

# Coconut husk based building & packaging materials

Binderless board production technology

Ir. E.R.P. Keijsers

Agrotechnological Research Institute (ATO bv, the Netherlands)

Philippine Coconut Authority (PCA, Philippines)

Fibre Industry Development Agency (FIDA, Philippines)

Subsidised by CFC, Supervised by FAO

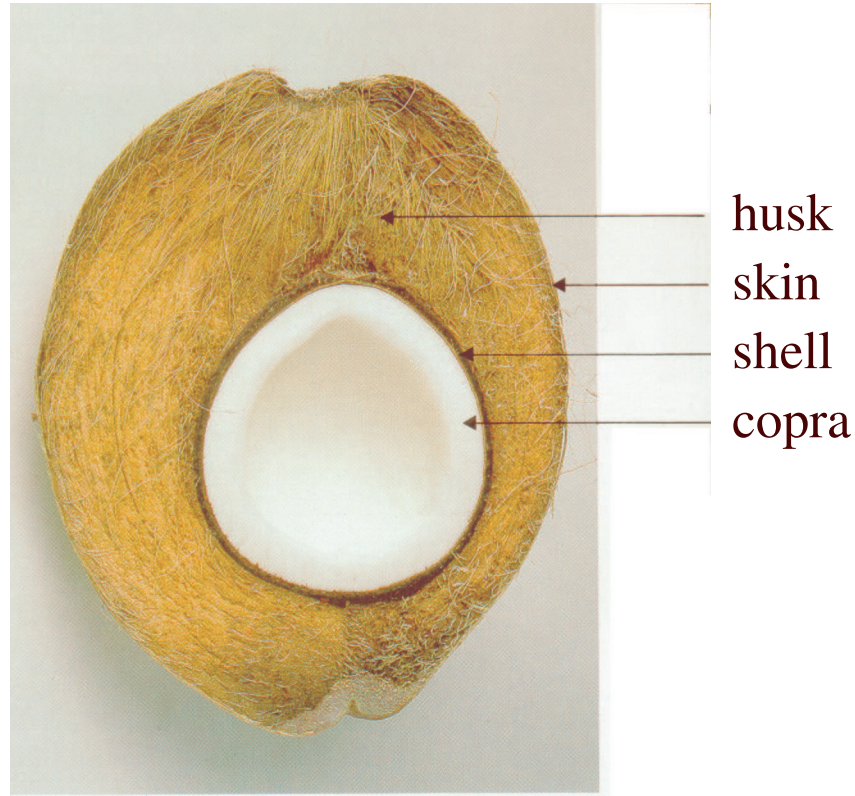
## Aim of research project

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- Development of a process for the manufacturing of building and packaging materials based on coconut husk without the addition of a chemical binder to be implemented in tropical countries.

# The coconut

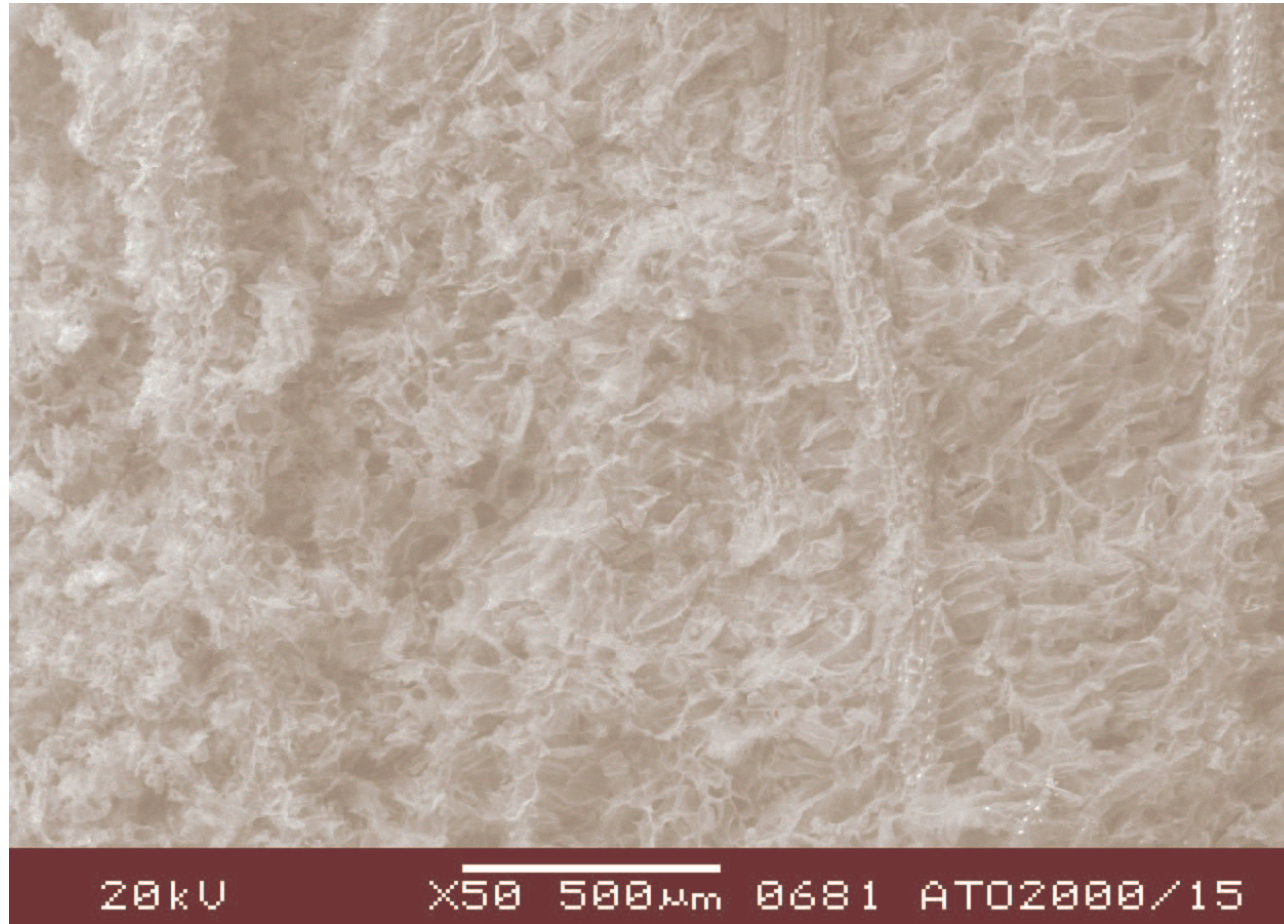
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Cross section of coconut

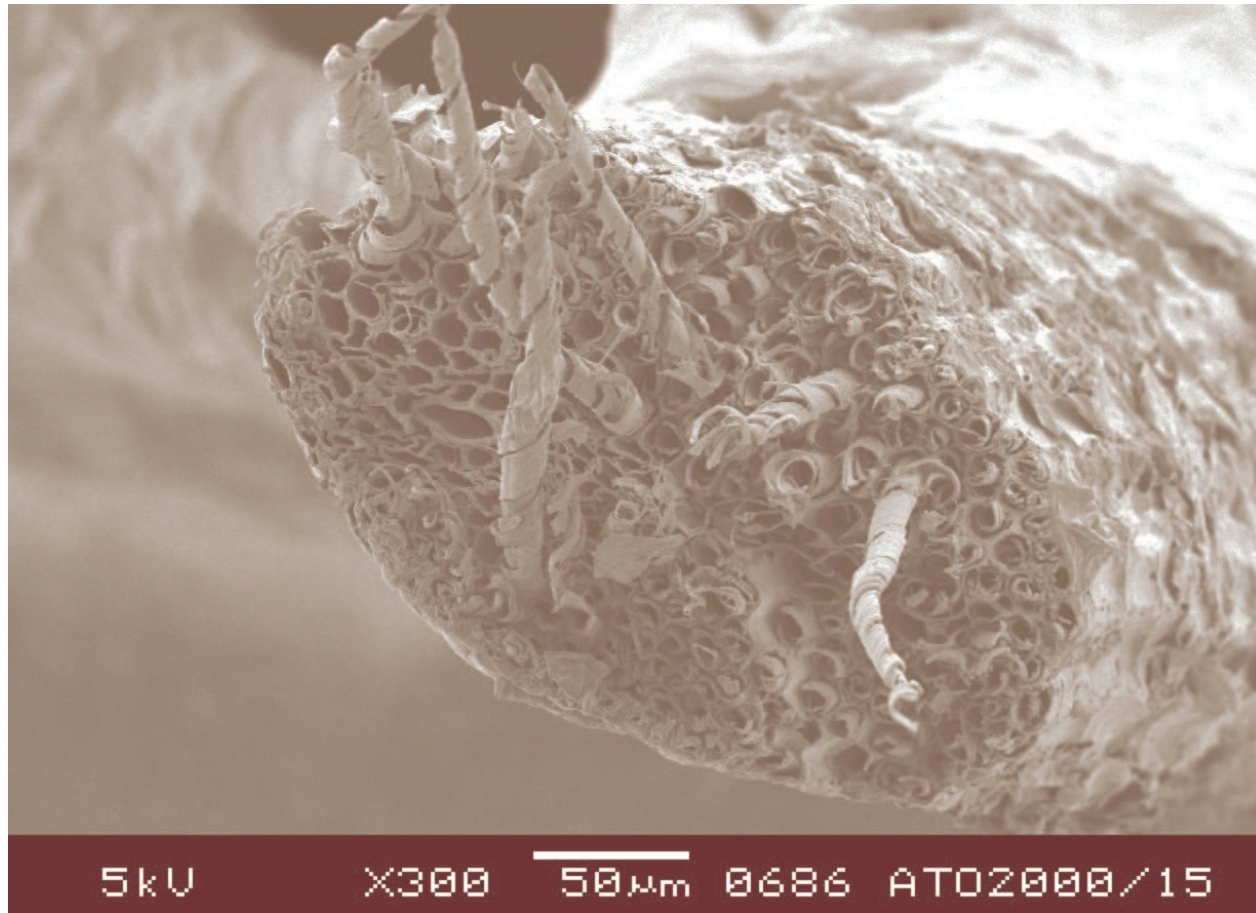
# Coconut Husk

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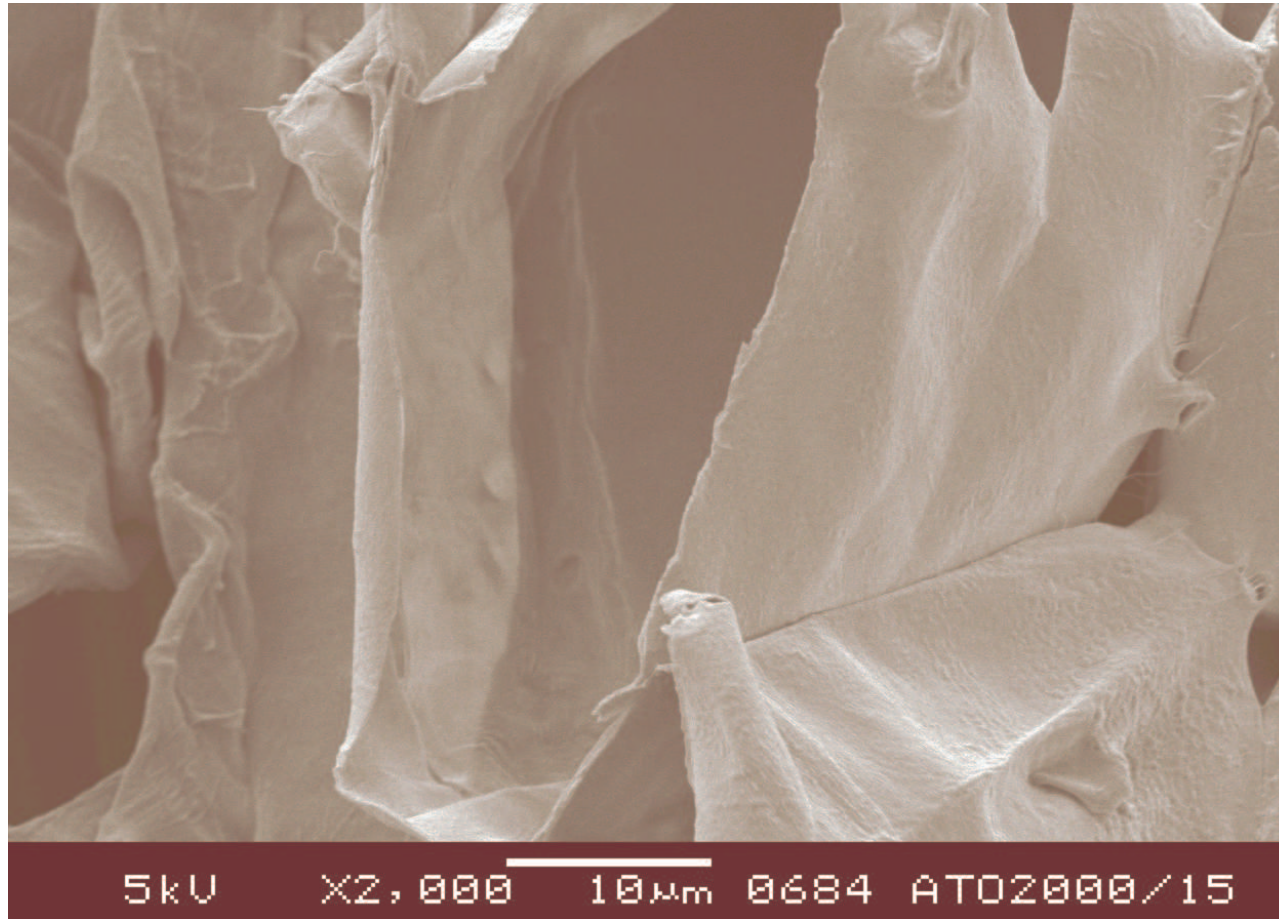
# Coir

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# Coconut Pith

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# Coconut husk availability of raw material

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World wide abundant availability in wet tropical areas

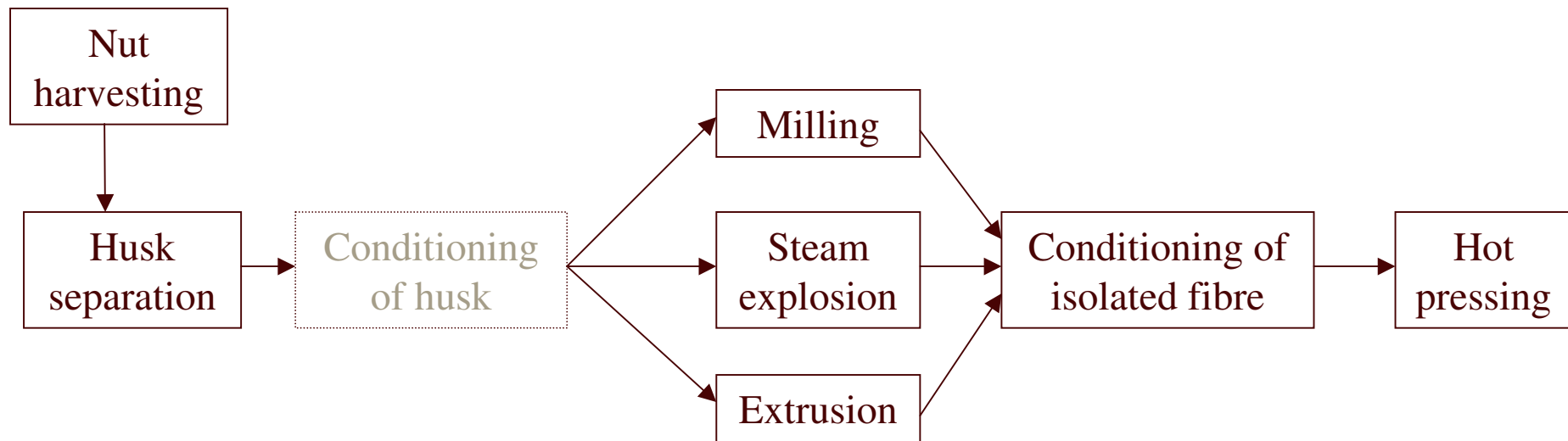
- by product from coconut production
- under utilised renewable resource
- piling up residues from fibre extraction

# Process overview

Husk harvesting

Fibre isolation method

Board manufacturing

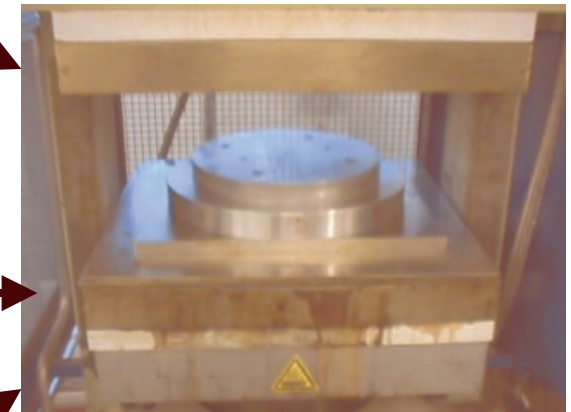
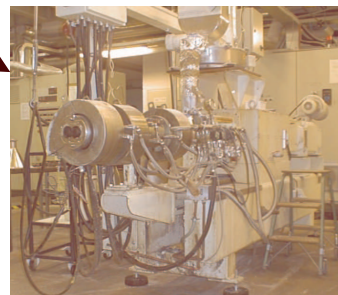
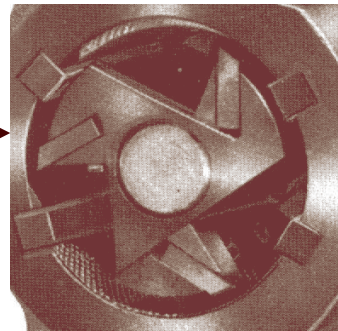


# Process overview: lab scale equipment

Husk harvesting

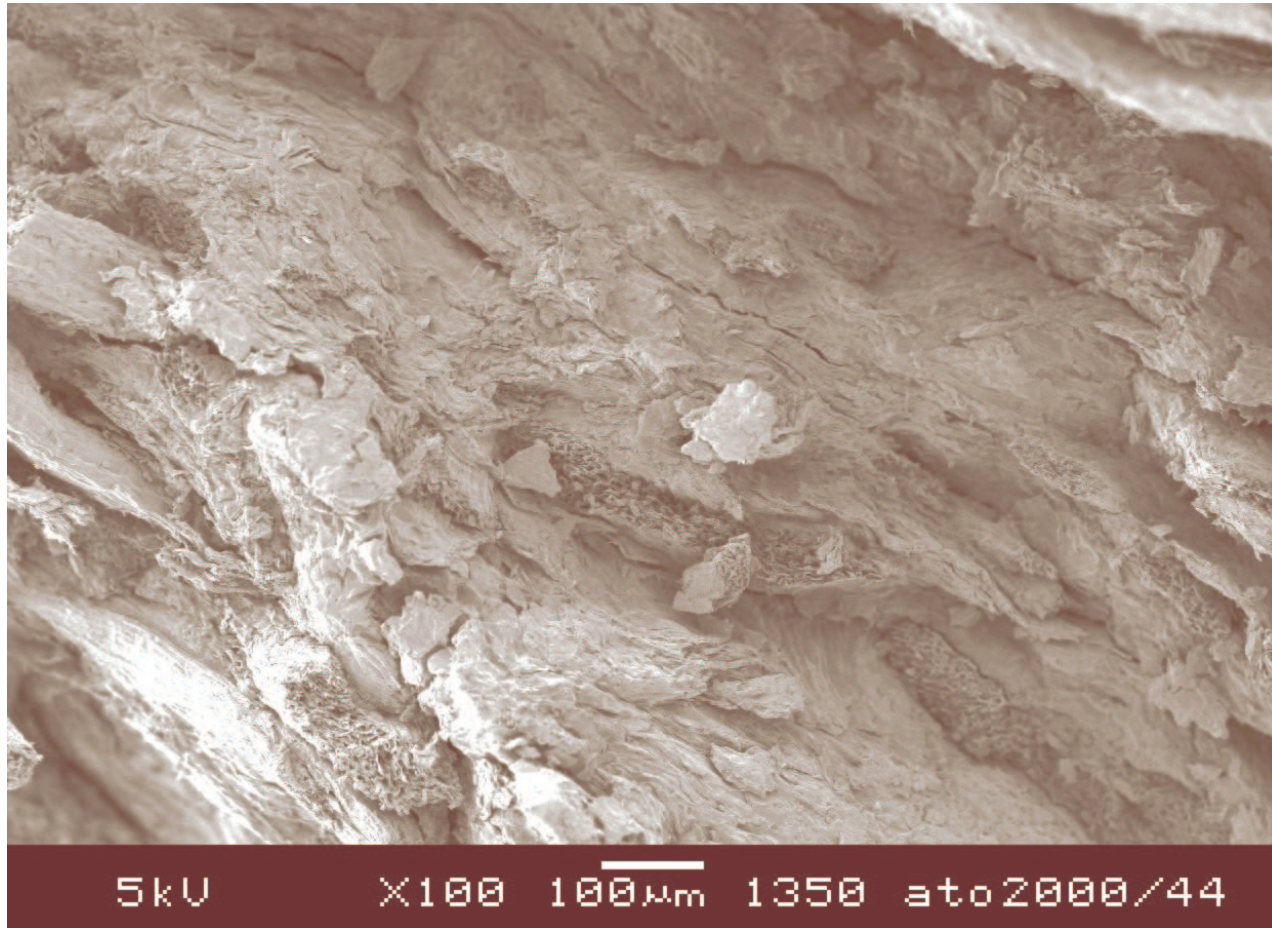
Fibre isolation method

Board manufacturing

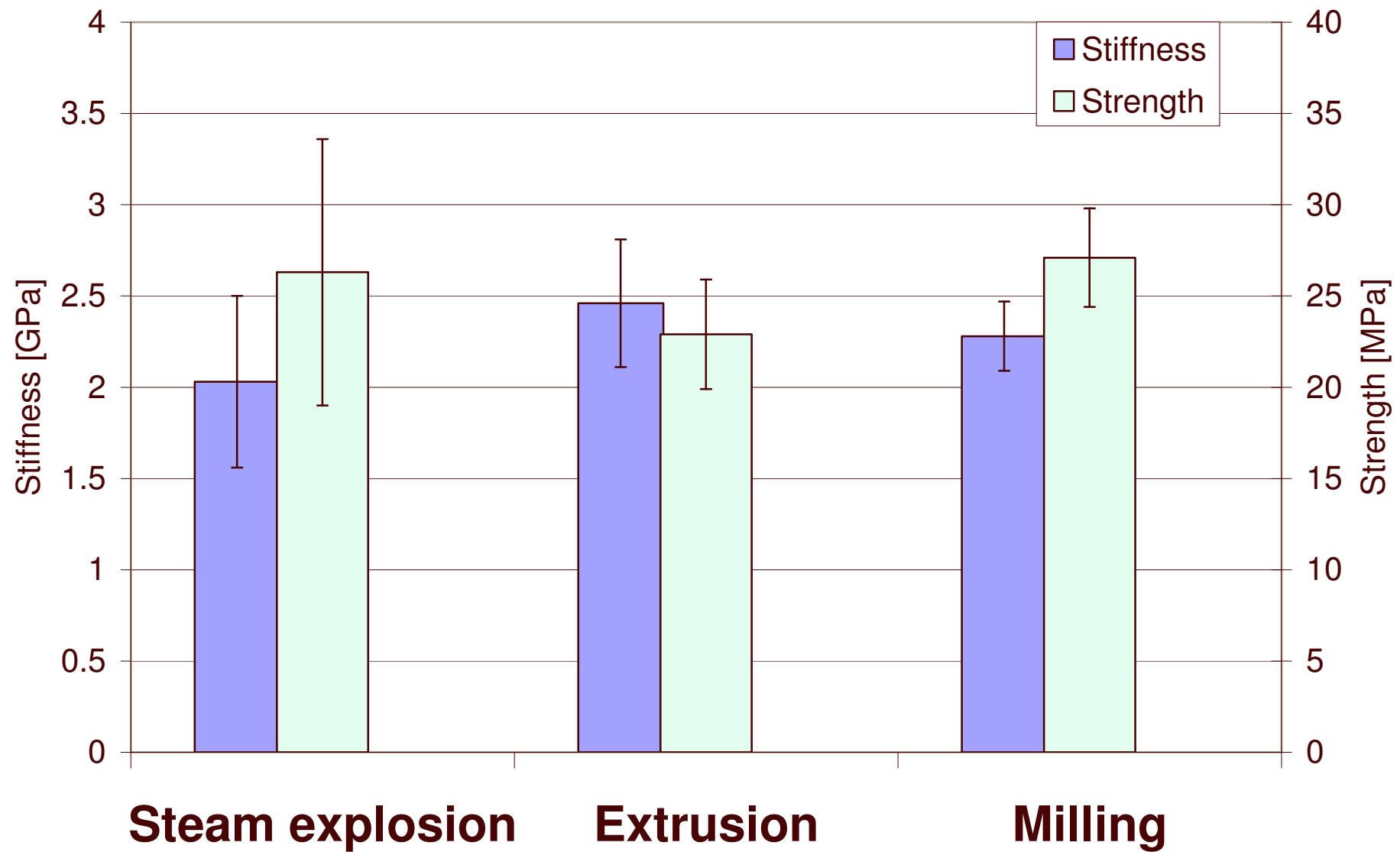


# Coconut husk board

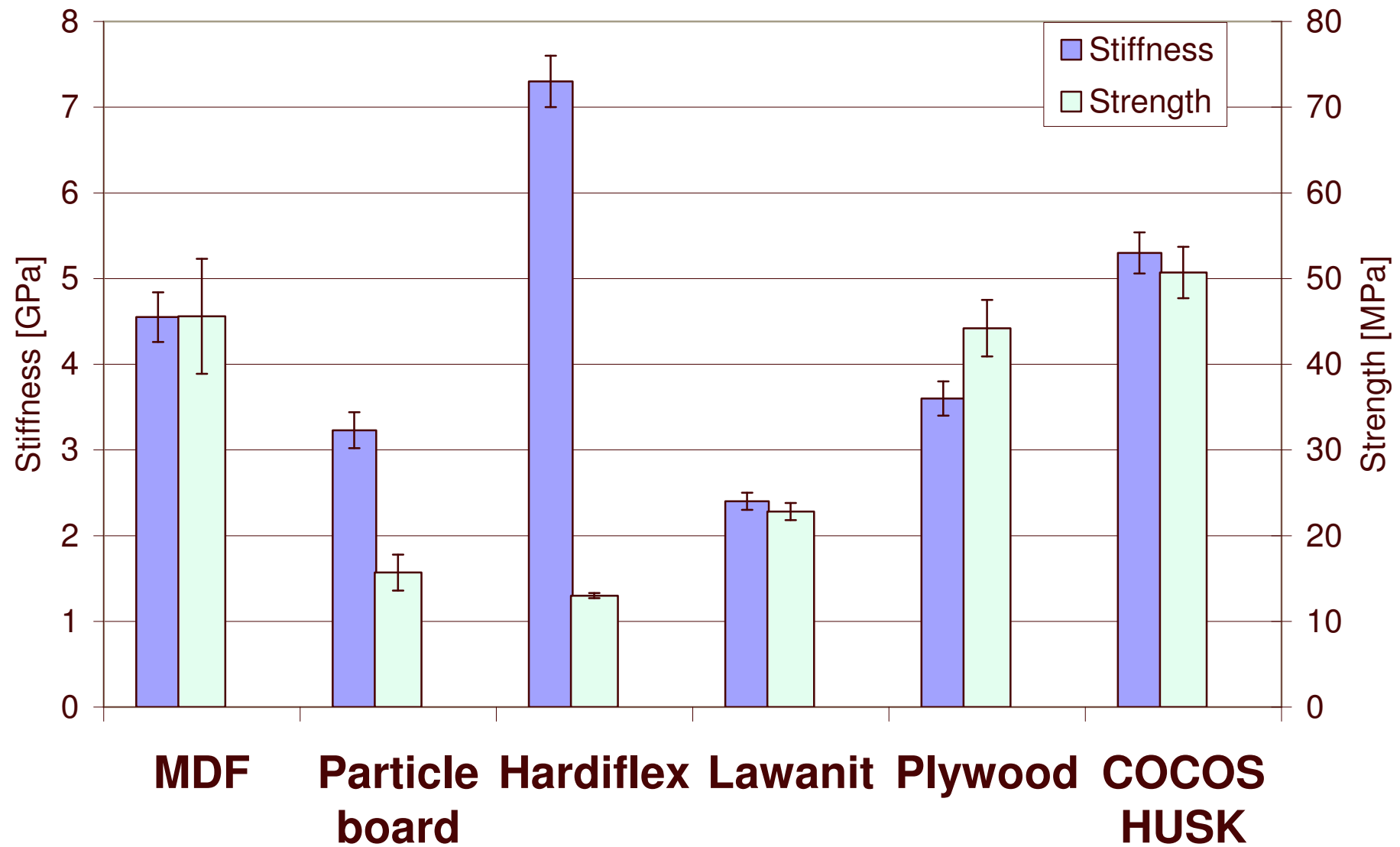
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# Flexural Performance



# Coconut Husk Board compared to Commercial Boards



# Coconut Husk Board compared to Commercial Boards

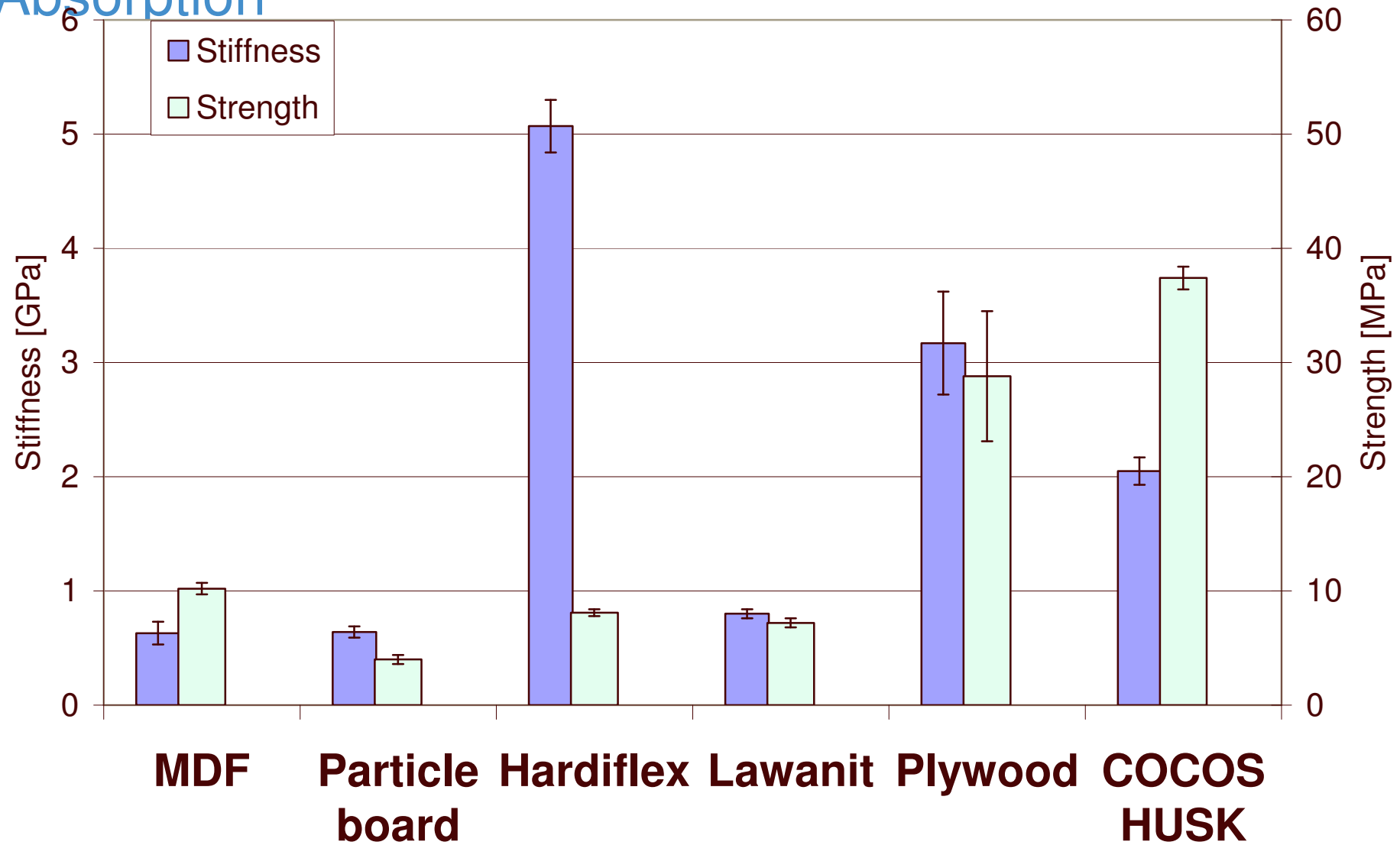
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## Density, Water Absorption & Thickness Swelling

	$\rho$ [g/cm <sup>3</sup> ]	WA [%]	TS [%]
Plywood	0.4	40	4
Particle Board	0.7	67	21
MDF	0.8	24	17
Lawanit	0.9	58	24
Hardiflex	1.4	25	0
<b>COCOS HUSK</b>	<b>1.4</b>	<b>8</b>	<b>8</b>

# Husk Board vs. Commercial Boards after Water

## Absorption



## Handling properties of coconut husk boards

- Easy handling using conventional sawing, drilling, finishing and sanding equipment.
- Fasteners applicable after pre drilling.
- Screw withdrawal value 3100 N, requirement (ANSI) for high density board is 1555 N.
- Density ca. 1300 kg/m<sup>3</sup>.

# Conclusion

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- Promising development of new building and packaging materials for production and use in tropical areas
  - robust processing technology
  - abundantly available cheap raw material
  - good to excellent mechanical performance
  - sustainable production without the addition of chemical binders
  - possibilities for 3D compression moulding

# Project status

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- Board production technology proven on lab-scale
- Scaling up in Philippines during next 1.5 years