



ENERGY AND LOW-INCOME TROPICAL HOUSING (ELITH) SURVEY TOOL

The following survey tool has been developed to investigate popular building techniques and material utilisation in the construction of low-income housing in Uganda. This is to enable researchers to determine factors that influence material choice and utilisation, and the embodied energy of materials as applied in the construction of the housing typology in question. The data

collected will be used to determine energy utilised in material extraction, transportation, and installation. In the case of processing and manufacturing embodied energy, appropriate inventories are utilised at the analysis phase. In addition the tool will attempt to capture maintenance-embodied energy.

1. GENERAL INFORMATION

The section seeks to collect qualitative data for the study. This is essential for the study decisions made in the selection of housing materials are subject to the context within which the housing is situated.

DISTRICT/TOWN:

DATE:

TIME OF VISIT:

SITE DESCRIPTION Mountain Hill Valley River Forest Additional description -	BUILDING CONDITIONS Excellent Fair Good Bad Additional description -	Contextualisation			
		Income/Life quality index	Typology/ Location		
			Isolated	Village	Periurban
		Most deprived rural/ Urban			
Very basic rural and urban					
Moderately poor rural and urban					
Upward moving rural and urban					

Note:

a) Most deprived rural/urban - suffering from a severe and damaging lack of material and benefits, b) Very basic rural and urban - Having only the basic and essential requirements without any luxury, c) Moderately poor - average provision within the low-income housing bracket, d) Upward moving rural and urban - Showing signs of differentiation and provision of luxury

Construction		State of construction		Description			
Self help		Permanent		One room		Deep strip house	Plot area
Mutual aid		Semi- Permanent		Two room		Mixed residential - commercial	Ground floor area
Self help with artisans		Temporary		Square four room house		Number of levels	Building foot print
Mutual aid with artisans				Single strip house		No. of levels below ground	Approximate plot ratio
Artisans/ small scale contractor				Double strip house		No. of levels above ground	

2. RENOVATION INVENTORY

Information gathered with regards to renovation works allows the study to document changes in material utilisation over time and contributing factors.

Year of construction:	Year of last renovation (if any)
Has any change in use occurred since building construction? If yes, describe	
Has any change in material use occurred in renovation works? Highlight area and detail in Section 3- Material Inventory : Landscape <input type="checkbox"/> Floor <input type="checkbox"/> Walling <input type="checkbox"/> Roof <input type="checkbox"/>	

3. LANDSCAPE/SITTING

A physical description of buildings (with particular attention to neighbouring units and orientation)

Draw site layout :(*Indicate orientation, relevant neighbouring buildings and the distances to each*)



3.1 MATERIALS INVENTORY

The section seeks to determine the materials used in the construction of different parts of the building, that is, landscape, flooring, walling and roofing systems; furthermore, for each system, the survey seeks to acquire insight into choices for material selection.

Note

Material source: Specify - (P) Primary; primary source of material production, (S) Secondary and (T) Tertiary; intermediate sources for example stores and builders' yards

Mode of transport: Specify - loading capacity, and make

Composite materials indicate as used in building system. Analysis of composite parts undertake in - 5. CONSTRUCTION MATERIAL INVENTORY

A. LANDSCAPE

Landscape refers to the designed land with the purpose to create functional open spaces and/or make it more visually appealing. This includes all the visible features such as scenery, topography and the nature of the terrain. It also includes systems such as drainage systems and external works.

Name	Surface Area (m ²)	Materials	Material source and distance (Km) from site	Mode of transport
		Material		
Water supply				
Storm water drainage				
External works				

INFLUENCES ON MATERIAL SELECTION - For material in sub group utilised most extensively.

Respondent's designation: Construction trades person Building owner Renter Material

Durable	Readily available	Easy to use/ install	Cheap	What I know	Good looking/ What I like	External influence*	Don't know	Other (Specify)

Note: Detail external influence, for example advertising, peer pressure, commonly used etc

B. FLOOR

Defined as the surface on which activities necessary for occupation take place.

Name	Surface Area (m ²)	Materials						
		Internal floor finish (Annex i)	Material source and distance (Km) from site	Mode of transport	Foundation Construction method (Annex ii)	Foundation construction material inventory	Material source and distance (Km) from site	Mode of transport
FL01								
FLO2								

INFLUENCES ON MATERIAL SELECTION - For material in sub group utilised most extensively.

Respondent's designation: Construction trades person Building owner Renter Material

Durable	Readily available	Easy to use/ install	Cheap	What I know	Good looking/ What I like	External influence*	Don't know	Other (Specify)

Note: Detail external influence, for example advertising, peer pressure, commonly used etc

C. WALLING

Defined as an upright construction having a length and height much greater than its thickness and presenting a continuous surface except where incorporated with openings.

Note

Use of masonry elements should be indicated as such in the table below. Documenting the composition of masonry units is undertaken in C. MASONRY INVENTORY

Orientation	Total Surface Area		Total Surface Area of Openings (m ²)	Materials							Total Thickness of wall (mm)	
	Height (m)	Length (m)		Main Building Material	Material source and distance (Km) from site	Mode of transport	External Finish	Material source and distance (Km) from site	Internal finish	Material source and distance (Km) from site		Mode of transport

INFLUENCES ON MATERIAL SELECTION - For material in sub group utilised most extensively.

Respondent's designation: Construction trades person Building owner Material Renter

Durable	Readily available	Easy to use/ install	Cheap	What I know	Good looking/ What I like	External influence*	Don't know	Other (Specify)

Note: Detail external influence, for example advertising, peer pressure, commonly used etc

Masonry unit (material)

No of units /m ²	
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Dimensions	L	B	H
Cement content by volume			
Average thickness of mortar joint		Mortar mix	

Attach image*

Attach image*

Masonry unit (material)

No of units /m ²			
Dimensions	L	B	H
Cement content by volume			
Average thickness of mortar joint		Mortar mix	

D. WALLING - WINDOWS

Catalogue of windows on façade grouped based on orientation.

Orientation	No.	Unit Surface Area (m ²)	Type of glass					Total glass thickness (mm)	Material source and distance from site	Mode of transport
			Clear	Tinted	Reflective	Single glazing	Double glazing			

E. WALLING - WINDOW FRAMES

Material (Annex iii)	No. of openings	Unit Surface Area (m ²)	Total thickness of frame (mm)	Material source and distance from site	Mode of transport	Equipment utilised in installation	Power rating	Estimated hours of use

INFLUENCES ON MATERIAL SELECTION - For material in sub group utilised most extensively.

Material

Respondent's designation: Construction trades person Building owner Renter

Durable	Readily available	Easy to use/ install	Cheap	What I know	Good looking/ What I like	External influence*	Don't know	Other (Specify)

Note: Detail external influence, for example advertising, peer pressure, commonly used etc

F. WALLING - DOORS

Location	No.	Unit size (B x H)	Material thickness (mm)	Material source and distance (Km) from site	Mode of transport	Equipment utilised in installation	Power rating	Estimated hours of use
Internal								
External								

INFLUENCES ON MATERIAL SELECTION - For material in sub group utilised most extensively.

Respondent's designation: Construction trades person Building owner Renter

Durable	Readily available	Easy to use/ install	Cheap	What I know	Good looking/	External influence*	Don't know	Other (Specify)

Note: Detail external influence, for example advertising, peer pressure, commonly used etc

A. ROOF

Defined as an assembly designed to weather proof and normally insulate a building from solar gain.

Type	Slope (°)	T o t a l S u r f a c e		Material information								
		Estimated (E)	Actual (A)	External roof covering (Annex iv)	Material source and distance (Km) from site	Mode of transport	Internal water proof layer (Annex v)	Material source and distance (Km) from site	Mode of transport	Ceiling material (Annex vi)	Material source and distance (Km) from site	Mode of transport
Gable roof												
Pitch roof												
Flat roof												
Mono pitch												

INFLUENCES ON MATERIAL SELECTION - For material in sub group utilised most extensively.

Respondent's designation: Construction trades person Building owner Renter

Durable	Readily available	Easy to use/ install	Cheap	What I know	Good looking/	External influence*	Don't know	Other (Specify)

Note: Detail external influence, for example advertising, peer pressure, commonly used etc

Depth of roof overhang (mm)	Roof support material	Material source and distance (Km) from site	Mode of transport

4. ON SITE MACHINE INVENTORY

The use of mechanically driven equipment for material installation contributes to the material's embodied energy. The section gathers information on mechanically driven equipment employed on site whose use can be unequivocally proved.

Equipment								
Process								
Energy type (fuel)								
Amount/day (Amount/hour)								
Time span								

5. CONSTRUCTION MATERIALS INVENTORY

Data to gather information on the production and supply process of base constituents of composite building materials

Material details	Source	Process	Equipment utilised	Time span/unit	Energy type (fuel)	Amount / day	Distance to next destination	Destination	Mode of transport	Energy type (fuel)	Amount/km (Amount/trip)
Cement											
Sand											
Machine crushed aggregate											
Hand crushed aggregate											
Other											

Note

Material source: Specify - (P) Primary; primary source where material is produced (extracted); (S) Secondary and (T) Tertiary - intermediate sources for example stores and builders' yards

Destination: Specify - Secondary (S), Tertiary (T), and Site (S)

Mode of transport: Specify - vehicle-loading capacity, and make

Annex (i) Internal Floor Finish

1. Earth
2. Cement screed
3. Concrete
4. Ceramic tiles
5. PVC Tiles
6. Others - Specify

Annex (ii) Foundation Construction method

1. Strip foundation
2. Raft foundation
3. Pad foundation
4. Others (specify)

Annex (iii) Window frame material

1. Steel casement
2. Timber
3. Others (specify)
- 4.

Annex (iv) External Roof Covering

1. Clay tiles
2. Concrete tiles
3. Iron Sheets
4. Concrete slab
5. Grass thatch
6. Sisal cement tile
7. Others (specify)

Annex (v) internal water proofing material

1. Polythene sheet
2. Iron sheet
3. Others (specify)

Annex (vi) Ceiling material

1. Gypsum
2. T&G timber
3. Soft board
4. None
5. Other (Specify)

Annex (ix) Photographs

Annex (x) Building plans

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