



Wood as Low-Carbon Material for housing needs

FAO Workshop on Wood Products in the Sustainable Bioeconomy
10-11 December 2019



Presentation outline

Background on GGGI

The need for low-carbon materials

Objective of Technical Report

Selection framework & materials

Supply chain considerations

GGGI at a Glance



Headquartered in **Seoul**, GGGI has **32 Members** with operations in **33 countries**



GGGI's mission

To help developing country governments transition towards a model of economic growth that is environmentally sustainable and socially inclusive.

GGGI Capacity Statement on Green Buildings

2017: Developed the **GREEN BUILDING MATERIAL DATABASE REPORT**, providing design data and material selection criteria to building developers for maximizing resource-efficiency in buildings.

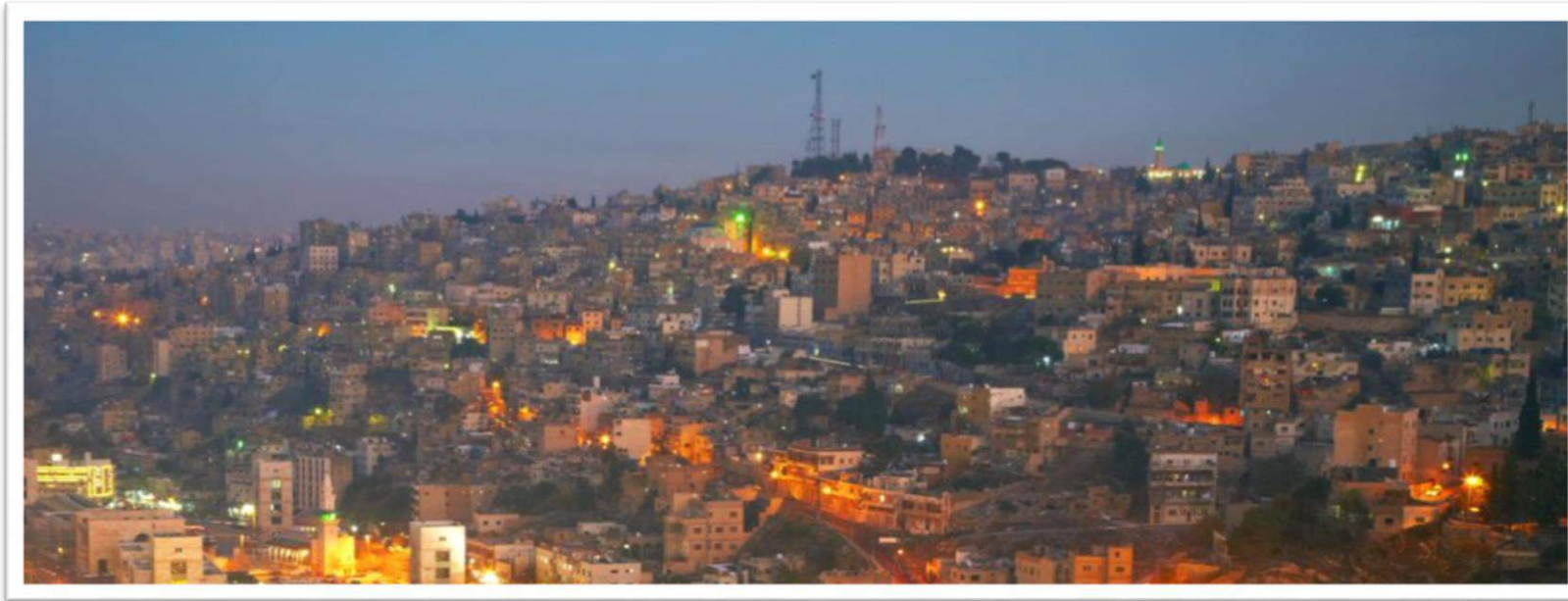
2017-18: Coordinated the drafting of **Rwanda Green Building Minimum Compliance System**, promoting resource-efficiency, improved indoor environmental quality, environmental protection and other forms of green innovations and included as an Annex to the Rwanda Building Code (in 2019).

2019: Published technical report on **Meeting Global Housing Needs with Low-Carbon Materials**, outlining material options, selection framework and key considerations in supporting industry-wide transition towards low-carbon building materials.

2019: Conducted the **Green Building Readiness Assessment** in Senegal, engaging with government, academia, professional associations, material suppliers and contractors.



THE NEED for low-carbon materials



300 million houses needed by 2030

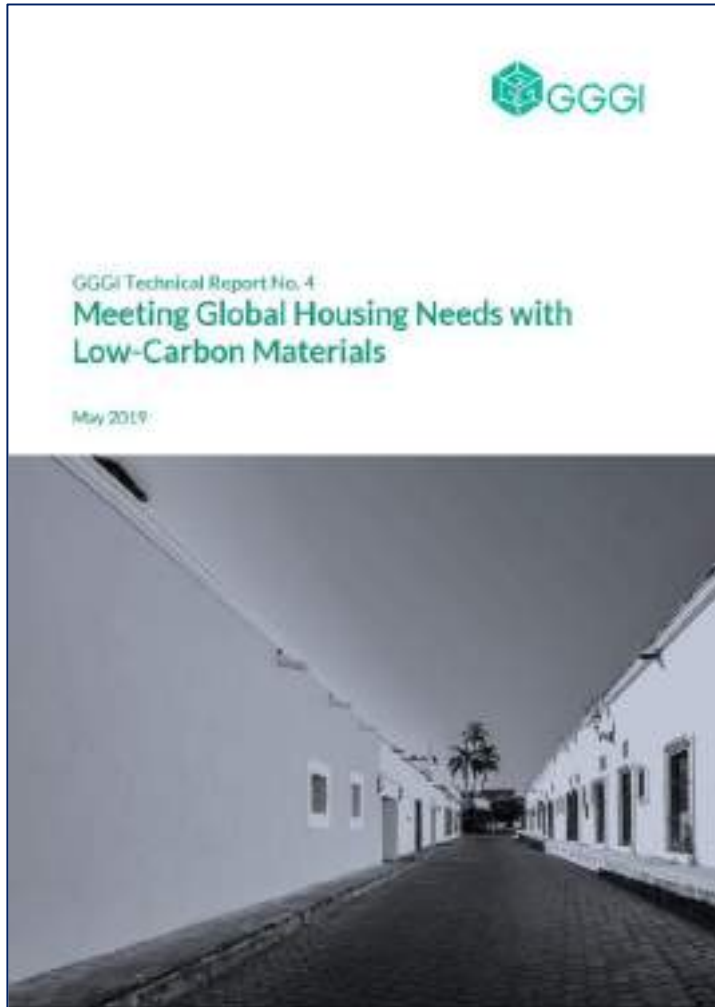
Concentrated in the cities of Least Developed Countries (LDCs), where over 1 billion people are already living in inadequate housing.

Material depletion & global warming

Need to reduce carbon emissions from buildings and diversify in building materials from concrete and steel.

Technical, financial and human resource gaps

Governments are challenged by funding and capacity gaps, as well as competing demands, in meeting the need for affordable housing.



To explore material options that

- **Meet housing needs** of low-income city dwellers with lower environmental (energy) requirements.
- Promote innovative and scalable practices for **replicable housing solutions** with reduced financial and environmental costs.
- **Support the local economy** through job creation, skills upgrading and support to micro, small and medium enterprises (SMEs).

SELECTION FRAMEWORK & MATERIALS

Local environmental conditions

- Earthquake-prone area
 - Flood-prone area
- High wind speeds (typhoon/coastal areas)
 - High thermal fluctuations
- Extreme heat / extreme cold

Life cycle environmental impacts

1. Sustainable/renewable source
2. Local source (reduced transportation)
3. Low production energy & pollution
4. Recyclable/Biodegradable

Benefit to local economy

1. Local production, economic opportunities.
2. Ease of construction (creates local low-skilled jobs)
3. Regulatory compliance
4. No toxic substances (health of manufacturers & occupants)

Wood

Bamboo

Straw

Earth

Stone

Recycled
materials

Green
concrete

Some possible low-carbon materials discussed in the report.



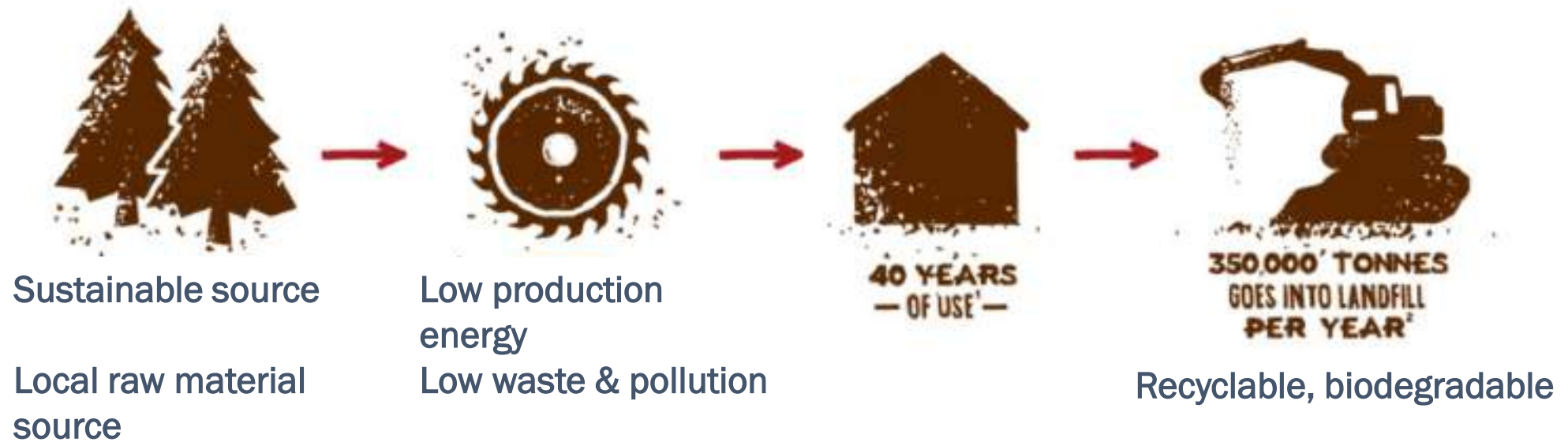
Opportunities for using wood for housing



What people want

Resources available

Life cycle environmental impacts



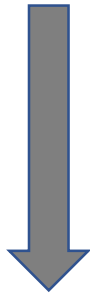
Life cycle environmental impacts

Sustainable source
Local raw material source



- Sustainable forest management.
- Regulatory oversight, monitoring, enforcement.
- Accurate accounting & reporting.

Low production energy
Low waste & pollution



- Only half a log is turned into lumber. Waste wood is burnt or used for other products.
- Chemicals for wood treatment – chromium, arsenic – can be harmful to humans and environment.

Recyclable, biodegradable



- Treated timber cannot be burnt as cooking fuel.
- Disposal in landfill is costly.
- Maximize opportunities for reuse/recycling.

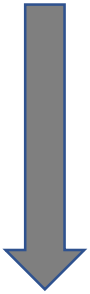


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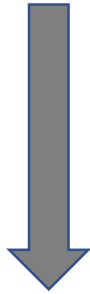
Benefits to local economy

Local production, economic opportunities



- Local supply vs global demand.
- Balancing profits with meeting local needs.
- Supportive regulatory environment.

Ease of construction (local jobs)



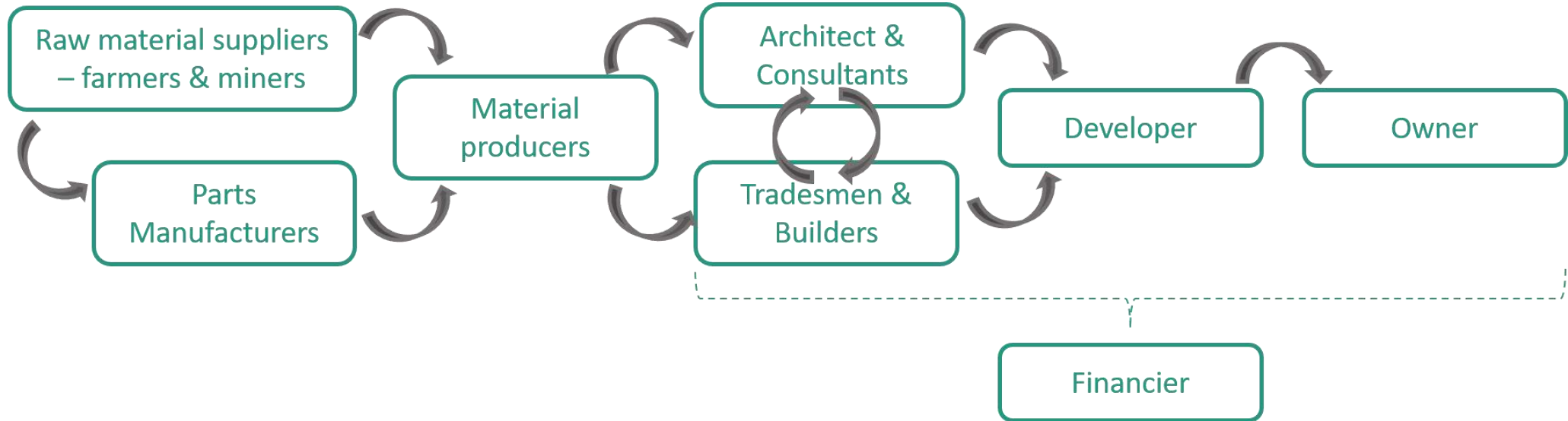
- High-tech processing and precise design requirements not suitable.
- Opportunity to enhance design and production capacities.
- Develop skills for deconstruction, recycling.

Regulatory compliance



- New skills and new jobs in monitoring and compliance.
- Enhance investor confidence in product quality through a well-regulated market.

SUPPLY CHAIN CONSIDERATIONS



Key stakeholders and flow of goods/services in construction supply chain

- Continuous reliable SUPPLY
- Manufacturing facilities
- Skilled WORK FORCE
- Standards & Certification
- Market Integration

Supply chain considerations to be considered when developing new building products.

Wood as low carbon building material

Advocates	Government	Developers, owners	Architects, engineers, producers, plantation owners
Change attitudes	Promote potential of local wood for meeting local housing needs.	Promote the attractiveness of wood as a modern and safe building material.	Promote appreciation of wood as a low-cost material for high quality housing.
Enhance capacities	<ul style="list-style-type: none"> To regulate and monitor forest/plantation management practices. To regulate, enforce and incentivize the meeting of local housing demands prior to exporting. 	<ul style="list-style-type: none"> For ensuring wood is sustainably and legally harvested. For verifying wood products used have been through sufficient quality processing and checks. 	<ul style="list-style-type: none"> To account for real life cycle impacts of wood as a raw material, including forest emissions. To design, produce and construct attractive, comfortable, resilient and low-cost housing with local labor.

Cautious optimism on increasing use of wood for meeting affordable housing needs.

Thank You



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