



Shelter Cluster NWSW Cameroon
ShelterCluster.org
Coordinating Humanitarian Shelter



**Northwest Cameroon Shelter Cluster Workshop
on Environmental Mainstreaming 1st and 2nd March 2023
Report of Outcomes**



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The report covers the following aspects:

1. [A review of ECHO's Minimum Environmental Requirements and what that means for Shelter Cluster partners.](#)
2. [Environmental Screening Using the NEAT+ Environmental Screening Tool](#)
3. [Designing the Response with the NEAT+ Activity Modules](#)
4. [List of Environmental Mainstreaming Activities Brainstormed](#)
5. [Use of Shelter Scorecards to Evaluate Environmental Impact](#)

The key action points from the workshop include:

1. Shelter Cluster partners to use the NEAT+ sensitivity modules and NEAT+ activity modules as they are preparing for new project locations and to assess new areas in the field. Contact the Shelter Cluster for support with the analysis or for receiving the XLS tools.
2. Shelter Cluster to emphasize use of [Shelter Kit Checklist](#) and household needs assessments prior to conducting distributions to cut-down on accumulation of unwanted waste. Make NFI checklist to complement already ongoing Shelter Kit Checklist.
3. Shelter Cluster to reach out to development partners such as UNDP to help in the identification of common initiative groups that may already be engaged in environmental mainstreaming to support the mainstreaming in Shelter Cluster activities.
4. Shelter Cluster to start measuring environmental indicators in the HRP by adding the mainstreaming activities as sub activities in the 5W as of the March dataset to be collected in April 2023. Reporting should include text and also photos for helping to monitor the implementation as mainstreaming in a shelter or nfi output.
5. Shelter Cluster partners to explore how to measure the environmental footprint of the items and materials they are using through employing an environmental score card approach.

Introduction

On the 1st and 2nd of March, Shelter Cluster partners met in Bamenda in Cameroon's Northwest Region to have a two-day workshop on environmental mainstreaming. The workshop touched on the following themes:

- DG-ECHO's Minimum Environmental Requirements
- Environmental Screening to compliment humanitarian assessments
- Planning the response with environmental mainstreaming
- Monitoring of the environmental mainstreaming in the Shelter Response
- Shelter Scorecard Approaches

The workshop had several purposes:

- Provide follow up and share findings from the Shelter Cluster workshop held in Yaoundé on the 24th November.
- Inform partners about the Minimum Environment Criteria that ECHO has put in place and what activities are envisioned under the Shelter and Settlements Chapter
- Capacitate partners on the use of environmental screening using the NEAT+ set of tools.
- Continue to improve Shelter Cluster partners' ability to perform both needs and response analysis in designing their shelter and NFI activities.
- Operationalize and define clearly what "minimum criteria" should be mainstreamed in Shelter and NFI activities so as to be able to better monitor those indicators that were place in the Humanitarian Response Plan 2023.

The Shelter Cluster training was attended by 16 people from the following agencies: AWA, COHESODEC, CRS, H4BF, GCR, GWA, IMC, IRC, NRC, REWAC, SHUMAS, SIRDEP, UNHCR WESAD

What follows is a summary of the workshop. It includes the methodology used for the workshop, the results, and the recommendations for operationalizing environmental mainstreaming in the Shelter Cluster's response.

Setting the Stage: Minimum Environmental Requirements

To introduce the thematic of the workshop, the Shelter Cluster coordinator presented the [ECHO Minimum Environmental Requirements](#) which are now mandatory for all partners that want to apply for ECHO funding in any of the key sectors where environmental mainstreaming should be present: Shelter, WASH, Food Security, Health, and other Infrastructure related sectors. Some key points from this presentation:

- Environmental requirements refer to the fact that this year, agencies must include considerations for reducing their environmental impact in humanitarian activities in their proposals starting in 2023.
- ECHO is the first donor in our response to put these requirements, but as a major humanitarian donor, it means that other donors may follow suit.
- Contextualization of the requirements is required and such criteria as urban or rural settings and stability levels of displacement will influence the applicability of the requirements. One can consider that the Northwest Region while having many pendular movements that Shelter/NFI responses are responding to fairly predictable patterns of displacement and humanitarian shelter-related need, so they are indeed applicable to the context.
- There is a difference between environmental mainstreaming and standalone environmental projects. The focus of today's workshop would be on mainstreaming environmental considerations into Shelter and NFI activities. Mainstreaming means mitigating the environmental impacts of Shelter/NFI interventions as much as possible and not just separate greening activities that would be better as standalone initiatives.
- Shelter being an infrastructure focused sector is usually one of the most harmful sectors to the environment in humanitarian action.
- Shelter Minimum Environmental Requirements include the following:
 1. Environmental Screening with report and recommendations (focus of 1st day of workshop)
 2. Decreasing negative impacts on the host population: deforestation or extraction of natural resources.
 3. As much as possible try to use existing facilities rather than construct new ones
 4. Avoid areas of scientific interest and deforestation
 5. Hazard mapping and risk analysis
 6. Use of sustainable materials and certified suppliers
 7. Use of proper insulation in rental programmes
 8. Use of local labour
 9. Avoidance of harmful energy practices
 10. Build back safer principles
- Presentation of positive and negative examples of environmental mainstreaming

The Nexus Environmental Assessment Tool: Sensitivity Tool

During the one-day training in Yaoundé, the participants used the [Rapid Online Environmental Impact Assessment Methodology](#) as a way to assess generally the environmental risks in the Far North and the 4 regions impacted by the crisis in the Northwest and Southwest. It was the impression of the Shelter Cluster Coordinator that the tool was useful as an initial orientation, but as it was very multisectoral nature it would need more detail to be operationalized in the shelter response at subnational level. During the ECHO presentation in Yaoundé, the NEAT+ set of tools was recommended by ECHO, and it was announced in December, that through NORCAP trainings would be delivered in Cameroon at the end of 2023. Shelter Cluster partners had also made a request in December to have trainings specifically on the NEAT+ set of tools.

After consultation with ECHO and NORCAP, it was decided to focus on the [NEAT+ Sensitivity](#) and Activity Modules as the main tools and to encourage Shelter Cluster partners to use it in the Northwest and Southwest regions. The NEAT+ tools are field-oriented and have detailed shelter modules. As Shelter Cluster partners are already using the Kobo tools for a number of the Shelter Cluster's initiatives, it was decided to use the Kobo form. Given that security constraints and access limited the ability of the Shelter Cluster and partners to do these trainings in the field, it was decided to simulate the field reality in the workshops by creating seven case studies. As the Northwest Region has 7 regions, there was one village selected from each of the Region's 7 regions. The case studies were developed from a variety of sources: the OCHA Multisector Needs Assessment, the Shelter Cluster Needs Assessments, and Community Development Plans. In addition, the [Shelter Cluster developed 21 maps](#) which would help the participants to fill out the sensitivity questionnaire. Where there were potential gaps, Shelter Cluster partners filled in the questionnaire with their own knowledge and analysis of the communities selected. As there were 16 people in the workshop, only 5 out of the 7 case studies were used enabling each group to have at least 3 people. It was important to emphasize that the tool is an analysis tool bringing together various resources and not direct data collection.



Akwaja Results of Sensitivity Analysis

[Link to Case Study](#)

Issues of High Concern	Issues of Medium Concern	Issues of Low Concern
Indoor air pollution, caused by poor ventilation and cooking/heating, may be an issue.	The displaced population may be in a state of high uncertainty. There may be a lack of incentive to practice sustainable behavior.	There is a high concentration and/or number of people. The potential environmental impact is greater.
The water sources may be vulnerable to contamination. Water quality may be an issue.	The community is close to an international border. Transboundary resource management and/or pollution may be a concern	The community may have low self-sufficiency. There may be a greater demand (and impact) on the local environment.
There is low capacity to manage solid waste. Environmental sanitation and disease transmission may be an issue	Rates of deforestation may exceed regeneration capabilities. Deforestation may be a risk.	The community may not be socially cohesive. This can prevent collective action and lead to social conflict.
There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.	Management of waste, including that generated by the crisis, may be an issue. Crisis waste can pose public health risks, and impede relief or recovery activities.	There may be a weakened or poor governance system. There may be low capacity for environmental management.
The area may have poor slope stability. Landslides or mudslides may be a risk.	This area may be at risk of soil erosion from water.	The environment has fragile ecosystems. Further assessment is required to determine if loss of biodiversity is accelerating.
	Natural resources may be scarce and in high demand. This can lead to social conflict.	The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.

Bamunka Results of Sensitivity Analysis

[Link to Case Study](#)

Issues of High Concern	Issues of Medium Concern	Issues of Low Concern
<p>There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.</p>	<p>There is a high concentration and/or number of people. The potential environmental impact is greater.</p>	<p>The displaced population may have a poor understanding of local ecosystems. This makes it difficult to manage the environment effectively.</p>
<p>Natural resource availability/accessibility may be affected by changing climatic conditions.</p>	<p>The water sources may be vulnerable to contamination. Water quality may be an issue.</p>	<p>The environment has fragile ecosystems. Further assessment is required to determine if loss of biodiversity is accelerating.</p>
	<p>There is low capacity to manage solid waste. Environmental sanitation and disease transmission may be an issue.</p>	<p>The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.</p>
	<p>There is low capacity to manage sewerage and faecal sludge. Environmental sanitation and disease transmission may be an issue.</p>	<p>There are areas of high cultural significance. This can threaten social cohesion.</p>
	<p>Management of waste, including that generated by the crisis, may be an issue. Crisis waste can pose public health risks, and impede relief or recovery activities.</p>	<p>The community may have a high dependency on the natural environment. This can threaten livelihoods and social cohesion.</p>
	<p>This area may be at risk of flooding.</p>	<p>The community is close to an international border. Transboundary resource management and/or pollution may be a concern.</p>

Ichim Results of Sensitivity Analysis

[Link to Case Study](#)

Issues of High Concern	Issues of Medium Concern	Issues of Low Concern
The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	The community may be close to a protected/conservation area. There may be legal/social implications.	There is a high concentration and/or number of people. The potential environmental impact is greater.
The water sources may be vulnerable to contamination. Water quality may be an issue.	Rates of deforestation may exceed regeneration capabilities. Deforestation may be a risk.	The community may have low self-sufficiency. There may be a greater demand (and impact) on the local environment.
The area may have poor slope stability. Landslides or mudslides may be a risk.	Indoor air pollution, caused by poor ventilation and cooking/heating, may be an issue.	The community may not be socially cohesive. This can prevent collective action and lead to social conflict.
The area may have heightened exposure to climate-related risks and extreme weather events.	There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.	There may be a weakened or poor governance system. There may be low capacity for environmental management.
Natural resources may be scarce and in high demand. This can lead to social conflict.	There is low capacity to manage sewerage and faecal sludge. Environmental sanitation and disease transmission may be an issue.	The environment has fragile ecosystems. Further assessment is required to determine if loss of biodiversity is accelerating.
There may be high and/or unsustainable rates of extraction of resources from the local environment.	This area may be at risk of soil erosion from water.	The community may have a high dependency on the natural environment. This can threaten livelihoods and social cohesion.
Natural resource availability/accessibility may be affected by changing climatic conditions.	The area may be affected by (previous) conflict related hazards or pollution.	The community is close to an international border. Transboundary resource management and/or pollution may be a concern.
		The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.
		Management of waste, including that generated by the crisis, may be an issue. Crisis waste can pose public health risks, and impede relief or recovery activities.
		This area may be at risk of soil erosion from wind.

Mankon Results of Sensitivity Analysis

[Link to Case Study](#)

Issues of High Concern	Issues of Medium Concern	Issues of Low Concern
The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	There is a high concentration and/or number of people. The potential environmental impact is greater.	The community may have low self-sufficiency. There may be a greater demand (and impact) on the local environment.
The community may be close to a protected/conservation area. There may be legal/social implications.	The environment has fragile ecosystems. Further assessment is required to determine if loss of biodiversity is accelerating.	The displaced population may have a poor understanding of local ecosystems. This makes it difficult to manage the environment effectively.
There are areas of high cultural significance. This can threaten social cohesion.	There is low capacity to manage solid waste. Environmental sanitation and disease transmission may be an issue.	There may be a weakened or poor governance system. There may be low capacity for environmental management.
There is low capacity to manage sewerage and faecal sludge. Environmental sanitation and disease transmission may be an issue.	Management of waste, including that generated by the crisis, may be an issue. Crisis waste can pose public health risks, and impede relief or recovery activities.	Rates of deforestation may exceed regeneration capabilities. Deforestation may be a risk.
The area may have heightened exposure to climate-related risks and extreme weather events.	The area may have poor slope stability. Landslides or mudslides may be a risk.	The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.
Natural resources may be scarce and in high demand. This can lead to social conflict.	This area may be at risk of soil erosion from water.	Indoor air pollution, caused by poor ventilation and cooking/heating, may be an issue.
There may be high and/or unsustainable rates of extraction of resources from the local environment.	This area may be at risk of flooding.	There is a risk of air pollution from nearby activities.
	The area may be affected by (previous) conflict related hazards or pollution.	There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.

Njinikom Results of Sensitivity Analysis

[Link to Case Study](#)

Issues of High Concern	Issues of Medium Concern	Issues of Low Concern
There is a high concentration and/or number of people. The potential environmental impact is greater.	Rates of deforestation may exceed regeneration capabilities. Deforestation may be a risk.	The community may have low self-sufficiency. There may be a greater demand (and impact) on the local environment.
The environment has high biodiversity value. Vulnerable and/or rare flora and fauna may be at risk.	Indoor air pollution, caused by poor ventilation and cooking/heating, may be an issue.	The displaced population may be in a state of high uncertainty. There may be a lack of incentive to practice sustainable behavior.
The community may be close to a protected/conservation area. There may be legal/social implications.	There is low capacity to manage sewerage and faecal sludge. Environmental sanitation and disease transmission may be an issue.	There may be a weakened or poor governance system. There may be low capacity for environmental management.
There are areas of high cultural significance. This can threaten social cohesion.	Management of waste, including that generated by the crisis, may be an issue. Crisis waste can pose public health risks, and impede relief or recovery activities.	The environment has fragile ecosystems. Further assessment is required to determine if loss of biodiversity is accelerating.
The water sources may be vulnerable to contamination. Water quality may be an issue.	This area may be at risk of soil erosion from water.	The community may have a high dependency on the natural environment. This can threaten livelihoods and social cohesion.
There is low capacity to manage solid waste. Environmental sanitation and disease transmission may be an issue.		The environment has a low regenerative capacity. The effects of land and soil degradation are more significant.
There is low capacity to manage wastewater. Environmental sanitation and disease transmission may be an issue.		The water resources may have a low regenerative capacity. Water scarcity may be an issue.
The area may have poor slope stability. Landslides or mudslides may be a risk.		The area may be affected by (previous) conflict related hazards or pollution.
The area may have heightened exposure to climate-related risks and extreme weather events.		Natural resources may be scarce and in high demand. This can lead to social conflict.

Severity Tool Debrief

Each group presented the results of their deliberations in plenary and read through the analysis that the tool generated. Two other case studies that were not looked at during the workshop were [Bofi Village in Menchum Valley](#) and [Ngwo Village in Momo Division](#). Shelter Cluster partners were encouraged to use the tool in their field assessments. It was emphasized that in addition to using secondary analysis, there may be the need to do household data collection, focus group discussions and consultation with key informants to be able to fill out the tool, especially as Shelter Cluster partners have not conducted assessments in all locations.

It was emphasized that the NEAT+ Sensitivity Tool could not replace hazard mapping or any in-depth environmental assessment, but rather it was a tool to ensure awareness of the environmental surroundings of shelter interventions. The rankings of concerns act as a risk register prior to starting the planning stages of a project. The prompts were global in nature but generated by the specific responses for each area. It was remarkable to observe that within each case study there was varying degrees of environmental differences.

The Shelter Cluster Coordinator explained the environmental analysis tool in excel and said that the Cluster team could support partners in analysis or support M&E staff in the use of the tool. The Shelter Cluster team had prepared the tool for the village level, but partners could also decide depending on their application, if they wanted to choose one village per subdivision if they were having to cover many surrounding villages in their area of implementation.



Designing the Response

The Shelter Cluster Co-Chair led Shelter Cluster partners through a quick recap of the Shelter Cluster activities and technical standards for the response in the Northwest and Southwest crisis. The Shelter Cluster Coordinator then introduced the Shelter Modules that were part of the [NEAT+ Activity Modules](#). Given that this was a Shelter Cluster specific focus, the emphasis would be on the Shelter Modules but it was good to know that the WASH and Food Security Models were also available for those partners that are engaged in more than one sector.

The workshop attendees returned to their working groups to work on the design of the response. The Shelter Cluster Coordinator encouraged the participants to think broadly without regard to funding constraints. One of the challenges with environmental mainstreaming is that many partners stop at the stage of assessing the environment, but they do not go as far to mainstream specific activities in the proposals that they develop. Donors like ECHO who have developed an environmental mainstreaming requirement are open to funding activities that reduce the humanitarian environmental footprint, even if it is more costly, but partners need to get into the habit of designing quality proposals without convincing themselves to not propose environmental mainstreaming because it is too costly.



Shelter Summary

Based on the response that each group designed, the Shelter Activity Tool proposed some generic recommendations summarized below:

Site Selection	Shelter Design	Shelter Materials	Shelter Construction	Household Item/NFI	Energy	Roads and Access
<p>This area has been identified as at risk of natural hazards such as landslides, erosions, flooding and/or storm surges. Additional risk assessments should be conducted. Minimize the exposure of the settlement and/or individual shelters to potential hazards. Disaster risk reduction infrastructure, systems or practices could also be considered.</p>	<p>This area has been identified as potentially having periods of hot and humid weather. Consider thermal comfort in the design of the shelter through designs that are well ventilated, block sunlight and have low thermal capacity. This also minimizes energy required for cooling.</p>	<p>Disaster waste has previously been identified as a potential issue. Disaster waste can be a source of construction materials. Using disaster waste reduces burdens on natural resources, relieves reconstruction efforts and minimizes environmental impacts of unmanaged disaster waste.</p>	<p>Erosion, deforestation or land degradation has been identified as a potential concern in this area. Clearing and excavation activities can exacerbate the effects of these environmental issues. Avoid or minimize the scale of these activities, and consider rehabilitative activities such as re-vegetation.</p>	<p>Solid waste has been identified as a potential concern in this area. Distribution activities can contribute to increased waste generation, with negative health and environmental consequences. Unmanaged waste can also lead to water stagnation, increasing risk of vector transmission.</p>	<p>Deforestation has been identified as a potential issue. Energy usage and deforestation are closely related due to the use of wood and charcoal. Deforestation degrades local ecosystems, undermining community resilience and livelihood opportunities.</p>	<p>Wastewater management has been identified as a concern in this area. Access routes should have adequate drainage to ensure structural stability and avoid erosion and sedimentation. Water drained off the route should be managed (e.g. infiltration with drainage basins).</p>

Site Selection	Shelter Design	Shelter Materials	Shelter Construction	Household Item/NFI	Energy	Roads and Access
<p>This area has been identified as being close to fragile/niche ecosystems, high value ecosystems or protected/cultural areas. Consider the feasibility of selecting another location. If alternative sites are not feasible, consider educating the community of the significance of these areas.</p>	<p>This area has been identified as potentially having periods of heavy rainfall and storm activity. Consider having proper flood protection (e.g. raised areas) and drainage in the design of the shelter, as well as design features resistant to heavy winds.</p>	<p>Deforestation has been identified as a potential concern locally. Efforts should be made to minimize sourcing and dependency on local wood supply as to avoid exacerbating potential deforestation concerns.</p>	<p>Wastewater management has been identified as a concern in this area. There may not be adequate infrastructure to manage wastewater, leading to environmental degradation and increased risk of vector transmission. An adequate management plan for wastewater from construction activities should be in place.</p>			<p>Deforestation has been identified as a concern in this area. Routes which enable access to forest resources can lead to increased rates of land clearing, harvesting and deforestation. Environmental impacts of future developmental opportunities enabled by this new access should be considered.</p>

Site Selection	Shelter Design	Shelter Materials	Shelter Construction	Household Item/NFI	Energy	Roads and Access
<p>This area has been identified as being vulnerable to industrial- or conflict-related hazards or pollution. Assess the safety and security of the site from residue contamination or hazards. Consider if safe and sustainable access to necessary resources such as water or land for cultivation is possible.</p>	<p>This area has been identified as having potentially having unstable soils and being at risk of erosion. Consider having appropriate structural support and foundations in the design of the shelter.</p>	<p>Land and soil degradation and erosion has previously been identified as a potential concern. Responsible sourcing of sand and gravel should be considered to avoid potential exacerbation of these issues.</p>	<p>Solid waste management has been identified as a potential concern in this area. There may not be adequate public services or infrastructure to manage construction waste. Waste should be appropriately stored and transported, and a suitable location for final disposal identified.</p>			<p>Fragile/niche/high-value ecosystems or protected/cultural areas have been identified in this area. Construction of access routes can bisect ecosystems, lead to increased rates of resource extraction or cause environmental degradation. Routings should, where possible, avoid or minimize intrusion into key areas.</p>
<p>Increased exposure to climate-related hazards (e.g. floods, storms, wildfires, droughts, sea level rises) has been identified as a concern. The siting of shelters and settlements should minimize vulnerability to these events, e.g. by avoiding sites near flood plains and rivers.</p>						

Shelter Summary Debrief and Review of List of Activities that Shelter Cluster can Mainstream

Following the review of the various projects submitted, Shelter Cluster partners had a number of questions and feedback about the suggestions, as there seemed to be a more finite list of recommendations generated by the tool. The first inquiry was to whether the recommendations from the tool were indicating that the project proposal was poorly developed. The Shelter Cluster Coordinator clarified that the tool was providing useful reminders and prompts that would help Shelter Cluster partners to remember in the development of their project proposals, concept notes, and standard operating procedures when carrying out a program. The tool should be considered more of as an interactive checklist than a scoring of one's project proposal. Timing, feasibility, and contextualization of the recommendations were also discussed. The Shelter Cluster Coordinator reminded partners that it may not be immediately that these actions can be put into place. For instance in the case of Akwaja, which is found to be in the worst Shelter Severity Level 5 of Extreme Inadequacies, if the population needs fuel it may not be feasible in the first year of an intervention to change all the stoves and provide a sustainable connection to gas cooking due to the location's remoteness. It may also require humanitarian agencies to work with development actors and to think not only about year 1 of a humanitarian response but to think about how some of the challenges may be addressed in the next few years to lessen the humanitarian footprint. Such argumentation, considerations, and selection of plan of implementation is a necessary part of the response analysis.

There was also some confusion on environmental mainstreaming and stand-alone environmental interventions. For example a distribution of shelter and NFI materials accompanied by the establishment of a community garden may be considered as two separate interventions. The replacement of plastic items in these kits with more sustainable materials made by IDPs would be environmental mainstreaming.



Shelter Cluster partners started a brainstorming of a list of activities which they could mainstream into the response. The list of activities included the following:

1. **Recycling of Materials:** This would mean finding other uses of the material. For certain items like tarpaulin, it can't be re-used as a tarpaulin in a shelter, but it can be reused. With all the plastic waste generated by drinking bottles in Cameroon, the government announced a plan to convert plastic waste into pavement tiles.¹ Options such as up-cycling (improving the item) or down-cycling (turning it into an inferior item) would need to be explored for each item.
2. **Contextualization of NFI kits-** Shelter Cluster should make sure that partners are ensuring that they are not always taking a kit approach with every household which is a frequent contributor to waste due to unwanted or unneeded items. The Shelter Cluster team can make an NFI checklist available in addition to what is in the Household Needs Assessment tool. Cash and Voucher also have a tendency to cut down on this waste as the household is able to do their own prioritization.
3. **Replacing plastic items in the NFI kits with materials that are more sustainable.** Suggested items included steele cups, clay cooking pots. Production of such items can also be made as livelihood activities for IDPs to train them in the production of these items.
4. **Use of existing building facilities-** Given the context of the Northwest and Southwest which has primarily been urban, by default, the shelter response has benefited from the available of existing infrastructure. Shelter strategies should prioritize as much as possible repairs rather than off foundation construction. Where rental assistance is detected, minor repairs should bring that apartment or housing to standard as a way of improving shelter.
5. **Training of Shelter Committees on safer building practices,** land selection, and tenure issues.
6. **Setting up of solid waste management at distribution locations**

or as an accompaniment to any distributions. **Donating the bins** to facilitate waste management long after the distribution is over.

7. **Developing a plan to change to alternative fuel sources other than wood for cooking** by also identifying other actors who can support the shift to sustainable stove distribution.
8. **Installation of drainage or drainage improvements at locations where shelter construction including repair activities** are being done to improve waste water management at the construction site.
9. **Environmental offsetting activities such as the planting of trees or gardens to restore any decrease in carbon dioxide absorption caused by the use of raw materials** in construction.
10. **Use of an environmental score card to evaluate the impact of the activity on the response and subsequent environmental mitigation** based on the results.

In order to monitor the environmental mitigation activities in the Shelter Cluster response the Shelter Cluster proposes to add them as sub-activities to the Shelter Cluster 5W tool to report against the following green HRP indicators that are proposed for the Humanitarian Response Plan 2023:

- # of HHs reached with core and essential Non-Food Items that meet environmental criteria
- # of HHs assisted with distributed/installed emergency shelter materials/kits that meet environmental criteria
- # of HHs assisted with shelter that meet environmental criteria
- # of HHs assisted by constructed/repaired/rehabilitated community/ public infrastructure and facilities that meet environmental criteria

Reporting on this will begin for the March 2023 5Ws which will be collected in April.

1 <https://www.businessincameroon.com/economy/1904-12508-govt-to-build-a-unit-to-transform-plastic-waste-into-paving-stones-in-kousseri>

Shelter Score Card and Approaches

The key formula to remember in the calculation is that

$$\text{Carbon Footprint} = \text{Carbon Dioxide (CO}_2\text{) Emission} + \text{CO}_2\text{ Absorption Cease/Stop}$$

Carbon Dioxide Emission

1. Average quantity in kilograms of Carbon Dioxide emitted per man-made material produced
2. Average quantity of water in liters used in the production of man-made materials.
3. Transportation Costs

Material Carbon Dioxide Emissions and Water Waste¹

Type of Material	Average quantity in kg of CO ₂ emitted per kg of material produced	Average quantity of water used in liters per kg of material produced
Plastic	6 kg of CO ₂ emitted for 1 kg of plastic produced	17 l of water used for 1 kg of plastic
Steel	2 kg of CO ₂ emitted for 1 kg of steel produced	705 l of water used for 1 kg of steel
Cement	1 kg CO ₂ emitted for 1 kg of cement produced	.2 l of water used for 1 kg of cement
Burned Bricks	.3 kg of CO ₂ emitted for 1 kg of bricks produced	Depending on brick density
Glass	.8 kg of CO ₂ emitted for 1 kg of glass produced	5.8 l of water used for 1 kg of cement

Transportation²

Means of Transport	Average Quantity of CO ₂ emitted in kg
Land Transport by Truck	.105 kg of CO ₂ emitted per ton of material transported per kilometer
Sea Freight	.025 kg of CO ₂ emitted per ton of material transported per kilometer

¹ Reproduced from [UNHCR Shelter and Sustainability](#) p. 10

² Reproduced from [UNHCR Shelter and Sustainability](#) p. 11

Carbon Dioxide Absorption Cease/Stop

Estimates the kilograms of Carbon Dioxide absorption that is stopped by removing natural materials particularly trees from the atmosphere.

Data to calculate the amount of CO₂ Absorption Cease³

Age of trees or bamboo poles	Average quantity of CO ₂ absorption cease in kg per year
Young tree (up to 10 years old)	6 kg CO ₂ /year
Old tree (above 10 years old)	21 kg CO ₂ /year
Young bamboo pole (up to 4 years old)	5 kg CO ₂ /year

³ Reproduced from [UNHCR Shelter and Sustainability](#) p. 11

The environmental and carbon footprint also needs to be taken into consideration with a number of other shelter criteria:

- Its technical performance and expected lifespan when exposed to the elements (wind resistance, protection from floods, seismic resistance, flammability resistance, thermal comfort, personal security (lockable/not), and accessibility)
- Habitability (covered living space, privacy, natural lighting, artificial lighting, its materials, and facilities (WASH, cooking, living, sleeping)), many of the criteria that can be measured through the Shelter Cluster Standardized Household and Post Distribution Monitoring Tool
- Affordability (cost/income, the cost per m², the cost per m² per the lifespan of the shelter, and maintenance costs.)

The case study of Ituri provided an opportunity for the Cluster partners to reflect on some challenges that may be present when selecting the most appropriate shelter: spacing and availability of land, stage of the emergency, expected time that IDPs will remain in the shelter, availability of the materials, familiarity with maintenance and local building practices, and other contextual factors. Environmental criteria has to be selected with all these other criteria in mind.



Tree protection (environmental impact)

The tree protection is assessed based on the decrease in forest area (wood and bamboo) due to shelter construction activity. It is calculated by taking into account the quantity of trees and/or bamboo poles used to build a specific shelter type.



CO₂ emission mitigation (environmental impact)

The CO₂ footprint is calculated by taking into account CO₂ emissions as well as the CO₂ absorption cease in relation to the shelter life span and covered living area.



Material efficiency (environmental impact)

Material efficiency is evaluating the quantity of the construction material used for a specific shelter typology and its impact on the environment during extraction, production and processing (CO₂ emissions and water usage). Material reuse options after disposal are also taken into account. The material intensity is then weighted in relation to the shelter covered living area.



Technical performance

The technical performance of a specific shelter typology is determined by assessing its structural resistance in the event of a hazard and the suitability of the shelter design.



Shelter habitability

The shelter habitability is determined by assessing the covered living area, privacy characteristics, appropriateness of shelter materials and construction techniques, the natural and artificial lighting aspects and access to facilities.



Shelter affordability

The shelter affordability is determined by considering the cost of a specific shelter with all the associated expenditures (production, transport, construction) in relation to the shelter life span as well as the shelter covered living area.

At the end of the workshop, the Shelter Cluster Coordinator initiated a session on how to create an environmental score card of a shelter. The purpose of this session was to inform partners how various materials, their origin, and format contributed to the shelter's environmental footprint. This also can be applied to other areas of the response. In order to share this with partners, the Shelter Cluster presented material from [UNHCR's publication on Shelter and Sustainability](#), specifically focusing on the case study of the emergency shelter response to internal displacement in Ituri, Democratic Republic of the Congo which has a similar ecoregion to that of the Northwest and Southwest Region of Cameroon.

Emergency Shelter: 3x3.5 M Wooden Gable Frame with Tarpaulin Walls and Roof



Bill of Quantities

	Item specification	Unit	Quantity	Unit cost in USD*	Total cost in USD*
Shelter Super Structure	Gum poles with ø 8-10 cm, 3.5 m long	pieces	5	1.2	6
	Gum poles with ø 8-10 cm, 2.5 m long	pieces	7	1.2	8.4
	Gum poles with ø 4-5 cm, 3.5 m long	pieces	11	1	11
	Gum poles with ø 4-5 cm, 3 m long	pieces	6	1	6
	Gum poles with ø 4-5 cm, 2 m long	pieces	10	1	10
	UNHCR plastic tarpaulin, sheet 4 x5 m	pieces	3	12	36
	Nails 10 cm long	kg	2.5	3	7.5
	Nails 4 cm long	kg	1.75	3	5.25
	Roofing nails (umbrella type), 5 cm long	kg	1	3	3
Openings	Timber plank 10x5 cm, 3.5 m long	pieces	3	3.5	10.5
	Door locking system	pieces	1	0.5	0.5
	Door hinges	pieces	2	0.25	0.5
Labour	2 unskilled	day	2	3	12
	1 skilled worker	day	1	8	8
					104.65 + 20
	Total				124.65

* Prices according to the 2019 local market assessment.

Emergency Shelter: 3x3.5 M Wooden Gable Frame with Tarpaulin Walls and Roof

Variation A

Structure	gable timber frame
Walls	UNHCR plastic tarpaulins
Roof	UNHCR plastic tarpaulins
Footing	poles 50 cm deep with compacted earth
Floor	natural earth
Openings	one door [90 cm x 190 cm] no windows, ventilation under each eave



Suggested temperature range



Number of people required for setup



Time required for setup*



Average life span of the shelter

Environmental impacts

Raw materials used*	gum trees	0.5 m ³
	water*	3 910 liters
Manmade materials used	plastic (tarpaulins)	0.13 m ³
	steel (nails)	5.3 kg
CO ₂ emissions	material production	84 kg
	transportation	35 kg
CO ₂ absorption cease	due to deforestation	90 kg/year
	Total	209 kg
CO ₂ footprint	kg of CO ₂ / Life span / Area	
	208.7 kg / 1 year / 10.5 m ²	
	≈ 20 kg of CO ₂ / year / m ²	
Damage of natural habitat	Deforestation & erosion	
Material reuse	Timber elements and tarpaulins can be recycled	

Affordability

Costs	Cost / Life span / Area
	\$ 124.65 / 1 year / 10.5 m ²
	≈ \$ 11.9 / year / m ²

Technical performance

Wind resistance	complying
Flood mitigation	on plot/site flood mitigation measures
Ventilation	meets minimum vent. requirements
Flammability	meets fire retardant criteria
Thermal comfort	not fit for extreme temperatures ²
Personal security	not guaranteeing personal security
Accessibility	adaption measures necessary

Habitability

Covered area	suitable for 3 occupants (Sphere)
Privacy	not designed for minimum privacy
Natural light	no natural light
Artificial light	no access to artificial lightning
Shelter materials	not adapted to local practices
Facilities	communal facilities in the site



Sustainability Score Card

Tree protection	🌳🌳🌳🌳🌳
CO ₂ emission mitigation	🌳🌳🌳🌳🌳
Material efficiency	🌳🌳🌳🌳🌳
Technical performance	🌳🌳🌳🌳🌳
Shelter habitability	🏠🏠🏠🏠🏠
Shelter affordability	🌳🌳🌳🌳🌳

Score Interpretation: 1 = poor, 2 = fair, 3 = average, 4 = good, 5 = excellent
The criteria for the evaluation was established based on the overall performance of the shelters presented in this document

**Transitional Shelter: 3x3.5 M Wooden Gable
Frame with Wattle & Daub Straw Reinforced Earth Walls
UNHCR Tarpaulin for the Roof**

Bill of Quantities



	Item specification	Unit	Quantity	Unit cost in USD*	Total cost in USD*
Shelter Super Structure	Gum poles with ø 8-10 cm, 3.5 m long	pieces	5	1.2	6
	Gum poles with ø 8-10 cm, 2.5 m long	pieces	7	1.2	8.4
	Gum poles with ø 4-5 cm, 3.5 m long	pieces	11	1	11
	Gum poles with ø 4-5 cm, 3 m long	pieces	6	1	6
	Gum poles with ø 4-5 cm, 2 m long	pieces	10	1	10
	Bamboo sticks with ø 2-3 cm, 3.5 m long	pieces	56	0.25	14
	Bamboo sticks with ø 2-3 cm, 3 m long	pieces	23	0.2	4.6
	Bamboo sticks with ø 4-5 cm, 2.5 m long	pieces	10	0.25	2.5
	Bamboo sticks with ø 4-5 cm, 2 m long	pieces	17	0.2	3.4
	Bamboo sticks with ø 2-3 cm, 2 m long	pieces	35	0.15	5.25
	UNHCR plastic tarpaulin, sheet 4 x5 m	pieces	1	12	12
	Nails 10 cm long	kg	2.5	3	7.5
	Nails 4 cm long	kg	1	3	3
	Roofing nails (umbrella type), 5 cm long	kg	1	3	3
	Synthetic rope with ø 0.5 cm	m	80	-	15
	Soil excavation	m ³	5	-	-
	Straw (average 6 kg per bundle)	bundle	2	2	4
Labour Openings	Timber plank 10x5 cm, 3 m long	pieces	3	3.5	10.5
	Door locking system	pieces	1	0.5	0.5
	Door hinges	pieces	2	0.25	0.5
	Bush stick braiding, 90x190 cm	pieces	1	5	5
Labour	2 unskilled worker	day	7	3	42
	1 skilled worker	day	2	8	16
	Total				132.15 + 58 190.15

* Prices according to the 2019 local market assessment.

Variation B

Structure	gable timber frame
Walls	wattle & daub with straw reinforced earth
Roof	UNHCR plastic tarpaulins
Footing	poles 50 cm deep with compacted earth
Floor	natural earth
Openings	1 door [90 x 190cm] no windows, ventilation under both eaves



Sustainability Score Card



Score interpretation: 1 = poor, 2 = fair, 3 = average, 4 = good, 5 = excellent
The criteria for the evaluation was established based on the overall performance of the shelters presented in this document

Environmental impacts



Raw materials used*	gum trees	0.48 m ³
	bamboo	0.35 m ³
	water*	4 641 liters
	soil	5 m ³
	straw	12 kg
Manmade materials used	plastic (tarpaulins)	0.04 m ²
	steel (nails)	4.5 kg
CO₂ emissions	material production	33 kg
	transportation	38 kg
CO₂ absorption cease	due to deforestation	225 kg/year
	Total	296 kg
CO₂ footprint	kg of CO ₂ / Life span / Area	
	296 kg / 2 years / 10.5 m ²	
	= 14 kg of CO₂ / year / m²	
Damage of natural habitat	Deforestation & erosion fall through hazards due to soil excavation	
Material reuse	Timber elements and tarpaulins can be recycled	

Technical performance



Wind resistance	complying
Flood mitigation	on plot/site flood mitigation measures
Ventilation	meets minimum vent. requirements
Flammability	meets fire retardant criteria
Thermal comfort	partially mitigates extreme temperatures†
Personal security	guarantees personal security
Accessibility	adaption measures necessary

Habitability



Covered area	suitable for 3 occupants (Sphere)
Privacy	not designed for minimum privacy
Natural light	no natural light
Artificial light	no access to artificial lightning
Shelter materials	partially adapted to local practices
Facilities	communal facilities in the site

Affordability



Costs	Cost / Life span / Area
	\$ 190.15 / 2 years / 10.5 m ²
	= \$ 91 / year / m²

**Transitional Shelter: 3x3.5 M Wooden Gable
Frame with Wattle & Daub Straw Reinforced Earth Walls
Thatch Roof**

Bill of Materials



	Item specification	Unit	Quantity	Unit cost in USD*	Total cost in USD*
Shelter Super Structure	Gum poles with ø 8-10 cm, 3.5 m long	pieces	5	1.2	6
	Gum poles with ø 8-10 cm, 2.5 m long	pieces	7	1.2	8.4
	Gum poles with ø 4-5 cm, 3.5 m long	pieces	15	1	15
	Gum poles with ø 4-5 cm, 3 m long	pieces	6	1	6
	Gum poles with ø 4-5 cm, 2 m long	pieces	18	1	18
	Bamboo sticks with ø 2-3 cm, 3.5 m long	pieces	56	0.25	14
	Bamboo sticks with ø 2-3 cm, 3 m long	pieces	23	0.2	4.6
	Bamboo sticks with ø 4-5 cm, 2.5 m long	pieces	10	0.25	2.5
	Bamboo sticks with ø 4-5 cm, 2 m long	pieces	17	0.2	3.4
	Bamboo sticks with ø 2-3 cm, 2 m long	pieces	35	0.15	5.25
	Nails 10 cm long	kg	2.5	3	7.5
	Nails 4 cm long	kg	1.5	3	4.5
	Synthetic rope with ø 0.5 cm	m	30	-	6
	Synthetic rope with ø 0.5 cm	m	80	-	15
	Soil excavation	m ³	5	-	-
	Straw (6 kg/bundle) - earth mix	bundle	2	2	4
	Straw (6 kg/bundle) - roof cover, 2 m long	bundle	5	3	15
Openings	Timber plank 10x5 cm, 3 m long	pieces	3	3.5	10.5
	Door locking system	pieces	1	0.5	0.5
	Door hinges	pieces	2	0.25	0.5
	Bush stick braiding, 90x190 cm	pieces	1	5	5
	Timber plank 10x5 cm, 3 m long	pieces	2	3.5	7
	Window locking system	pieces	2	0.5	1
	Window hinges	pieces	4	0.25	1
Bush stick braiding, 65x60 cm	pieces	2	3	6	
Labour	2 unskilled worker	day	9	3	54
	1 skilled worker	day	3	8	24
	Total				166.65 + 78
					244.65

* Prices according to the 2019 local market assessment.

Variation C

Structure	gable timber frame
Walls	wattle & daub with straw reinforced earth
Roof	thatch
Footing	poles 50 cm deep with compacted earth
Floor	natural earth
Openings	1 door [90 x 190cm], 2 windows [65 x 60cm], 2 eave vents & 2 gable vents [50 x 30cm]



Environmental impacts



Raw materials used¹	gum trees	0.57 m ³
	bamboo	0.35 m ³
	water ²	4 320 liters
	soil	5 m ³
	straw	42 kg
Manmade materials used	steel (nails)	4 kg
CO₂ emissions	material production	8 kg
	transportation	37 kg
CO₂ absorption cease	due to deforestation	237 kg/year
	Total	282 kg
CO₂ footprint	kg of CO ₂ / Life span / Area	
		282 kg / 4 years / 10.5 m ²
		= 7 kg of CO ₂ / year / m ²
Damage of natural habitat	Deforestation & erosion fall through hazards due to soil excavation	
Material reuse	Timber elements can be upcycled	

Technical performance



Wind resistance	complying
Flood mitigation	on plot flood mitigation measures meets minimum vent. requirements
Ventilation	
Flammability	partially flammable (roof)
Thermal comfort²	mitigates extreme temperatures ²
Personal security	guarantees personal security
Accessibility	adaption measures necessary

Habitability



Covered area	suitable for 3 occupants (Sphere)
Privacy	not designed for minimum privacy
Natural light	meets minimum light requirements
Artificial light	no access to artificial lightning
Shelter materials	adapted to local practices
Facilities	communal facilities in the site

Affordability



Costs	Cost / Life span / Area
	\$ 256.65 / 4 years / 10.5 m ²
	= \$ 6.1 / year / m ²



Sustainability Score Card



Score Interpretation: 1 = poor, 2 = fair, 3 = average, 4 = good, 5 = excellent
 The criteria for the evaluation was established based on the overall performance of the shelters presented in this document

Conclusions from the Presentation on the Shelter Score card

By looking through these key images and the case study, Shelter Cluster partners noted that as the quality and lifespan of the shelters increased, the carbon dioxide risk mitigation moved to excellent while the tree protection declined from average to fair. They noted that this was also facilitated by the reduction of man-made materials in the use of the shelter and their replacement with raw materials. Shelter Cluster partners also observed that the overall impact on tree protection would have to be calculated as suggested in the NEAT+ activity tools by calculating the total number of shelters to be built in that location, not only of one shelter as the images above illustrate.

Shelter Cluster partners were informed that UNHCR has now developed a tool that is in pilot mode through its HQ to calculate the carbon dioxide design. The Shelter Cluster Coordinator was trying to submit the Wotutu shelters if UNHCR and Plan are able to recover the old bill of quantities and designs from 2021. The Shelter Cluster has been encouraging Shelter Cluster partners to also increase their capacity at doing repair works for the many shelters that are damaged by the crisis. Shelter Cluster partners can also use this methodology to evaluate the environmental footprint of Shelter and NFI items. The methodology also brings another frame of analysis for market-based programming (discussed in December 2022). This is knowing the origin of where man-made materials are produced. For example for the many corrugated iron sheeting materials used in roofing and now encouraged to provide better repairs, it is known that many of the providing markets are in Douala Cameroon. It is also necessary to identify where these retailers received the iron sheeting as it may have also been produced in China or other locations. Such awareness also helps in better calculating the environmental footprint.

There is not any environmental score cards for NFIs, but by seeing how it works through this case study, one can apply it to NFIs and energy as well. The Score Card is another way to evaluate Shelter and NFI activities' impacts on the environment and can help Shelter Cluster partners in conducting a response analysis and mainstreaming environmental risk mitigation in their programming.