

Shelter research at The University *of* Edinburgh



THE UNIVERSITY *of* EDINBURGH
Institute for Infrastructure
and Environment



Global Challenges Research Fund

- £1.5 billion fund from the UK government
- Support cutting-edge research that addresses the challenges faced by developing countries
- Strengthen capacity for research in developing countries through partnerships
- Provide an agile research response to humanitarian emergencies

Working on GCRF-funded Projects



Prof Luke Bisby
Chair of Fire and Structures
Fire Engineering
FRP Strengthening



Dr Yuner Huang
Steel Structures
Energy Infrastructure



Julian Vercruysse
Research Assistant



Dr David Rush
Fire & Structural
Engineering
Steel and Composite
Structures



Dr Chris Beckett
Earthen Structures
Soil Mechanics



Dr Rupert Myers
Sustainable Materials
Industrial Ecology



Dr Rory Hadden
Fire Engineering
Pyrolysis and Flammability



Dr Thomas Reynolds
Timber Engineering
Structural Dynamics



Dr Graham Spinardi
Integrating technical and
social aspects of fire safety

Projects

Composite Cold-Formed Steel and Timber Panels

- Widely available materials in post-disaster reconstruction
- Great potential to improve the quality of transitional shelters
- Target: India and Malaysia

Improving Resilience for Informal Settlements Fire (IRIS-Fire)

- Evaluate and model the spread of fire to identify hazards
- Recommend any sociological changes
- Target: informal settlements in Cape Town, South Africa. 500 deaths annually due to fire

Database for Sustainable and Energy Efficient Materials in sub-Saharan Africa (DEEMA)

- Detailed information on the performance of building materials
- Support sustainable designs
- Target: built environment professionals across sub-Saharan Africa

Resilience of the Built Environment to Cyclones (REBEC)

- Assessing the exposure (e.g. wind loads), sensitivity (e.g. building materials) and adaptive capacity (e.g. social infrastructure) effects of climate change
- Target: indigenous houses in Madagascar. In 2017, 81 deaths and over 300,000 buildings were destroyed as a result of cyclone Enawo

Partnerships with local stakeholders

Improving Resilience for Informal Settlements Fire (IRIS-Fire)

- Implementing the necessary sociological changes through community leaders
 - Collaborating with fire services in Cape Town
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Resilience of the Built Environment to Cyclones (REBEC)

- Academic Partners in East Africa and Madagascar
- Implementing recommendation through the National Council of Engineers Association of Madagascar

Composite Cold-Formed Steel and Timber Panels

- Developing sustainable products with Malaysian forestry researchers
 - Working with trade bodies and suppliers in Malaysia and India
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Informational Database for Sustainable and Energy Efficient Martials in sub-Saharan Africa (DEEMA)

- Academic Partners in Uganda and South Africa

Efficient and resilient structures



Efficient and resilient structures



Efficient and resilient structures



Kyvelou, P., Reynolds, T., Beckett, C., Yong, P-W., Huang, Y. (2018). Composite Panels for Cold-formed Steel and Timber for High-density Construction. Proceedings of the World Conference on Timber Engineering, Seoul, South Korea, August 20-23, 2018.

Efficient and resilient structures

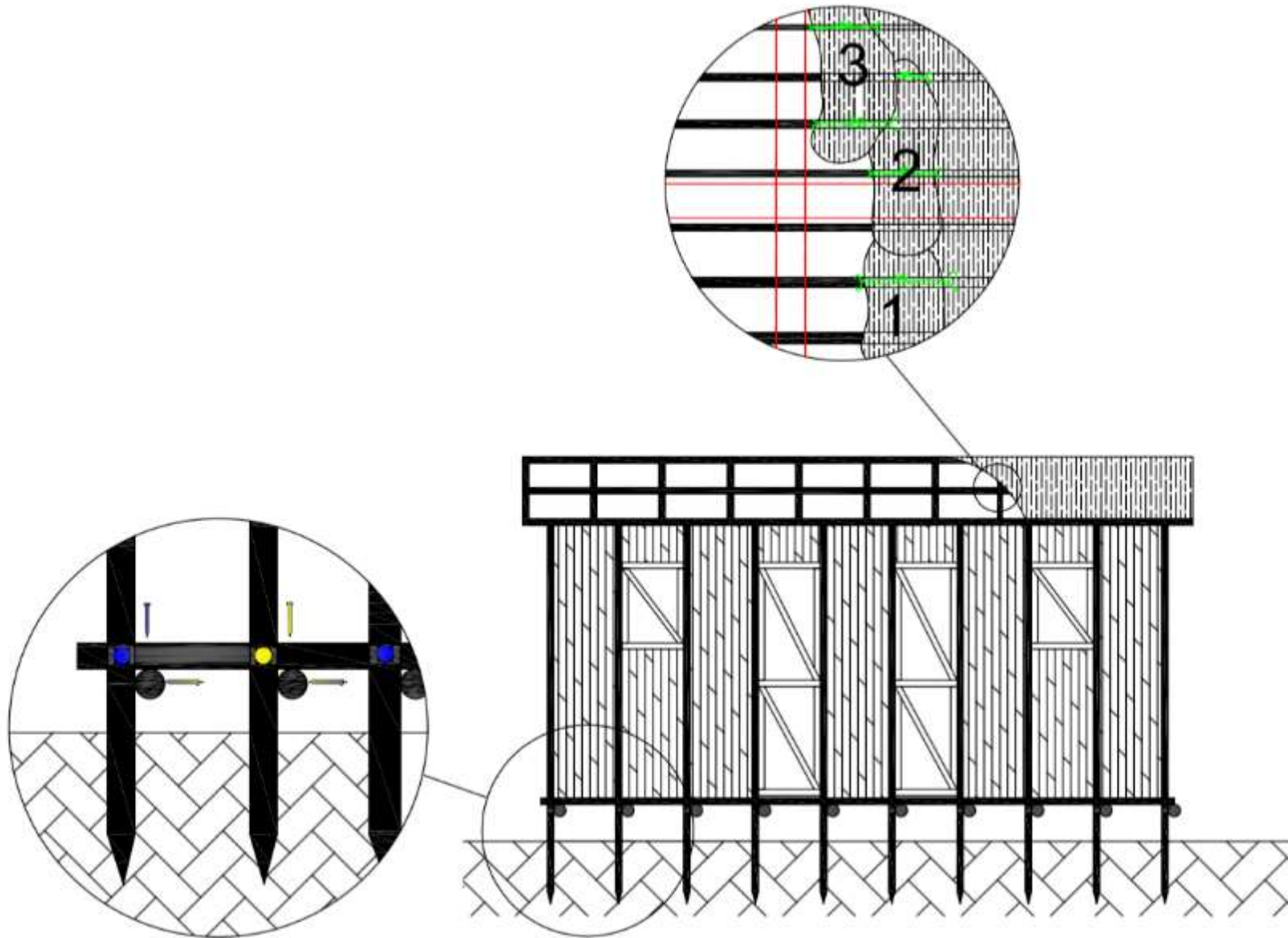
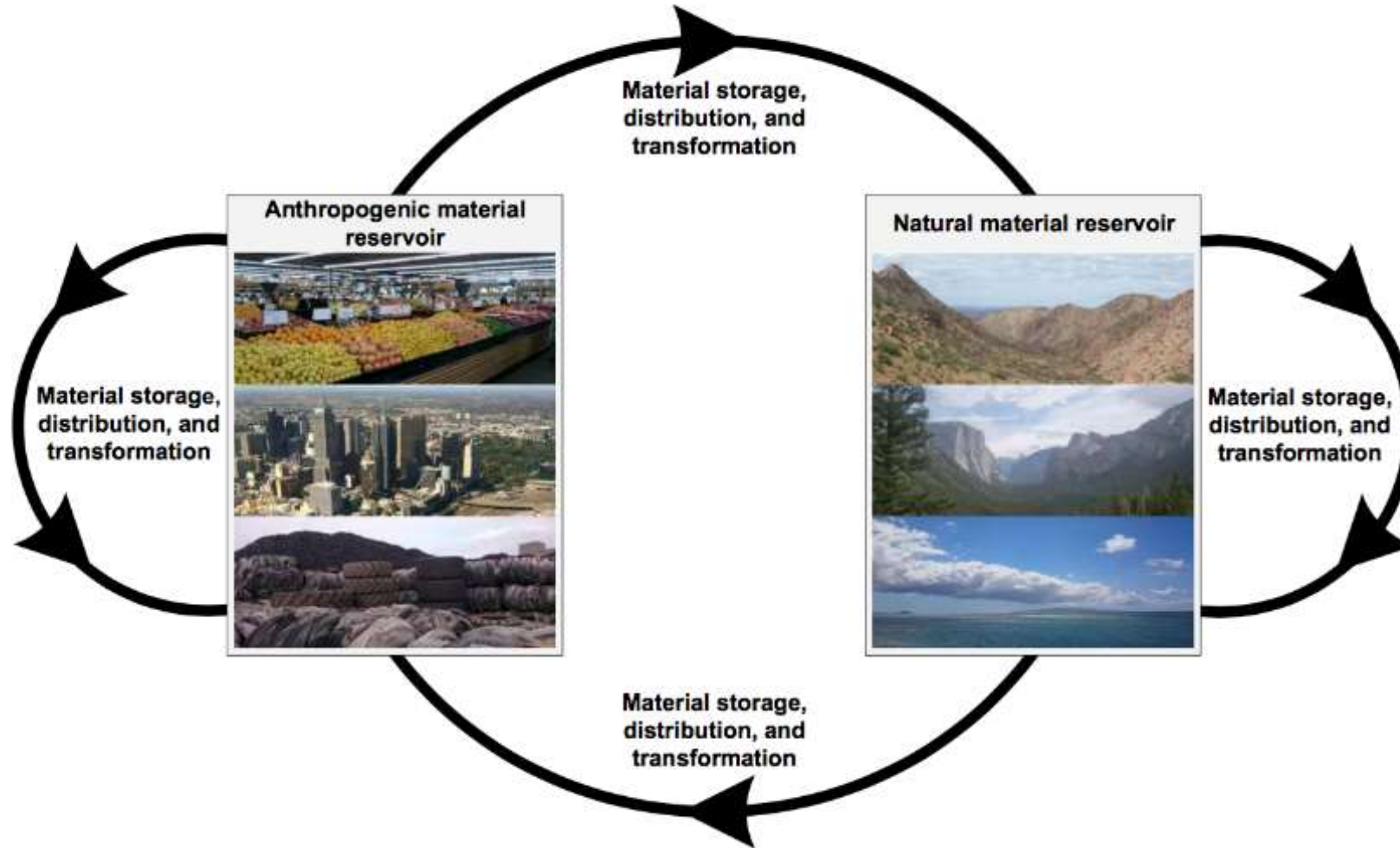


Image: Harinaivo Ramanantoanina

Sustainable materials



Myers, R. J., Fishman, T., Reck, B. K., & Graedel, T. E. (2018). Unified Materials Information System (UMIS): An Integrated Material Stocks and Flows Data Structure. *Journal of Industrial Ecology*. <https://doi.org/10.1111/jiec.12730>

Sustainable materials



Fire resistance



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