SHELTER DESIGNS
IN THE NORTHERN REGION OF
MOZAMBIQUE

CATALOGUE OF THE DIFFERENT
SOLUTIONS APPLIED BY
SHELTER CLUSTER PARTNERS

- OCTOBER 2021 -
### SHELTER ASSISTANCE TYPE

<table>
<thead>
<tr>
<th>B</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td><strong>METHODOLOGY</strong></td>
<td>Distribution of Basic HH kit for self-construction</td>
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<td></td>
</tr>
<tr>
<td><strong>AREA</strong></td>
<td>9-18 sqm (depending on the solution)</td>
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<tr>
<td><strong>COST</strong></td>
<td>179 USD</td>
<td></td>
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<tr>
<td><strong>TIME</strong></td>
<td>Depending on the solution chosen</td>
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<tr>
<td><strong>MATERIALS PROVIDED</strong></td>
<td>Tarp + tools (+NFIs)</td>
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<tr>
<td><strong>LIFESPAN</strong></td>
<td>6-12 months</td>
<td></td>
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<tr>
<td><strong>HLP</strong></td>
<td>Plots allocated by CCCM – DUAT for the site</td>
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</tbody>
</table>

**CONCLUSION**

This minimum kit, supported by tools and technical guidance for BBB practices would be the most efficient, but vulnerable HHs would require assistance for construction.

- Resilience of shelters not guarantee.
- Environmental impact due to the uncontrolled collection of local materials.
- Lack of technical support affects the impact.

+ Supports coping mechanisms, increasing resilience.
SHELTER ASSISTANCE TYPE

**METHODOLOGY**
Provision of materials and construction by 2 skilled carpenters and 3 assistants

**AREA**
11,4 sqm/unit – 45,6 sqm/module – 182,4 sqm/block

**COST**
295 USD/unit – 4,700 USD/block 16 units

**TIME**
14 days

**MATERIALS PROVIDED**
Wooden poles, bamboos, CGIs, nails, rope, etc.

**LIFESPAN**
1-2 years

**HLP STATUS**
Plots allocated by CCCM – DUAT for the site

Shelter solution for people on transit
Independents units within the communal shelter

Limited space
Lack of privacy
Temporary solution for a limited period of time

**CONCLUSION**
This communal shelter is adequate for people in transit, before relocation is done to the site or for a limited period of time while traveling to the final destination.
SHELTER ASSISTANCE TYPE

**METHODOLOGY**
Distribution of key materials and labor provided

**AREA**
8 sqm

**COST**
99 USD (with labor)

**TIME**
1.5–4 hours

**MATERIALS PROVIDED**
Bamboo, common nails 3.5”-5”, recycled rubber cord “corda de pneo”, bamboo mat “esteira”, tarpaulin.

**LIFESPAN**
6 months

**HLP STATUS**
Plots allocated by CCCM – DUAT for the site

Quick construction
Transport materials for a high number of shelters in the same truck.
Low cost
Good dimensions for temporary centres.
Easy to transport

Limited space and lack of privacy
Requires treatment of bamboo
Not easy to upgrade
No elevation from the ground
Protection concerns as there are no internal divisions and no doors

**CONCLUSION**
It is a fast solution for an immediate response in a temporary site but needs to immediately be upgraded if the intention is of a longer stay.
SHELTER ASSISTANCE TYPE

<table>
<thead>
<tr>
<th>METHODOLOGY</th>
<th>Distribution of materials and labor provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA</td>
<td>11 sqm</td>
</tr>
<tr>
<td>COST</td>
<td>41 USD (labor?) – 2,500 MZN</td>
</tr>
<tr>
<td>TIME</td>
<td>1 day</td>
</tr>
<tr>
<td>MATERIALS</td>
<td>All materials distributed: bamboo, common nails 3.5”-5”, recycled rubber cord “corda de pneo”, bamboo mat “esteira”, tarpaulin.</td>
</tr>
<tr>
<td>LIFESPAN</td>
<td>6 months</td>
</tr>
<tr>
<td>HLP STATUS</td>
<td>Area for construction provided by local authorities - DUAT TBC</td>
</tr>
<tr>
<td></td>
<td>Can be built quickly</td>
</tr>
<tr>
<td></td>
<td>It is not necessary technical support</td>
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<tr>
<td></td>
<td>It was accepted by the community</td>
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<tr>
<td></td>
<td>Pieces of the roof very well tied</td>
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<tr>
<td></td>
<td>Resilient against strong winds community</td>
</tr>
<tr>
<td></td>
<td>Can be easily upgraded</td>
</tr>
<tr>
<td></td>
<td>It is cheap</td>
</tr>
<tr>
<td>+</td>
<td>It is necessary to be trained</td>
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<tr>
<td></td>
<td>It is necessary to have some technical skills</td>
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<tr>
<td></td>
<td>It is different from the common shelters</td>
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<tr>
<td></td>
<td>Difficult to replicate by the community</td>
</tr>
<tr>
<td></td>
<td>without training</td>
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</table>

CONCLUSION

It is a very resilient solution for emergency shelter, with great optimization of resources, and attractive for the community, however, its technical complexity requires technical skills and training.
### METHODOLOGY
- **Materials and labor provided**

### AREA
- 9 sqm

### COST
- 26 USD

### TIME
- 1 day

### MATERIALS PROVIDED
- Tarp, Bamboo, Tie Wire, Nails, etc

### LIFESPAN
- 6-12 months

### HLP STATUS
- Plots allocated by CCCM – DUAT for the site

#### Positive
- Construction time is very short
- Economic
- Quickly assembled by low skilled people
- Easy to be extended
- Area of coverage is good for 3 family members, when normal family size is 5

#### Negative
- Requires treatment of bamboo
- Not easy to upgrade
- No elevation from the ground
- Protection concerns as there are no internal divisions and no doors

### CONCLUSIONS
- This solution was used as a phased approach in order to allocate families in their plots, while they could start the construction of their permanent shelter. However, as this solution covers main shelter needs, community was not encouraged to build permanent shelters quickly. Strong mobilization required.
METHODOLOGY
Materials provided and construction done by a team of 4-6 people + additional team for mudding task to assist to vulnerable families

AREA
8 sqm (+8 sqm exterior/kitchen area) to be extended to 16 sqm

COST
120 USD

TIME
4–6 hours

MATERIALS PROVIDED
Tarp, Wooden poles, bamboo, tie wire, rubber rope and nails

LIFESPAN
12 months

HLP STATUS
Plots allocated by CCCM – DUAT for the site
Strong community appropriation of the model, which has ensured the transmission of knowledge.
Improvement on local construction techniques.
Easy upgrading and scalability.
More durable solution including local materials and technique

+ Lifespan reduced due to the tarp lifespan
Risk during the rainy season due to lack of foundation

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CONCLUSIONS
Improved immediate emergency shelter solution in terms of technique and size. This core-emergency shelter is inspired in local construction, so it has generated a great degree of acceptance. However, the roofing materials require constant maintenance and replacement to ensure their durability.
<table>
<thead>
<tr>
<th>METHODOLOGY</th>
<th>Distribution of materials, and self-construction with technical guidance</th>
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</thead>
<tbody>
<tr>
<td>AREA</td>
<td>18 sqm</td>
</tr>
<tr>
<td>COST</td>
<td>236 USD (including labor)</td>
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<tr>
<td>TIME</td>
<td>3 days</td>
</tr>
<tr>
<td>MATERIALS PROVIDED</td>
<td>Materials provided: Bamboo, local wooden poles “estacas”, common nails 3.5”-5”, recycled rubber cord “corda de pneo”, bamboo mat “esteira”, tarpaulin, burnt wire, thick plastic.</td>
</tr>
<tr>
<td>LIFESPAN</td>
<td>6-12 months (depending on the upgrade)</td>
</tr>
<tr>
<td>HLP STATUS</td>
<td>Plots allocated by CCCM in coordination with INGD – DUAT for the site</td>
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</table>

**CONCLUSION**
Efficient design for immediate upgrade of most emergency shelter solution, providing more adequate space, and that also can be further upgraded. It has good acceptance in the community.
**METHODODOLOGY**  Construction by skilled and unskilled teams

**AREA**  24 sqm (6x4 m)

**COST**  1,300-1,600 USD (including labor)

**TIME**  7 days

**MATERIALS PROVIDED**
- Bamboo, local wooden poles “estacas” (Pau Rachado\Eucaliptus),
- Wooden poles “Barrotes”,
- Corrugated Galvanized Iron roof sheet,
- Iron rods,
- Cement,
- Fixing materials,
- Doors,
- Windows, etc.

**LIFESPAN**  5-10 years

**HLP STATUS**  IDPs living in resettlement sites on plots of 20m x 30m provided by the Government.

**POSIBILITIES OF EXPANSION AND UPGRADE**
- Enough space and privacy
- Offers strong foundations and strong structure with bracings

**USE OF WOODS AND BAMBOO IS HIGH**
- Cost may be high for the most vulnerable communities.
- Requires plastering to protect the walls from rain, this increases the cost

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**CONCLUSION**
- It is a fast solution for a permanent shelter solution, with improvement of local construction techniques that can easily be replicated by the community. It has good acceptance in the community.

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*PALPOC defines this solution as a Permanent Shelter Solution*
**SHELTER ASSISTANCE TYPE**

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**METHODOLOGY**

Construction done by 14 daily workers

**AREA**

24.5 sqm

**COST**

500 USD

**TIME**

8 days

**MATERIALS RECEIVED**

Wooden poles, timber, bamboo, CGI, tire wire, nails, rope, etc.

**LIFESPAN**

5-10 years

**HLP STATUS**

Resettlement site provided by the Government.

**CONCLUSION**

This permanent solution is adequate for the context as it is socially accepted and can be easily replicated. It incorporates BBB principles, with some attention to the traditional technique, to increase its resilience.

- Easy to build
- Traditional technique well known by the community
- It can be upgraded
- Improved ventilation and privacy
- Use local materials
- Adequate overhang

- High quantity of materials required
- Requires maintenance
**METHODOLOGY**

Construction with hired labor and support from beneficiaries

**AREA**

18 sqm

**COST**

670 USD

**TIME**

5 days

**MATERIALS PROVIDED**

Tarp, wooden poles, bamboo, CGIs, Tie Wire, Nails, rope, cashew nut oil, bolt lock, etc

**LIFESPAN**

15 years

**HLP STATUS**

Plots allocated by CCCM – DUAT for the site

- More covered space and privacy.
- More durability
- Safe construction
- Technical knowledge provided to beneficiaries

+ It takes too long to be built.
- Requires technical skills.
- If built by beneficiaries, requires a lot of mobilization.

**CONCLUSION**

This permanent solution is adequate for the context as it is socially accepted and can be easily replicated. It incorporates BBB principles, with some attention to the traditional technique, to increase its resilience.
SHELTER ASSISTANCE TYPE

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**METHODOLOGY**
Construction with skilled labor

**AREA**
20.54 sqm

**COST**
1,700 USD (including labor)

**TIME**
1 day prefabrication + 9 days construction

**MATERIALS PROVIDED**
Bamboo, wooden poles, CGI roofing, mosquito net, chicken net, rebars, cement, fixing materials, etc.

**LIFESPAN**
10-20 years

**HLP STATUS**
Beneficiaries own the land

**CONCLUSION**
It is a fast solution for a permanent shelter solution. Adapted technique using local materials, but too complex to be replicated, especially in remote areas (islands).

- **Construction time adequate**
- **Resilient solution**
- **Can be upgraded easily**
- **Proper ventilation**
- **Adequate space, privacy and safety**

- **It requires technical support**
- **Cannot be replicated by the community**
SHELTER ASSISTANCE TYPE

**METHODOLOGY**  Construction with hired labor

**AREA**  33,6 sqm

**COST**  840 USD (including labor)

**TIME**  6 days

**MATERIALS**  Wooden poles, bamboo, CGI, tire wire, nails, door, windows, cashew nut oil, locks, etc.

**RECEIVED**  Land selected by the Government - DUAT TBC

**LIFESPAN**  25 years

**HLP STATUS**  Easy to build

- Traditional technique well known by the community
- It can be upgraded
- Improved ventilation and privacy
- Use local materials
- Lack of community participation
- Lack of elevated platform
- Small overhang by the sides to protect the mud walls

**CONCLUSION**  This permanent solution is adequate for the context as it is socially accepted and can be easily replicated. However, technique can be improved by including more BBB principles, and community participation should be encouraged.
### SHELTER ASSISTANCE TYPE

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</table>

### METHODOLOGY
- Construction with hired labor (skilled and unskilled)

### AREA
- 24 sqm (6x4 m)

### COST
- 1,300-1,600 USD (including labor)

### TIME
- 7 days

### MATERIALS PROVIDED
- Bamboo, local wooden poles “estacas” (Pau Rachado\Eucaliptus), Wooden poles “Barrotes”, Corrugated Galvanized Iron roof sheet, Iron rods, cement, fixing materials, doors, windows, etc.

### LIFESPAN
- 5-10 years

### HLP STATUS
- IDPs living in resettlement sites on plots of 20m x 30m provided by the Government.

### POSSESSIBILITIES OF EXPANSION AND UPGRADE
- Enough space and privacy
- Offers strong foundations and strong structure with bracings

### USE OF WOODS AND BAMBOO IS HIGH
- Cost may be high for the most vulnerable communities.
- Requires plastering to protect the walls from rain, this increases the cost

### CONCLUSION
- It is a fast solution for a permanent shelter solution, with improvement of local construction techniques that can easily be replicated by the community. It has good acceptance in the community.
RESETTLEMENT SITE + RURAL

SHELTER ASSISTANCE TYPE

METHODOLOGY
Construction with hired labor (skilled and unskilled)

AREA
24 sqm

COST
1,800 USD (including labor)

TIME
10 days

MATERIALS PROVIDED
CSEB, wooden poles, CGI roofing, Iron rods, cement, fixing materials, doors, windows, etc.

LIFESPAN
15-30 years

HLP STATUS
Resettlement site provided by the Government.
Possibilities of expansion and upgrade
Adequate space and privacy
Offers strong foundations and strong reinforced walls
Cheaper and more sustainable solution vs. cement blocks

CSEB bricks vary in quality when done with manual machine or when done with industrial machine
Cost may be high for the most vulnerable communities.

CONCLUSION
Design that offers a permanent shelter solution, improvement of local construction techniques (from the regular soil brick to a stabilized soil brick) that can easily be replicated by the community with appropriate machinery. It has good acceptance in the community.

*PALPOC defines this solution as a Permanent Shelter Solution
**METHODOLOGY**  
Construction with hired labor (skilled and unskilled)

**AREA**  
24 sqm

**COST**  
2,300 USD (including labor)

**TIME**  
10 days

**MATERIALS PROVIDED**  
Cement blocks (10”, 15”, 20”), Wooden poles, CGI roof sheet, Iron rods, cement, fixing materials, doors and windows, etc.

**LIFESPAN**  
15-30 years

**HLP STATUS**  
Resettlement site provided by the Government.

*Possibilities of expansion and upgrade*  
Adequate space and privacy (internal partitions)  
Offers strong foundations and strong reinforced walls

*Cement bricks vary in quality when done with manual machine or when done with industrial machine*  
Cost is high as it requires more cement and iron

**CONCLUSION**  
Design that offers a permanent shelter solution that can easily be replicated by the community with appropriate training and orientation. It has good acceptance in the community.

*PALPOC defines this solution as a Permanent Shelter Solution*