11° WORLD BAMBOO CONGRESS
Xalapa, Veracruz, México
August 14 to 18, 2018

WORLD BAMBOO

World Bamboo Ambassadors

AMBASSADOR STORY
15th August 2018

Bamboo, beyond the hype.

"A call for action"

Hector F. Archila

Amphibia BASE's CEO & Visiting Research Fellow @ UoBath

UNIVERSITY OF BATH

amphibia

amphibia

Bio-based Advanced Structural Engineering

What is AMPHIBIA?

amphibia

Technology-based British company working on **Disruptive Manufacturing Technologies** & **Building Systems** for the mainstream use of **Bamboo** in **Construction**.

Helping suppliers and manufacturers innovate and create value with bamboo...

Untapped resource

31.5 million ha
Worldwide
Global Wood Scarcity by 2030 [1]

Environmental credentials

★★★★★

15x CO_2 Steel & 6x CO_2 Oak

Cement = 1ton CO_2 /ton
Global Wood Scarcity by 2030 [1]

US $ 36bn

US $64 million (USA)
US $159 (EU)

Growing demand

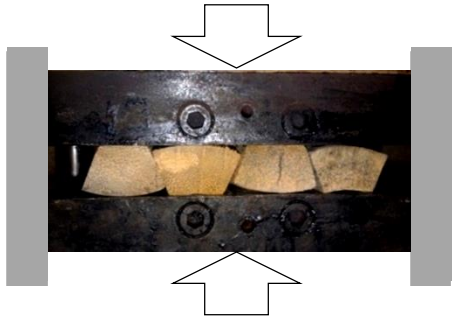
WPC & NFC = 206k ton & 92k ton (EU)

Emerging economies

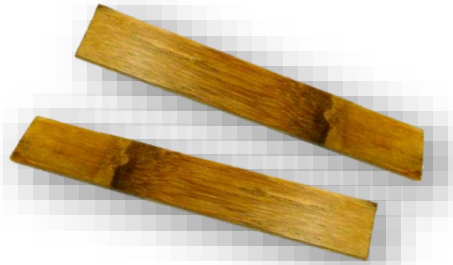
Scalable model

Social end Economic development
Preferential Tariffs (Import / Export)

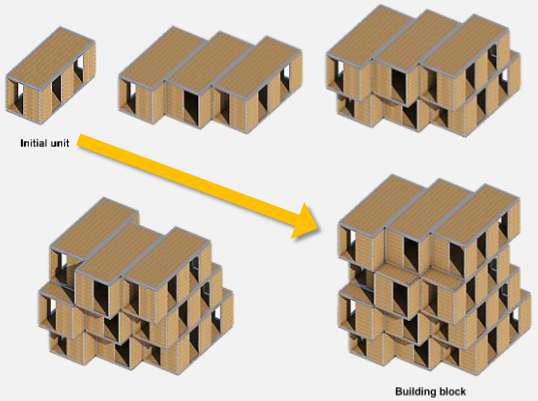
[1] Source 2011, Jonsson et al., Swedish-forest-sector-outlook



Densified Bamboo Planks



Engineered bamboo products



Prefabricated systems

Lightweight systems

Bamboo

Advanced Manufacturing Technologies

High Value Added bamboo products & Building systems

- ✓ **2x** stronger
- ✓ **50%** less waste & glue
- ✓ **Faster** @ source
- ✓ **5x** less transport

- ✓ **Carbon negative**
- ✓ **No chemicals**
- ✓ **Structural**

The TECHNOLOGY bit

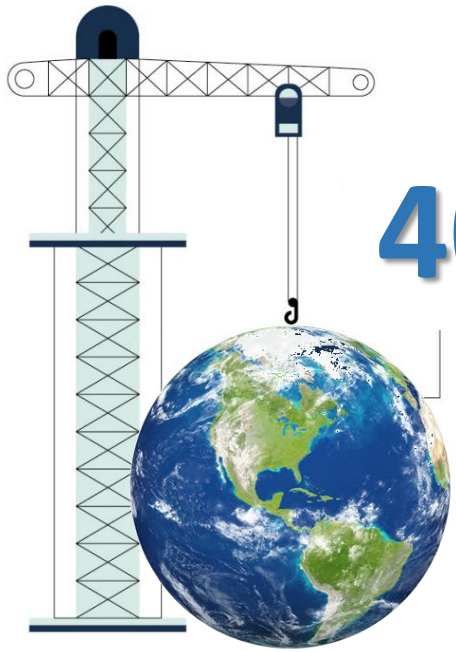
CONSTRUCTION Industry

★★★★★

£ ★★★★★

★★★

★★★



The built environment sector consumes **up to 40% of the world's energy and emits up to 30% of global greenhouse emissions.**
Source: UNEP SBCI

World's

40 % energy

30 % GHG

The IMPACT

✓ Lightweight

✓ Structural

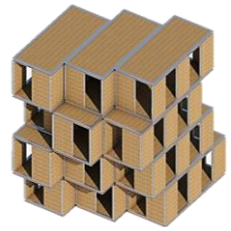
✓ Carbon negative

amphibia

Advanced Manufacturing Technologies

Bamboo Value Chain

Feasible Products & Systems



Suppliers | **Manufacturers** | **End customers**

Prove the Technology + **Cost** + **Product Demonstrations**

Lab to field

Technology trials & Product development

Value + Revenue

Social & Economic development

PLAN of ACTION

Challenges

CALL for ACTION


gettyimages
David Bathgate

- ✓ Protection by design
- ✓ High added value

DESIGN & QUALITY

Poor man's timber

Design for the poor = Poor design = Low added value

Concept model of flood resistant Blooming bamboo home by H&P architects
Source: Design-boom

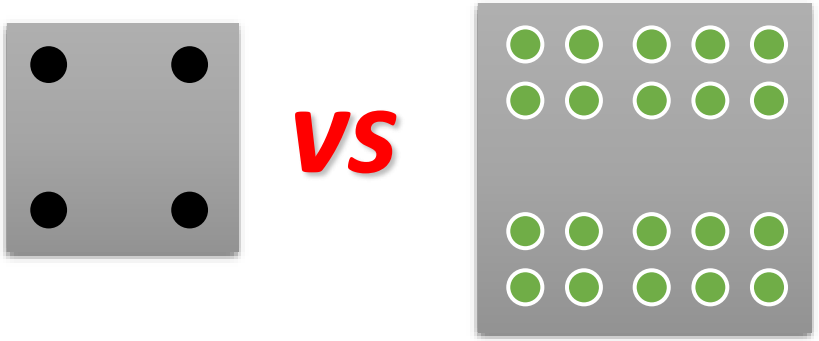
Casas elevadas de caña de Guadua by INBAR. Source: La revista

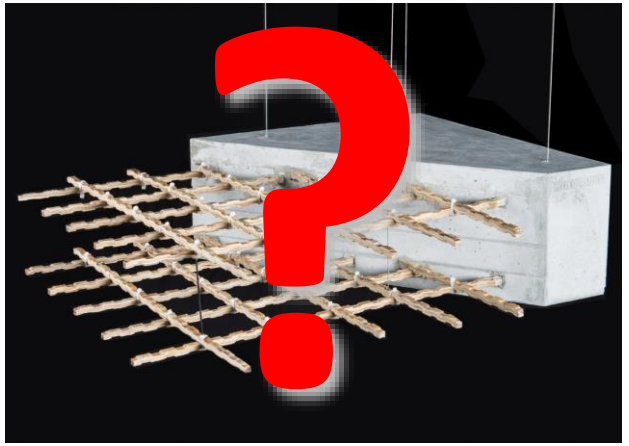
HIGH Added VALUE

Not a steel replacement in reinforced concrete…!

- ✓ *It swells, crashes, and either requires more material and transformation (bamboo composite).*

https://theconstructor.org/structural-engg/bamboo-reinforced-concrete-mix-design-construction/15054/





https://www.dezeen.com/2015/11/04/bamboo-fibre-stronger-than-steel-dirk-hebel-world-architecture-festival-2015/

Appropriate USE

Bamboo reinforced concrete is an ill-considered concept …!

- ✓ *It is NOT: cheaper, safer, more durable, nor more sustainable than steel reinforced concrete.*

Materials and Structures (2018) 51:102
https://doi.org/10.1617/s11527-018-1228-6

CrossMark

ORIGINAL ARTICLE

Bamboo reinforced concrete: a critical review

Hector Archila · Sebastian Kaminski · David Trujillo · Edwin Zea Escamilla · Kent A. Harries

https://link.springer.com/content/pdf/10.1617%2Fs11527-018-1228-6.pdf

Appropriate USE

Bamboo products as ‘de-facto’ sustainable

✓ *Engineered bamboo vs other materials*

Rayon made from bamboo vs. Bamboo fibres

Flaws on the manufacturing process, that converts bamboo fibres into a synthetic fabric (rayon) and involves toxic chemicals and harmful by-products.

TEXTILES VERTRAUEN Geprüft auf Schadstoffe nach Oeko-Tex® Standard 100 A07-0198 Hohenstein

TEXTILES VERTRAUEN Umweltfreundlicher Betrieb nach Oeko-Tex® Standard 1000 OTS 072754 Centrocot

TEXTILES VERTRAUEN 100 plus Schadstoffgeprüfte Textilien nach Öko-Tex Standard 100 + Öko-Tex Standard 1000 Prüf-Nr. 000000 TESTEX Zürich

GLOBAL ORGANIC TEXTILE STANDARD

FSC ©

for life

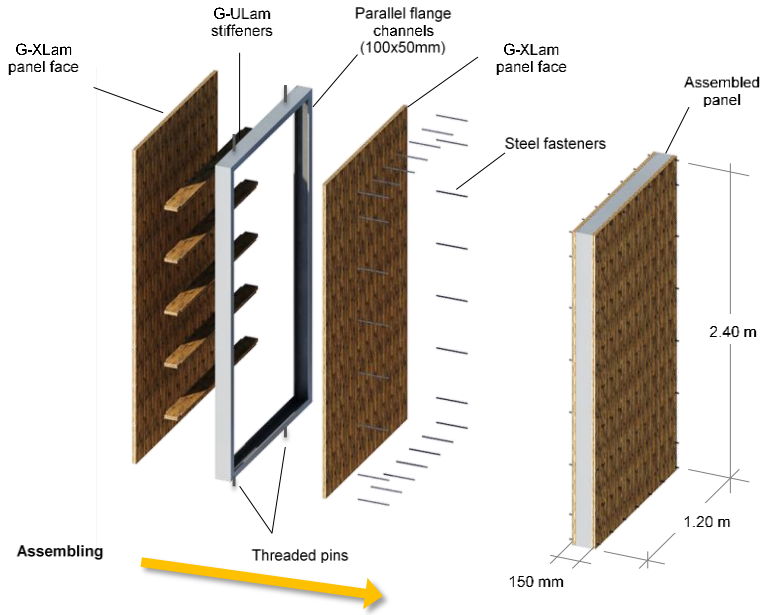
fair for life

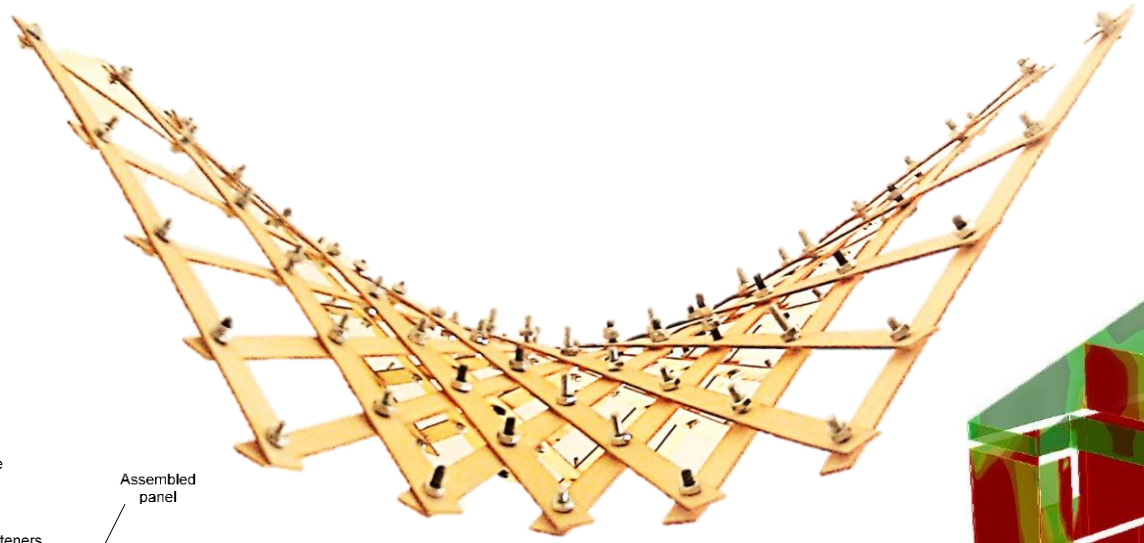
www.appliedsafety.net.au/productimages/NB7023L.jpg

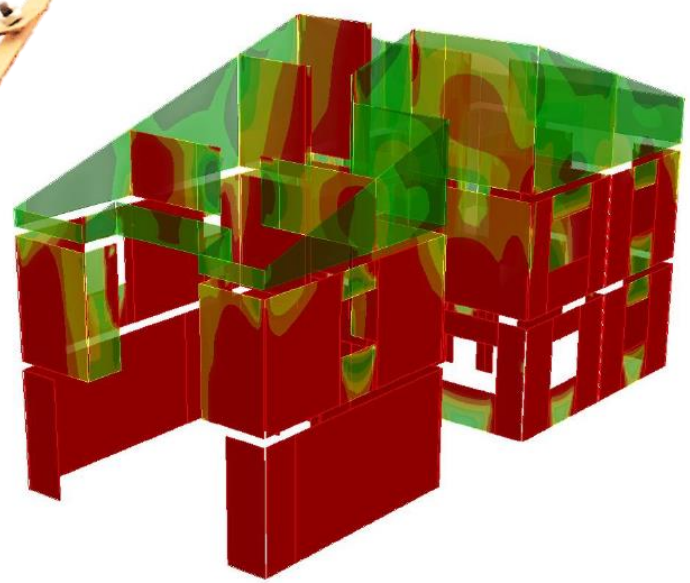
TELL the TRUTH

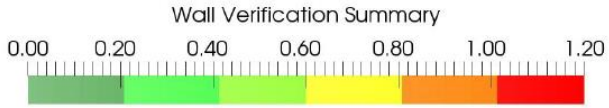
Hybrid materials & systems

Product design + Manufacturing + Feasibility (Tech + Commercial)



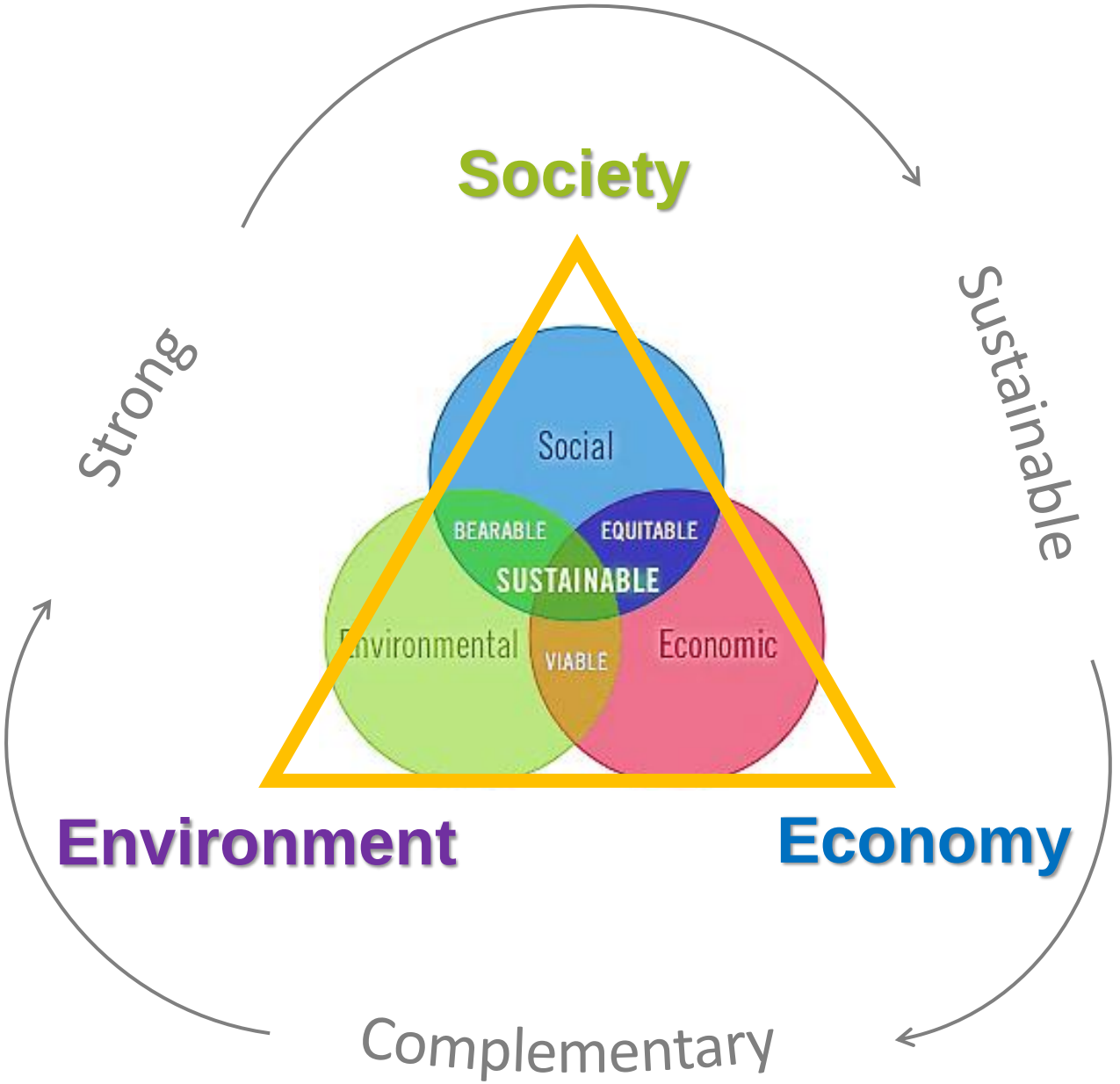






Images by Hector Archila @amphibia_group

R&D + innovation



17 UN Global objectives

End of poverty, inequality and climate change by 2030

WBCMEXICO

BALANCE

Gracias - Thanks !

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