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Profitability Analysis and Characterisation of Non-Carbonized Baobab Fruit Shell Briquettes in Malawi

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Abstract

Baobab (*Adansonia digitata* L.) tree has multi-purpose uses and different parts of the tree are reported to be useful. However, baobab fruit shells are regarded as wastes which have no economic value and as such they are wantonly discarded around factory and harvesting sites in Malawi. Briquette production is sought to be an ideal venture to add economic value to the shells.

This study investigates profitability and characterisation of non-carbonized briquettes from baobab fruit shells and mixture with other biomass materials in Malawi. The study is mixed methods and conducted in three major cities and two other districts. Nine types of briquettes, comprising varying ratios of baobab fruit shells, rice husks, groundnut shells and dried tree leaves were produced. Total production cost was found to be MK4, 568,124.8 per tonne, with fixed and variable cost amounting to MK4, 426,000.40 and MK142, 124.40 per tonne respectively. The various briquette types were characterised in terms of calorific value, shatter index, ash content, density and moisture content. For example, briquettes from baobab fruit shells only had calorific value of 18.753 KJ/Kg and moisture content of 5.5 %. The energy value of 18.753 KJ/Kg refers to the fact that baobab fruit shell briquettes are competitive to firewood and fossil fuels by their calorific value. A market survey which involved 246 individuals was carried out to investigate market potential of briquettes. Random and convenience sampling techniques were used in selecting individuals. Gross margin and break-even point analysis were performed to estimate profitability. SPSS was employed to analyse briquette demand. Pearson Correlation and Chi-square statistical tools were used to establish the relationships and associations respectively regarding briquette usage. The 5 point-likert scale was used to assess respondents' attitudes and perceptions on briquettes. One-way ANOVA was used to determine significant differences between types of briquettes.

Keywords: Baobab, biomass, briquette, characterisation, fixed cost, variable cost