I am grateful...

To God for renewing my strength and giving me perspective on what truly matters;
To my loving husband and best friend Kleber for his unconditional support, love, and encouragement even when the situation seemed impossible;
To my parents, Wilmar and Regina, without whom I would not be here today, my education was always their top priority;
To my big sister Camila, for all the virtual meetings, love, and support;
To my parents-in-law, Roberto and Telma, for the hours of prayer;
To my nieces Olivia and Ana Rafaela, and nephew João Vitor for always bringing me joy;
To all family and friends that celebrated with me each step of the way;
To my friend Raquel for our weekly check-in meetings and words of encouragement;
To the people I barely knew, for their simple acts of kindness.
And last but not least, to my incredible supervisors Shea and Liane, and Examiner Emilio for guiding me through this difficult theme and process. Who encouraged me to be bold and ask the big and difficult questions, but also reminded me to breathe and have fun!

Thank you all for being a link in this chain of care!
My name is Claudia Larsen and I’m originally from Curitiba, Southern Brazil. A region that received millions of European immigrants from the early 1800s. My mom’s family is Italian and my dad’s family is Danish/German.

My dad’s family was in the timber business for many generations up until my grandfather and the woodyard was often our playground as kids.

My architectural education and work experience are combined between Brazil, Spain, the UK, and now Sweden. This has naturally prompted me to frequently look for similarities, connections, and better practices.

More recently I’ve started reflecting on what ties us all together, sort of ‘the global market of architecture’. I learned that the construction industry is the least modernized of the industries, which allows for unsustainable practices, such as illegal materials trade and modern slavery, to hide behind its inefficiencies and complexities.

To be honest, coming across these notions of modern slavery and illegal trades, was quite shocking to me, especially when looking at some numbers. Some people are really profiting from the suffering, literal sweat, and blood of other people, who simply have no other choice.

But this then led me to think that our profession is all about choices, however, are we making the right ones? Do we have the right information to hand to ensure our choices contribute towards achieving the sustainable development goals?
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GLOBAL LAWS FORBID THE USE OF SLAVE LABOR IN THE BUILT ENVIRONMENT, YET OUR BUILDINGS, AND THE MATERIALS THAT GO INTO OUR BUILDINGS, ARE HEAVILY RELIANT ON SLAVE LABOR.”

(Grace Farms Foundation, 2020, p.4)

ABSTRACT

Globalization facilitated many advancements in society. Through technology distances have been shortened, markets connected, and cultures shared. However, it has also magnified societal issues on a global scale. Illegal trades permeate all major industries, including the construction sector, and rely on the most vulnerable to build highly lucrative operations.

“Global laws forbid the use of slave labour in the built environment, yet our buildings, and the materials that go into our buildings, are heavily reliant on slave labour.”

(Grace Farms Foundation, 2020, p.4).

In the forefront of sustainable materials, timber has been progressively taking ground for being both ecologically renewable and economically viable. However, it is also among the materials at the highest risk of embedded slavery and is often linked to illegal logging, jeopardizing the social aspect and holistic approach of the sustainable development goals.

As architects, are we taking our share of responsibility and playing our part to ensure our specifications are not promoting such practices? Does the holistic sustainable perception of building with timber reflect the reality? Also, does the lack of ethical criteria within the construction process compromise the sustainability status of building with timber?

This thesis aims to raise awareness of this pressing crisis, with an emphasis on the timber supply chain. Having the extraction of wood in the Amazon region of Brazil as a case study, seeking an understanding of the social impact of victims of forced labour, a major type of modern slavery within the sector. By understanding the main global actors, current practices, and policies, it pursues through design to gather the relevant information and arm professionals with the right questions in pursuit of breaking the cycle of vulnerability, exploitation, and re-victimization of those in forced labour.

Continuous graphical reflections are used to support the findings and build the alternative perspectives on building with timber. A continuous construct to the final written and graphical manifestos: A call for ethical approach in design. Followed by a designer roadmap directing the reader to available tools to make this happen. A practical invitation for change.

KEY WORDS:
FORCED LABOUR WITHIN THE BUILT ENVIRONMENT
TIMBER SUPPLY CHAIN
ILLEGAL LOGGING
SOCIAL SUSTAINABILITY
INTRODUCTION

AIM

OBJECTIVE:
This thesis’ objective is to call for Ethical Criteria to be included as a requirement in every construction project, toward a comprehensive sustainability approach.

PURPOSE:
The research is structured to raise awareness of the presence of modern slavery - associated with illegal practices - within the timber supply chain globally and calls for shared responsibility and action of decision-makers within the industry.

RESULTS:
A compilation on information of social unsustainability within the supply chain with a focus on timber.
Graphical and Written Manifestos: a call for Ethical Design Criteria to be included in all design projects.
Toolkit: a compilation of existing tools and resources that make Ethical Criteria Adoption possible.

MAIN QUESTIONS

Does the holistic sustainable perception of building with timber reflect the reality?

Does the lack of ethical criteria within the construction process compromise the sustainability status of building with timber?

How can architects include ethical criteria in projects when building with timber?

BACKGROUND

For years our sustainability focus as an industry has been on the ecological and economical aspects of construction, which is reflected in the various ‘green’ certifications, however, we are failing to acknowledge the impact building and construction has on social sustainability. Inspired by the Design for Freedom Movement (Grace Farms Foundation, 2022), this thesis aims to investigate the sustainability status of timber considering its social impact within the materials supply chain.

Timber has been progressively taking ground for being both ecologically renewable and economically viable. However, it is also amongst the top five materials at the highest risk of embedded slavery (Prince, S; C de Baca, L; Thatcher, C; 2020), often associated with other illegal practices, throughout its supply chain.

Even though there has been technological progress within the construction industry over the years, it is still the least modernized, which allows such illegalities to hide behind its complexities and inefficiencies. (Prince, S; C de Baca, L; Thatcher, C; 2020). In fact, according to the (ILO, 2017), construction workers represent 18% of those found in forced labour in 2017, the second-highest rate, only preceded by domestic workers who account for 24%.

The lack of transparency within supply chains limits the effectiveness of social responsibility in our certifications. Consequently, this limits our capacity as architects and designers, to make socially responsible choices and assure a building’s sustainable credentials.

Are we perpetuating this type of modern slavery within our built environment, and in that case how many slaves work for us?
INTRODUCTION
CLAUDIA LARSEN
FOREST IN CHAINS
CLAUDIA LARSEN

Is it sustainable building with timber?
Not disregarding the numerous qualities of timber and the benefits of its application in the built environment, towards achieving sustainable development, this thesis focuses on the lack of ethical criteria within the forestry industry, which allows criminal activities to take place at cost of human lives. It exposes the consequences of increasing demand within a disaggregated and unmodernised industry. a disaggregated and unmodernised industry.

METHOD
The methods used in the thesis were:

Literature studies
Literature studies: consist of a review of reports & statistics issued by Global Organizations on the topics of Human Slavery & Forced Labour within the supply chains for the built environment, with a focus on timber. A deeper investigation has been carried out on illegal logging and laundering of wood from tropical forests

Design by Research
Graphical representation of findings and focus on raising awareness through questions rather than proving answers.

Case Study
An investigation of the timber supply chain within Brazil, one of the world’s top producers of wood globally.

THEORY
The research has been compiled using Rhetoric Theories to attract attention and raise awareness about this pressing crisis (1), motivate professionals to act with values (2) supported by facts of the crude reality of people working within our supply chains (3). (See Figure INT-2)

1. LOGOS
2. ETHOS
3. PATHOS

M = Message

READING INSTRUCTIONS
Each chapter consists of information from the different themes and critically analyses each finding by linking them – as in a chain – with the main question: Does the holistic sustainable perception of building with timber reflect the reality?

At the end of each chapter, there is a combination of written and illustrative expressions from a designer’s point of view, intending to raise further questions, thoughts, and a potential starting point for further debate. Enjoy!

DELIMITATIONS
Is it sustainable building with timber?
Not disregarding the numerous qualities of timber and the benefits of its application in the built environment, towards achieving sustainable development, this thesis focuses on the lack of ethical criteria within the forestry industry, which allows criminal activities to take place at cost of human lives. It exposes the consequences of increasing demand within a disaggregated and unmodernised industry. a disaggregated and unmodernised industry.
**1 MODERN SLAVERY**

**DEFINITIONS**

**Modern slavery:** “situations of exploitation that persons cannot refuse or leave because of threats, violence, coercion, deception, and/or abuse.” (ILO, 2017, p. 16)

**Modern Slavery Cycle:** characterised by the victims’ conditions of vulnerability, exploitation, rescue & re-victimization. (See image CH1-4)

**Forced Labour:** “all work or service that is exacted from any person under the menace of any penalty and for which the said person has not offered themselves voluntarily. ... a forced labour situation is determined by the nature of the relationship between a person and an ‘employer’ and not by the type of activity performed, however arduous or hazardous the conditions of work may be, nor by its legality or illegality under national law.” (ILO, 2017, p. 16)

**Environmental Rule of Law:** “Environmental rule of law provides an essential platform underpinning the four pillars of sustainable development—economic, social, environmental, and peace. Without environmental rule of law, development cannot be sustainable”. (UNEP, 2019, p. 21)

---

![Modern Slavery diagram](Figure CH1-1 Modern Slavery diagram. Adapted from Walk Free Foundation, 2018)
exacerbated by the lack of modernity within the industry. Such complexities and inefficiencies are a perfect environment for illegal practices to be hidden.

Over the years, awareness of forced labour in construction sites has started to emerge, however raw and composite materials produced using forced labour predominantly go with impunity. These are people, largely poor, who are simply searching for a decent job and a better life, that remains virtually invisible, hidden behind walls of severe exploitation, unable to leave because of violence, threats, coercion, deception, or abuse of power. (ILO, 2020)

This is especially alarming if we take into consideration the intrinsic correlation between forced labour, poverty, and climate degradation. (Bales & Sovacool, 2021).

According to UNEP (2020), the building construction industry is responsible for approximately 40% of global energy-related CO2 emissions. "A significant percentage of this comes from the extraction, processing, and energy-intensive manufacturing of building products. (CEI-Bois & Milestone, n.d., p.2)
1.2 KEY RISK FACTORS

The global integration of economies, including labour markets, has brought many opportunities for businesses and workers. It promoted overall economic growth, despite the economic crisis, however, not everyone has benefited from it proportionally. On any given day in 2016, 25 million people could be found in forced labour, of which 17% were children. Men accounted for 37%, women 63%, and 50% of all victims of forced labour imposed by the private sector were affected by debt bondage (ILO, 2017). [See Image CH1-5]

In fact, The Global Estimates indicate that the private economy accounts for the majority of forced labour, which highlights the importance of the collaboration with the business community, along with employers and workers’ organizations, and civil organizations – to eradicate forced labour in supply chains and the private economy as a whole. (ILO, 2017)

Another important consideration found by the ILO (2017) was the differences in sex in the typology of forced labour exploitation. Male victims were much more likely to be found in the agriculture, construction, manufacturing, and mining sectors.

Poverty, lack of education, illiteracy, gender, and migration are some of the socio-economic factors that make people vulnerable to forced labor. Some of the victims will eventually get rescued, but if they cannot find better conditions for those that made them vulnerable in the first place, they are most likely re-victimized and caught up in this endless cycle of poverty. (ILO, 2014). [See Image CH1-4]

Education and literacy are crucial factors, as educated individuals are more likely to know their rights, and be able to read contracts, being less exposed to exploitation and coercion.
1.3 - WHAT ARE THE IMPACTS?

The most severe and lasting impacts are suffered by the victims and survivors who, according to the ILO (2014), will usually lose much of their earnings due to wage retention, debt payments, and underpayment of wages, and will face strenuous conditions with little or no pay. The physical and emotional traumas may also follow them for much of their lives. (See Figure CH1-5).

The prevalence of forced labour is also bad for law-abiding businesses as they are faced with unfair competition and risks of denigrating the reputation of entire sectors and industries. Governments and societies are also harmed as “the profits are privatized, while the costs are socialized”. (Prince, S; C de Baca, L; Thatcher, C, 2020, p.56). Profits generated from the ‘theft’ of the victims’ labour bypass the national tax collection system and the costs for dealing with forced labour cases are significant. The investigation, law enforcement, rescue, and assistance of victims come at a significant cost.

“ILO, 2014, P.47

THE CONTINUED EXISTENCE OF FORCED LABOUR IS BAD FOR ITS VICTIMS, FOR BUSINESS AND DEVELOPMENT. IT IS A PRACTICE THAT HAS NO PLACE IN MODERN SOCIETY AND SHOULD BE ERADICATED AS A MATTER OF PRIORITY”
### 1.4 - The Fight Against Modern Slavery - 21st Century Milestones

Efforts to eliminate modern slavery in the 21st century have progressively been accomplished. From individual countries to the United Nations, as well as committed movements such as Design for Freedom, adds to the hours of research and investigation to solve this global puzzle.

The adoption of the 17 Sustainable Development Goals by the United Nations marked an important global milestone in the fight against modern slavery. As although all individual efforts are valid, it only truly becomes effective when tackled consistently and collaboratively.

This becomes especially evident when investigating modern slavery within the built environment and the global market of the materials supply chain. It is no longer possible to isolate such issues to individual countries, as the domino effect reverberates on a global scale, and therefore requires a global solution. The Design for Freedom Report and Toolkit proposes exactly that, the collaboration of all built environment professionals to develop and use consistent tools within construction materials supply chains to boost technology and bring transparency to fight this crisis.

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Event/Institution</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900-2021</td>
<td>UNITED STATES</td>
<td></td>
<td>U.S. Lacey Act was specifically amended in 2008 to include illegal timber prohibition of entry into the U.S.</td>
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<tr>
<td>1998</td>
<td>ILO</td>
<td>Declaration on Fundamental Principals and Rights at Work</td>
<td>Member States Commit to respect and promote principles and rights in four categories: “Freedom of association and the effective recognition of the right to collective bargaining, the elimination of forced labour or compulsory labour, the abolition of child labour and the elimination of discrimination in respect of employment and occupation”. (ILO, 1998)</td>
</tr>
<tr>
<td>2004</td>
<td>BRAZIL</td>
<td></td>
<td>The National Pact for the Eradication of Slave labour is launched. A collaboration between civil organizations, businesses, and government to promote the engagement of companies in the prevention and eradication of forced labour in their supply chains. Enforcement includes the inclusion companies in a ‘dirty list’.</td>
</tr>
<tr>
<td>2004</td>
<td>UNITED NATIONS</td>
<td></td>
<td>Appointment of a Special Rapporteur on Human Trafficking. Responsible to investigate, monitor, and recommend solutions to this specific human rights violation.</td>
</tr>
<tr>
<td>2005</td>
<td>INTERNATIONAL LABOUR ORGANIZATION</td>
<td></td>
<td>First Global Slavery Index is released. The number of slaves was estimated to be 29.8 million globally. The 2014 index estimated an increase to 35.8 million.</td>
</tr>
<tr>
<td>2011</td>
<td>CALIFORNIA</td>
<td></td>
<td>California Transparency in Supply Chains Act. Sets a requirement to disclose efforts to eliminate forced labour and human trafficking from major manufacturing and retail firms’ supply chains.</td>
</tr>
<tr>
<td>2013</td>
<td>WALK FREE FOUNDATION</td>
<td></td>
<td>First Global Slavery Index is released. The number of slaves was estimated to be 29.8 million globally. The 2014 index estimated an increase to 35.8 million. Increases jail sentence for traffickers from 14 years to life, allows authorities to seize assets, and pay compensation to victims. Sets measures to protect people at risk and requires businesses to disclose efforts to ensure slavery-free supply chains.</td>
</tr>
<tr>
<td>2015</td>
<td>BRITAIN’S MODERN SLAVERY ACT</td>
<td></td>
<td>Adopts 17 Sustainable Development Goals, with Goal 8 focused on Decent Work and Economic Growth where targets 8.7 and 8.8 calls for the end of slavery and eradication of forced labour and human trafficking by 2030.</td>
</tr>
<tr>
<td>2015</td>
<td>UNITED STATES</td>
<td></td>
<td>U.S. Trade Facilitation and Trade Enforcement Act (TFTEA)</td>
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<tr>
<td>2017</td>
<td>FRANCE</td>
<td></td>
<td>French Corporate Duty of Vigilance Law</td>
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<tr>
<td>2018</td>
<td>AUSTRALIA</td>
<td></td>
<td>Modern Slavery Act</td>
</tr>
<tr>
<td>2020</td>
<td>GRACE FARMS FOUNDATION</td>
<td></td>
<td>Design for Freedom Report</td>
</tr>
<tr>
<td>2021</td>
<td>UNITED STATES</td>
<td></td>
<td>U.S. Uyghur Forced Labour Prevention Act</td>
</tr>
<tr>
<td>2022</td>
<td>GRACE FARMS FOUNDATION</td>
<td></td>
<td>Design for Freedom Tool Kit</td>
</tr>
</tbody>
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Figure CH1-6. 21st Century Modern Slavery Fight Milestones. Adapted from (Thomson Reuters Foundation, 2015 & SDG’s)
Our lack of communication and collaboration has allowed criminal activities to take place subsidized by slave labour.

How is it possible that for so many years, we have gotten away with proclaiming innovation in our designs and techniques to better serve the people inhabiting our projects and our planet, nevertheless completely ignoring all those countless people extracting and producing the materials that make buildings materialise?

To be quite honest, what struck me the most, is that even after 20 years in the industry, I had never actually found myself thinking about it, as if materials extracted themselves from the natural environment into manufacturers and suppliers’ facilities, or naively assumed that at least most of those people had decent working conditions.

We dedicate our lives to designing for people, and investigating how systems and materials impact our wellbeing, health, productivity, and social engagements, but how little do we engage with those that play such indispensable roles in our supply chains?

This is a crisis that can no longer be ignored, there must be a radical shift in the way we lead this industry. Otherwise, we are being nothing but hypocritical by calling our designs ‘green’ or ‘sustainable’ for future generations, when this is only true still for a minority of the planet’s population.

If each sector would take their share of responsibility according to their industry’s impact, with a share of 40% of CO2 emissions, the construction industry has no other alternative than to modernize now! And us, Architects hold a strategic position within the sector, with potential for real change.

Every decision made, every line drawn, and every material chosen has a direct impact on the people using the space as well as the livelihoods of people across the planet. It is not possible to keep outsourcing the responsibility.

The profession must shift to looking at the design and construction process holistically — from material extraction to assembly and operation — ensuring safe and equitable labour practices.

The first step for this shift to happen is awareness. Instead of feeling overwhelmed and stagnated with the various challenges this shift bestows, how about we change our perspectives, our points of view, and as a collective use our agency to engage with supply chains. Turning those alarming numbers and percentages, into real people, professionals, whom we heavily rely on to keep our industry moving. The fight for their freedom and rights is the same fight to make our designs truly and holistically sustainable. "Once you know it you cannot unknow it. It is time to act!"
DEFINITIONS:

Freedom of association: it is a human right that ensures humans are free to form and participate in formal or informal groups. (ILO, 1996-2022)

Gross domestic product (GDP): is a measure that captures a country’s economic output, countries with higher GDPs will have a greater number of services and goods generated within them, often associated with higher quality of living.

G20 countries: Intergovernmental forum to address leading issues in the global economy, such as sustainable development, financial stability, and climate change mitigation. They are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States, and the European Union. Spain is also invited as a permanent guest. (Walk Free Foundation, 2018)

Timber laundering: much like money laundering, it means converting illegally cut-logs to legally certified timber by exploiting legal gaps.
The Built environment is complex, built by people for people. All stakeholders play a vital role in the construction process, however not all consider the impact of their decisions holistically. It is expected from construction companies, for example, to deliver on quality, schedule, and budget. However, it is rarely expected that contractors make decisions based on the social and environmental impacts of the materials supply chain or the construction methods being used. This needs to change. The increasing complexity of buildings and the global market of materials make it nearly impossible to eliminate forced labour from the supply chain without these values being incorporated into the practices of all of those involved, including subcontractors, manufacturers, and commodities-level actors in areas such as Forestry.

Changing the status quo takes time, especially when dealing with conflicts of interests and policies, however, the reality is we don’t have the 50 years it took to normalize ‘green materials’ after a small group sounded the alarm (Prince, S; C de Baca, L; Thatcher, C, 2020), so we must review lessons learned from this process to advocate human dignity by engaging a generation committed to eliminating human suffering from our built environment.

Once aware most industry professionals would agree that the presence of modern slavery within the built environment is unacceptable, the great majority would also say that their role is too small and their agency too limited to promote real change. (Prince, S; C de Baca, L; Thatcher, C, 2020) Which evidences the need for collaboration.

So, how to turn individual moral beliefs into industry action? Many movements within the industry emerged with advancements in technology. Two main advancements are progressively happening are the ability to track and trace supply chains and the off-site construction in a controlled environment, both of which are embedded with a ‘slave-free filter’.
would advance the agency of ethical design. The key is collaboration, by sharing these realities, ideals, and tools a new paradigm in design can emerge.

The Architectural Design Team holds a strategic position of influence and can be a key driver of change with awareness and correct tools at hand. The ethical response is now live in society and there is an opportunity to bring awareness to clients and key stakeholders.

Architectural Education also has a key role in raising a new generation of architects with an ethical design mindset, aware of the existing tools, and taking part in the advancement and development of such technologies. A holistic approach is a must-have, especially when it comes to critical aspects of projects, such as materials choice. Students tend to repeat the status quo inertia of the industry, most of the time without questioning whether who came before truly got it right or not. Change must be tackled at both levels, both at formation (students) and reformation (industry professionals).

With the engagement of all of those involved and transparency, there is potential for less conflicting information about sustainable practices, and hopefully, public disbelief turns into activism at all levels. The Media and Arts can play an important role in raising awareness. On the other hand, media is also an important sales tool for industries, where only the positive side of building with certain materials is portrayed. This could, therefore, be considered a form of misinformation, as it influences designers to specify certain materials without showing all the impacts throughout the supply chain.

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"IF EVERY LINE WE DRAW AFFECTS A STRING OF MATERIAL PRACTICES WITH AN ECOLOGICAL IMPACT, IT ALSO AFFECTS A SERIES OF LABOR PRACTICES THAT IMPACT HUMAN RIGHTS".

(Grace Farms Foundation, 2020, P.77)
2.2 TIMBER, AN AT-RISK MATERIAL

Timber is amongst the most used construction materials in the world, it is also at high risk of embedded forced labour and human trafficking within its supply chain. It is estimated that the Forestry Industry formally employs 13 million workers and another 41 million informally (FAO, 2022), which allows for exploitative conditions both in logging and sawmills. Workers are usually migrants and work tends to take place in remote areas, making labour inspections challenging (FAO, 2022). Workers are normally found in poor living and working conditions with excessive working hours, suffer non-payment of wages and debt-base coercion (Baumann, 2022).

Risks of forced labour are found in both developed and developing countries, reinforcing that, efforts to end it must occur at a global level. And given that an estimated 38% of wood products are being used for building and construction (Innovative Tools in the Movement Toward Slave-Free Buildings, 2020), the origin of timber, how and by whom it is produced is the responsibility of all those involved, from decision makers on design, construction, to manufacturing teams worldwide.

The at risk materials
- rubber
- glass
- fiber & textiles
- steel
- electronics
- timber
- bricks
- stone
- copper
- iron
- minerals
- precursors

Main producers of at risk
- Russia
- Sweden
- Brazil
- Guyana
- Canada
- Peru
- Cameroon
- Uganda
- Vietnam
- North Korea
- Solomon Islands
- Papua New Guinea
- Tanzania
- China
- Kyrgyz Republic
- Czech Republic
- Laos
- Indonesia
- Malaysia
- Indonesia
- Brazil
- Peru
- Mexico
- Colombia
- Peru
- Bangladesh
- Vietnam
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The increasing demand and opacity of the timber supply chain, both attract and allow criminal activities to take place. It is estimated that between 15-30% of timber comes from illegal sources, and for tropical soft and hardwood that number may be as high as 90%. A great proportion of this is only possible due to the flows of funding from investors based in the EU, U.S., and Asia. (Nellemann, 2014)

Illegal logging is the most profitable environmental crime, it can generate revenues up to 5-10-fold higher than legal practices for all those involved. It usually goes without impunity as it normally takes place in conflict regions or where there is widespread corruption. (Nellemann, 2016)

This then becomes a transnational crime challenge when timber is laundered within its supply chain and the lack of transparency makes it extremely difficult for those purchasing the material to ascertain whether it comes from illegal or legal sources and under what conditions it has been produced.

Although some actions have been taken by countries, China, the largest importer of timber globally, as an example, has been found processing and selling timber found in illegal shipments from Asia and Africa (Vedluch, 2022).

### At risk sawn timber

<table>
<thead>
<tr>
<th>Brazil softwood</th>
<th>Brazil &amp; Peru hardwood</th>
<th>Russia softwood</th>
<th>Russia hardwood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine</td>
<td>Peru, White Oak, Walnut</td>
<td>Pine, Spruce, Fir</td>
<td>Oak, Birch, Aspen, Elm</td>
</tr>
</tbody>
</table>

**Applications and end products**

**Sawn timber**
- Architectural roof trusses, cladding, decking, fencing, flooring, framing, pergolas |
- Rails, balustrades, interior/exterior |
- Retaining walls |
- Stairs |
- Packaging

**Wood veneer**
- Laminated wood |
- Furniture applications and decoration |
- Interior doors |
- Mosaiics |
- Inlays |
- Flooring decoration |
- Door cladding

**Plywood**
- Laminated wood |
- Furniture |
- Formwork for wet concrete |
- External wall construction |
- Flooring systems |
- Packaging

**Laminate wood**
- Flooring |
- Furniture |
- CLT (Cross-Laminated Timber) |
- Doors |
- Cabinetry

Illegal logging activity’s share of total logging worth between US$30-100 billion - 10-30% of global wood trade (Nellemann, 2014)

Main producers

Main importers

Share in illegal exports
- Up to 50%
- More than 50%

Figure CH2-9. Blood timber flow. Source: Adapted from Black wood dependency - Main bilateral flows of illegal timber map (Nelleman, C; INTERPOL Environmental Crime Programme, 2012)
2.4 FORCED LABOUR AND ILLEGAL TIMBER: INEXTRICABLE RELATIONSHIP

Illegal logging can occur in any phase of the supply chain (see Figure CH2-7) and perpetrators use various tactics to conduct their ‘businesses’ unnoticed. Workers in illegal timber operations, usually migrants, are exposed to unsafe working conditions where regulations are not usually enforced due to their remote locations, lack of oversight, and government corruption. It is estimated that up 50% of illegal logging globally is reliant on forced labour. (ILO, 2017)

When compared to other sectors, Forestry holds 11% of victims of forced labour exploitation and there is a prevalence of male victims – 68%, while female victims account for 32%. (ILO, 2020) They are usually kept in poor living conditions, usually exposed to the elements, with no sanitation, or proper cooking facilities, working long hours with minimal, if any, safety equipment.

Perpetrators will use various forms of coercion to prevent them from leaving, which may include personal threats to them and their families, retention of documents, and even death.

“AT THE END OF THE YEAR, IF YOU HAVE A LOT OF MONEY TO RECEIVE, THEY WON’T PAY YOU. THEY’LL HAVE YOU KILLED. THEY MIGHT OWE R$10,000 OR 15,000 [US$2,400 OR 3,600] TO A WORKER. BUT A GUNMAN WILL COST ONLY R$3,000 [US$700]”

– FORESTRY WORKER IN THE AMAZON (KNOWTHECHAIN, 2019, P.1)
2.5 TIMBER TRANSPARENCY: ALREADY AVAILABLE AND REQUIRED

Although most forestry certifications available (See Figure CH2-9), figure the mandate of slave-free workmanship as part of the criteria, companies can still have the certification without disclosing a supplier list and/or information on their supply chain workforce. Through research Know the Chain (2019) revealed the results of an assessment of the largest publicly listed companies in the forestry and paper sector. There were major gaps in supply chain transparency, stakeholder engagement, and freedom of association. It is shocking to learn that none of the companies disclosed their supplier list with the associated workforce, nor do they engage with global or local trade unions to support freedom of association in their supply chains. (See Figure CH2-10)

As an industry, it is imperative that we not only know where the materials are coming from, but who is sourcing and how. Unethical sourcing can be connected to environmental injustice, as well as ecological degradation. (Prince, S; C de Baca, L; Thatcher, C, 2020)

**CERTIFICATIONS**

<table>
<thead>
<tr>
<th>Programme for the endorsement of Forest Certification (PEFC)</th>
<th>Sustainable Forestry Initiative (SFI)</th>
<th>Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Stewardship Council (FSC) Certifications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The graphic captures the percentage of companies disclosing at least some information on each of the indicators.

**COMPANY DISCLOSURE BY INDICATOR**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Disclosing Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier Code of Conduct and Integration into Supplier Contract</td>
<td>59%</td>
</tr>
<tr>
<td>Management and Accountability</td>
<td>13%</td>
</tr>
<tr>
<td>Stakeholder Engagement</td>
<td>0%</td>
</tr>
<tr>
<td>Supply Chain Transparency</td>
<td>0%</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>0%</td>
</tr>
<tr>
<td>Purchasing Practices</td>
<td>3%</td>
</tr>
<tr>
<td>Recruitment Fees</td>
<td>0%</td>
</tr>
<tr>
<td>Freedom of Association</td>
<td>0%</td>
</tr>
<tr>
<td>Grievance Mechanism</td>
<td>23%</td>
</tr>
<tr>
<td>Remedy Programs</td>
<td>5%</td>
</tr>
</tbody>
</table>

39 Major Paper, Forestry and Home furnishing retail sectors Reflects the key areas of the UN Guiding Principles on Business and Human Rights

"IT IS TIME TO AMEND OUR CERTIFICATION AND RATING SYSTEMS TO PLACE GREATER PRIORITY ON ADDRESSING FORCED LABOUR IN OUR BUILDING MATERIALS"

(Grace Farms Foundation, 2020, P.66)
2.6 WHO IS TO BLAME?

Expanding markets and networking beyond borders are the modus operandi for most businesses, suppliers from across the globe take orders and make shipments regularly. The social responsibility for eliminating illegal logging and associated forced labour practices within the timber supply chain is often placed in the countries where the crime is happening. Although these countries have their share of responsibility, they are certainly not alone.

Simply put, legal or illegal, there is supply because there is demand. It is important to understand where the products produced by forced labour are being sold and consumed. According to the Global Slavery Index (Walk Free Foundation, 2018) taken together, the G20 Countries are annually importing US$354 billion worth of these at-risk materials – of which US$1.4 billion relates to timber. However, only seven G20 countries have formally taken action to stop governments and businesses from sourcing services and goods produced by forced labour.

So, who is buying all these materials? Well, governments are the biggest buyers, but we, the common citizen should not take our impact for granted, we can and must demand accountability from our governments, as well as take our individual share and act on it. It is not good enough to expect change and continue to consume ‘as if there was no tomorrow’.

Also, it is important to note that institutional investments in forestry have grown exponentially “from an estimated US$10-15 billion in the early 2000s to over US$100 billion today”, (KnowTheChain, 2019) However, what is truly shocking is that their risk assessment is limited to deforestation and climate change, and forced labour risks are rarely on the agenda, even though very little if any, action is taking place to address them.

FORMAL ACTIONS AGAINST MODERN SLAVERY:

- G20 COUNTRIES TAKING FORMAL ACTION
- G20 COUNTRIES NOT TAKING FORMAL ACTION

"ILLEGAL LOGGING FOR THE INTERNATIONAL TIMBER TRADE IS PREDOMINANTLY A RESPONSE TO THE EXTERNAL DEMAND FOR WOOD PRODUCTS GENERATED BY CONSUMER NATIONS" 

(SUNE, ET. AL., 2018, P.12)

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(SUNE, ET. AL., 2018, P.12)
2.7 IT'S ALL FOR PEOPLE BY PEOPLE. WHICH PEOPLE?

Building with timber is sustainable for whom? Biophilic design and the ecological sustainability sense are progressively driving designers toward timber. However, **is the industry ready to extract and process all this timber with the same dignity for ALL?**

Figure CH2-13: It's all for people by people. Which People? (Source: Claudia Larsen 2022)
3 THE CASE OF BRAZIL

Figure CH3-01. View of the Amazon River from an airplane, dense tropical forest, reflection in the water. Source: Adobe Stock 316423534

Figure CH3-02. Land uses and occupation in Brazil. Adapted from (Embrapa, n.d.)

Land Uses and Occupation in Brazil

- PROTECTED AND PRESERVED AREA (66.3%)
- AGRICULTURE & LIVESTOCK (30.2%)

1. Areas for the Preservation of Vegetation in The Rural World no Vehicles
2. Integral Conservation Units
3. Indigenous Lands
4. Native Vegetation in Vacant and Unregistered Lands
5. Infrastructure and Others
6. Planted Forests
7. Crops
8. Planted Pastures
9. Native Pastures

30.2%
66.3%
3.5%
The Federative Republic of Brazil is the largest country in both Latin and South America, with an area of 8,515,767 km² (fifth largest in the world) and has the sixth-largest population globally with 214,581,555 people (IBGE, 2022). Due to over a century of mass immigration from around the world, Brazil is one of the most ethnically and multicultural nations in the world. (Philander, 2012). It is also the largest country to have Portuguese as the official language.

Brazil is home to 60% of the Amazon rainforest, the world’s largest tropical rainforest, with an extension of 5,500,000 km², an area more extensive than the EU and more than half of the United States (Rainforest Foundation Norway, n.d.). The Amazon basin has the world’s largest river, the highest biodiversity of any ecosystem, and the biggest population of indigenous forest peoples, some living in voluntary isolation. (Mongabay, 2020)

The Brazilian Amazon has been in the spotlight for a few years as the climate crisis advances and forest conservation is on the top of the Environmental Agenda. These are facts. And throughout this investigation, my efforts have been to gain clarity on the subject and step back to widen my perspective.

The truth is, I was not able to answer most of my questions. The amount of conflicting information only endorses the theory that the truth varies depending on the interest, mostly economic. In a world heading towards starvation of resources, co-dependency values are becoming overridden by individual interests, at whatever cost, even human.

This only enforces the need for transparency and the use of technology for traceability in the timber industry. A system immune to tampering, hacking, and bribery.

The amount of resources found in Brazil makes it a target for genuine international markets, as well as criminal activities. Everyone is after the money, including those in government. The well-known ‘car-wash
operation’ led by Brazilian Federal Police a few years ago, started to shed a light on the profound and deep-rooted corruption mechanism installed in the country. And the Brazilian people started to wake up to the true and absurd depth of looting, both monetary and ecological schemes, happening in the country.

The reality is, whatever you decide to believe, you will find enough information to support it. One of the things I constantly find myself doing during this thesis is trying to position myself in other people’s realities, and change my perspective. From the victims of modern slavery to the president of a country. Figure CH3-04 illustrates that reaching the perfect balance is a great responsibility for governments. Ensuring the well-being of the rural poor and indigenous peoples, supporting the interests of the industry, and fulfilling the demands from foreign governments, and requirements from the aid community. (Butler, 2019) If corruption and conflict of interest is added to this scenario, a sense of helplessness starts to sink in. Hence the importance of education and critical thinking.

On the specific topic of land tenure, some studies show that the rising and accelerated rate of deforestation suggests that the closing of forests as untouchable parks and reserves has not deterred perpetrators nor improved the quality of living or economic opportunities for the rural poor. (Butler, 2019). “In 2019, 770,148 hectares of the Amazon rainforest was cleared, of which 474,974 were in protected territories (conservation areas and indigenous lands) and of this area, just 2,122 ha had been "authorized for deforestation". (Leitão, Hoare, Uehara, & Farhan, 2021)

Others suggest that land privatization boosts illegal logging, using legal permits, and laundering operations as shown in the previous chapter. (See figure CH2-7). In another article, research shows that 200,00 hectares of logging were accounted for in ten municipalities, five of them in Mato Grosso, two in Amazonas, and the others in Roraima, Acre, and Para. Of which, 78% were reported to be on privately owned land. (Ennes, 2021)

Also, there is a misconception that all indigenous communities want to carry on their primitive way of living, isolated from civilization, technology, and healthcare. To explore their land sustainably, make a decent living, and not be vulnerable to perpetrators, including those in command of forced labour.
3.2 - TREES GROWING MONEY

High profits drive illegal logging making use of forced labour.

DEGRADATION

Perpetuates the Modern Slavery Cycle

HUMAN RIGHTS ABUSE

CONSCRIPTION

HIGH PROFITS

FORCED LABOUR

ILLEGAL LOGGING

contamination
3.3. FIGHTING FORCED LABOUR IN FORESTRY

When it comes to combating forced labour, Brazil has been identified as one of the most progressive countries. However, despite all progress made, strengthening of policies and instruments are still required to eradicate such fundamental labour and severe human rights violations. (T.M. Costa, 2009).

In Forestry, this issue becomes even harder to identify and punish through severe law enforcement as such illegalities usually take place in remote areas. Furthermore, exploited victims rarely denounce such activities and seek authorities to report abuse as they are afraid to be held accountable for environmental crimes – even though it is out of necessity. (Repórter Brazil, 2018)

Exploited workers in rural areas in Brazil are largely men aged between 15 and 40, with low levels of education – of which around 20% have never attended school. (Vuong, 2013). This profile encompasses workers cutting down native vegetation, raising cattle, planting, and harvesting crops, and those involved in the production of vegetable coal.

The violation of their human rights includes high-risk duties without proper equipment, degrading working conditions, mistreatment and violence, inadequate remuneration and unfair compensation, restriction of freedom, and degrading accommodation. (See Figure CH3-06)
3.4 - NATIONAL EFFORTS

**Relevant bodies:**
- IBAMA
- FUNAI
- Federal Prosecution Office
- Federal Police
- Civil Society

**Non-Profits:**
- Imazon
- Imaflora
- Idesan
- Instituto Centro de Vida (ICV)

**Tools:**
- Smart Lab Brasil
- Know your Supplier

**Projects:**
- Projeto Marco Zero
- Amazonia Protege
- MapBioma Brazil
- National Pact for the Irradication of slave labour
- Payment of labour compensation and unemployment benefit to freed workers

**Enforcement:**
Tactics: Satellite imagery
Brazil has the most advanced system, a sophisticated rapid-response satellite system that can detect and locate large-scale deforestation in near real-time, which triggers enforcement units to react quickly. (Hermann, Bakhtary, & Conway, 2020)
- Special Mobile Inspection group
- The ‘dirty list’ for businesses

3.5 - INTERNATIONAL EFFORTS

**INTERNATIONAL EFFORTS TO COMBAT DEFORESTATION**

**COP26:**
Leaders of more than 100 countries vowed to end deforestation by 2030

**REDD+**
(Reducing Emissions from Deforestation and Degradation)

**Payment for Ecosystem Services**

**Non-Profits:**
- Imazon
- Imaflora
- Idesan
- Instituto Centro de Vida (ICV)

**Tools:**
- Smart Lab Brasil
- Know your Supplier
3.6. HOW ARE WE, THE PEOPLE, KEEPING INFORMED?

As a Brazilian is it heart-breakings to see how polarization in politics and disinformation both in the mainstream and social media are impacting the country and its people – to be fair a phenomenon not exclusive to Brazil.

There is no longer space for a healthy debate where all sides are heard and respected. It feels that to express an opinion, like in football games, you must first buy a ticket declaring which side you are on, and 'run for your life if you find yourself in the wrong crowd.

To win global wars, such as forced labour within the built environment, we must all collaborate and seek the facts, the truth, and take care of each other. Social media has given people the opportunity to voice their opinions which is a positive advancement in democracy, however, it seems many are taking this privilege lightly, and often sharing information without checking the source. This is dangerous and, in various instances, contributes to a culture of hatred, instead of one of collaboration and education. (See Figures CH3-09-12).

Mainstream media’s modus operandi seems to have shifted and is often not bringing facts, reporting the reality, but setting opinion trends influenced by political or economic reasons.

People are confused, not sure what to believe, and in most instances generate a sense of helplessness and anxiety, as opposed to activism.

Mainstream media often collaborate and seek the facts, the truth, and take care of each other. Social media has given people the opportunity to voice their opinions which is a positive advancement in democracy, however, it seems many are taking this privilege lightly, and often sharing information without checking the source. This is dangerous and, in various instances, contributes to a culture of hatred, instead of one of collaboration and education. (See Figures CH3-09-12).

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People are confused, not sure what to believe, and in most instances generate a sense of helplessness and anxiety, as opposed to activism.
"Wood is the only sustainable structural material that grows worldwide which can enable a substantial decarbonisation of the built environment based on existing business models and proven technology; providing vast carbon sinks in our rural areas and carbon stores in our cities".

Time for Timber Manifesto (CEI-BOIS & Milestone, n.d., p.3)

**DEFINITIONS:**

- **Carbon sink:** “an area of forest that is large enough to absorb large amounts of carbon dioxide from the earth’s atmosphere and therefore to reduce the effect of global warming”. (Cambridge Dictionary, 2022)

- **Circular economy:** “The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended.” (European Parliament, 2022)

- **Sustainable forest management:** The aim of sustainable forest management (SFM) is to ensure that forests supply goods and services to meet both present-day and future needs and contribute to the sustainable development of communities. (FAO, n.d.)

- **Biophilic Design:** translates to “love of life” or “love of living things”. (Wilson, 1986).
4.1 - WHY ARE WE BUILDING WITH WOOD?

With 2/3 of the world population expected to live in urban centres by 2050 (UN, 2018), there is a high demand for new buildings as well as renovation of existing ones. If we are to reach net-zero by 2050, the construction industry must decarbonize.

Currently, the sector is responsible for approximately 40% of the energy-related CO₂ emissions globally (UNEP, 2020), being the two main sources:

1. operational - heating, cooling, and power.
2. embodied emissions in materials - the extraction, processing, and energy-intensive manufacturing.

Wood is progressively taking ground within the industry for its naturally renewable qualities. As it sequesters carbon as trees grow in forests, stores carbon in harvested wood products drives sustainable forest management, and contributes to a circular economy, as wood products can be recycled, reused, and recovered for low-carbon energy at end-of-life. (CEI-Bois & Milestone, n.d.)

Another important aspect is the interior quality of spaces, considering we spend an estimated 90% of our time indoors. Therefore, bringing nature into buildings, through the use of natural materials such as wood, has proven to have a positive impact on their inhabitants. (Stopka & Lerner, 2016)

In office buildings, for example, the use of exposed timber has been linked to many positive outcomes in people's well-being, from the reduction of stress to productivity boost, and thus reduction of sick leave.

This concept is not new, biologist Edward O. Wilson introduced it in his book Biophilia – which translates to “love of life” or “love of living things”. (Wilson, 1986)

Translating these concepts into the design, it addresses human connections with nature, through water, light, green plants, and natural materials.

Standing from this perspective, it is only logical to think that the increased use of wood in the built environment is an effective way of reducing emissions from the two main sources listed above, whilst promoting connection with nature and well-being for those in the urban centres.

All these attributes of using timber in projects have generated a material market shift, and high demands from the forestry industry, boosted by investments as described in the previous chapter. The high profit in the sector attracts criminal activities, such as illegal logging, which creates unfair competition with law-abiding businesses and has 50% of its production reliant on forced labour. (See Figure CH4-02)

It is important to note that producing timber through Sustainable Forestry Management, does not equal to the preservation of Natural Forests, as most of the forestry industry makes use of monoculture plantations. Therefore, biodiversity loss is still a reality. This leads us to the main thesis question: Does the holistic sustainable perspective of building with timber match the reality? And additionally: Is the industry ready to supply all the promoted demand in a sustainable way?
Global population growth

does the industry ready to supply all the promoted demand in a sustainable way?

how are architects contributing to this crises?

Natural forests diminishing

is the industry responsible for 40% of total energy related emissions?

which people?

build for people

disaggregated + least modernised industry

sustainable development for all people + planet into the future

sustainable forestry management
certifications do they cover all aspects of sustainable development?

loss of biodiversity

not supported by scientists

illegality 50% reliant on forced labour US$30-100 billion in value 10-30% of the global trade

illegal logging*

2000's US$10-15 billion today US$100 billion

attracts criminal activities

illegality,

tax evasion, degradation, biodiversity loss, hidden & difficult law enforcement
technology is key

*15-30% of the global trade 50-90% in tropical forests

Improved forestry industry investments

boosted by propaganda: forest industry design team are we misinformed?

why wood? carbon sink renewable circular economy biophilic design

social sustainability focus on end users is this the whole picture?

generated a market shift

high demands = big profits economic challenge

everyone wants a share of the market it is all about the money

Attracts criminal activities

Privatising profits and socialised costs

why are we standing from?

Where are we standing from?

Natural forests diminishing

loss of biodiversity

loss of biodiversity at human cost endless cycle of poverty

 Does the hollistic perspective of building with timber reflect the reality?

how are architects contributing to this crises?

Natural forests diminishing

De-carbonise construction materials

sustainable for all people + planet into the future

is this happening?

best material choice: wood if sustainably managed!

is this the whole picture?

social sustainability focus on end users

construction materials

monoculture is still an issue

northern forests diminishing

30-100% in tropical forests

4.2. BUILDING WITH TIMBER MIND-MAP

(grounded by Claudia Larsen 2022)
4.3 - Why are we building with timber: The industry's manifesto

Figure CH4-02: Why are we building with timber?
(Source: Claudia Larsen 2022)

- **Stores carbon in harvested wood products**
- **It’s durable**
- **Fast and efficient to build with**
- **Contributes to a circular economy as wood products can be reused, recycled and recovered for low-carbon energy**
- **Drives sustainable forest management leading to greater growth**
- **Good for health and well being**
- **Sequesters carbon in forests as trees grow**
- **Structurally strong**
- **Naturally beautiful**
- **Contributes to a circular economy as wood products can be reused, recycled and recovered for low-carbon energy**
4.4 - TIMBER MARKETING: IS IT ABOUT THE PLANET?

Hindsight

Hundreds of Companies Promised to Help Save Forests. Did They?

Cargill, Nestle, Carrefour and others pledged to reach net-zero deforestation in their supply chains by 2020.

Pressure increasing on fragile forests - Stuart Goodall

NGOs say FSC label offers little protection for forests, Indigenous people

Zero carbon house shows it's time for timber - Stuart Goodall

Slaves to deforestation: Labor abuses fuel Brazil's Amazon destruction

Supply chain warned Russian timber imports 'could be illegal'

Wooden skyscrapers Are on the Rise

Explainer: how to increase the use of timber

Transforming Trees Into Skyscrapers

Time for Timber: global wood manifesto launched

Read, Repair, Recycle, Replant, Repeat.

The Scotsman
"WE NEED LEADERS NOT IN LOVE WITH MONEY BUT IN LOVE WITH JUSTICE. NOT IN LOVE WITH PUBLICITY BUT IN LOVE WITH HUMANITY".

-MARTIN LUTHER KING JR. (JR. ET AL., 2005, P.287)

5.1 - A MATTER OF PERSPECTIVE - FINAL REFLECTIONS

It is easy to feel overwhelmed by the amount of information and nature of this investigation. It is crucial to understand that the perspective we design from, will have an impact on all those involved from the design team, and supply chain collaborators, to end-users. We must not give up. Make use of the available tools and help develop others. (See Sections 5.5 &5.6 and Appendix A)

Building with timber has great potential, however, we must understand the industry’s current limitations and push for modernization ensuring we are not contributing to this crisis.
5.2 - MANIFESTO

Figure CH5-01. Manifesto. (Source: Claudia Larsen 2022)
S
ome call it human evolution, the survival of the fittest, I call it loss of humanity.

Architecture has marked important transitions in human history, from nomadic hunter-gatherers moving from temporary shelter to temporary shelter, to settled farmers, to the birth of the first civilizations.

Architecture has always been considered a noble profession, and the architect too often compared to the creator of the universe, as if seated on a throne.

A master evolving with the advancement of technology, expressing one’s own desire on someone else’s property. A sign of status.

Standing still from a specific point of view, where the world they build, looks simply perfect.

The fittest of society will have access to the master and they too will share the glory.

Fast forward time, evolution has made us live longer and there are more of us.

There is now a realization that resources are finite and that we might not be making the best use of them. Proving us not to be good stewards of our home, our planet.

We gather to discuss, understanding that is no longer possible to ignore that part of society from whom we haven’t shared our discoveries, our evolution.

We have taken so much from our lands and theirs that the planet is starting to cry out.

Our own survival now depends on changing our ways, by sharing; knowledge, resources, love.

Finding ways to take less and produce more, look at everyone’s needs. But are we?

From stone to timber, our built environment is tainted with the blood of those who cannot advocate for themselves.

And our evolution just seems to have changed the media we use to tell a different story from the same point of view.

‘Green buildings’ and the right choice of materials do not account for the people extracting and processing them, and nor do we, the architects.

The certifications help us clear our conscious that we are doing right by the planet, and in some aspects we really are, but again, we are not looking at the full picture nor from the opposite perspective.

Take timber, the material of the moment, renewable, efficient, beautiful, all true. Truly remarkable pieces of architecture, showcasing the advancement of technology and collaboration between specialties.

Improving the quality of life of those inhabiting the space. Seems like we have found our formula for sustainable development. At what cost might I ask? Seems like a dream, too good to be true.

And it is. The matter of fact is that even though we have evolved, our industry is still disaggregated and is the least modernized, which allows us to put a blind eye on who is producing all this timber and how, almost like not my problem. Is it not?

Well, it is, and the truth is we are failing. Failing to provide the same level of dignity throughout the construction process. As if without the material we could really do anything.

Because there is so much demand, everyone has their eyes on the prize. Those who have care for the planet and people. And also, those who care solely for their pockets.

And the sustainable built environment we so proudly propagate is being built at the cost of human blood, degraded environments, and endless cycles of poverty.

We must change our point of view, we must take responsibility for our choices, and we must bring humanity into our designs. It is no longer acceptable to build for humans at the cost of humans. Development can only be sustainable if available to all.

Join the movement of ethical design now!
5.4 - WHERE DO WE STAND?

Being Promoted

"SLAVERY IS PERCEIVED AS THE DISTANT PAST AND CLIMATE CHANGE IN THE 'DISTANT FUTURE', BUT BOTH ARE HAPPENING RIGHT NOW".
- SHANNON HOBBS (O'CONNELL, FLEURY, MACKIE, & WITT, 2021, P.15)

The reality for a large proportion of the extraction process

ASSEMBLY & OPERATION

AWARENESS
A HOLISTIC VIEW
USE OF TIMBER
FOR A RESILIENT
WITHIN
THE BUILT
ENVIRONMENT

Supply Chain with safe & equitable labour practices

MATERIAL EXTRACTION

Figure CH5-02. Where do we stand? (Source: Claudia Larsen 2022)
5.5 - BUILDING WITH TIMBER DESIGNER ROADMAP
(TO BE READ IN CONJUNCTION WITH 5.6)

Understanding the impact of building with timber is the first step toward implementing ethical criteria into the design. It is important to look beyond the current discourse and demand accountability and transparency from suppliers and professionals involved in the construction process. Based on the Building with Timber Mind-Map (Figure CH4-02), this Roadmap proposes the use of existing tools at the different stages towards preventing illegal logging, forced labour, and associated criminal activities within the timber supply chain. It also encourages further understanding of the current practices of Sustainable Forestry Management and its association with monoculture plantations and biodiversity loss.

Furthermore, encourages the development of new tools collaboratively. This is a ‘global work-in-progress’ that must be incorporated into every architectural practice and education program if we are to end this crisis soon. See below a suggested list of tools associated with Figure CH5-04 and illustrated in Figure CH05-03. Additional useful tools can be found in Appendix A.

1. Figure INT-2 - Delimitation Diagram
   Sustainability in Building with Timber (p.13)
2. Design for Freedom Materials Tracking Schedule
4. Design for Freedom Supplier Outreach Letter & Questionnaire
5. Design for Freedom Report
6. A Call for Ethical Design Manifesto (p. 72-73)
Global population growth is the industry ready to supply all the promoted demand in a sustainable way?

Does the hollistic sustainable perspective of building with timber reflect the reality?

Natural forests diminishing - Monoculture is still an issue - Sustainable forestry management

Best material choice: wood if sustainably managed!

Why wood? carbon sink renewable circular economy biophilic design

Sustainable forestry management - Engage on the inclusion of ethical criteria within materials library.

Boosts forestry industry investments - Engage with Forestry industry/timber supplier. Forced labour must make the agenda.

Illegal logging* 50% reliant on forced labour US$30-100 billion in value 10–30% of the global trade

Illegal logging* unfair competition

Natural forests diminishing

Privatised profits and socialised costs - People extracting the materials are as important as your client - you need both!

De-carbonise construction materials

Consider the impact on other pillars of sustainability

Have all people in mind

Promote digital models, integration tools, big data, and analytics

Demand supply chain transparency, who and how. Make use of available tools.

INCLUDE ETHICAL CRITERIA IN YOUR SPECIFICATION

Ask whether those promoting the use of timber are actively working to combat forced labour

High demands = Big profits economic challenge

Generated a market shift

Do not engage with companies that cannot disclose their supply chains.

Privatised profits and socialised costs - Engage on the inclusion of ethical criteria within materials library.

Attracts criminal activities

Avoid specifying materials from global hotspots.

Consider all perspectives and be the one to start the conversation, we must understand the full impact of building with timber.

People extracting the materials are as important as your client - you need both!

Consider the impact on other pillars of sustainability

Be sure to understand the impact and go beyond the propaganda.

Engage on the inclusion of ethical criteria within materials library.

Include ethical criteria in your specification

Engage with Forestry industry/timber supplier. Forced labour must make the agenda.

Generated a market shift

Engage on the inclusion of ethical criteria within materials library.

INCLUDE ETHICAL CRITERIA IN YOUR SPECIFICATION

Ask whether those promoting the use of timber are actively working to combat forced labour

High demands = Big profits economic challenge

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High demands = Big profits economic challenge

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Do not engage with companies that cannot disclose their supply chains.
The process of this research has been a turning point in my career and an eye-opener as a world citizen. During the investigation, I had this constant image in mind where I was pulling an endless chain out of a box, and each link revealed a deeper crisis than the previous. Like removing filter layers from a photograph, new perspectives hidden in plain sight emerged.

It is absolutely infuriating that amid the 21st century there are more people in slavery than at any other time in history - being a large proportion within the built environment materials supply chains. How have we managed to get away with subsidizing responsibility for this long?

Having a new understanding of the profound and extensive impact of my decisions as part of a design team, weighed on me. Worlds apart, yet so co-dependent. Same industry, completely different realities. The level of inequality is shocking.

Furthermore, I started from the premise that building with timber is in fact ecologically sustainable and economically viable. However, encountered an even bigger issue: Illegal logging. A fertile ground for all sorts of crime - including forced labour. Ranked the most profitable of environmental crimes, and the third most profitable transnational crime, only behind counterfeiting and drug dealing.

The more I learned, the more contradictory it all seemed to me. How can we be endorsing timber promoting campaigns when the forestry industry is clearly struggling to supply all the demand sustainably? At COP26, leaders of more than 100 countries vowed to end deforestation by 2030, and let’s imagine we are there. What does it look like? More plantations? That might alleviate the issue of modern slavery substantially, but what about biodiversity loss? Isn’t that one of the main concerns about tropical forests’ devastation?

Although the sense of helplessness and frustration are still present, another of activism and hope emerge when learning what is being done by professionals around the globe. People, that like me, believe that together we do have enough agency to fight this massive crisis. Feasible proposals, such as the inclusion of ethical criteria in design projects are already available. The technology has already been developed, we need to make use of it.

Transparency is the key to releasing people from endless cycles of poverty within our supply chains and providing the same level of dignity to all. We must change the perspective we are designing from. Having the correct knowledge and tools are an important start to releasing the great sustainable potential building with timber has. Currently, the holistic sustainable perception of building with timber does not seem to reflect the reality, but it can. It starts with you and me. Join this movement now!


ILO. (1998). ILO Declaration on Fundamental Principles and Rights at

REFERENCES
CLAUDIA LARSEN
FOREST IN CHAINS
CLAUDIA LARSEN
REFERENCES
REFERENCES (CONT.)


PRI. (2019, May 17). Principles for Responsible Investment. Retrieved 03 20,
REFERENCES (CONT.)

2022, from Forestry Executive Summary: https://www.unpri.org/forestry/responsible-investment-in-forestry/4389.article


REFERENCES

CHAPTER 1

Figure CH1-1 – Produced by the author based on: Walk Free Foundation. (2018). Modern slavery is an umbrella term [Illustration]. In The Global Slavery Index (p. 7).


Figure CH1-4 - A21. (n.d.). Rescue [Illustration]. A21. https://www.a21.org/content/united-kingdom/507k

Figure CH1-5 – Produced by the author based on: ILO. (2014). Profits and poverty: the economics of forced labour. Geneva: International Labour Office.


CHAPTER 2


Figure CH2-1. Who influences the building supply chain? Source: Produced by the author based on (Grace Farms Foundation, 2020, p. 53)

Figure CH2-2. Line impact. Source: Produced by author.

Figure CH2-3. Forced labour: Adapted from: Ripper, J. R. (n.d.). Burned Para [Photograph]. Imagens Humanas. https://imagenshumanas.photoshelter.com/image/I0000gXKwNIMQ0c0

Figure CH2-4. Blood timber. Source: Adapted from (Grace Farms Foundation, 2020)

Figure CH2-5. At-risk sawn timber. Source: Adapted from (Grace Farms Foundation, 2022)

Figure CH2-6. Blood timber flow. Source: Adapted from Black wood dependency - Main bilateral flows of illegal timber map (Nelleman, C; INTERPOL Environmental Crime Programme, 2012)

Figure CH2-7. Illegal logging and log laundering. Source: Adapted from (Nellemann, 2014, p.65)


Figure CH2-9. Certifications. Source: Produced by author

Figure CH2-10. Company Disclosure by indicator. Source: Adapted from (KnowTheChain, 2019)

Figure CH2-11. Adapted from: SIGA. (n.d.). HoHo Vienna [Photograph]. Siga Swiss. https://www.siga.swiss/se_sv/projekt/hoho-wien#gallery-d041350c-fae2-4bf9-9591-93baf8667b2-1

Figure CH2-12. G20 Countries Map + The flow of timber in a Global Context. Source: Produced by the author based on (Walk Free Foundation, 2018) & (Nellemann, C, INTERPOL Environmental Crime Programme, 2012)

IMAGE REFERENCES (CONT.)

CHAPTER 3


Figure CH3-02. Land uses and occupation in Brazil. Adapted from Embrapa. (n.d.). Sintese - Portal Embrapa. Portal Embrapa. Retrieved 5 March 2022, from https://www.embrapa.br/car/sintese

Figure CH3-04. Government duty. Source: Produced by author.

Figure CH3-05. Trees Growing Money. Source: Produced by author.

Figure CH3-06. Forced Labour Characteristics. Source: Produced by author.

Figure CH3-07. National Efforts. Source: Produced by author.

Figure CH3-08. International Efforts.

Source: Produced by author

Figure CH3-09. Emmanuel Macron, President of France Twitter Post. Aug 22, 2019. Source: #ActForTheAmazon.


CHAPTER 4

Figure CH4-01. Building with Timber Mind Map. (Source: Claudia Larsen 2022)

Figure CH4-02. Why are we building with timber? (Source: Claudia Larsen 2022)

Figure CH4-03. Timber Marketing: Is it about the Planet? (Source: Claudia Larsen 2022)

CHAPTER 5

Figure CH5-01. Manifesto. (Source: Claudia Larsen 2022)

Figure CH5-02. Where do we stand? (Source: Claudia Larsen 2022)

Figure CH5-03. Timber Marketing: Is it about the Planet? (Source: Claudia Larsen 2022)

DISCUSSION

Figure DC-01. Discussion. (Source: Claudia Larsen 2022)
## APPENDIX A - USEFUL TOOLS

<table>
<thead>
<tr>
<th>Organization</th>
<th>Tool</th>
<th>Link</th>
</tr>
</thead>
</table>
| ACAMS        | Modern Slavery Certification | https://www.acams.org/en/membership/acams-membership-for-individuals/
| Alliance 8.7 | Global Partnership committed to achieving Target 8.7 of the 2030 Sustainable Development Goals. | https://www.alliance87.org/action-groups/supply-chains/|
| Forest Legality Initiative | Provides tools and resources to improve transparency and accountability in forest-related supply chains, and informs policy and purchasing decisions through data and analysis | https://forestlegality.org/|
| FRDM         | Website - supply chain transparency | https://www.frdm.co/|
| Freedom Collaborative | Anti-trafficking platform | https://freedomcollaborative.org/|
| Global Fund to End Modern Slavery | Website | https://www.gfems.org/|
| Global Initiative | Against Transnational Organized Crime | https://globalinitiative.net/|
| Global Witness | Challenging abuses of power to protect human rights and secure the future of our planet | https://www.globalwitness.org/en/|
| Grace Farms Foundation | Design for Freedom Toolkit | https://www.designforfreedom.org/home/design-for-freedom-toolkit/|
| ILAB         | Comply Chains | https://www.dol.gov/ilab/complychain/|
| Know the Chain | A resource for companies and investors to address forced labour in global supply chains. | https://knowthechain.org/|
| Made in a free world | Website | https://madeinafreeworld.org/|
| MapBiomas Brasil | Collaborative network formed by NGOs, universities, and technology start-ups | https://mapbiomas.org/en/project|
| Rights Lab - University of Nottingham | Slavery-Free Cities Index | https://www.nottingham.ac.uk/research/beacons-of-excellence/rights-lab/index.aspx|
| Slavery footprint | How many slaves work for you? | https://slaveryfootprint.org/|
| SmartLab Brasil | Observatory for the Eradication of Slave Labour and Trafficking in Persons | https://smartlabbr.org/trabalhofeciente|
| Surveillance to identify illegal practices | An online platform that provides data and tools for monitoring forests | https://www.globalforestwatch.org/|
| UN Global Compact | Collaboration and Innovation Platform | https://www.unglobalcompact.org/|
| Verité       | Provides the knowledge and tools to eliminate the most serious labour and human rights abuses in global supply chains. | https://www.verite.org/about/|