QUALITY ASSESSMENT OF NON-CARBONIZED BANANA PEDUNCLE BRIQUETTES AS AFFECTED BY STARCH-BASED BINDERS FROM DIFFERENT BANANA WASTES

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ABSTRACT

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The study was conducted to assess the quality of non-carbonized briquettes from banana peduncle with starch-based binders from different banana wastes. The study was conducted using a Complete Randomized Design, with four treatments and three replications. The primary raw material utilized for the production of non-carbonized biomass briquettes was the banana peduncle with banana pseudo-stem starch, and banana peel starch as binder in different proportion and cassava starch as controlled variable. The treatment (T) was 100% cassava starch (T1), 100% banana pseudo-stem starch (T2), 50% banana pseudo-stem starch and 50% banana peel starch (T3), and 100% banana peel starch (T4). The density, volatile matter, durability, ash content, carbon content, calorific or heating value, and burning rate, as well as the cost per unit produce of the

briquettes, were measured and evaluated using One-Way Analysis of Variance at significance levels of 1% and 5%.

Significant differences were noted in the average durability, ash content, fixed carbon content, calorific or heating value, and burning rate across the different treatments. There were no significant differences in the average density and volatile matter between the different treatments. Results revealed that the density of the briquettes from Treatment 1 to 4 met the recommended value. In T2, the briquette observed was high in density, durability, ash content, calorific value, and burning rate but low in fixed carbon content. However, in T4, it was observed that it has a high volatile matter but low in terms of durability. Cost analysis indicated that the cost per kilogram of the briquettes produced from all treatments was cheaper in comparison to the commercially available briquettes.

Keywords: Non-carbonized briquette, banana waste, banana peduncle, banana pseudo-stem starch, and banana peel starch.