CCCM CLUSTER ONLINE MEETING 2021

SMAC - A Life Cycle Analysis Tool to Assess the Carbon Footprint of Humanitarian Shelter Options

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Why Consider Life Cycle Assessment?

- Cradle to grave
- Allows for consideration of global environmental impact
- Results can be expressed as CO^2 equivalents for comparative impact measurement
- Carbon foot printing/"greening" of operations
- Allow shelter designers to modify designs to minimize CO^2 equivalents
- Better shelter product by improving decision making

Do no harm

Inappropriate humanitarian disaster responses can inadvertently do more harm than good.

Be climate sensitive

Failure to consider the links between disaster responses, environmental resources and climate change can increase the risk of conflict by damaging the natural resource base that communities rely on.

Conflict responses must be 'disaster smart'

Disaster-blind conflict interventions, such as poorly planned resettlement programmes, can reinforce disaster risks.

Distribute aid equitably and avoid exacerbating inequalities

Humanitarian responses can exacerbate pre-existing inequalities or create new ones by unequally distributing aid.

Don't assume responses are politically neutral in fragile situations

By assuming that humanitarian efforts are immune to political manipulation, aid workers may inadvertently cause harm, exacerbating grievances in places where state–citizen relations are already fragile.

Sphere Shelter Standard 7 Indicator 3: "Percentage of shelter constructions using low carbon emission construction materials and methods" (Sphere, 2018).

1 SHEET

Reducing environmental impact in humanitarian response

Thematic sheets provide more detailed guidance and reflections on themes relevant to the Sphere Handbook. They are based on inputs received throughout the 2017-18 Handbook revision and further guidance and can be updated over time as needed, to reflect learning in the sector.

Sphere

The environment in humanitarian action: towards sustainability, resilience and accountability

"Programmes should minimise their environmental impact and consider how procurement, transport and choice of materials, or land and natural resource use may protect or degrade the environment further." (Sphere Handbook: *What is Sphere?)*

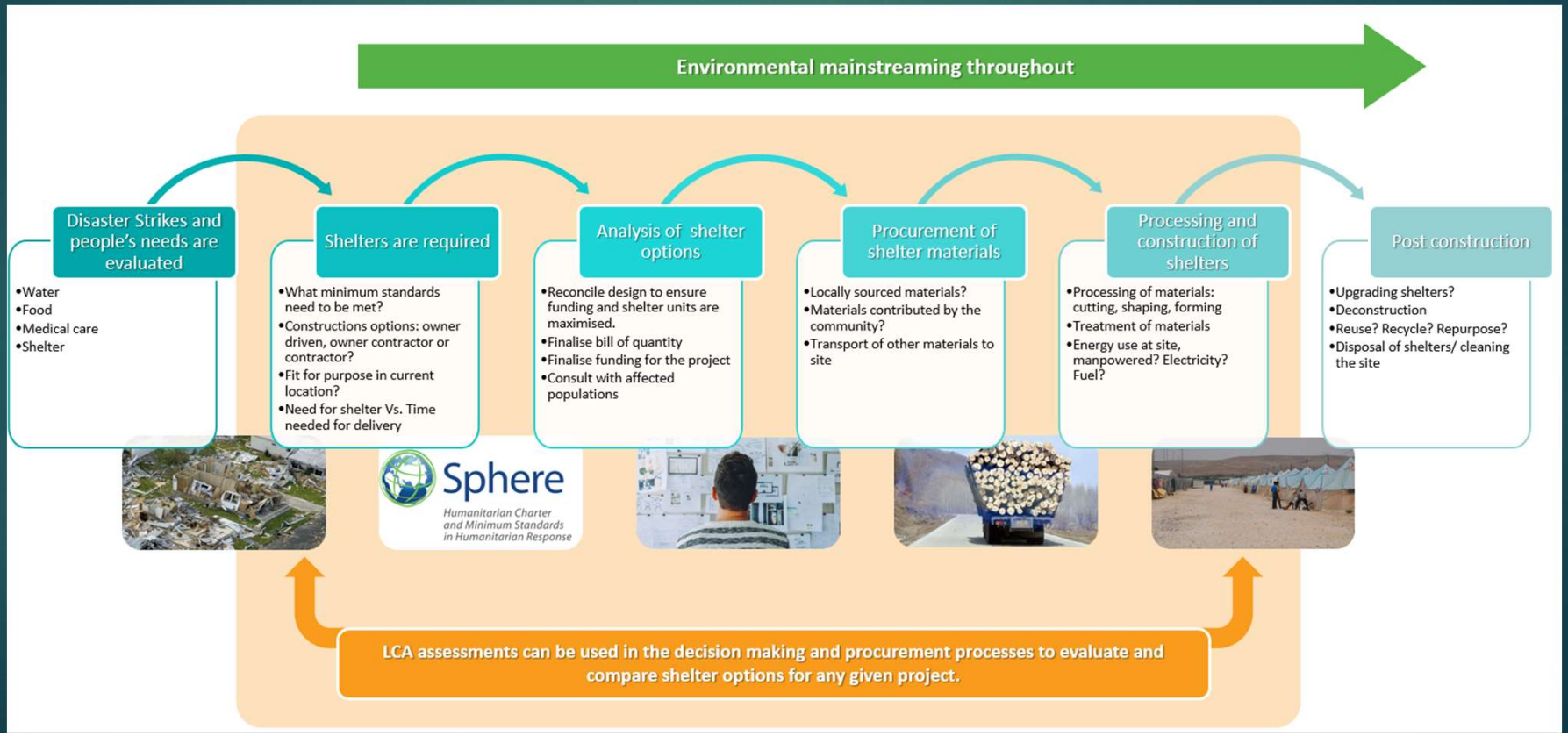
Shelter and settlement standard 7 on Environmental sustainability is the most prominent environmental reference in Sphere and to a large extent can be applied to other sectors. Its key activities are:

- Integrate environmental impact assessment and management into all planning;
- Implement environmentally sustainable programmes;
- Select sustainable materials and techniques;
- Manage key environmental impact issues such as solid waste, energy and land use practice;
- Establish, restore and promote safe, reliable, affordable and environmentally sustainable energy supply systems; and
- Protect, restore and improve the ecological value of operational sites during and after use and decommission/transition to development in an environmentally sensitive way.

The Tool – Based on BRE's LIST

https://www.bretrust.org.uk/knowledgehub/lca-for-the-humanitarian-sector/

To Inform and Support Decision-Making



Using SMAC – Shelter Methodology for the Assessment of Carbon

- Excel-based tool
- Easy (and quick) to Use – Non-expert methodology
- Designed to allow comparison between different shelter specifications
- Based on Bill of Quantities for shelter specifications, requiring information on
  - Component Materials
  - Packaging Materials
  - Transportation Distances and methods
  - End of Life Considerations

Using SMAC

B	C	D	E	F	G	H	I	J	K	L
Specification 1										
General product details										
Name:	Example product 1									
Description:	Example product 1 is XXXXXX									
Specification 1 Life Expectancy	0									
Country of manufacture										
Country of use										
Weight per unit (kg)	251									
Raw materials average Recycled content %	15%									
Packaging materials average Recycled content %	#DIV/0!									
Component Materials										
Component Number	1	2	3	4	5	6	7	8	9	10
Component Name	Example 1A	Example 1A	Example 1A							Example 1A
Notes										
Level 1	Concrete	Composite	Brick							Wood and Boards
Level 2	Structural Concrete	Glass Fibre Reinforced Plastic	Clay Brick							Board
Level 3	:3 (Cement:Sand:Aggregate) no r	Polyester Resin								MDF
Level 4		GFRP Composite Poles								
All level entry										
kgC02eq/kg	0.155	9.9	0.213	0	0	0	0	0	0	0.856
Material Quantity (kg)	120	25	50	0	0	0	0	0	0	30
Recycled content (%)	50%	90%	0%	0%	0%	0%	0%	0%	0%	10%
Recycled at end of life (%)										

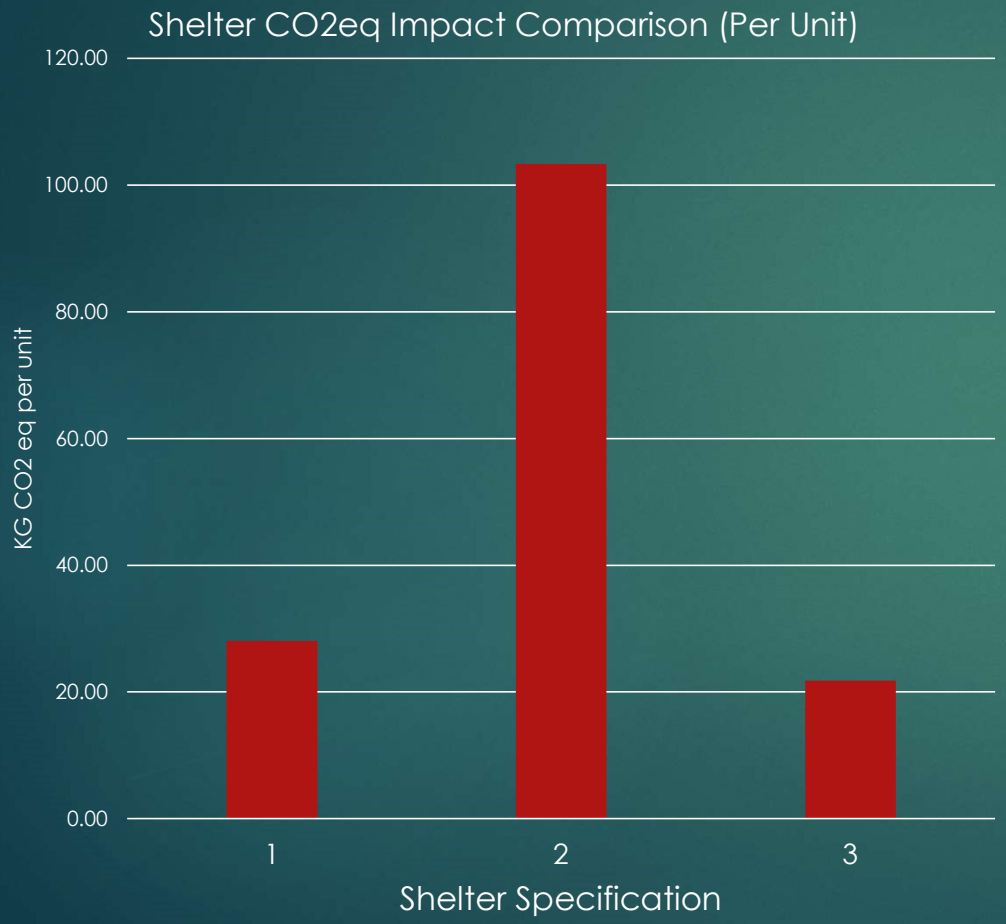
Using SMAC

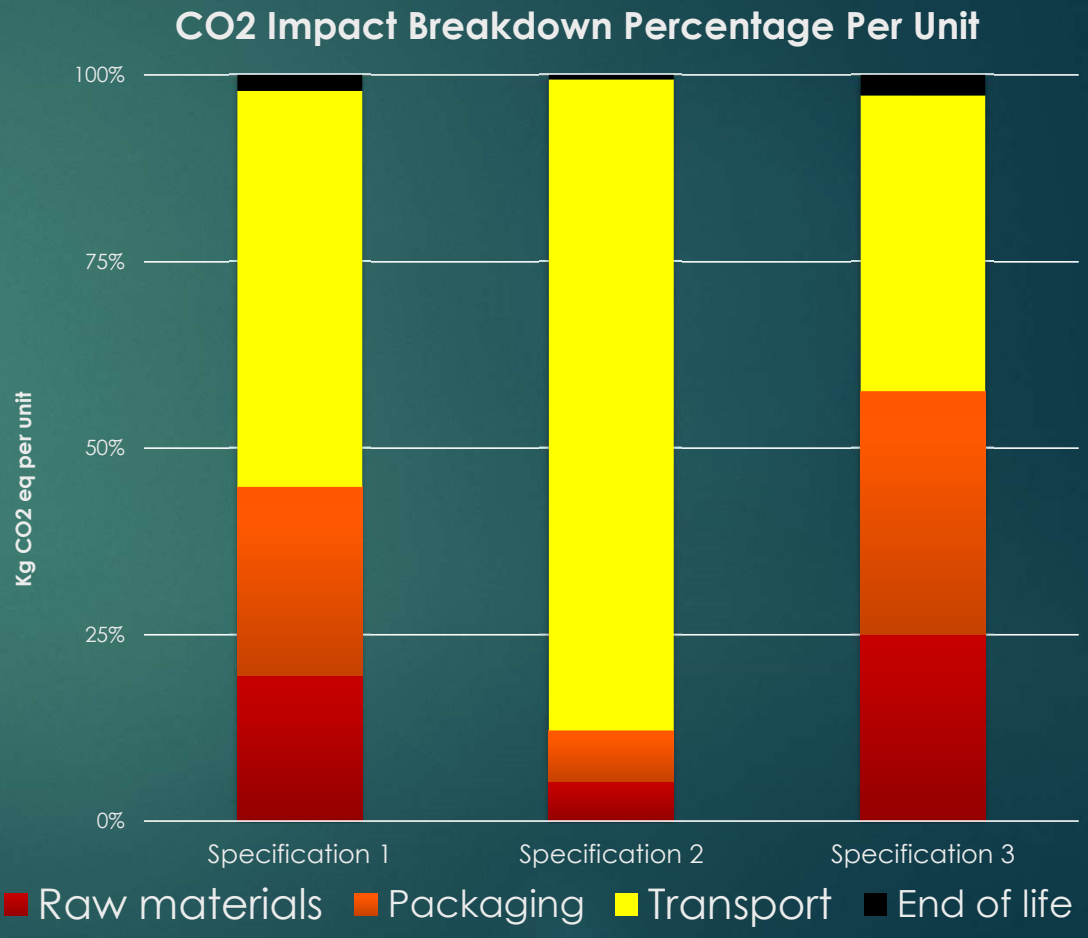
32												
33		**Packaging Materials**										
34		Packaging Number	1	2	3	4	5	6	7	8	9	10
35		Packaging Name	Example 1B	Example 1B								
36		Notes										
37												
38												
39	(E)	Level 1	polyester/polyethylene strapping	recycled cardboard								
40												
41		All level entry										
42		kgC02eq/kg	2.2286847	1.5272102	0	0	0	0	0	0	0	0
43												
44	(F)	Quantity (kg)	25	1								
45	(G)	Recycled content (%)										
46	(H)	Recycled at end of life (%)										
47												
48												
49												
50		**Specification 1 - Components and Packaging**										
51	(I)	Weight Per Unit (Kg) excluding packaging	225									
52	(J)	Weight Per Unit (Kg) including packaging	251									
53	(K)	Product recycled content (%)	0.38									
54	(L)	Packaging recycled content (%)	0									
55												
56												
57												

Using SMAC

58		**Specification 1 - Transportation**									
59		**Country of Manufacture**	**0**								
60			**Lorry**	**Train**	**Ship**	**Air**					
61	(M1)	Country of Origin to Point of Arrival in Country (km)	500	0	0	0	**Please enter km travelled into all the relevant boxes - enter 0 if not applicable**				
62	(M2)	Point of Arrival to Warehouse / Store (km)	100	0	0	0	**Please enter km travelled into all the relevant boxes - enter 0 if not applicable**				
63	(M3)	Warehouse to Construction Site (km)	600	0	0	0	**Please enter km travelled into all the relevant boxes - enter 0 if not applicable**				
64	(M4)	Construction Site to Disposal Site (km)	1000	0	0	0	**Please enter km travelled into all the relevant boxes - enter 0 if not applicable**				
65	(M5)	Total distance travelled	2200	0	0	0					
66	(N)	Weight of materials (kg)	251	251	251	251					
67											
68											
69											
70		**Specification 1 - End of Life**									
71											
72			1	2	3	4	5	6	7	8	
73			Plastic	Composite	Brick	0	0	0	0	0	
74	(O)	Kg CO2eq EOL	0.30808308	0	0	0	0	0	0	0	
75	(P)	Reused:									
76	(Q)	Recycled:									
77	(R)	Incineration:									
78	(S)	Landfill:									
79											
80											
81											

Comparing CO2eq of different shelter specifications





Tool Development and Next Steps

Available for Testing – Coming Very Soon!

If you would be interested in trialing the first version, please contact havedisastercallkelly@gmail.com

Stephen.Alexander@bregroup.com

Development of open-source tool

- Identification of open access data that can be utilized for different products or materials and modified by users
- Potential for addition of new materials – NFIs, Packaging, CCCM etc.

Support for Decision-Making

- Roadmap for Research Chapter – An Environmental Balanced Scorecard Approach