UN-HABITAT TINY HOUSE
Sustainable Living Unit in the Tropics

Meeting shelter needs through Low Carbon Pathways

This sustainable living unit in the Tropics is a prototype of an affordable house provided with all basic services including: clean energy, food production, onsite waste management, natural lighting and ventilation and many more sustainable design principles.

Cost of UN-Habitat tiny house:

- Building materials: 8,000 $
- Solar system: 3,000 $
- Vertical farming: 2,000 $
- Biogas system: 650 $
- Solar hot water system: 850 $
- Labour: 4,000$
- Total: 18,500 USD

Car charging facility: 3,900 USD
Features of the UN-Habitat Tiny House

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Building orientation and allocation of spaces within the house

- The long axis of the building is along East- West to minimize direct solar radiation penetration in the building and reduce heat gain;
- The veranda and the kitchen are located on the East and West facing walls to act as buffer zones against heat gain but benefitting from daylighting;
- Space is optimized to make it the most efficient use e.g. the staircase provides spaces for storage with a mobile bed.
- Beds provide additional storage spaces.
- The building occupies a total space of 56m² to minimize the foot print.

Daylight, opening and natural ventilation

- Window to wall ratio does not exceed 20 % and are mainly placed on North and South facades;
- Sun shading are provided from the roof overhangs;
- The vegetation wall in the north (vertical farming - aquaponic) are utilized to produce food while minimizing heat gain;
- Roof vents and openings are utilized to enhance natural ventilation and lighting.
Building envelope materials
- Local available building materials are used to minimise the cost and reduce carbon footprint;
- Laminboards, used as wall, are made of recyclable and re-usable materials with low toxic emissions;
- Light colour exterior reflect solar radiation and light coloured interior finishing enhance natural lighting;
- The walls and floor are made of locally available recyclable materials.

Renewable energy
- A photovoltaic system is placed on the roof to generate clean energy (2 kilowatt);
- A solar hot water system provides hot water for the occupants;
- A biogas digester provides the home with gas for cooking and natural fertilizer for farming.

Water conservation and efficiency
- Rainwater harvesting systems is utilized to collect and store water;
- Water efficient appliances and water-saving fixtures are included in the design.

Sanitation
- on-site waste water treatment system is installed to produce biogas and natural fertilizer;
- The toilet (WC) is connected to the biogas system.
Solid waste management
- Waste segregation bins are available in the house to promote waste separation at source

Food production
- Self-sufficient vertical aquaponics system provides fruits, vegetable and fish increase food security and a balanced diet for the family

Incremental housing unit
- “Incremental Housing” is a strategy to satisfy housing demand in rapidly urbanizing context.
- This feature is included in the UNHTH which has been designed to stand alone or configured in a modular connected layout. This will allow its inhabitants to expand their sustainable living unit according to the spatial needs and budget of the family.

For further information, please contact:
Vincent Kitio,
Chief, Urban Energy Unit,
Urban Basic Service Branch, UN HABITAT
vincent.kitio@un.org
Tel: +254-20 7624343

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