



Climate Smart
Forest Economy
Program



CSFE East Africa

PATHWAYS FOR SECTOR
DEVELOPMENT IN EAST AFRICA

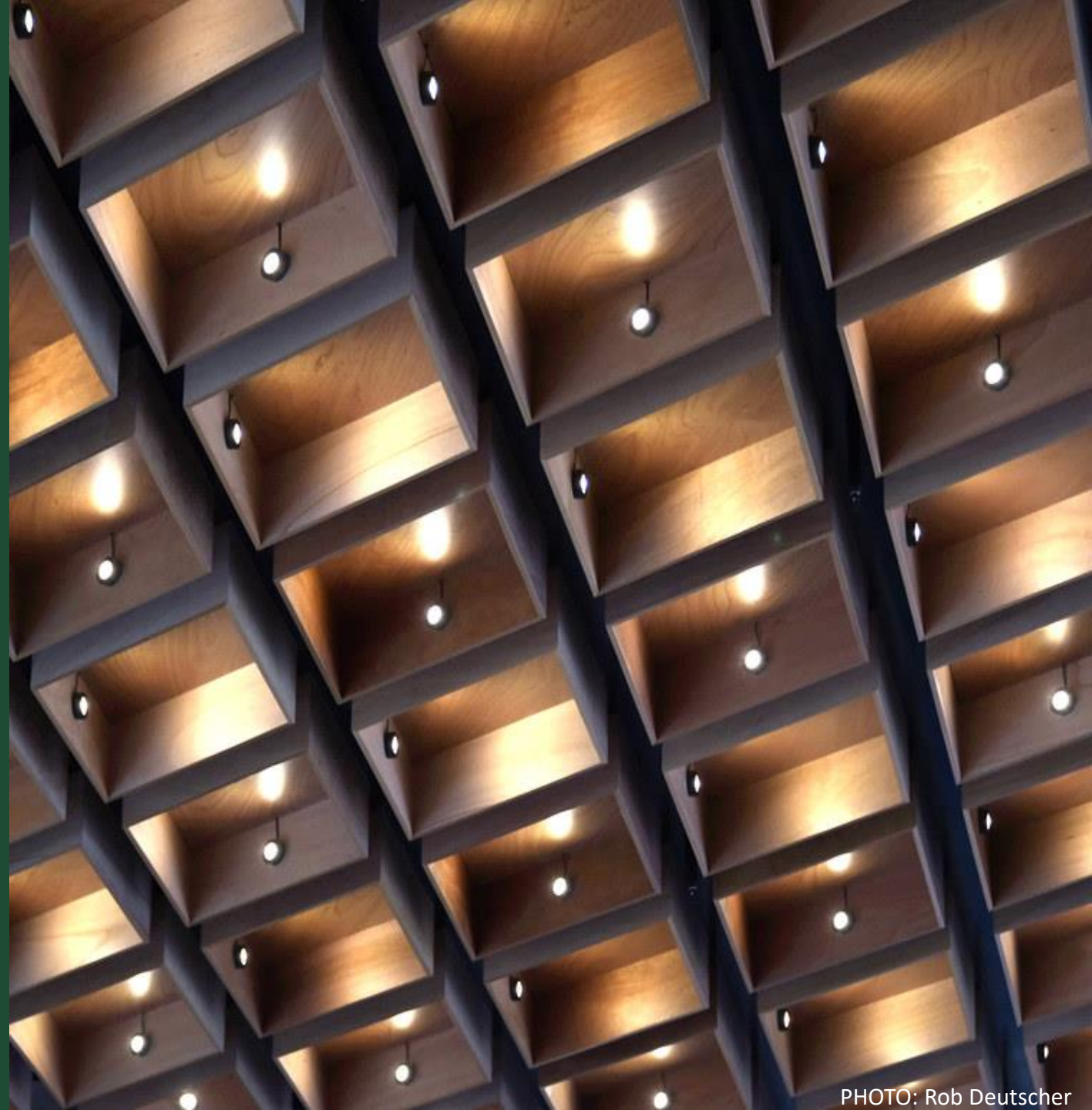


PHOTO: Rob Deutscher

1	SECTION I Introduction
2	SECTION II Global North: EU
3	SECTION III Global South: Brazil and South Africa
4	SECTION IV Recommendations

SECTION I

Introduction

The mass timber construction sector was first developed in the Global North, where it still leads the global market today

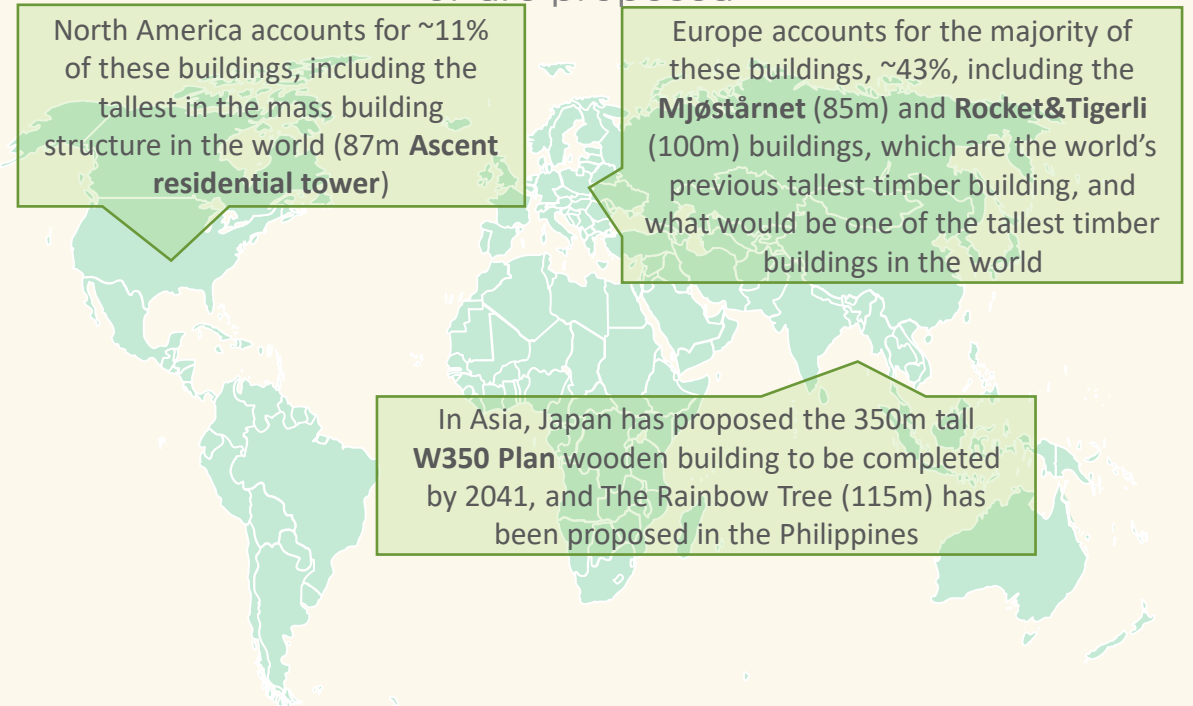
MASS TIMBER CONSTRUCTION SECTOR

The Global North is leading the resurgence of the use of timber in construction. Globally, ~2.8M m³ of Cross Laminated Timber (CLT), a leading mass timber product, was produced in 2021, 91% of which originated from Europe and North America. The majority of large and notable mass timber projects have been concentrated in these regions.

Overall, engineered wood is a widely accepted construction material in both the Global North and South. The Global North, particularly Europe, is pushing the boundaries of its use through sustainability-focused design. Mass timber investment throughout the value chain and architectural innovation from the region has influenced and incentivized its global use. As a result, value chains in Europe are better developed than in the Global South, they dictate global market prices and products available. For example, CLT is usually made from spruce, the main lumber species in Europe. The feasibility of using tropical hardwoods, largely found in the Global South, to manufacture CLT has not yet been effectively explored. Although mass timber construction is growing in the Global South, there is an opportunity to expand its use and leverage the natural forest resources available in some of these regions.

NOTABLE CONSTRUCTION BUILDINGS

Globally, as of 2021, there are 139 mass timber structures over 8 stories high that have been built, are under construction, or are proposed



There are market learnings for East Africa from the approaches and interventions adopted in both the Global North and Global South

The Climate Smart Forest Economy in East Africa – As the mass timber construction industry grows and develops in East Africa, the European Union provides a useful example of how a regional market can be developed. South Africa and Brazil represent contextual case studies on pathways to accelerate sector development in the Global South.

GLOBAL NORTH



To date, Europe is the global market leader in the mass timber construction industry. Member states of the **European Union** have been at the **forefront of innovation and development of the sector**. This report identifies what **regional learnings can be adopted for East Africa**.

GLOBAL SOUTH



Similarly to East Africa, **Brazil's natural forest reserves position it well for sourcing timber for construction**. As the country faces local and international pressure to preserve its forest area while aiming to monetize the natural resource, East Africa can **learn from how the country is developing its timber construction by leveraging its natural forest resources**.



Despite its limited forest area, **South Africa** has established itself as a **significant regional player in the trade of forest products** in Sub-Saharan Africa through its productive plantation industry. This and its well-developed and sizeable construction industry offer **lessons on developing a mass timber construction industry in the country**.

Image source: Noun project

SECTION II

Global North: EU

Mass timber is relatively widely used in the EU, and largely accepted as a positive climate-change response

Mass timber industry use

Large timber buildings in the EU are usually for residential use. Of the 20 tallest buildings built or proposed in Europe, 16 are residential, while the remainder is mixed-use.

The **public sector is the main investor for timber buildings in many EU member states.** The majority of mass timber buildings in the region are constructed using CLT.

Mass timber perceptions and behaviours

CLT was developed in the 1990s, but it wasn't until the early 2000's that a **wave of sustainable building and construction innovation accelerated the material's use.** Architects and policymakers continue to show an eagerness for using mass timber in construction.

Although largely positive, public opinion on mass timber construction varies (particularly outside of Austria and the Nordic region, both of which are familiar with the material). Timber structures are **perceived as being eco-friendly, healthy, and aesthetically pleasing.** However, there is a preference for other forestry functions to tackle climate change and common misconceptions about fire safety, durability, and quality are still a barrier to wider mass timber adoption.

As seen in England, **perceptions of timber construction can also deteriorate due to external influences.** For example, the Grenfell fire in London led to **laws prohibiting the use of combustible materials, including timber, in the external walls of tall buildings in England and Scotland.** Although construction experts agree that fire safety is not a risk when timber is used correctly, there has been a decrease in the overall confidence in its use in the region.

Mass timber is also an economically viable substitute for common construction techniques in the EU

Attractiveness of mass timber

- A cubic meter of CLT used on European construction sites is estimated to cost between **USD 2,400-3,000**
- Globally, the material cost of mass timber is slightly higher than the cost of reinforced concrete
- However, mass timber costs can be offset by factors such as labor costs, project timelines, and the modality of the design
- The higher material cost has been highlighted as a barrier for timber construction projects in the region because investors rarely consider costs outside of building material costs for construction projects

Materials

The material cost of building with timber can be up to **30% higher** when compared to reinforced concrete. Cost can differ depending on the structural components being built

Labor

Construction **requires fewer people on site for assembly** because materials can be pre-fabricated which has direct implications on building costs

Schedule

Pre-fabrication improves scheduling. In the Global North, **construction schedules can be decreased between 20-61%**, which reduces time-related project costs

East Africa needs to address misconceptions about mass timber and communicate the material's economic value in the cost-sensitive market

CONSIDERATIONS FOR EAST AFRICA – PERCEPTIONS AND BEHAVIOURS

The public sector can play a crucial role in driving mass timber use. Ideally, the public sector embraces mass timber as a mechanism to tackle climate change.

In the EU, the perception of timber construction is largely positive from both decision-makers (such as the public sector and construction firms) and end consumers. **East Africa should align the perspectives of suppliers and consumers for mass timber construction to support the market for wider adoption of the product.**

This will involve addressing misconceptions on the material's sustainability, safety, and durability. These perceptions are barriers to mass timber adoption. Ongoing efforts to build mass timber structures and demonstrate its use may assuage some of the concerns expressed by developers and consumers.

CONSIDERATIONS FOR EAST AFRICA – ECONOMIC ATTRACTIVENESS

The higher material cost of mass timber may **disincentivize cost-sensitive developers and consumers in East Africa.** The material cost for mass timber in the region is likely to remain higher than using concrete and steel, particularly if the building stock is imported from the Global North. **Local mass timber production, which is already being explored in the region, could decrease this cost.**

Communicating the nuances of cost-saving aspects such as reduced labor requirements and shorter project schedules will be important to encourage potential investors and developers. And outside of environmental advantages, stakeholders can emphasize the thermal, acoustic, and aesthetic advantages of timber construction.

Increasing costs of construction materials in East Africa generally are also likely to influence these conversations. Investors may be more risk-averse if they believe the sector is in flux or they may be more open to exploring different building techniques which could decrease project costs, such as mass timber.

Supply for mass timber in the EU is supported by a strong local value chain, and free trade and movement of timber in the region

VALUE CHAIN DEVELOPMENTS

Raw materials	The type of forests present in the EU are favorable to developing mass timber because of the familiarity of working with the dominant tree species and the availability of smaller diameter timber which allows for longer engineered wood products.
Manufacturing	Large quantities of CLT are produced in the EU, and the entire value chain and supply chain remains largely within the region. CLT production is concentrated in the Alpine region (Germany, Austria, and Switzerland), and Finland. As such, there is a lot of intra-EU trade of CLT and raw materials, and little, if any, import of the product.
Transport	As a free trade region, the trade of timber to large consumer countries does not have import taxes, whereas imported wood products may be subject to tariffs. This allows for local price competitiveness of raw materials and final products. For countries like Germany, which is also a large consumer, excess demand for CLT is supplemented by other member states, which protects the country from national supply shocks.
Construction and use	The global demand for CLT has grown, but with production slowly moving to other regions and developing countries, this regional EU supply balance is unlikely to change. As the demand for CLT has grown, meeting local demand has been prioritized by suppliers over opportunities for export.

CONSIDERATIONS FOR EAST AFRICA

CLT production in the EU is concentrated in a handful of countries, some member states are mostly importers of these products. **Free trade between member states has enabled the easy flow of goods and competitive pricing** between harvesters, manufacturers, and builders from different countries

The flow of mass timber largely remains internal to the region, such that local regional demand is met and very little, if any, import occurs. East Africa can similarly **ease the trade of mass timber products within the East Africa Community**. This collaborative structure to build the supply chains for the region **allows states to concentrate their efforts towards the elements of the value chain they see fit to develop**.

This localized supply chain in the EU is not without its risks. After Brexit, Britain was ill-equipped to handle local demand for timber because 80% of building softwood came from Europe. These supply challenges contributed to the UK experiencing higher prices and longer delivery times for building materials in the following years. Additionally, regional-level decision-making, such as the sanctions put on Russia, a large exporter of lumber, can limit the agency of countries to determine their own trade conditions and political mechanizations depending on their domestic needs. As East Africa establishes their own timber construction market, individual **countries can establish appropriate structures to safeguard against import disruptions and susceptibility to over-reliance between member states**.

Industry development and considerations for East Africa



See following slides for details



Overarching and sector-specific Policy and Regulation targeting climate and sustainability goals, have been used to kick start the industry. This has encouraged the use of mass timber as a building material and has resulted in the widespread adoption of strategies and tools that support the industry. Overarching and harmonized regional policy and regulation has also promoted regional competitiveness and therefore investment into local mass timber construction sectors.

Aligning on relevant climate-related goals will be beneficial for East Africa. This would link mass timber to other climate goals in the respective countries, allowing member countries to develop local targets to meet shared climate goals in the industry.



The public sector drives Investment and Incentivization in the mass timber industry, this spans across the value chain, from mass timber R&D to timber structure construction. Government agencies have played a critical part in supporting market development for the mass timber industry. This has included financial incentivization, the development of support structures for industry actors, and playing a key role in demonstrating the viability of the use of mass timber. The public sector has developed mass timber projects and some local governments have issued mass timber requirements when commissioning new building structures.

The public sector in East Africa can aim to provide this industry support. However, due to resource limitations, these activities may need private sector participation via public private partnerships (PPPs) with other industry players.



The necessary uptake of Safeguards and Sustainability measures has created a viable productive mass timber industry. In the EU, there is regional alignment on adopting mechanisms to prevent illegal logging, ensure sustainable sourcing, and build sustainable accountability. These goals are maintained despite a very productive timber industry because value chain stakeholders cannot successfully operate in the market if these guidelines are not in place.

East Africa could aim for a similar top-bottom approach that creates a sustainability culture in the mass timber industry, such that all actors are incentivized, mandated and encouraged to uphold these standards.



The global climate crisis is the root Macrotrend that has influenced the mass timber industry in Europe. Combatting climate change has included activities in carbon sequestration, reduction of greenhouse gas emissions, and the use of renewable resources, all of which are relevant for the mass timber industry. The wide acceptance of timber construction as being a net-positive influence on climate change is why it is one of the acceptable conduits for these efforts.

East Africa should similarly position mass timber as a mechanism to address climate change and include it in relevant regional discussions on climate topics.

Overarching and sector-specific policy and regulation targeting climate and sustainability goals have been used to kick start the industry



INTERVENTION

DETAILS AND OUTCOMES

CONSIDERATIONS FOR EAST AFRICA

Policy and Regulation

In the wake of the climate crisis, the EU aims to achieve carbon neutrality by 2050. Member states have been required to develop similar long-term strategies for this goal, and some have been motivated to improve on this target and include the mass timber construction sector in their strategies.

- To achieve this 2050 target, the EU's strategies include building a low carbon economy, efficient resource use, and sustainable waste management, which, when applied to the construction sector, include the target of 70% recovery of construction and demolition waste, exploiting carbon sequestration opportunities, reaching high resource efficiency levels, and wide use of the life-cycle approach in the sector
- These regional-level targets have likely contributed to certain member states aiming to be market leaders in the mass timber construction industry by contributing to the framework the EU has laid out and deepening their influence and improving their competitiveness in the timber construction sector through various national programs
- Finland recently became the first EU state to pursue carbon neutrality within a timeline as early as 2035, it includes a clear framework for timber construction with the aim to double the use of timber as a building material in 4 years

Regional-level climate commitments and alignment on the positive role mass timber could play to meet climate targets will support the establishment of mass timber industries, and provide targets for member countries to aim towards.

Many countries have established regulations regarding sustainability in the construction sector. These policies focus on accounting for ecological impact during the construction of new buildings and establishing carbon performance standards for the sector.

- Life Cycle Assessments (LCAs) have been the primary tool used in the region to assess the ecological impact of new buildings and have been used to create standards and make procurement decisions
- In the Netherlands LCAs for new buildings have been mandatory since 2013, which has contributed to the rising use of sustainable materials such as timber in the country
- For France's recent Positive Energy and Carbon Reduction program stakeholders have partnered with the state to pilot, measure, and refine policy for sustainable construction and the country has also recently passed a law that requires all new public buildings to be built from 50% timber or other natural materials

Establishing supporting policies and regulations for mass timber will encourage its use towards meeting climate goals. Builders will need to learn and adapt to meet compliance requirements.

The public sector drives investment and incentivization in the industry, this spans across the value chain, from timber R&D to construction



INTERVENTION	DETAILS AND OUTCOMES	CONSIDERATIONS FOR EAST AFRICA
Investment and Incentivization	<p>Government agencies linked to the agricultural sector, trade, and environmental activities have provided financial incentives for timber construction to actors across the value chain.</p> <ul style="list-style-type: none"> • Many Nordic governments have promoted the industry through subsidies for green buildings methods and timber construction projects that would positively influence the uptake of timber by pushing design innovation and proving the value creation of timber construction • Collaboration between different agencies with linked goals within the mass timber industry has been used to broaden the sector’s development and improve impact by targeting sustainability mandates through environmental agencies, wood sourcing through agriculture and forestry agencies, and economic development and export opportunities through trade and business agencies 	<p>Building subsidies will incentivize builders to use mass timber. And although funding would not always be from government agencies, there is an opportunity for agencies in different industries to collaborate and improve the impact of their investments by pooling resources.</p>
	<p>Government agencies have also invested in developing the mass timber market by creating networks, knowledge banks, and supporting elements of the value chain.</p> <ul style="list-style-type: none"> • Member states have been allocating resources towards organizing the R&D in the sector, building up programs of study in higher education facilities, promoting engineered wood export industries, organizing training events to strengthen the necessary skills, and developing corporate growth and anchor tenant models for the industry • Finland and Sweden have been regional leaders in timber construction in the EU as a result of many of these interconnected efforts 	<p>Besides financial investment, building a supportive environment for the market can also incentivize investors, decrease risks for market actors, and ease the adoption of mass timber.</p>
	<p>The public sector has been crucial in demonstrating the use of mass timber through public procurement projects, some local governments have issued mass timber requirements when commissioning new public building structures.</p> <ul style="list-style-type: none"> • The public sector has supported the adoption of timber construction by commissioning timber buildings for government structures to demonstrate the viability and sustainability of these projects, and to prompt construction firms to develop them as well • In Norway, public institutions account for 75% of timber buildings 	<p>Demand for mass timber also needs to be generated, as a large commissioner of infrastructure, the public sector is well positioned to provide some these use-cases.</p>

The voluntary uptake of safeguards and sustainability measures by stakeholders has created a viable productive mass timber industry



INTERVENTION	DETAILS AND OUTCOMES	CONSIDERATIONS FOR EAST AFRICA
Safeguards and sustainability measures	<p>Transparency and legal accountability throughout the supply chain system and the high uptake of global certification standards have resulted in the wide adoption of sustainable practices in the mass timber industry.</p> <ul style="list-style-type: none"> • The European Union Timber Trade Regulation requires harvesters, processors, and distributors to account for the chain of custody of construction timber in order to prevent illegal logging • There is also high adoption of global sustainability certifications (such as FSC) because, although not mandatory, it is a necessity to successfully operate in the market • As a result, commonly used structural timbers in Europe are largely derived from sustainable forests. 	<p>Similar policies tackling illegal logging exist in East Africa, however, mandatory or incentivized adoption of sustainability certification can further support sustainability efforts.</p>
	<p>Member states have taken up the responsibility of driving regional forest-related strategies in their countries to protect and maintain forest areas, giving them the agency to continue their productive timber industries within those parameters as they see fit.</p> <ul style="list-style-type: none"> • Europe does not have a harmonized policy for forest resources, however, the region has a shared vision to prevent forest cover loss through the EU's Forest Strategy and Biodiversity Strategy that guide forest-related policy development for member states • Despite human-induced pressure on forests, forest area in the region has increased by 90,000km² a year between 1990 and 2015, partly attributed to the rural exodus and subsequent increase in commercial forest area under appropriate sustainable forestry practices such as afforestation and sustainable forest management, increasing protected forest area, and efforts towards biodiversity, forest natural expansion, and carbon sequestration 	<p>Countries are able to continue productive timber industries even with these safeguards in place instead of the blanket bans on certain forest activities which are often adopted in the Global North. By encouraging sustainable forest management at a regional level, countries can decide how to grow their timber industries while meeting agreed-upon climate outcomes.</p>
Influential macrotrends	<p>The global climate crisis initiated the many environmental and forest interventions that have significantly impacted the mass timber industry in the EU.</p> <ul style="list-style-type: none"> • As the pressure on forests increases in Europe due to increasing population resulting in increasing land use and expanding urban areas, mass timber construction has emerged as a viable option to achieve climate goals, specifically, carbon sequestration, reduction of greenhouse gas emissions, and the use of renewable resources 	<p>At the core of the mass timber industry is the desire to mitigate climate change. East Africa will need to align on the role and impact potential for mass timber in their climate action.</p>

SECTION III Global South: Brazil and South Africa

Despite significant potential, the mass timber industry in Brazil is still in its nascency

Mass timber industry use

- Crosslam, one of the largest engineered manufacturing companies in Brazil has been **manufacturing glulam and CLT since 2008 and 2012 respectively**
- One of the **first significant uses of mass timber in the country occurred in 2014**, when glulam was used for the roof of the Iguatemi Fortaleza Shopping Centre.
- There have been **many projects since then, driven by both international and small local private sector players.**
- Engineered wood in the country is largely manufactured from pine and eucalyptus, both of which are readily available in the country.

Mass timber perceptions and behaviours

Masonry housing is still dominant in Brazil. However, structural timber is a common building material in the country. The use of mass timber is in its nascency. Architects have started using wood to differentiate their projects and to be at the forefront of sectoral development.

Overall, there are still some biases against wood in the country. **Wood is perceived as being of low quality and durability and is not seen as a sustainable source of building material.** The latter concern is influenced by the historic exploitation of wood resources in the country, and the continued challenge of illegal logging. Wood structures are seen as inferior to bricks and other such materials, and termites and fungi are a concern in the tropical climate. People also often associate timber housing with the very poor who live in slums and the very rich (due to an alleged high cost).

Despite the presence of local manufacturing, the mass timber value chain in Brazil still faces some obstacles

VALUE CHAIN BREAKDOWN

Raw materials	Despite the vast forest area, the majority of wood for the mass timber industry is harvested from planted forests, this is partly attributed to the sustainability associated with planted forests and the large variance of species in natural forest area
Manufacturing	<p>Primary manufacturing capacity comprises of several small-sized companies, which are created with relatively low investment due their compact size and still employ, obsolete technology, and low-yield machinery</p> <p>There are few manufacturers of mass timber in the industry, some, like Crosslam, largely serve the local market with very little export</p>
Transport	Planted forests are also preferred because of their closer proximity and ease of transport to industrial areas such as São Paulo for manufacturing
Construction and use	The first fully mass timber building was only constructed in 2020, it is a factory for a chocolate manufacturer

Value chain developments

Brazil established a local manufacturing supply for engineered wood before the demand was significantly established. This was not without its challenges. Crosslam struggled to develop its manufacturing capacity, they needed to import their factory equipment, deal with high exchange rates, and faced the difficulty of finding investors willing to take the risk in developing capacity that didn't exist in the country with partners with limited market experience.

Wood has a higher risk of deterioration in Brazil than other countries because of its tropical climate. Although much can be learnt from the Global North, adjustments are needed for the context of tropical climates, rainfall, the length of summer periods and temperatures affect the growth of raw materials and exposure of timber structures. For example, **unlike in European counterparts, mass timber in Brazil requires protection from moisture and insects** that degrade the material.

Brazil has a disjointed value chain, timber producers at the beginning of the value chain do not communicate well with the other end of the chain. This is particularly a challenge for the construction sector, where timber needs to meet structural specifications. End product manufacturers find it difficult to source appropriate wood, and producers may not know what timber the sector needs. This has hindered the market's development and opportunities for it to scale.

Stakeholders in East Africa should collaborate in developing the mass timber industry to accelerate impact and yield better ecosystem influence

CONSIDERATIONS FOR EAST AFRICA - PERCEPTIONS AND INDUSTRY USE

East Africa faces similar biases to Brazil on how wood is perceived. **The region will have to build the foundational step of linking mass timber construction with sustainable development goals.**

Brazil is in a position with substantial timber resources and significant construction sector GHG emissions. Yet, to date, the opportunity for mass timber has been slow to realize in country. This has partly been attributed to how small the timber construction market is relative to the construction industry, and that the small independent firms engaged in these activities have low impact on the overall construction sector. **Collaboration in East Africa between stakeholders will create greater impact, yield better influence, and unifying the movement encouraging the use of mass timber.**

CONSIDERATIONS FOR EAST AFRICA - VALUE CHAIN DEVELOPMENT

East Africa might face similar challenges to Crosslam in establishing local manufacturing capacity, particularly if consistent market demand has not yet been realized. Crosslam's first mover advantage has contributed to the organization being a regional leader in the mass timber industry in South America. There is also an opportunity for engineered wood suppliers to serve the broader African region as there are few manufacturers on the continent.

Value chain linkages and communication will be important in realizing the opportunity in East Africa. This further emphasizes the need for stakeholders to collaborate in order to achieve better impact and industry growth

Industry development and considerations for East Africa

See following slides for details



Brazil does not currently have the necessary Policy and Regulations for the use and manufacturing of engineered wood. Without specific standards for materials such as CLT, stakeholders often make use of European and Canadian standards. Stakeholders in Brazil have indicated their belief that the lack of technical regulation for the use of wood in buildings, has impacted their access to housing financing mechanisms

Updating construction standards for the adoption of mass timber will be important for East Africa as they could impact access to finance for customers and developers of mass timber structures, delaying the industry's development.



Much like in South Africa, there is little public sector involvement in Investment activities in the industry, and the private sector has been leading its growth. To date, the public sector has not incentivized the use of timber or mass timber in construction, and rarely makes use of wood techniques in the construction of public facilities.

East Africa, can similarly position the private sector to play a significant role in the development of its mass timber industry.



The local wood-based industry in Brazil does not value sustainability certification outside of trade with international markets where it is a requirement, and Sustainability and Safeguards for the forest sector are still a challenge. Despite the high wood productivity in Brazil, wood-based industries still struggle to balance the growth of the market with conservation and protection efforts for natural forests. Addressing Illegal timber is also still a challenge in the country.

Stakeholders in East Africa should prioritize sustainability and mechanisms to trace forest products to avoid any detrimental impact on the climate. These safeguards can limit mass timber being produced from unsustainable sources by increasing accountability along the value chain and could improve buy-in from investors and consumers who have misconceptions about the sustainability of mass timber construction.

Relevant regulation and market development structures are not yet available for the mass timber industry in Brazil



INTERVENTION	DETAILS AND OUTCOMES	CONSIDERATIONS FOR EAST AFRICA
Policy and Regulation	<p>Brazil does not have the necessary standards for the use and manufacturing of engineered wood, as such, manufacturers in the ecosystem are reliant on international standards which pose a risk to the industry.</p> <ul style="list-style-type: none"> • Unlike, many South American countries which rely on international timber standards developed for softwood species in the Global North, Brazil has its own timber design codes and standards, this is not the case for engineered woods and composites • Without specific standards for materials such as CLT, stakeholders often make use of European and Canadian standards when using these materials which need to be adjusted for the tropical climate in Brazil • Stakeholders in Brazil have alleged the lack of technical regulation for the use of wood in buildings, has impacted their access to housing financing mechanisms 	<p>Updating construction standards for the adoption of mass timber will be important for East Africa as they could impact access to finance for customers and developers of mass timber structures, delaying the industry's development.</p>
Investment and Incentivization	<p>Much like in South Africa, there is little public sector involvement in the development of the industry, and the private sector has been leading its growth.</p> <ul style="list-style-type: none"> • The public sector has not incentivized the use of timber or mass timber in construction, and rarely makes use of wood techniques in the construction of public facilities • Any investment into the industry from the public sector has not been construction-specific, but market players have been able to access funds and tax exemptions to grow and expand their enterprises • Small private sector mass timber enterprises have been the drivers of the industry in Brazil, and there is evidence that the number of firms and availability of engineered wood has been on the rise in the country 	<p>East Africa, can similarly position the private sector to play a significant role in developing its mass timber industry.</p>

While there are sustainable practises adopted by many actors in the region, these practises are not valued in the domestic market



INTERVENTION

DETAILS AND OUTCOMES

CONSIDERATIONS FOR EAST AFRICA

Safeguards and sustainability measures

The local wood-based industry in Brazil does not value sustainability certification outside of trade with international markets where it is a requirement, and sustainability for the forest sector is still a challenge.

- Despite the high wood productivity in Brazil, wood-based industries still struggle to balance the growth of the market with conservation and protection efforts for natural forests
- 3rd party certification is widely adopted to meet consumer demands and avoid being targeted by environmental groups, but the local market does not value these certifications
- Addressing Illegal timber is still a challenge in the country, and with CLT manufacturers also serving the local market, there is a high risk of unsustainable practices being adopted because of competitive, indiscriminate, and unregulated use of illegal or unsustainable timber in the industry

Stakeholders in East Africa should prioritize sustainability and mechanisms to trace forest products to avoid any detrimental impact on the climate. These safeguards can limit mass timber being produced from unsustainable sources by increasing accountability along the value chain and could improve buy-in from investors and consumers who have misconceptions about the sustainability of mass timber construction.

South Africa has a nascent mass timber industry, market growth is largely driven by the private sector

Mass timber perceptions and behaviours

- Timber construction practices in South Africa can be traced back to the 1800s, and timber building regulations were formalized in 1988
- **Architects in the country prefer to work with a mix of established and innovative building materials** and techniques, but despite the **vast majority being aware of engineered wood products, the materials are not often used**
- This is partly attributed to these **products being unfamiliar to contractors and clients**, and is also indicative of the declining construction skills in the country
- A study found that **local contractors have little knowledge and exposure of engineered wood products** and view timber construction as elite and aspirational
- However, there has been industry progress, for example, the University of Pretoria partnering with York Timbers, an integrated forestry company, to grow timber construction research and industry knowledge in the country

Mass timber industry use

- Wood demand in South Africa is largely met by the plantation industry
- There are 1.2M ha of plantation area, of which ~50% are pine, a softwood suitable to manufacture CLT
- Presently, **timber in construction largely consists of roof trusses**, only ~1% of new residential housing buildings are wood based
- Mass timber construction is relatively new in the country, **only a few private sector projects have consisted of engineering wood, but none have been entirely built from mass timber**
- Education facilities such as **Nelson Mandela University and the University of Pretoria have also invested in demonstrating the use of timber** in construction
- Of the timber structures built, prefabrication has been used to address the onsite skills gap during construction, allowing assembly by low-skilled laborers

Private sector stakeholders can also play a significant role in catalyzing the mass timber industry in East Africa

CONSIDERATIONS FOR EAST AFRICA

Using prefabricated designs to allow for the use of low-skilled laborers will be beneficial in East Africa's ecosystem. Much like East Africa, South Africa faces challenges in the experience and technical skills to work with engineered wood products.

The country has some industry interest but limited examples of mass timber use. **Private actors in the country have played a leading role in demonstrating the use of mass timber in construction projects.** Private organizations, consumers, and education facilities in East Africa are also able to showcase the use of mass timber to the wider population in the region in order to catalyze demand.

Private sector activities

"Nelson Mandela University will have constructed a CLT building that is set to influence a new direction for design and construction...The University will use the building to advance knowledge, research and skills about CLT and mass timber construction..."

Nelson Mandela University, New CLT building set to influence construction and design in SA

"The economic viability of multi-storey mass timber buildings in South Africa has come under the spotlight thanks to a research study carried out by Stephanus van der Westhuyzen, a Structural Engineer at leading consulting engineering and infrastructure advisory firm Zutari...."

Engineering News, Is a multi-storey mass timber building an economically viable option in South Africa?

"Sawmilling South Africa, along with its value chain partners such as the South African Wood Preservers Association, have been hosting a series of webinars on the timber in the built environment...."

BizCommunity, Zutari engineer conducts study on viability of multi-storey mass timber building in SA

Industry development and considerations for East Africa



See following slides for details



There are **Regulations governing mass timber in South Africa, however, timber construction has not been highlighted in relevant sustainability Policies.** Relevant regulations exist for both timber construction and engineered wood manufacturing. Timber is not highlighted in relevant policies as a mechanism to achieve government sustainability goals. The industry is supported by many institutions that improve industry compliance to international standards.

East Africa would similarly benefit from establishing the necessary regulatory structures to support sustainable and safe timber construction, despite the nascency of the sector to ease mass timber uptake for the private sector.



Industry **Investment and Incentivization** has largely come from the private sector through advocacy, R&D preparing the industry, and demonstrating the use of engineered wood. Different stakeholders in the private sector have played a critical role in realizing the opportunity. And although the government is active in developing the regulatory infrastructure for the use of mass timber, the public sector has not been participating in the market.

East Africa should note the importance the public sector can play as not just for policy, but as a customer for the mass timber industry as well. An ecosystem where multiple system actors are involved, including construction, timber, and education institutes, would also accelerate market growth in East Africa.



South Africa has developed timber-industry **Safeguards and Sustainability** measures that are applicable to the mass construction industry, but uptake of sustainability certification has been driven by growers wanting to serve international markets. The normalization of sustainability certification in timber-based industries will likely benefit the developing mass timber market. There is a high level of protection of natural forests, as a result, national timber demand is largely reliant on wood from tree plantations.

East Africa, with its abundant forest area, may not be constrained to this extent. Developing export markets for mass timber producers can encourage sustainability along the value chain which may normalize actors adopting sustainable practices when serving the domestic market as well.



Climate change has been an **Influential Macrotrend** on the timber industry in South Africa. Specifically, water restrictions have limited the number of new plantation areas established in the country. Local productivity has been decreasing because wood supply in South Africa is largely met by plantation forest area.

Stakeholders in East Africa should be proactive in identifying any present and emerging natural resource and climate-related impact that could negatively effect the goals of the industry, and address them accordingly. East Africa has been similarly experiencing extreme drought conditions, and tree planting can be very water intensive when the natural environment is unfavorable.^{1,2}

Established and developing timber regulations have positioned the private sector to drive industry development



INTERVENTION	DETAILS AND OUTCOMES	CONSIDERATIONS FOR EAST AFRICA
<p>Policy and regulation</p>	<p>Although the national drive for timber construction is in its nascency, South Africa has developed standards and regulations for the industry that have made it easier for the private sector to adopt the use of mass timber.</p> <ul style="list-style-type: none"> • Unlike many other countries where the sector is in its nascency, South Africa has established codes and standards for timber, and standards for engineered wood products like CLT are also under development • South Africa is also supported by non-state institutions that monitor and oversee timber construction in the country, such as the South African Institute of Timber Builders and South African Technical Auditing Services which promote industry development and compliance in the country • Timber building stock has not been particularly highlighted in relevant construction sector government policies in the country such as the Green Building Policy. 	<p>Establishing the standards and regulations for mass timber early in the development of the industry will not only encourage any early adopters but also mitigate any risks in the construction sector</p>
<p>Investment and Incentivization</p>	<p>Timber and construction-related entities, as well as educational institutions, have invested in the development of the industry in South Africa through advocacy, R&D preparing the industry, and demonstrating the use of engineered wood.</p> <ul style="list-style-type: none"> • There has been limited investment and incentivization from the government to develop and grow the mass timber industry in South Africa. • For example, although South African Forestry Company SOC Limited (SAFOL), a state-owned forestry company, aims to alleviate the country's infrastructure backlog by developing quickly constructed timber-frame structures, there is no evidence of progress towards this goal • Timber-, education-, and construction-related institutes have advocated for the use of mass timber, and private sector players, in particular, have invested in local production and supply of engineered wood. • South Africa is currently home to the only CLT manufacturers on the African continent 	<p>Unlike the EU, the private sector has played the critical role of driving the adoption of mass timber in South Africa. East Africa, can similarly position the private sector to play a leading role in the development of it's mass timber industry</p>

South African growers have largely adopted sustainability certification in order to serve international markets



INTERVENTION	DETAILS AND OUTCOMES	CONSIDERATIONS FOR EAST AFRICA
<p>Safeguards and Sustainability</p>	<p>South Africa has developed timber-industry safeguards and sustainability measures that are applicable to the mass construction industry, but uptake of sustainability certification has been driven by growers wanting to serve international markets</p> <ul style="list-style-type: none"> Natural forest area is mostly state-owned, and very protected under the National Forests Act 1998 against illegal harvesting Plantations are highly organized, Although not mandatory, ~80% of plantation forest area is FSC certified, this is partly attributed to the sector wanting to meet international standards due to the wide export of wood products Nationally, limited progress has been made in expanding certification for smaller enterprises, as a result, the South African Forestry Assurance Scheme (SAFAS), the national certification agency, was developed to improve certification for plantations of all sizes, including group certification 	<p>Export opportunities can motivate local stakeholders to adopt global certification systems if access to these markets is generated.</p> <p>Normalizing sustainability certification in timber-based industries may benefit the local mass timber market in the region.</p>
<p>Influential Macrotrends</p>	<p>Although green policies have yet to influence timber construction in South Africa, agricultural irrigation restrictions, in response to the projected water deficit in the country, have significantly influenced the plantation sector.</p> <ul style="list-style-type: none"> Without appropriate interventions, South Africa faces a 10-15% water deficit in 2030, as such, water licensing restrictions have been in place for more than 20 years on timber plantations, and have resulted in decreasing planted area 	<p>Present and emerging natural resource limitations and climate-related impacts may negatively effect the goals of the industry</p>

SECTION IV Recommendations

In addition, the below lessons and learnings can be applied to grow and scale the mass timber construction market in East Africa

1

Unify private sector stakeholders to accelerate development in the mass timber industry. The market in East Africa is likely to continue to consist of small and independent stakeholders along the value chain as it develops its domestic systems for sustainable sourcing, primary manufacturing, building regulation, and manufacturing capacity. Unifying the vision, communication, and standards of practice between these stakeholders to develop a larger regional network will create cohesion and greater and unified growth for the industry overall. A coalition of private sector stakeholders could develop industry accreditation (including sustainability practices), disseminate knowledge, standardize the use of mass timber, and engage the government to advance efforts toward building an enabling environment. As we've seen in both South Africa and Brazil, the private sector can make significant strides in developing a domestic mass timber market even when the public sector has yet to fully realize the opportunity. A mobilized private sector is particularly advantageous in a region like East Africa where the public sector is often overburdened and may have limited resources to devote to transforming the construction sector.

2

Improve public sector participation in the industry to accelerate the growth of areas of shared interest along the mass timber value chain. Mass timber can play a significant role in addressing many of the public sector's ambitions, including the goals to grow local timber production, develop timber-based manufacturing, and build affordable housing in the region. Advocacy and engagement with the public sector is needed to link these objectives with the mass timber industry. This will encourage the government to be active in shaping the market, such as i) Including the use of timber in green building subsidies and initiatives ii) Creating mass timber incentives for the manufacturing sector, and iii) Using mass timber in government infrastructure projects. Greater involvement of the public sector will also demonstrate the construction and climate benefits of mass timber construction and encourage government agencies to invest in building an enabling environment for the industry.

3

Gain regional-level alignment on the role mass timber can play in East Africa and build high-level goals for the industry in the region. As the industry develops, this will guide countries as they develop their own regulations, incentives, and sustainable practices for the industry. This top-down approach can allow member states to individually decide where they want to grow within the mass timber value chain, build mechanisms to ease trade, and hold each other accountable for upholding sustainability practices in the industry. These strategies could be embedded in existing forest management policy in the East Africa Committee.