

Production of Fuel Briquettes from Bamboo and Agricultural Residue as an Alternative to Charcoal

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1. Motivation

- ❖ 95% of all Ugandan households rely on charcoal, wood, or other forms of biomass for their household cooking needs [1]
- ❖ Fuel prices especially in urban centers continue to rise as firewood becomes increasingly unavailable.
- ❖ The land area covered by forests is estimated to decrease from 15% to 26% of Uganda's land area [2]



Fig1: A) fetching fire wood B) Three stone cooking stove
(sceincephoto.com) (energypedia.infor)

2. The Aim

- ❖ Bamboo plant is now famous for being one of the top solutions to quick economic growth and mitigation of climate change [2]
- ❖ Bamboo plants are the fastest growing plant species on Earth and are widely spread in tropical and subtropical climate regions [3]
- ❖ The aim of this study was to evaluate the potential of bamboo and agricultural residues for briquette fuel production. i.e. MC-Maize Char, BC-Bamboo char, CD-Charcoal Dust.

3. How did we do it?

Carbonization of Bamboo poles & maize cobs was done using a fixed kiln purely made of masonry material.

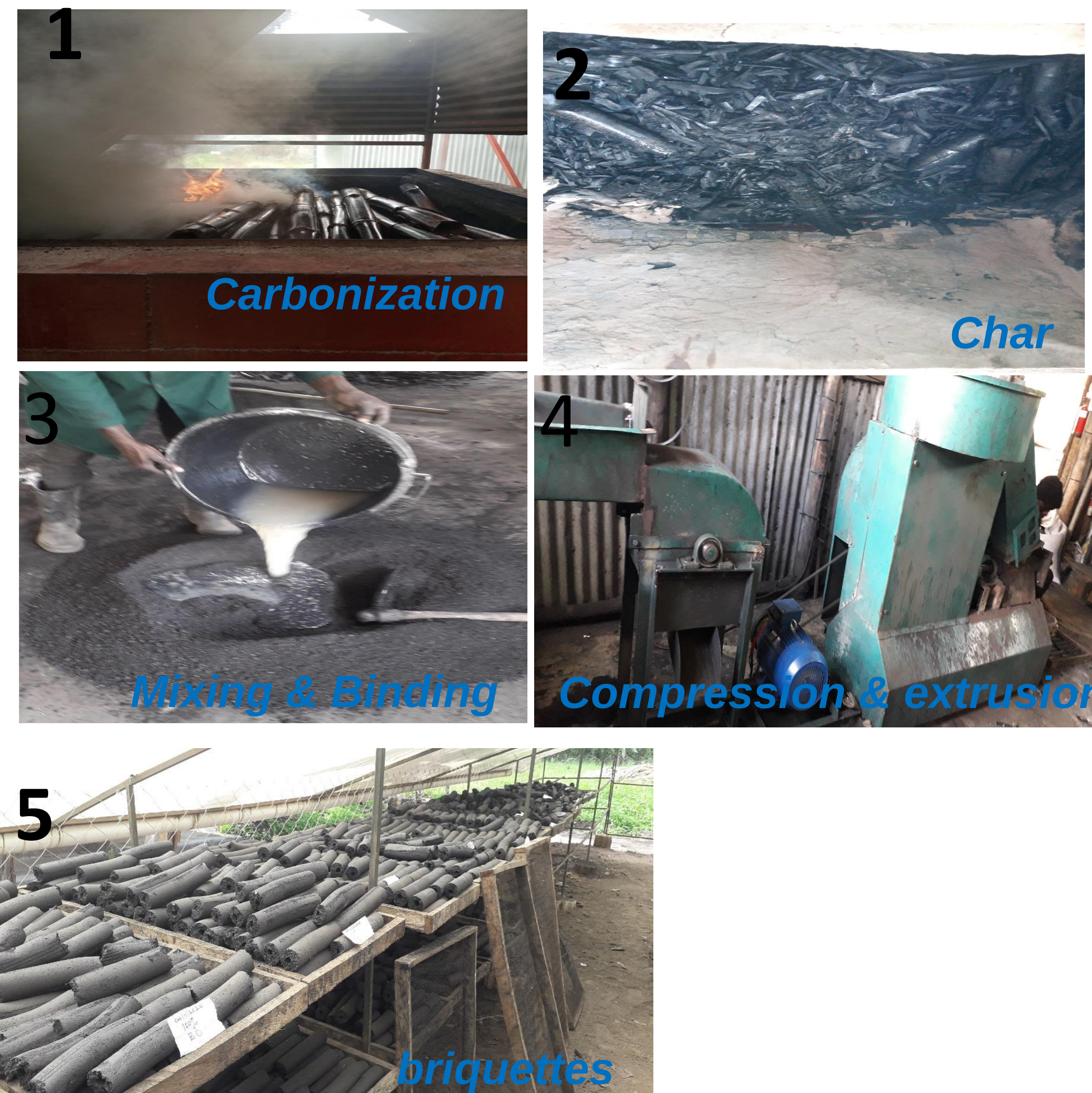


Fig 2: shows the production process steps in order of 1-5

6. References

1. Uganda Bureau of Statistics (UBOS) (2018) Uganda National Household Survey 2016/17. UBOS, Kampala
2. Mulindwa, P., Egesa, D., Osinde, A. and Nyanzi, E. (2021) Production of Fuel Briquettes from Bamboo and Agricultural Residue as an Alternative to Charcoal. Journal of Sustainable Bioenergy Systems, 11, 105-117
3. Brunerová, A., Roubík, H. and Brožek, M. (2018) Bamboo Fiber and Sugarcane Skin as a Bio-Briquette Fuel. Energies, 11, 2186. <https://doi.org/10.3390/en11092186>

7. Acknowledgment: Funded by Divine Bamboo Group

4. The outcomes

4.1 Heating Value (SDG 7 & 13)

(16.027 MJ.kg⁻¹ to 21.26 MJ.kg⁻¹)

Heating value Vs Feedstock Material

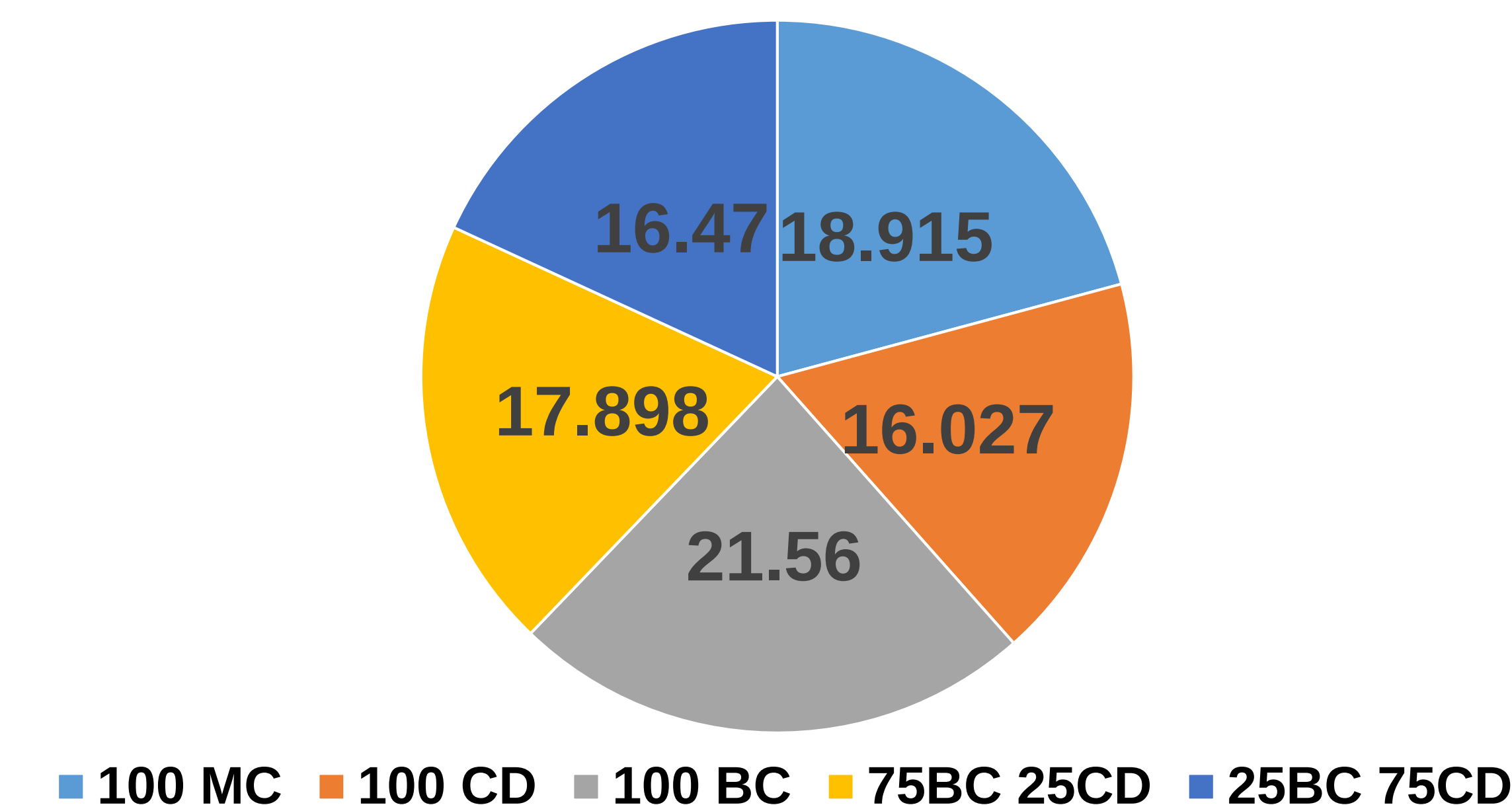


Fig 3: Effect of feedstock material on heating value.

4.2. Volatile matter (SDG 3)

(11.97% to 23.2%)

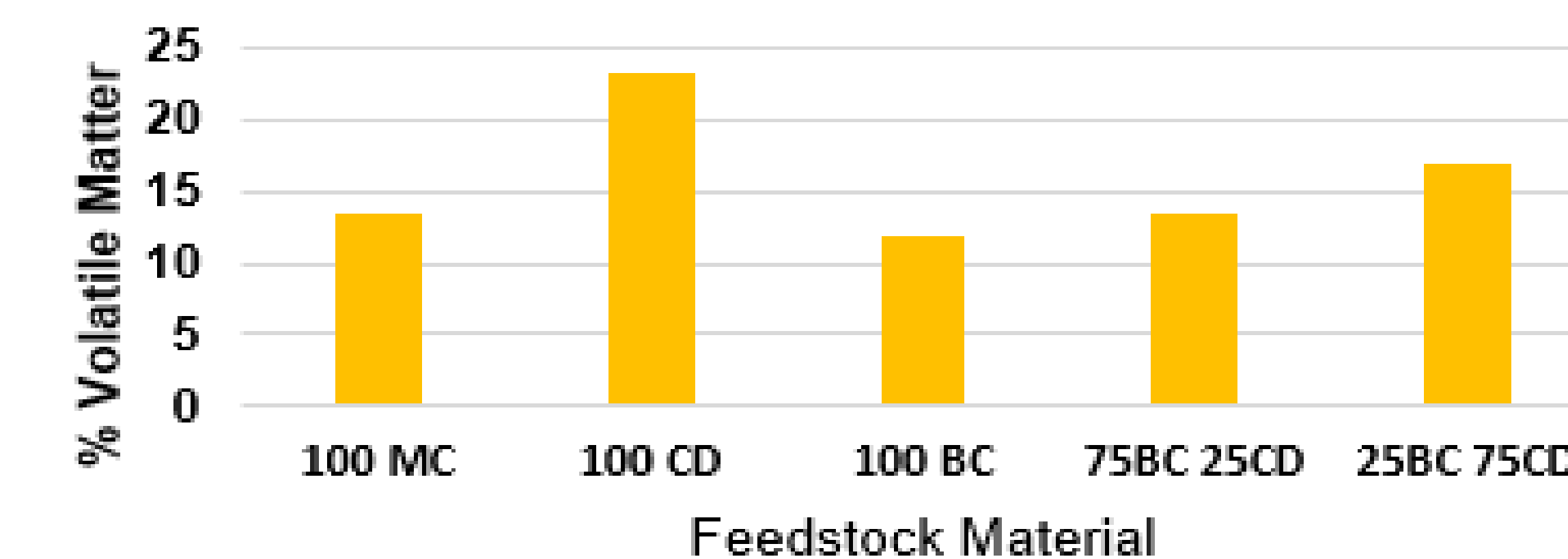


Fig 4: Volatile matter Vs Feedstock Material

5. Conclusion

- ❖ Wood wastes from Bamboo are suitable for briquette production.
- ❖ Utilization of bamboo plant will provide alternative biomass feedstock sources for energy