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Commodities at a glance: bamboo

By

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The views expressed are those of the author and do not necessarily reflect the views of UNCTAD.

Commodities at a glance: Bamboo

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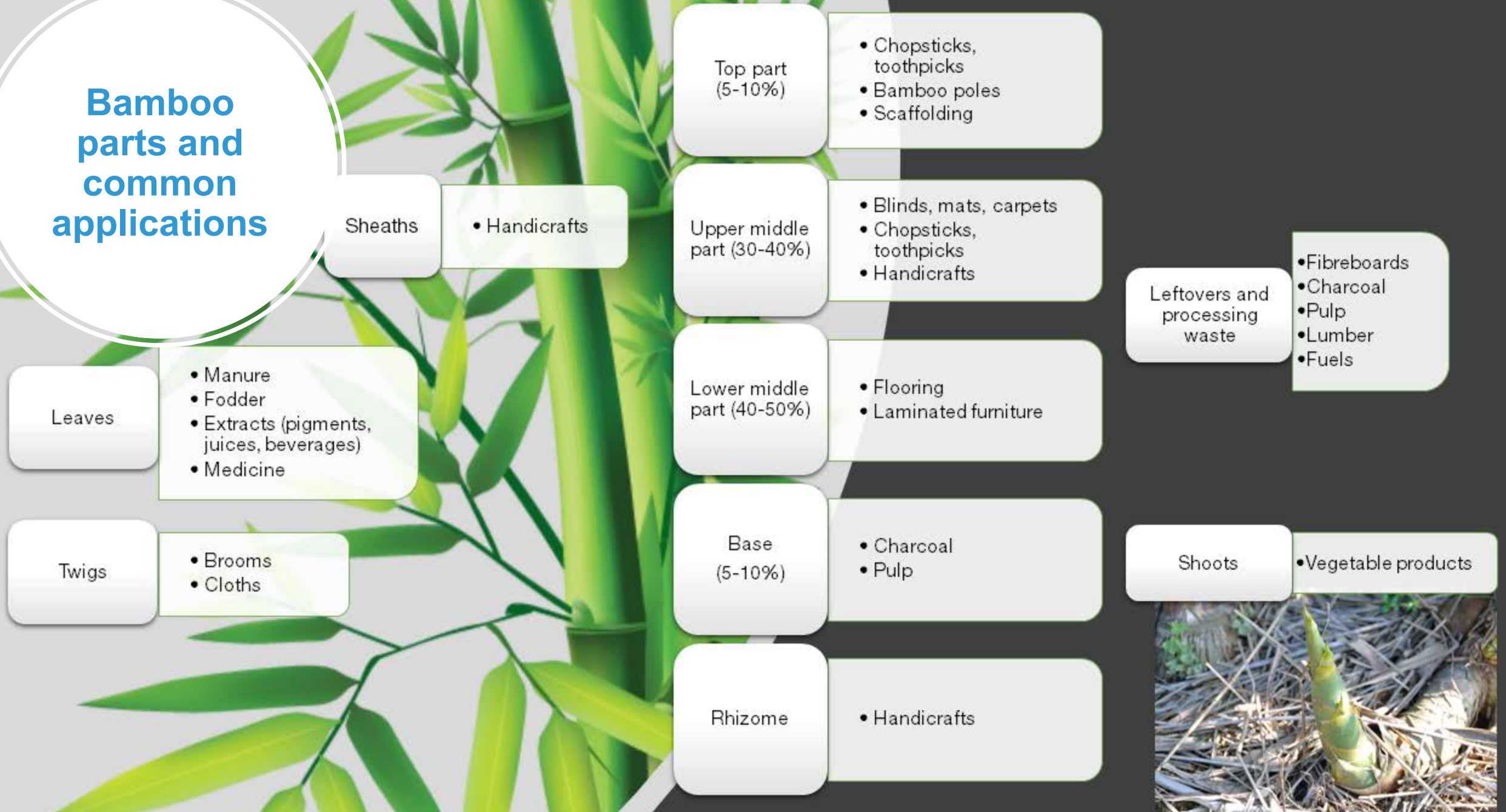
Outline

- Why the report?
- Common uses of bamboo
- Properties – mechanical and physical
- Opportunities and Challenges
- Potential benefits of developing bamboo sector
- International trade
- Conclusion

Why this report?

- Growing global interest in sustainable and renewable resources.
- Increasing global demand for sustainable products.
- To provide information on bamboo properties that could influence its selection as a building material.
- To contribute to understanding environmental and socio economic impacts of bamboo.
- Highlight opportunities for bamboo resource owners.

Bamboo parts and common applications



Source: Adapted from Zhaohua and Wei (2018)

Mechanical and physical properties

	Tension	Compression	Shear	Flexure	Fire resistance	Shrinkage
Bamboo	Good	Good	Low	Good	Average	High
Engineered Bamboo	Good	Good	Average	Good	Average	Low
Timber	Average	Good	Average	Good	Average	High
Plain concrete	Weak	Good	Weak	Weak	Good	Low
Reinforced concrete	Good	Good	Average	Good	Good	Low
Mild steel	Good	Good	Good	Good	Good	n.a

Opportunities in construction

- High tensile strength per unit weight – allows for large spans in construction.
- Carries more bending forces than timber and plain concrete – varied structural applications.
- Higher comp. strength than some species of timber and mixtures of concrete – substitute to heavy building materials without compromising strength; useful in scaffolding.
- Less dense than timber, steel, and concrete – good for building lightweight structures.
- Higher stiffness than most soft/hardwood timber – deforms less easily under working loads.
- Increased stiffness when transformed into engineered bamboo; less inherent variability than the natural material – promotes versatile use in construction; hardness and stiffness make it suitable for flooring, paneling, and decking.

Opportunities in construction



Source: Adobe

Other opportunities



Source: Adobe

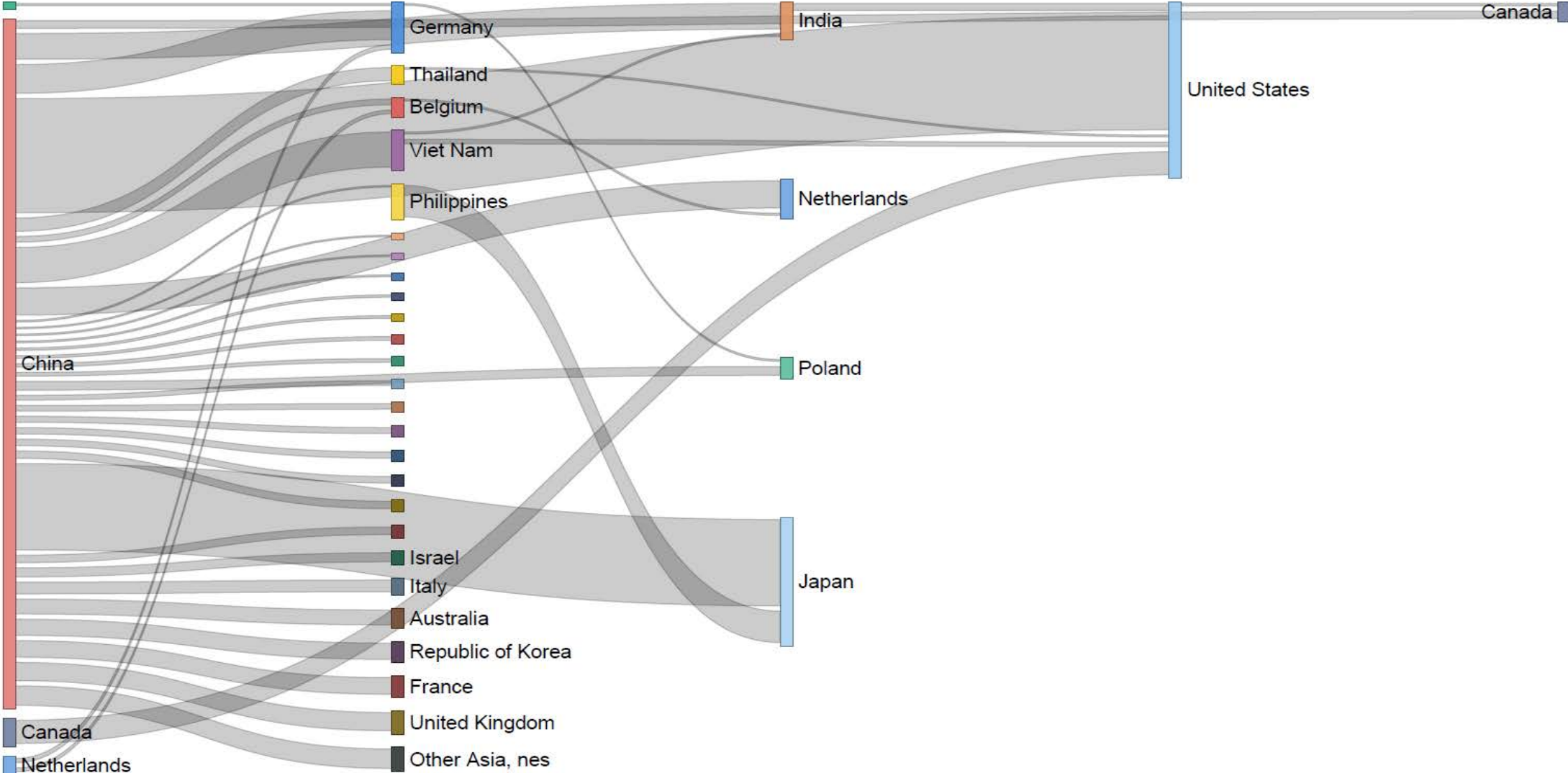
Challenges

- Bamboo loses strength rapidly when exposed to prolonged heat.
- Rich organic nutrient in raw bamboo creates good environment for breeding insects and fungal infection, often leading to infestation and degradation of bamboo.
- High amount of nutrients located in the inner circle of the raw bamboo makes protection and treatment of raw bamboo much more difficult than treatment of timber.
- Most chemical preservatives used to protect bamboo against biological attacks and degradation are toxic.
- Low shear strength makes culms split easily at joints.
- Variation of moisture content may lead to changes of physical state of bamboo.

Potential benefits of developing bamboo sector

- Job creation – planting, harvesting, processing and in value addition industries.
- Maximizing utilization rates of the plant can contribute to increasing producers' income.
- Boost to export income.
- Environmental benefits – rapid growing bamboo forests helps to quickly replenish deforested areas.
- Bamboo forests are good reservoirs of carbon sequestration.
- Bamboo forests protects plant and animal biodiversity.

International trade



Conclusion

- Rising demand for alternatives to costly wood and growing scarcity presents an opportunity to boost production of bamboo.
- Research needed on identifying suitable bamboo species for manufacturing competitive value-added products.
- Encouraging quality investment and partnerships in the bamboo sector could contribute to transfer of knowledge and technology, and enhancement of skills.
- Developing codes of practice to provide practical guidance on use of bamboo is crucial in promoting use of bamboo in complex structural applications.
- Including bamboo in national housing policies and regulations could contribute to meeting Target 11.1 of UN SDG Goal 11 (Ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums by 2030).

Thank you!

