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**LIFE CYCLE ASSESSMENT (LCA) FROM GATE-TO-GATE: IMPACT OF PALM OIL MILL WASTE INCORPORATION INTO FIRED CLAY BRICK**

Start Date :

**01/07/2022**

End Date :

**30/06/2024**

Duration :

**2 years 0 months 0 days**

Type of Grant :

**Professional Development Research University**

Grant Category :

**Internal Grant**

RMK :

**12**

## **EXECUTIVE SUMMARY**

Malaysia is experiencing rapid growth in the agricultural sector, especially the oil palm industry, which has resulted in the generation of large amounts of palm oil mill waste (POMW) during oil palm processing. The problem arises when these wastes are not managed properly. The government has allocated additional hectares of land to accommodate waste, but this option has resulted in financial losses over time due to increased transportation and maintenance costs. In addition, open dumping for POMW is not recommended since it periodically contaminates the soil around the dumping site with grease and oil residue. Most importantly, waste additives are most likely to improve brick properties. When high temperature is applied during firing process, it allows the volatilization of dangerous components, changes the chemical characteristics of the materials and incorporates potentially toxic components through fixation in the vitreous phase of recycled waste. In spite of the fact that bricks made from waste materials are generally acknowledged to offer environmental benefits, very few studies have been conducted to show the impact of their production on the environment exist. The system boundaries applied in this study are from gate-to-gate analysis of bricks incorporating palm oil mill waste. The addition of POMW as a raw material to make bricks allows a comparative assessment of their effect on the environment performance. Therefore, the objectives of this research are 1) to formulate the optimum ratio for clay soil-palm oil mill waste (POMW) in fired clay brick manufacturing 2) to investigate the physical and mechanical properties and the possible levels of gas emissions from soil-palm oil mill waste (POMW) brick during firing stage 3) to evaluate the environment impact of palm oil mill waste (POMW) incorporation into fired clay brick by conducting life cycle assessment (LCA)