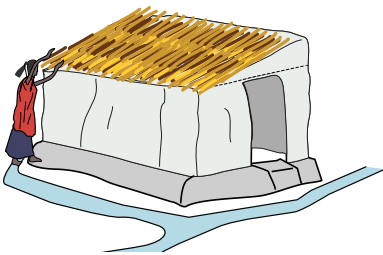


✓✓ Good

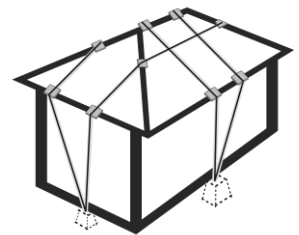


Use cardboard / other materials between sheet and frame

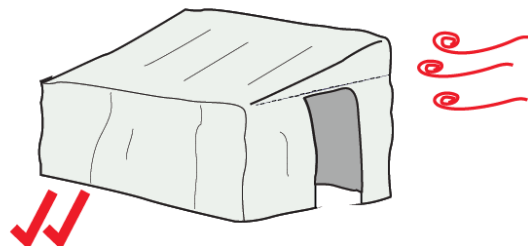
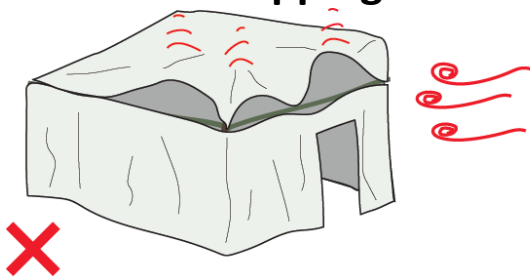
Protect sheets from the sun, using any materials available



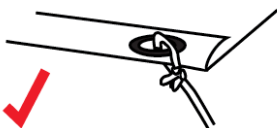
Add weights on the roof and tie it down with ropes and stones



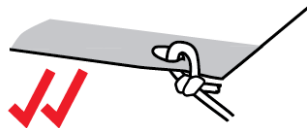
Stop plastic sheet flapping in the wind – it will get damaged



Ways of fixing by using rope



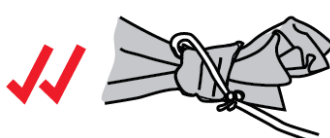
Rope through Eyelet



Rope through reinforcement band

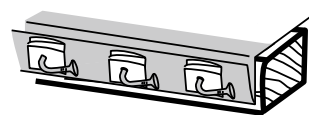


Place Stone Inside



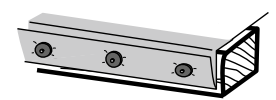
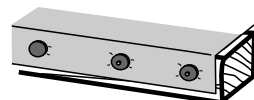
Make Knot with Rope Inside

-- or nails



Do bend nails, use washers or bottle caps

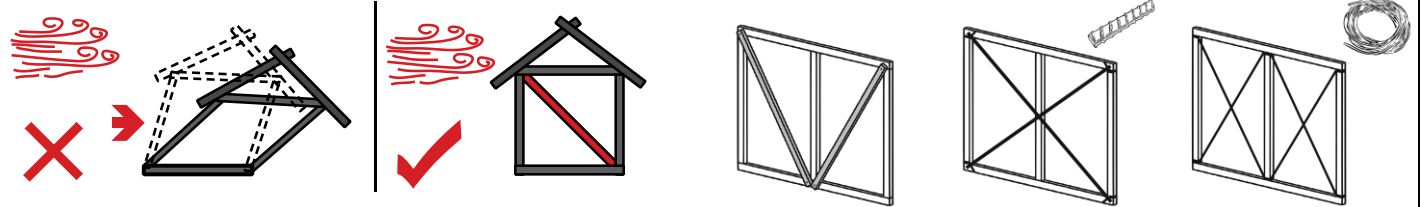
Bend nails, use washers, cardboard or bottle caps



Fold the sheet (or double-fold it)

# Structural reinforcements

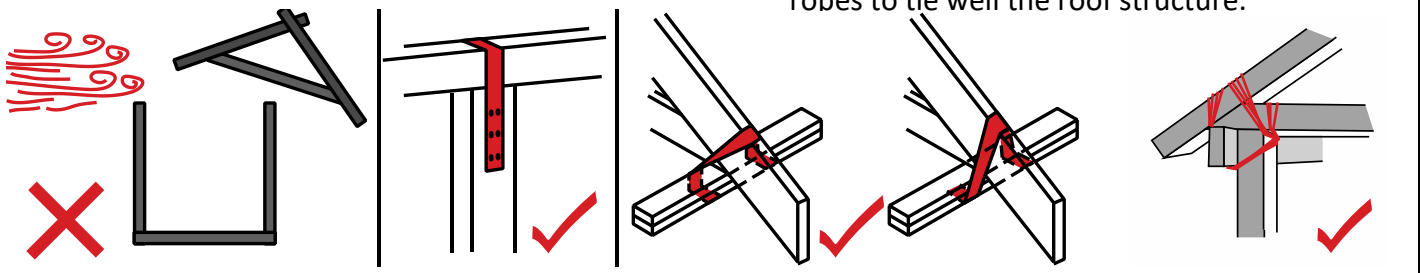
## 1. Brace the structure against the wind



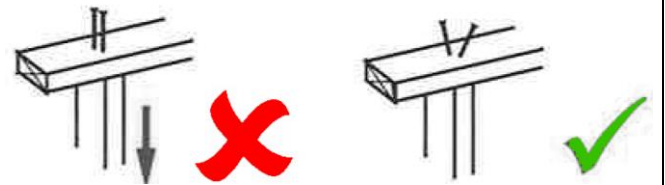
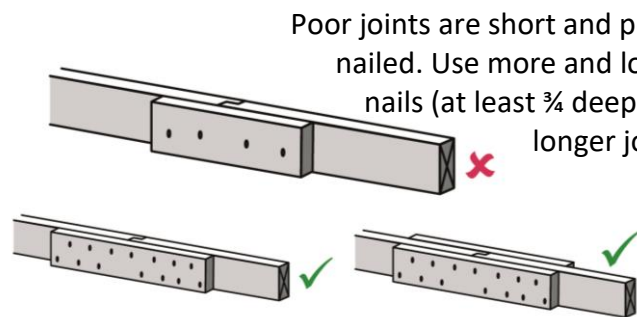
Timber, ropes, metal cables or full panels can be used. If using timber, ensure the bracing is on the inside of the shelter (or aligned with the vertical structure) rather than outside.

## 2. Strengthen joints and connections

Use metal straps (langa langa) or metal wires or ropes to tie well the roof structure.

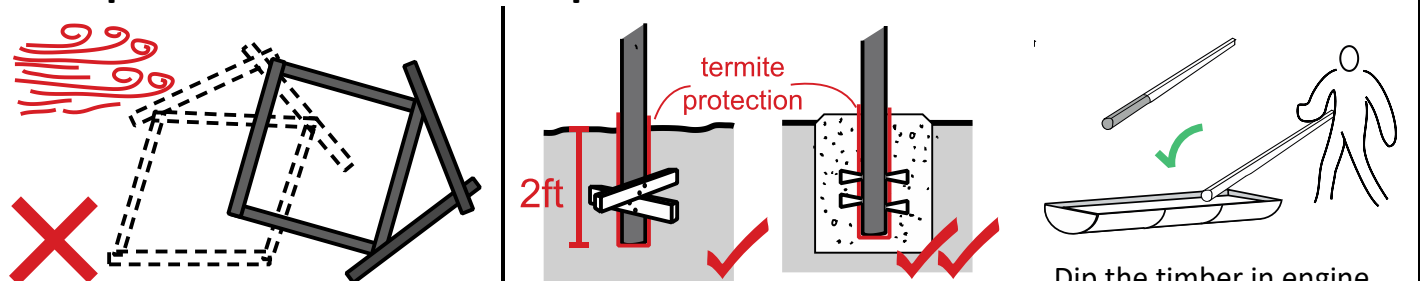


Poor joints are short and poorly nailed. Use more and longer nails (at least  $\frac{3}{4}$  deep) and longer joints.



If nails are the main (or only) connectors, use at least two and at an angle, not straight.

## 3. Improve foundations and protect timber from termites



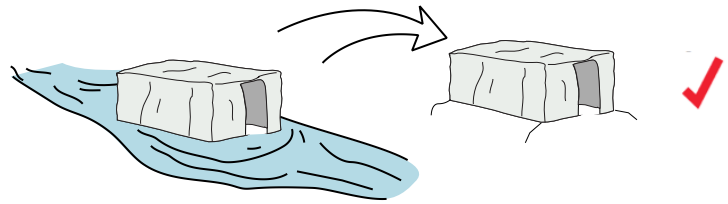
Add a footing/anchor, e.g. by using leftover pieces of timber, or concrete

Dip the timber in engine oil, rather than painting over it, for at least 2-3 ft.

## 4. Replace weak or damaged elements (timber, plastic/roofing sheets)

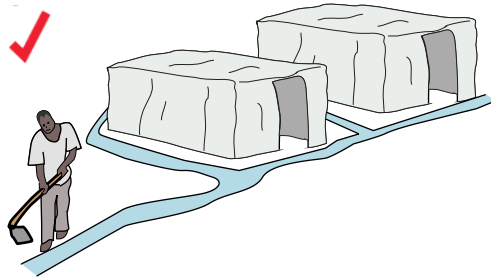
# Rainy season / flood mitigation

Ensure site-level drainage is in place and is free of debris and waste.

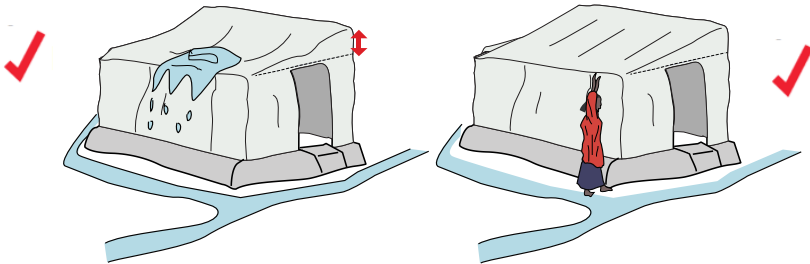


Avoid low land and flood-prone areas

Dig drainage ditches around shelters and connect them to the main drainage channels



Keep drainage ditches clear of waste/debris

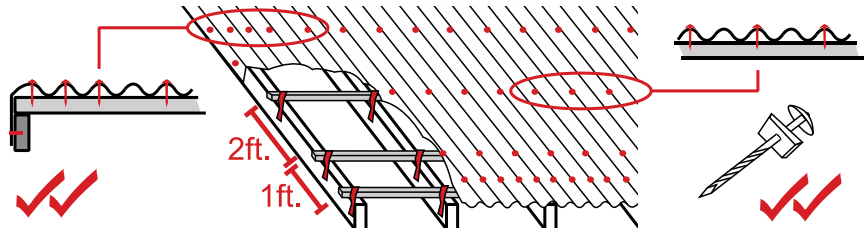
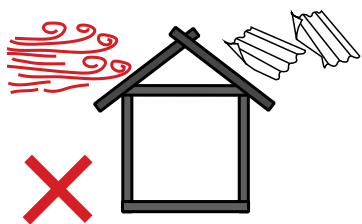


Use a sloped roof and pull roof coverings tight to allow for water run-off



Raise the floor and protect the sides with sand/soil

Upgrade/replace roof coverings to make them waterproof, to avoid leaking



If available, use roofing sheets and connect them well to the roof structure