

UNIVERSITI TEKNOLOGI MARA

**A COMPARATIVE RESEARCH
BETWEEN USAGE OF BUFFALO
ASSISTED IN-FIELD COLLECTION
(BAIC) WITH MINI-TRACTOR
GRABBER (MTG) AND THREE-
WHEELER MACHINE AT SELECTED
OIL PALM ESTATE**

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ABSTRACT

Through the past two decades, the number of machines used in oil palm estates has increased since it can overcome the labor shortage, particularly for the harvesting and collecting of fresh fruit bunches (FFBs). However, the cost of the machinery is high, and the sustainability of palm oil has been controversial because the diesel fuel from machinery has increased greenhouse gas emissions (GHG). Thus, the main purpose of this research is to determine whether BAIC (Buffalo Assisted In-Field Collection) is effective in collecting FFBs from estates located in Malaysia. Therefore, specific objectives emerged to explore the advantages of the BAIC before and during the operation, to compare the effectiveness in terms of cost, productivity, and labor reduction of the BAIC with MTG and three-wheeler machines, and to explore the perceptions of the estate's management (manager, assistant manager, and supervisor) regarding the BAIC as an environmentally friendly harvesting machine. This research focuses on interviewing, observation, secondary data analysis, and time and motion study methods. Findings from this research show that the advantages of using BAIC are that it is easy to tame, easy to train, and simple to determine the durability of a buffalo. Moreover, BAIC can save a lot of costs, particularly maintenance and fuel costs, and it is consistent when it comes to use in the estate since it usually does not suffer serious breakage to the point that it cannot be used compared to the MTG and three-wheeler machines. Furthermore, according to the observation, the division of labor (DOL) system for BAIC does not show labor exploitation. Lastly, for environmental conservation, the BAIC promotes a green environment. Therefore, the usage of BAIC should be reintroduced since its level of cost, productivity, and environmental sustainability meet the success factors of BAIC usage.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The harvesting of oil palms occurs when they reach maturity, usually approximately three (3) years after being planted in the field. This process involves cutting the bunches that weigh approximately 25 kilograms (kg) from the tree. The pruning process was also carried out during the cutting of the FFBs to expose the bunch base and make bunches easier to cut by the harvester. The bunch stalks were trimmed by a second worker or carrier after the FFBs were cut, and then they were loaded onto the harvesting machinery. This process is called harvesting or in-field collection.

However, according to the Malaysian Palm Oil Board (MPOB), the biggest problem currently facing the oil palm plantation industry is a labor shortage, particularly for the harvesting and collecting of fresh fruit bunches (FFBs). The oil palm plantation industry is experiencing a shortage of labor, notably for FFB harvesting and collecting, due to the difficulty in hiring both local and foreign workers, particularly those from Indonesia.

To fix labor workforce issues in the past, wheelbarrows was implemented in the mid-1960s, which is the simplest and most practical (Turner & Gillbanks, 2003). The structure of the wheelbarrow is a metal cart with a rubber tire that is inexpensive to purchase. The work is entirely dependent on the labor's efforts since no machines are used. However, the prolonged usage of a manual wheelbarrow is harmful to the labor's health since manual plantation labor must carry out several motions and lift heavy objects every day (Sukadarin et al., 2016). Moreover, it is no longer effective because it is time-consuming and causes people to suffer from work-related musculoskeletal illnesses (Ng et al., 2013).