The Inaugural Bio & Earth-Based Materials Compendium

An Initiative by the Bio-Based Working Group, Materials Hub, GlobalABC

Project Team

Harry Mills, Centre for Natural Material Innovation, University of Cambridge; Juan Yacopin, Centro Argentino de Ingenieros; Konish Naidu, Mona Mohammed, Tapiwa Nxele, Tamino Joshua Valentin Koehne, Qihui Yuan, UN Environment Programme; & Niccolas Ramirez, Costa Rica Green Building Council.

Harry Mills

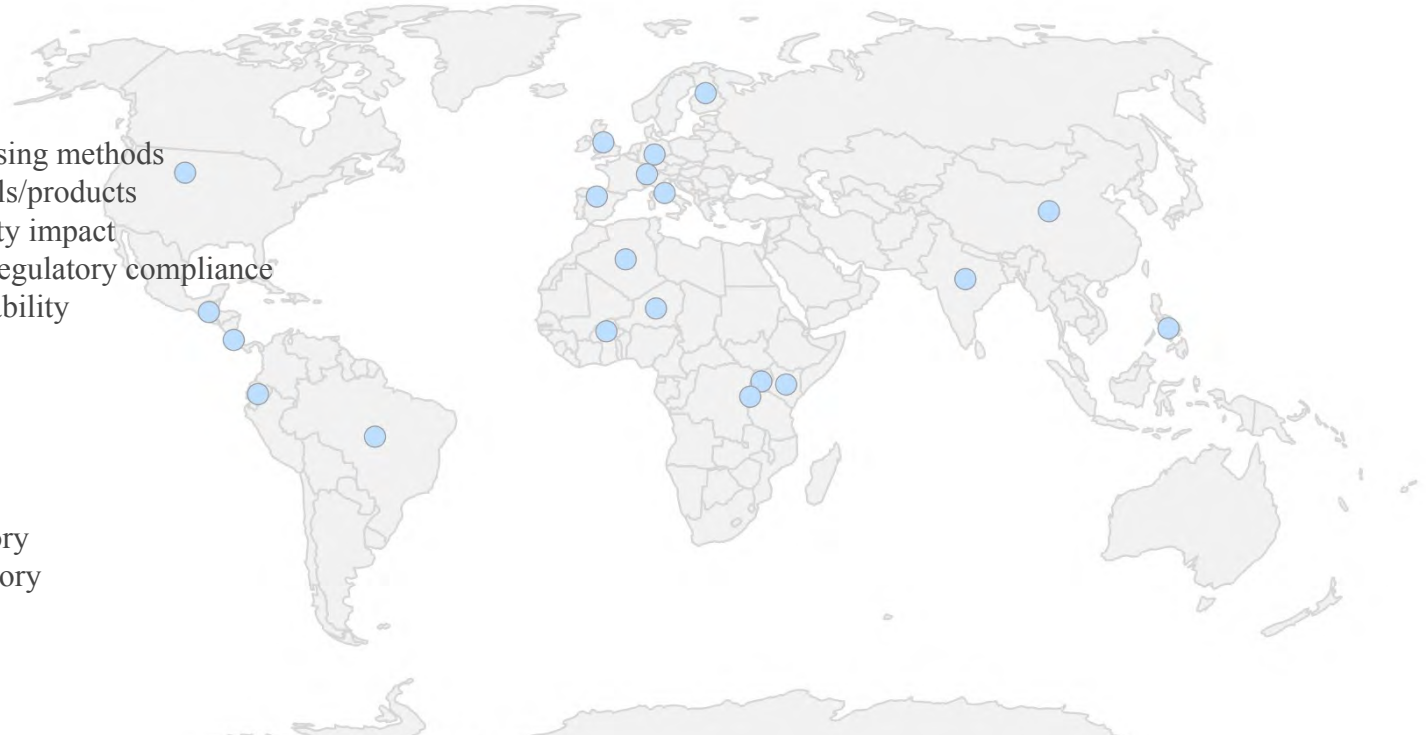
Researcher, Centre for Natural Material Innovation, University of Cambridge; & Co-Chair, Bio-Based Working Group, GlobalABC

Background & Process

Projects Categories Sought:
- Non-Structural and Structural Products
- Buildings of Any Typology

Evaluation Metrics:
- Material sourcing and processing methods
- Design innovation of materials/products
- Social, gender, and community impact
- Environmental analysis and regulatory compliance
- Project replicability and scalability
- Value chain integration

Selection Overview:
- 34 projects from 21 countries
    - 16 in Products Category
    - 19 in Buildings Category



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Products

Project Name	Country	Material	Application
Hexpressions	India	Cellulose, Coir (Coconut fibrous husk), Engineered Wood (Veneer or MDF)	Non Structural; Doors, Furniture
Earth-hemp insulation of timber-framed buildings	Switzerland	Wood, Hemp, Earth (raw)	Non Structural; Insulation
BIOM	Ecuador	Straw	Non Structural; Insulation
ISOGRIN	Algeria	Olive pomace, Binders (Wood Fibres, Gum)	Non Structural; Insulation
Sustainable Raw Earth Construction with Bio-Additives	France	Earth (raw), Soil, Bamboo and Mycelium Fibres	Non Structural; Block, Mix, Flooring
CannaBau-Technik	Germany	Hemp	Non Structural; Block
Making buildings carbon sinks	United Kingdom	Charcoal/Biochar	Structural, Non Structural; Block Brick Slip
Effects Of Gum Arabic As Partial Replacement Of Cement On The Structural Performance Of Laterite Blocks	Kenya	Earth (Binder), Aggregate, Wood residues/Sap/Gum	Structural, Non Structural; Block
Supra reciclaje	Guatemala	Wood/ Timber, Bamboo, Earth, Recycled concrete, steel slag, ashes, etc	Non Structural; Block, Mix, Flooring
Abacablend	Costa Rica	Wood/ Timber, Bamboo, Straw, Earth (compressed)	Non Structural; Block
Typhaboard	Germany	Typha (Cattail), Magnesite Binde)	Structural, Non Structural; Panel
Innovative Sandwich made from plant based materials	Brazil	Wood, shavings and fibres, sisal fibres, Earth Mineral binder	Structural; Panel
Kenafcrete® Biocomposite	Singapore	Kenaf	Structural, Non Structural; Panel
Circular B-I/O	Kenya	Wood, Bamboo, Hemp, Straw, Water hyacinth, Sargassum, Cassava Peel Ashes, Maize Cobs, Sugar Cane Bagasse, Miscanthus, Groundnut Shells, Coconut Shells, Cocoa Pods, Rice Husks.	Structural, Non Structural; Aggregate, Binder
Bamboo Veneer Lumber (BVL):	Singapore	Bamboo	Structural, Non Structural; Many
Iso Certified Mass Timber Kenya	Kenya	Wood	Structural, Panel, Many

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Buildings

Project Name	Country	Material	Application
Bonbon Resettlement Project	Philippines	Wood	Structural; Many
Affordable, biobased housing in Uganda	Uganda	Wood	Structural
Platte Fifteen	United States of America	Wood; EWP	Structural; EWP
Katajanokan Laituri	Finland	Wood; EWP	Structural; EWP
1510 Webster	United States of America	Wood; EWP	Structural; EWP
The New Model School	United Kingdom	Wood; EWP	Structural; EWP
Nez Perce-Clearwater Forest Service Supervisor's Office	United States of America	Wood; EWP	Structural; EWP
TILT	United States of America	Wood; EWP	Structural; EWP
Home Grown Cabin	United Kingdom	Wood, Wool	Structural
MO.C.A. (MOdulo Casa Autocostruita - Self-built house module)	Italy	Wood, Hemp, Straw	Structural; Many
CASA OC	Costa Rica	Earth Compressed, Abacá Fibre	Non Structural
Rwanda Institute for Conservation Agriculture	Rwanda	Wood, Terracotta, Brick, Compressed Stabilised Earth Blocks, Rammed Earth	Structural; Many
Bamboo-Timber Load-bearing Wall System	China	Wood, Bamboo, Straw, Palm Fibres, Earth Adobe Block	Structural; Many
Two Uncles Li‘s New House	China	Wood, Bamboo, Straw, Earth Adobe Blocks, Stone, Slate	Structural; Many
Composite bamboo shear walls	Philippines	Wood, Bamboo, Earth Binder, Aggregate	Structural
Building in Burkina Faso	Burkina Faso	Wood, Straw, Earth, Cow Manure	Structural
Collège Amadou Hampaté Bâ, Niger	Niger	Earth Raw, Compressed Stabilised Earth Blocks, Laterite Stone	Structural
Casa Nido	Costa Rica	Wood, Bamboo, Straw, Earth Raw, Clay	Structural

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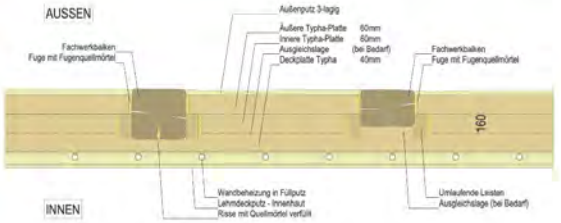
TYPHABOARD

Dr. Georgiev Consulting GmbH, Dipl.-Ing. Werner Theuerkorn, Prof. Dr. Martin Krus
Germany, 2006



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Making buildings carbon sinks

Dr. Frank Gommer, .Managing Director, Composite Designers Ltd
United Kingdom, 2023

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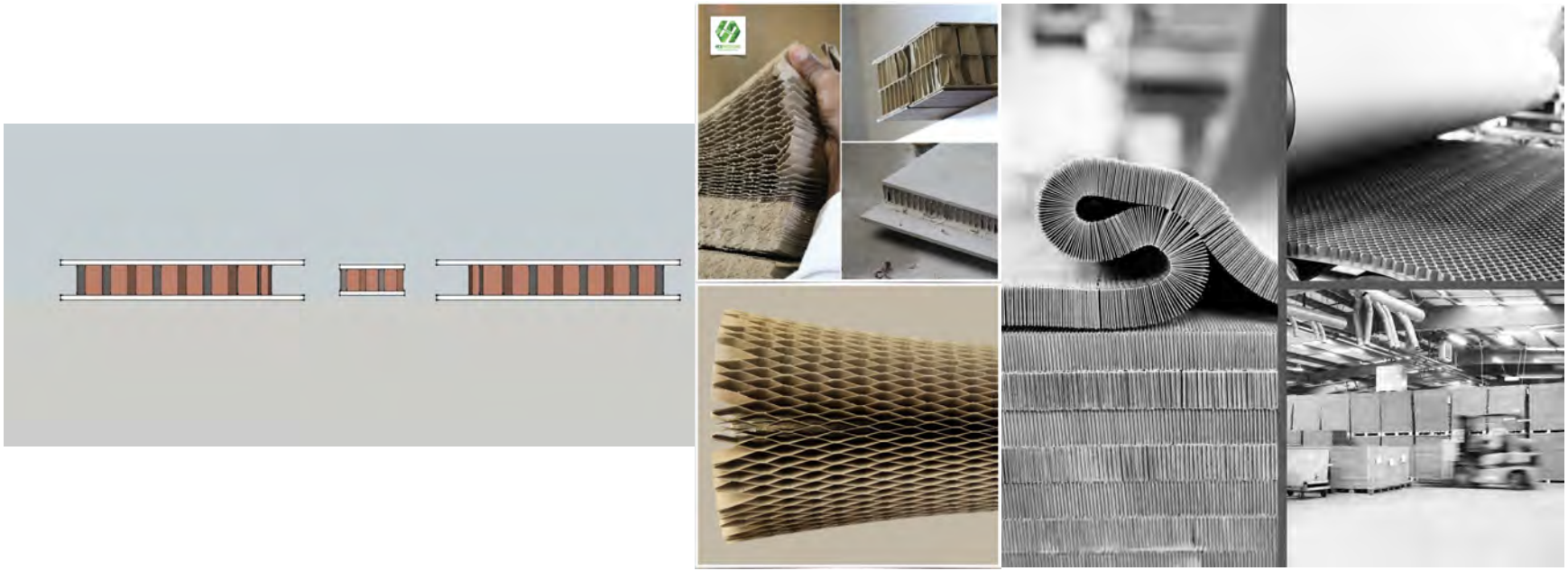
Hexpressions

Hexpressions, Shilpi Dua, Abhishek Rajora, Kush Jee Kamal
India, 2018



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Home Grown Cabin

George George Fereday London Metropolitan University
United Kingdom, 2021 - 2023

Completed cabin demonstrator revealing the layers of construction.

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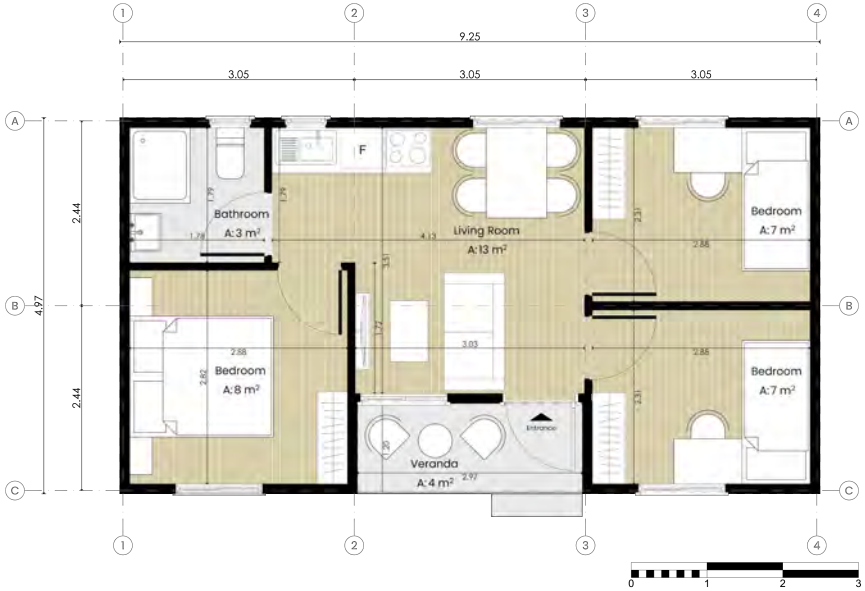
Affordable, biobased housing in Uganda

Easy Housing Wolf Bierens
Uganda, 2023 - 2024



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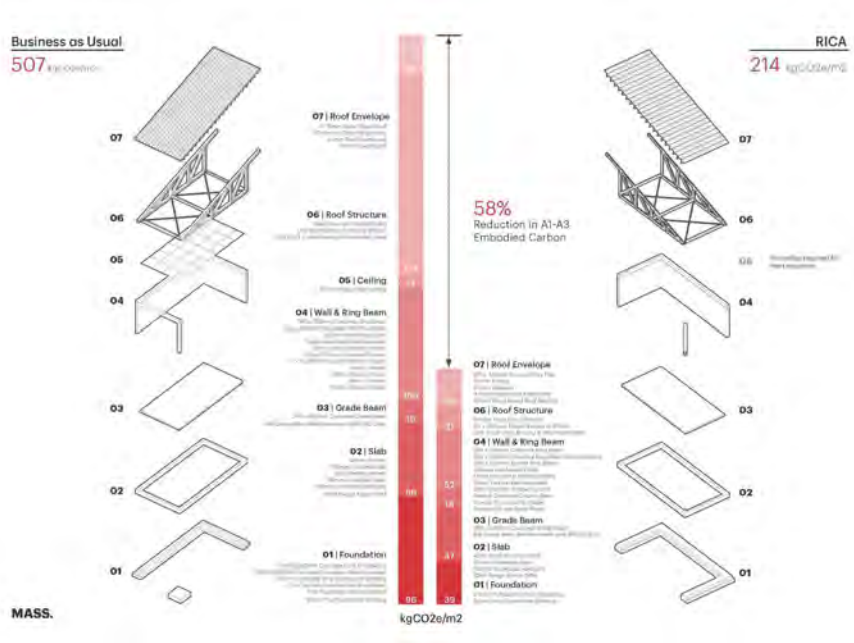
Rwanda Institute for Conservation Agriculture

MASS Design Group, Arup
Location: Bugesera, Rwanda. Timeline: 2018 - 2023.



Over 300 workers were been trained in sustainable construction methods, with 84 laborers receiving specialized training in trades.

Workers trained in rammed earth construction have formed a cooperative and now work across the country.

Over 2 million compressed stabilized earth blocks were fabricated during the construction of the RICA campus.

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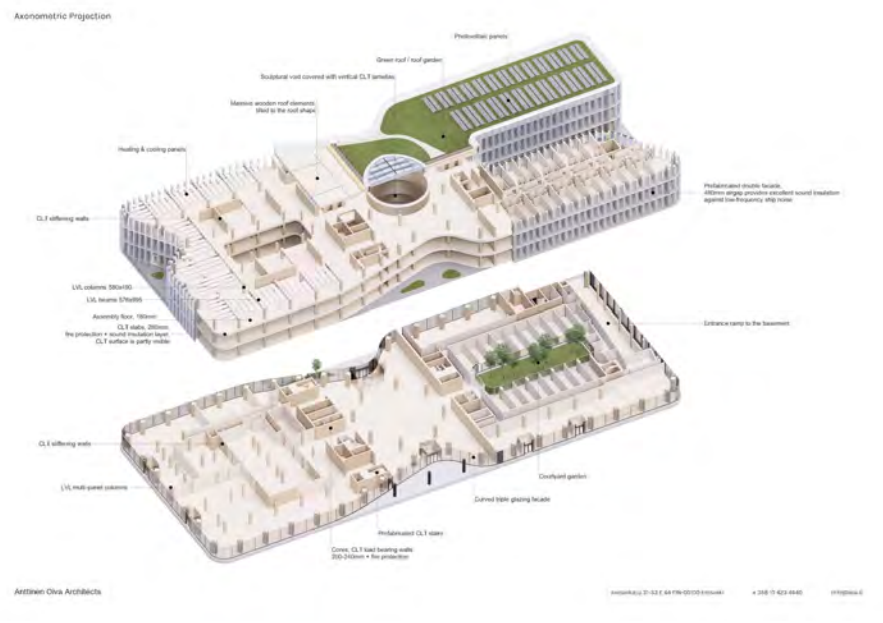
Katajanokan Laituri

Stora Enso
Helsinki, Finland, 2023



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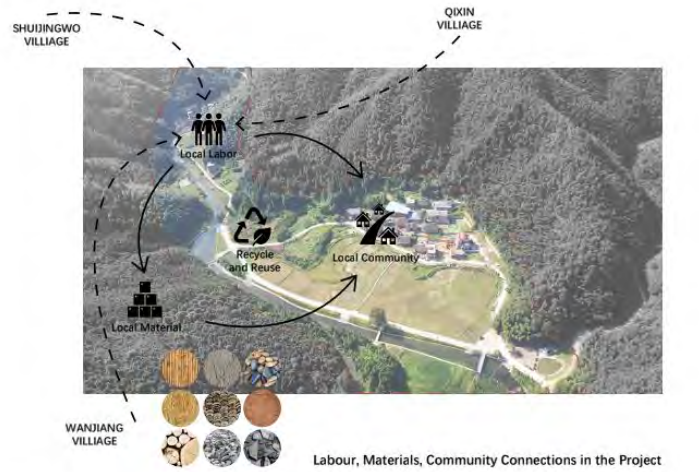
Two Uncles Li's New House

Chan Cheung Mun Chung Charitable Fund (CCMCCF)
Hunan, China 2023 - 2024



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Collège Amadou Hampaté Bâ, Niger

Article 25 - Architects & Project Managers
Niger, Sub-Saharan Africa, 2016-2022

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Casa Nido

Barro Vivo Costa Rica
Northern Costa Rica, 20/02/2023 - 15/09/2023

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New Model School

CNMI, Waugh Thistleton Architects
Cambridge United Kingdom, 2019 - 2023

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Technical Review Committee members:

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Thanks

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