



Malawi Shelter Cluster Technical Working Group for Promoting Safer Building Practices in Malawi

a collaboration with the Global Shelter Cluster Working Group on “Promoting Safer Building Practices” and partners of the GCRF research project





Agenda:

- 1. recap key weaknesses in rural housing : WHY do certain elements fail and how can those weaknesses be addressed**
- 2. Introduction and recap of last meetings discussions and conclusions**
- 3. What could be „green“ materials and technologies for Malawi ?**
- 4. What could be criteria to decide whether a material or technology is suitable and feasible for housing construction in poor communities**
- 5. AOB, suggestions for way forward**





Recap key weaknesses in rural housing FOUNDATIONS :

- Most houses do not have foundations or very shallow or only a header course to start wall construction → **house will be very vulnerable to flooding as well as EQ, walls are likely to fail in such events;**
- no use of damp proof membrane to protect wall from capillary effect of moisture from the ground → **structural strength is weakened considerably**
- plinth wall not protected against rain or splashing water → **rain and splashing water at the wall base can slowly erode the wall and weaken the whole structure.**



Wall starting on a header course on the ground without foundation



1. Absence of damp proof course.
Moisture reduces wall resistance



how to address foundation weaknesses

Ideal: build strong and deep foundations using durable materials

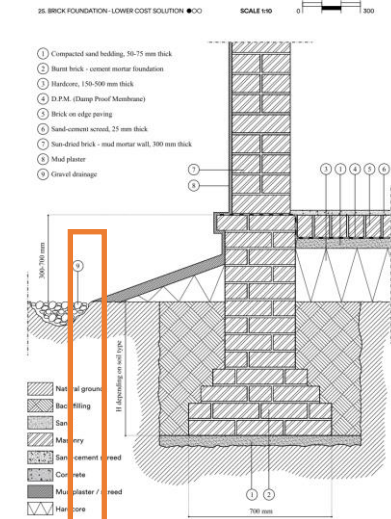
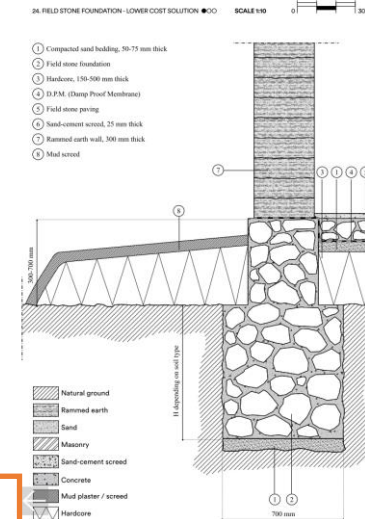
- Rubble (field stone) masonry
- Burnt brick with cement mortar

Low cost alternative solutions

- Damp proof membrane
- Raised plinth, ideally protected with bricks and/or plaster



Verandas (*khonde*) and other exterior covered spaces where many daily life activities take place as these shadowed spaces are very comfortable in hot days. House in Penganga, Ntcheu. © Jon Twingi



Plastic membrane protecting the wall from humidity in Masako, Dowa (bottom). © Jon Twingi



Recap key weaknesses in rural housing STRUCTURE:

- structural elements are often not properly dimensioned (only one-brick walls or too thin lintels) → **the whole loadbearing structure is weak and at risk of collapse!**
- structural timber parts and/or not treated against termite infestation → **risk of termite infestation that can weaken and destroy the structure!**



Walls with insufficient thickness and an important height are dangerous in the events of a disaster as they are not stable enough. CC - Ignasio Ngoma



When wooden poles are in direct contact with the ground and are not regularly treated or replaced, they are vulnerable to rising damp and decomposition. Veranda in Lfidzi, Salima. © Jon Twingi

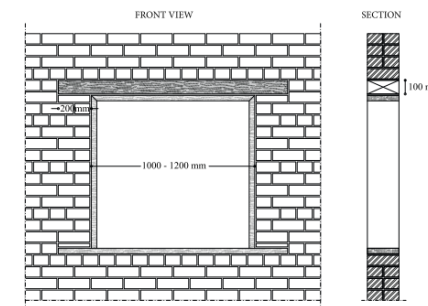
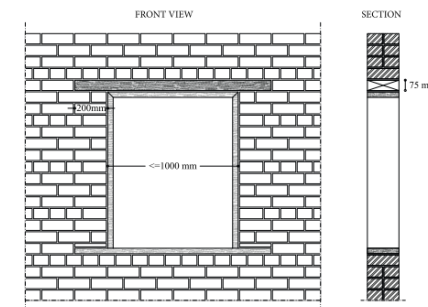


how to address weaknesses of the structure:

Ideal: Use strong and durable materials (like burnt brick and concrete) and proper dimensioning of elements

Low cost alternative solutions

- use good quality affordable materials and ensure good workmanship with the right techniques and constructive details
- Ensure proper dimensioning of all elements (walls and lintels, roof)
- Build walls with “stepped corners”
- Use termite treatment on wooden parts





1. Introduction and recap of last meetings discussions and conclusions

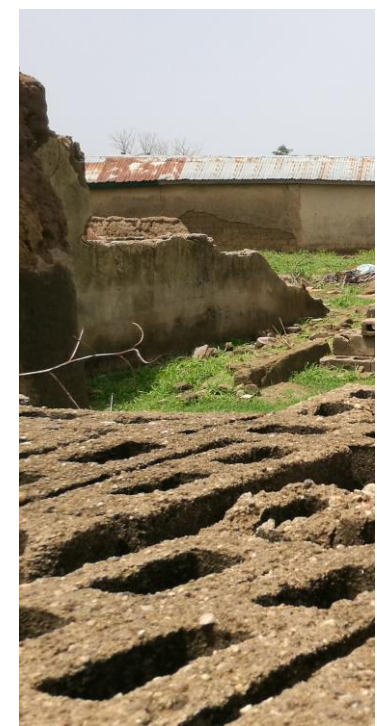
- Focus not only on technical solutions but on awareness raising and better understanding of weaknesses and risks
- Discussion on what are “green technologies”

→ **how to work towards the shared ambition of providing strong, durable housing facing the realities of poverty, lack of resources and limited capacities ?**





3. What could be „green“ materials and technologies for Malawi ?





What could be criteria to decide whether a materials, techniques, solutions is suitable: environmental aspects, affordability, availability,

■ ■ ■

	Very low cost		low cost		medium cost		High cost		Very high cost	
Foundation	Technical affordability	(range 1 to 5)	Technical affordability	(range 1 to 5)	Technical affordability	(range 1 to 5)	Technical affordability	(range 1 to 5)	Technical affordability	(range 1 to 5)
	Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures	
	Technical relevance	(range 1 to 5)	Technical relevance	(range 1 to 5)	Technical relevance	(range 1 to 5)	Technical relevance	(range 1 to 5)	Technical relevance	(range 1 to 5)
	Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures	
	Social impact	(range 1 to 5)	Social impact	(range 1 to 5)	Social impact	(range 1 to 5)	Social impact	(range 1 to 5)	Social impact	(range 1 to 5)
	Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures	
	Environmental impact	(range 1 to 5)	Environmental impact	(range 1 to 5)	Environmental impact	(range 1 to 5)	Environmental impact	(range 1 to 5)	Environmental impact	(range 1 to 5)
	Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures	
	Cultural impact	(range 1 to 5)	Cultural impact	(range 1 to 5)	Cultural impact	(range 1 to 5)	Cultural impact	(range 1 to 5)	Cultural impact	(range 1 to 5)
	Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures		Mitigation measures	