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1. General Information

Objectives & Functions

The UNHCR Shelter Sustainability Assessment Tool enables assessment of shelter designs in relation to environmental impacts, technical performance, habitability and affordability. This assessment is intended to support decisions regarding design and procurement of emergency, transitional and durable shelters provided by UNHCR and its partners.

In addition to assessing specific shelter designs, the Tool provides a compendium of past assessments, enabling users to review and compare designs when considering options for new assistance programs. Assessment reports and project information for each assessed shelter - including BOQs, drawings and images - can be downloaded from the Tool for use in project planning and reporting.

Content & Structure

The online tool is comprised of eight primary sections:

1. Project list page
2. Project information
3. Geometry
4. Bill of Quantities
5. Technical performance
6. Habitability
7. Environmental impact
8. Scorecard

In addition, the tool includes three secondary sections:

1. Compare shelters
2. Overview data
3. Reference data

Assessment Criteria

Criteria for sustainability assessment, drawn from the UNHCR Shelter and Sustainability Report (UNHCR, 2021):

- Environmental impact, comprising three sub-criteria:
 - Embodied CO₂equivalent (kgCO₂e/year/m²)
 - Embodied water (L/year/m²)
 - Material efficiency (kg/year/m²)
- Technical performance (% score based on defined criteria)
- Habitability (% score based on defined criteria)
- Affordability (shelter cost in US\$/year/m²)

2. System Information

System Requirements

The online Tool is accessed via a web browser such as Chrome, Edge, Safari, Firefox, etc. The tool can be accessed from a computer, tablet or phone; however, the layout is optimised for desktop and laptop computer.

No downloads are required to access and use the Tool.

Access & Users

The Tool is accessed at the website:

https://unhcr-tss.epfl.ch/shelter_sustainability/

Guest access is open and does not require registration. Guest users have read-only access. Guest users can freely navigate the Tool, review existing projects, download any existing project files and export comparison reports and assessment reports.

UNHCR Staff access requires a UNHCR username and password. UNHCR staff users have read and write access. UNHCR staff users can review existing projects and create new projects. UNHCR staff users can modify and delete projects that the User has created.

Administrator access is granted to specific UNHCR staff. Admin users can modify and deleted any project.

Security & Privacy

The Tool is subject to standard UNHCR security and privacy requirements.

Bug reporting & feedback

Reports of bugs (errors or malfunctions) and feedback can be sent to Tool administrators.

For bug reporting, please provide specific information such as the relevant screen/function, project and the browser used. Screenshots describing the error are helpful.

Feedback is welcome, including suggestions for additional materials and reference data.

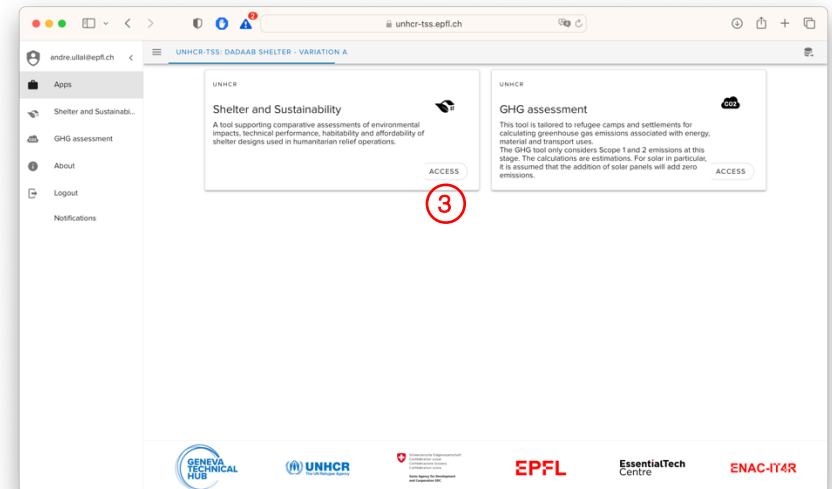
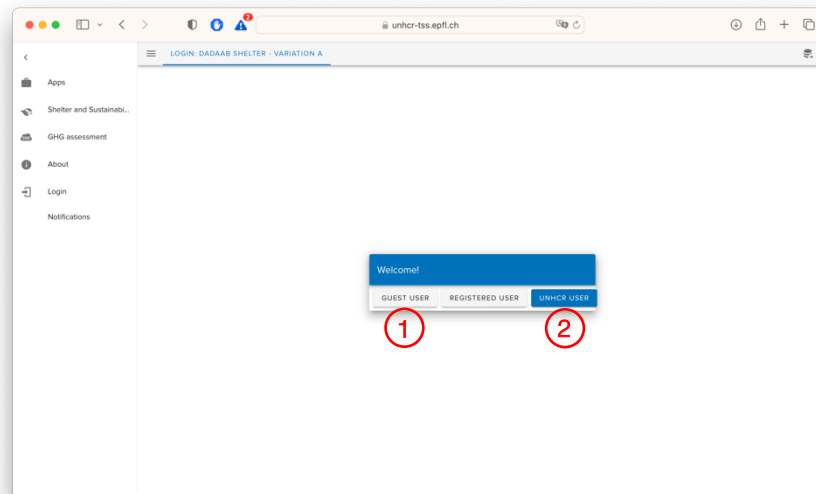
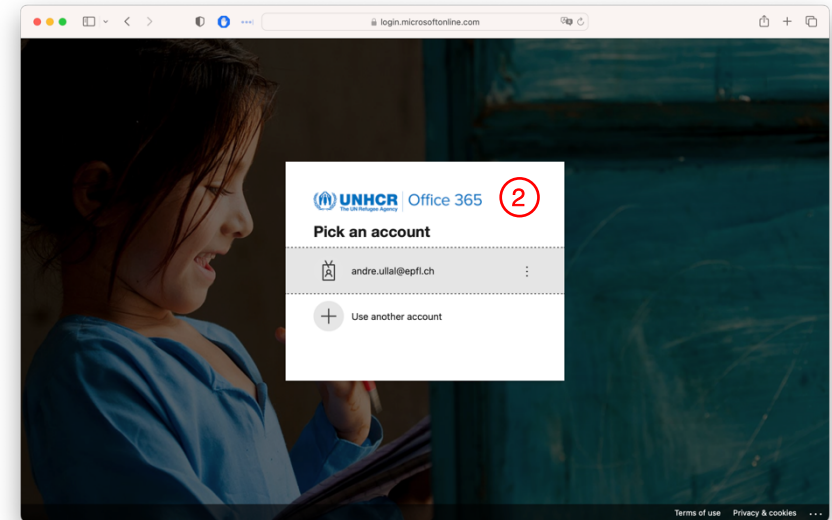
3. Accessing the tool

Access the tool at:

https://unhcr-tss.epfl.ch/shelter_sustainability/

via a web browser.

1. For Guest User (read-only) access, select [LOGIN AS GUEST]
2. For UNHCR Staff User (read-write) access, select [UNHCR LOGIN] then enter UNHCR credentials in the usual UNHCR access window.
3. From the Tool (Splash page), select [Shelter and Sustainability - ACCESS]



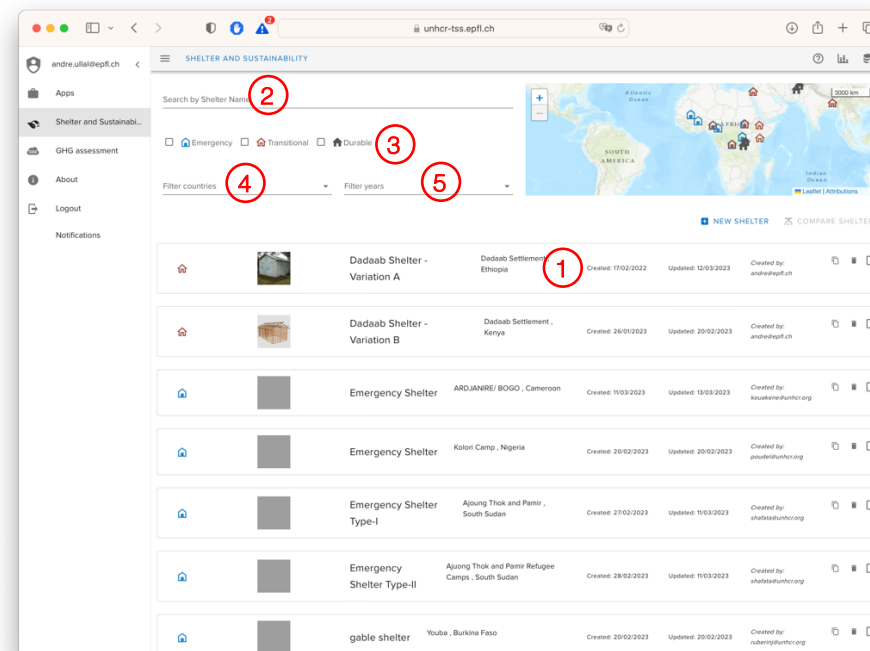
4. Viewing existing projects

All users have read-only access to all projects.

Read-only access allows viewing of all projects, downloading of any files, and exporting of reports. Read-only access allows changes can be made to project information fields, however these changes are not saved - any changes are lost when navigating to another page.

Read-write access allows viewing and modification of all project information, download of any files, and export of reports. Modifications or additions of information are saved when the User clicks outside the data entry field or navigates away from the page. UNHCR staff users have read-write access to projects that the User started or has been granted access to by the Owner.

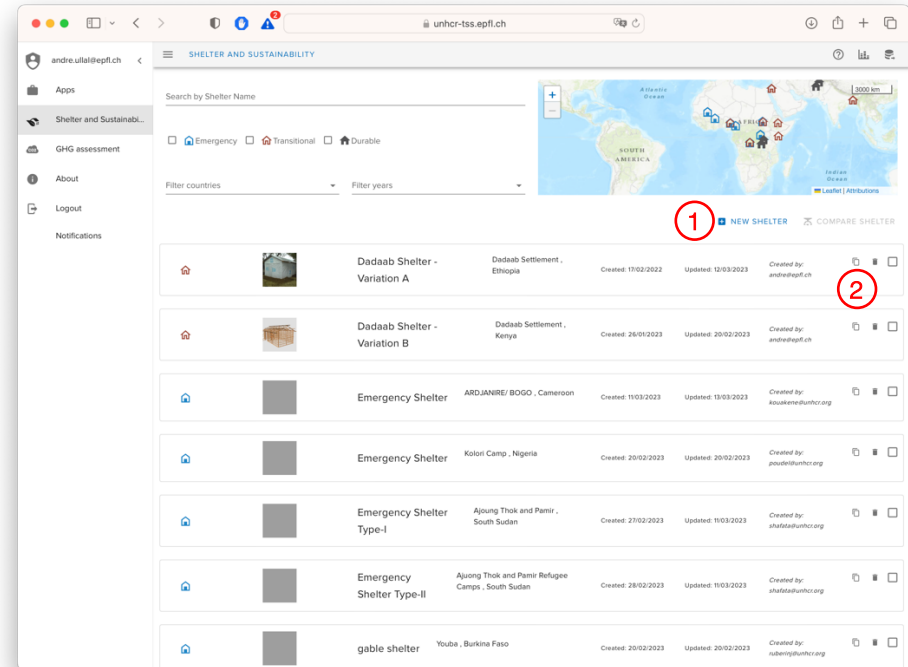
1. View an existing project, click on a badge on the {Project List} page. Each project badge includes:
 - a. Shelter type icon (emergency, transitional or durable)
 - b. Thumbnail image (if available)
 - c. Project name
 - d. Project location and country
 - e. Created (date)
 - f. Updated (i.e., last date modified)
 - g. Created by (i.e., the project Owner)
 - h. Copy project icon
 - i. Compare project checkbox.
2. Search for a project name using <Search by Shelter Name>
3. Filter projects by shelter type using the shelter type check boxes
4. Filter projects by country(ies) using <Filter countries>
5. Filter projects by year(s) added to the tool using <Filter years>



5. Creating new projects

New projects can be created (i.e., new assessments started) at the {Project List page} by two methods:

1. Create a new shelter using the [NEW SHELTER] button
 - a. Click of the [NEW SHELTER] button
 - b. Enter a project name in the popup field
 - c. The Project Information page opens to initiate data entry
2. Duplicate an existing project using the [DUPLICATE] icon
 - a. Click on the [DUPLICATE] icon
 - b. The User that copies the project becomes Owner of the copied project
 - c. Select the duplicated project to change the name and other project information



6. Entering project information

The {Project information} page records basic general information about the project and shelter design. Enter the required information for new projects or modify information for existing projects.

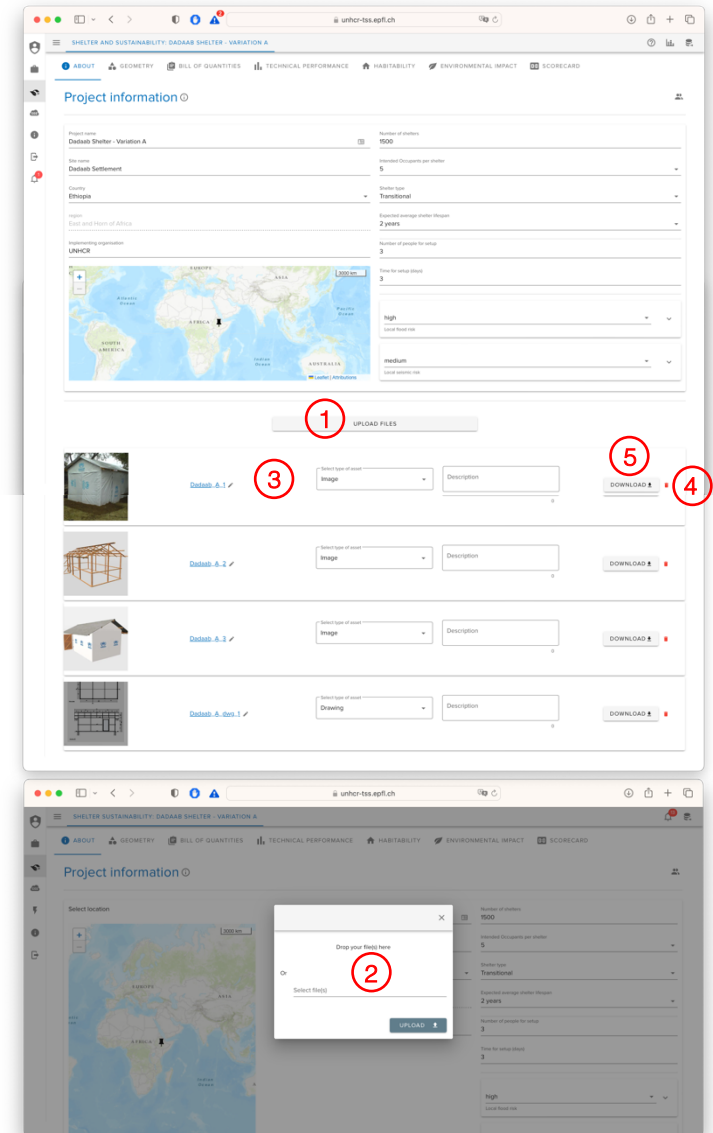
1. <Project name> the previously entered name can be modified and saved
2. <Site name> usually the relevant settlement or camp
3. <Country> select from the dropdown menu
4. <Region> defined automatically based on the country selected
5. <Implementing organisation>
6. <Number of shelters> i.e., number of shelters using this design at the location
7. <Intended occupants per shelter> select from the dropdown menu (only single-family shelters are considered)
8. <Shelter type> from dropdown menu
9. <Expected average shelter lifespan> select from the dropdown menu (years)
10. <Number of people for setup>
11. <Time for setup>
12. <Local flood risk> select from the dropdown menu (low, medium, high) considering broader project or program risk assessments where available
13. <Local seismic risk> select from the dropdown menu (low, medium, high) considering broader project or program risk assessments where available

The screenshot shows the 'Project information' page in the Shelter and Sustainability Assessment Tool. The page is titled 'Project information' and contains a form with various input fields and dropdown menus. A world map is visible on the left side of the form. The form fields are numbered 1 through 13, corresponding to the list of instructions provided. The form includes fields for Project name, Site name, Country, Region, Implementing organisation, Number of shelters, Intended Occupants per shelter, Shelter type, Expected average shelter lifespan, Number of people for setup, Time for setup (days), Local flood risk, and Local seismic risk. Below the form, there is an 'UPLOAD FILES' section with four rows, each containing a thumbnail image, a file name, a 'Select type of asset' dropdown menu, a 'Description' field, and a 'DOWNLOAD' button.

7. Uploading and downloading project files

At the {Project Information} page, project files including images, drawings and reports in a range of formats can be uploaded and stored projects to facilitate distribution and dissemination of shelter designs.

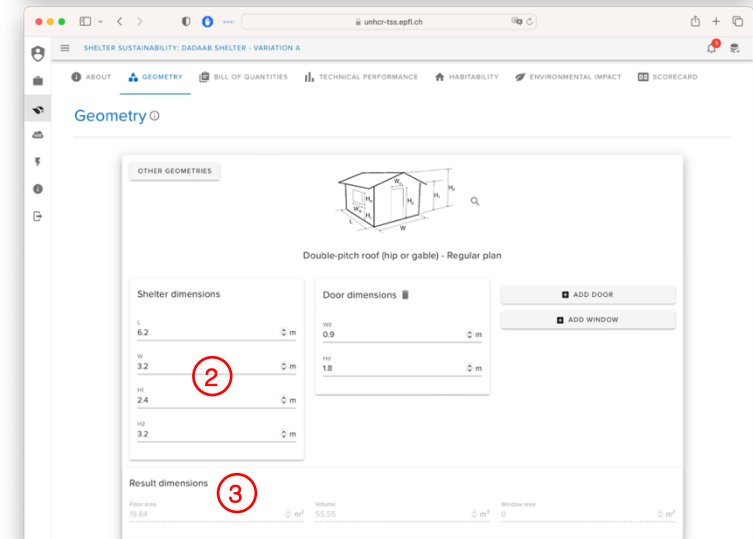
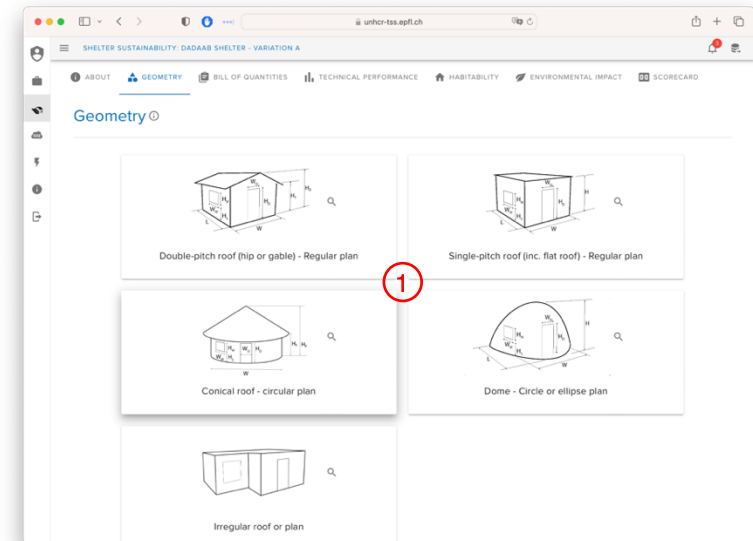
1. Select the [UPLOAD FILES] button at the bottom of the {Project Information} page
2. Either drag-and-drop files or select files via the pop-up browser
3. After uploading:
 - a. the file name can be modified
 - b. select the type of asset (image / drawing / report)
 - c. a description of the file can be added
 - d. uploaded files can be deleted
4. Select the [DELETE] button to deleted uploaded files
5. Select the [DOWLOAD] button to download uploaded files
6. There is a limit of 10Mb per file and 10 files per project



8. Entering geometry information

The {Geometry} page records information about the shelter form and dimensions, with subsequent area and volume calculations supporting assessment of other criteria. Enter the required information for new projects, or modify information for existing projects.

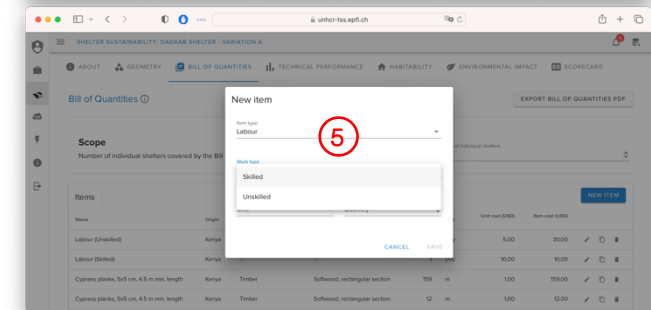
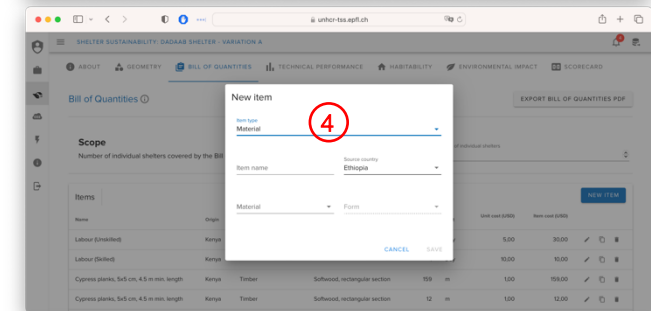
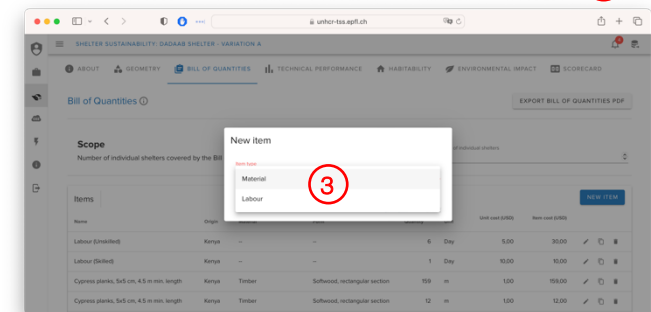
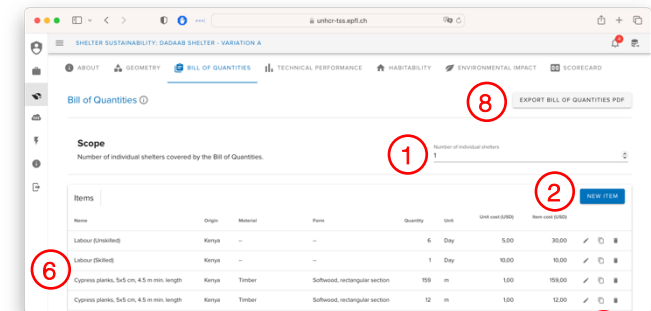
1. Select from one of the standard shelter forms:
 - a. Double pitch roof with regular (rectangular) plan
 - b. Single pitch or flat roof with regular (rectangular) plan
 - c. Conical roof with circular plan
 - d. Dome with circular or elliptical plan
 - e. Irregular roof or plan
2. Enter shelter dimensions:
 - a. <L> length of floor
 - b. <W> width of floor
 - c. <H1> height at wall (or lowest height)
 - d. <H2> height at centre (of greatest height)
 - e. <Wd> width of door
 - f. <Hd> height of door
 - g. <Ww> width of window
 - h. <Hw> height of window
 - i. <Hs> height of window sill
 - j. Use [ADD DOOR] to enter dimensions for another door
 - k. Use [ADD WINDOW] to enter dimensions for another window
3. Results of calculations for <Floor area>, <Volume> and <Window area> are presented at the bottom of the screen.



9. Entering Bill of Quantities information

The {Bill of Quantities} page records each item of labour and material required construction of the shelter - including specifications, quantity and cost for each item - used to calculate material efficiency, embodied carbon, embodied water and affordability.

1. <Number of individual shelters> enables recording of BOQ information for multiple shelters
2. Add a new item by selecting the [NEW ITEM] button
3. Select the item category: <Material> or <Labour>
4. For materials, enter:
 - a. <Item name>
 - b. <Source country> i.e., the country where the material is produced. An estimation may be required based on knowledge of the local building materials market
 - c. <Material> from dropdown menu, which determines subsequent options for <Form> and <Unit>, taking into account standard material dimensions and units
 - d. If a relevant <Form> is not presented, select <Other>, requiring entry of the item weight
5. For labour, select:
 - a. <Work type> Skilled / Unskilled
 - b. <Unit> Day / Hour / Lump sum
 - c. <Quantity>
 - d. <Unit cost>
6. The list of items is presented in alphabetical order
7. Existing items can be edited, copied or deleted using the icons
8. Select the [DOWNLOAD] button to download the completed BOQ in a standard format

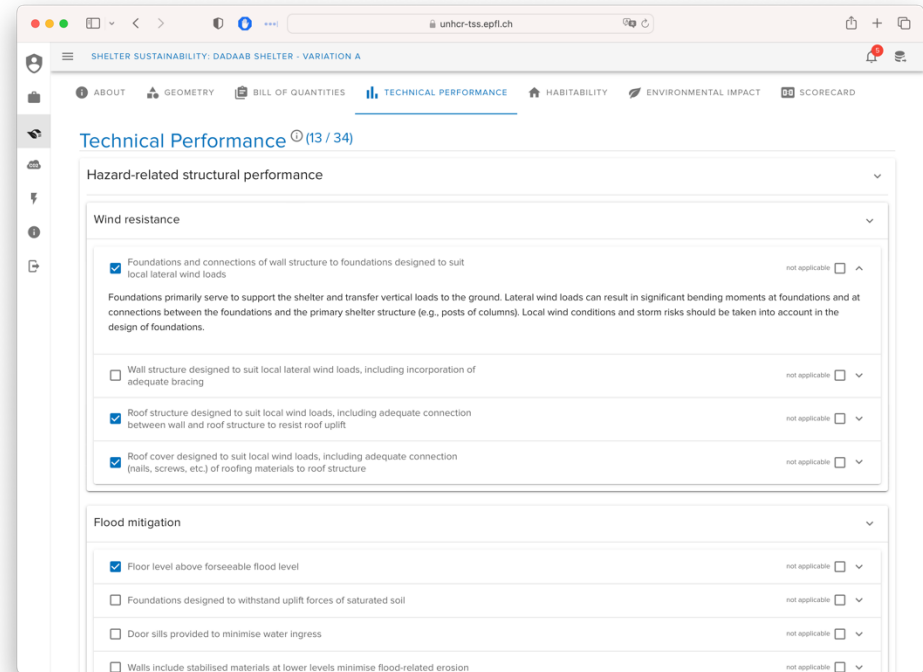


10. Assessing technical performance criteria

The {Technical Performance} page presents a series of criteria relating to structure, comfort, safety and security and construction.

For each of the criteria, a checkbox should be checked if the shelter meets the criteria or left unchecked if the shelter does not meet the criteria. If a criterion is not applicable to the shelter design (e.g., seismic resistance-related criteria in locations of very low seismic risk) the <Not applicable> checkbox can be checked.

A percentage score for technical performance is calculated based on the criteria that are checked, not checked or not applicable.

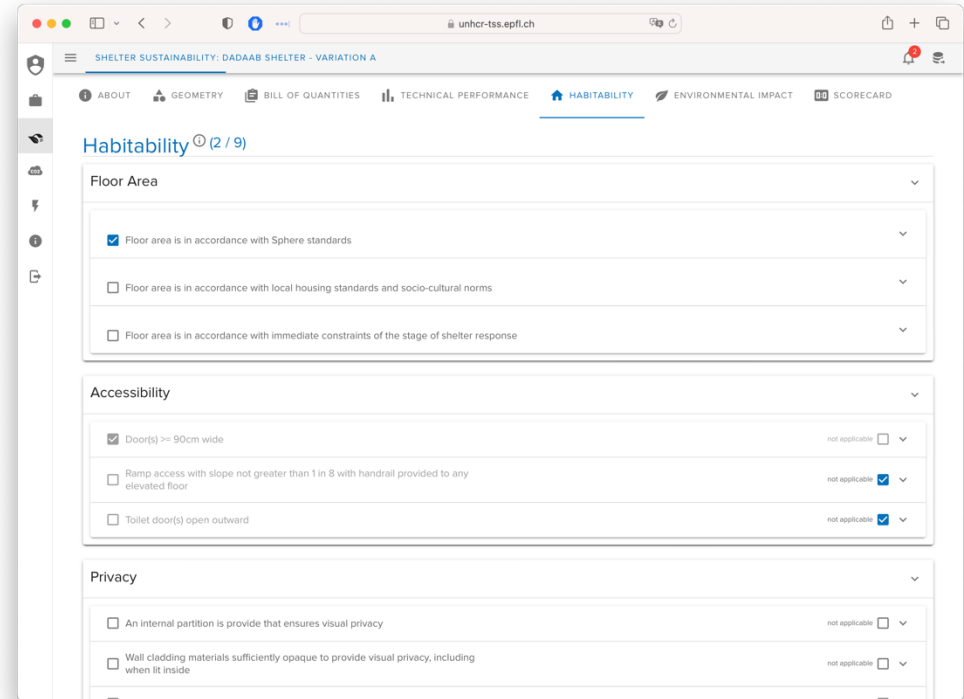


11. Assessing habitability criteria

The {Habitability} page presents a series of criteria relating to floor area, accessibility, privacy, lighting and complimentary facilities.

For each of the criteria, a checkbox should be checked if the shelter meets the criteria or left unchecked if the shelter does not meet the criteria. If a criterion is not applicable to the shelter design (e.g., seismic resistance-related criteria in locations of very low seismic risk) the <Not applicable> checkbox can be checked.

A percentage score for Habitability is calculated based on the criteria that are checked, not checked or not applicable.



12. Comparing projects

The project comparison function enables two or three projects to be compared side-by-side in relation to the assessment criteria and other important aspects of shelter design. This comparison can be exported in a standard format report.

1. On the {Project list} page, check the comparison checkbox for two or three projects,
2. Select the [COMPARE PROJECTS] button (the button becomes active only when a project comparison checkbox is checked)
3. The {Compare Projects} page presents side-by-side comparisons of the selected projects,
4. Select the [EXPORT COMPARISON PDF] to download a comparison report
5. Return to the {Project List} page by selecting the [RETURN] button

The top screenshot shows the 'Project list' page with a table of projects. The 'COMPARE PROJECTS' button is circled in red (1). The bottom screenshot shows the 'Compare Projects' page for 'Dadaab Shelter - Variation A' and 'Dadaab Shelter - Variation B'. The page displays various metrics and a 'RETURN' button circled in red (5).

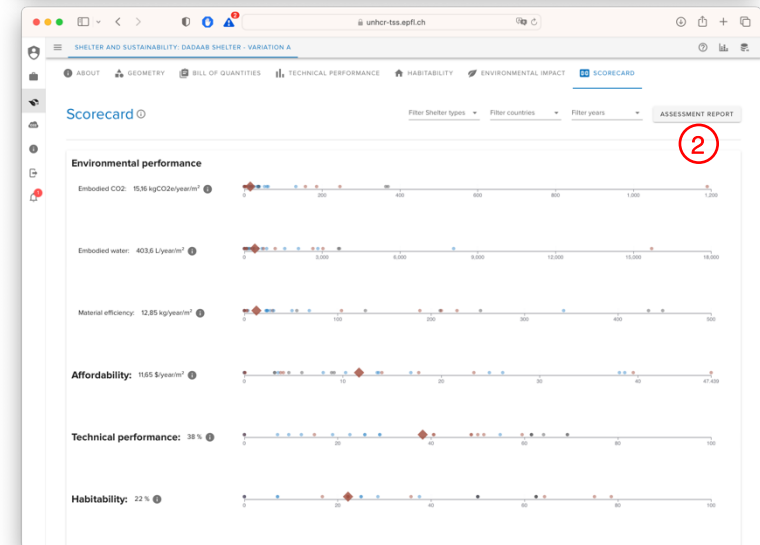
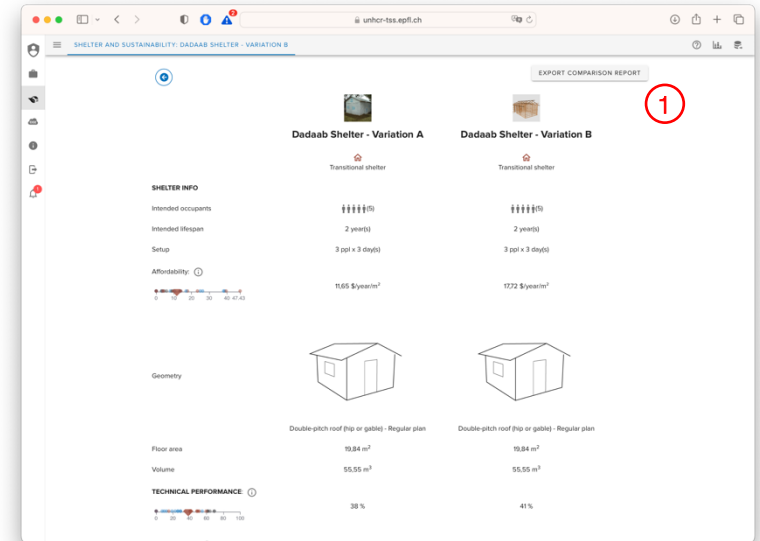
Project Name	Location	Created	Updated	Created by
Dadaab Shelter - Variation A	Dadaab Settlement - Ethiopia	Created: 11/03/2022	Updated: 10/03/2023	Created by: unrefcap@unhcr.ch
Dadaab Shelter - Variation B	Dadaab Settlement - Kenya	Created: 26/03/2023	Updated: 28/03/2023	Created by: unrefcap@unhcr.ch
Emergency Shelter	ABUJAHRI/9050 - Cameroon	Created: 10/03/2023	Updated: 18/03/2023	Created by: steudemann@unhcr.org

Metric	Dadaab Shelter - Variation A	Dadaab Shelter - Variation B
Intended occupants	(5)	(5)
Intended lifespan	2 years(0)	2 years(0)
Setup	3 ppl x 3 days(0)	3 ppl x 3 days(0)
Affordability	1555 \$/year/m²	1777 \$/year/m²
Geometry	Double pitch roof (rip or gable) - Regular plan	Double pitch roof (rip or gable) - Regular plan
Floor area	19.84 m²	19.84 m²
Volume	55.55 m³	55.55 m³
TECHNICAL PERFORMANCE	38 %	41 %
HABITABILITY	22 %	50 %
ENVIRONMENTAL IMPACT	15.55 kgCO2/year/m²	36.15 kgCO2/year/m²
Embodied CO2	409.6 kg/year/m²	735.2 kg/year/m²
Embodied water	13.88 kg/year/m²	36.2 kg/year/m²
Material efficiency	13.88 kg/year/m²	36.2 kg/year/m²

13. Exporting reports

Two types of report can be exported from the tool – a Comparison Report that presents the side-by-side comparison of two or three shelters and an Assessment Report that presents a summary of the assessment and shelter information.

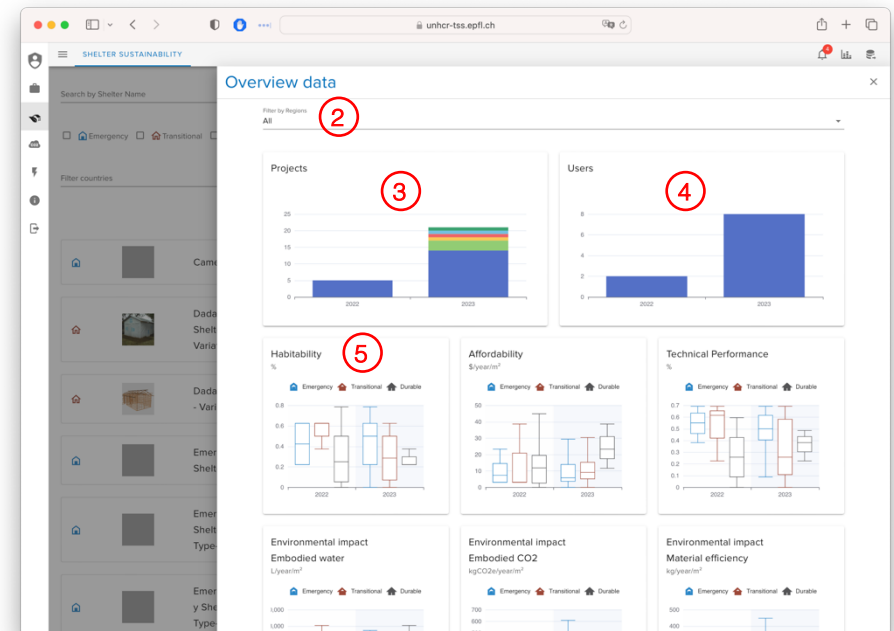
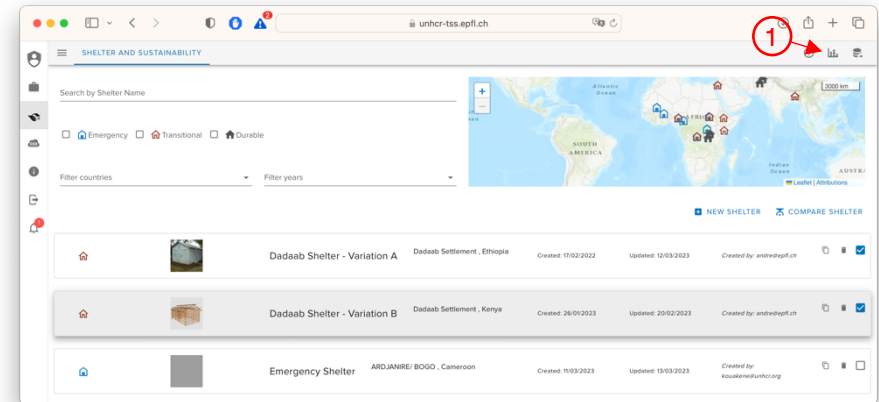
1. Download a Comparison Report at the {Project Comparison} page by selecting the [EXPORT COMPARISON PDF] button
2. Download an Assessment Report at the {Scorecard} page by selecting the [ASSESSMENT REPORT] button



14. Viewing overview data

The {Overview Data} page presents statistics about use of the Tool and about aggregate assessment results for each of the six primary assessment criteria.

1. Access the {Overview Data} page by selecting the chart icon at the top right of the {Project List} page
2. Filter overview data by region using the <Filter by regions> dropdown menu
3. <Projects> presents the number of projects added each year in a stacked bar chart that distinguishes the relevant organisations
4. <Users> presents the number of users that add projects each year in a stacked bar chart that distinguishes the relevant organisations
5. For each of the scorecard criteria, box-and-whisker charts present the annual median and quartiles for each shelter type (emergency, transitional, durable)



15. Viewing reference data

The {Reference data} page presents reference production-related coefficients for embodied carbon and embodied water for each material and transport-related embodied carbon coefficients for each source country.

1. Access the {Reference Data} page by selecting the storage icon at the top right of any page
2. The {Materials} tab presents coefficients for density, embodied carbon and embodied water for each distinct material and material form
3. For each coefficient, the reference for the coefficient can be displayed by hovering over the [INFORMATION] icon.
4. The {Transport} tab presents coefficients for transportation of materials between each source-destination country pair, using estimates based on country land areas, standard shipping routes, and average embodied carbon coefficients for standard transport modes

