

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF A PROTOTYPE
EXTENDABLE RAMBUTAN
PLUCKING DEVICE**

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ABSTRACT

Rambutan is a famous fruit in southeast Asia and the trees can grow from 15-24 meters high. Traditional methods of harvesting rambutan fruits from tall trees pose many difficulties including reaching high branches, safety risks associated with heights and fruit damage or loss from dropping. The objective of the project is to design and fabricate a versatile device to pluck rambutan fruit branches from tall trees. The device's key feature is to allow adjustable pole height, risk-free harvesting, provide versatility to prune and collect plucked rambutan fruit to prevent damage and collect them easier. This project introduces a device with container attached to it to collect fruit easier. The project is expected to improve efficiency, safety, and productivity, benefiting farmers, orchard owners, and communities by improving rambutan fruit harvesting, reducing labor, minimizing losses, and maximizing yields.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Rambutan is an edible tropical tree which belongs to the Sapindaceae family. The medium-sized tropical tree of rambutan is native to Southeast Asia and it is closely related to other various tropical fruits such as lychee, longan, pulasan and guinep [1]. The tree size can grow from 15 to 24 meters high [2]. The harvesting process of rambutan fruits from tall trees has long been a challenge for farmers and orchard owners. For instance, traditional methods often involve the use of ladders or other climbing equipment [3], which can be risky and time-consuming. Another popular method of harvesting fruit from tall trees is laying out tarps on the ground and shaking the tree so that the fruit falls into the tarps [4] [5]. These methods not only increase the chances of accidents and injuries but also limit the efficiency and productivity of the harvesting process [6]. Additionally, the act of manually plucking fruits and dropping them on the ground can result in fruit damage and loss.

To address these issues, the project has been developed. It recognizes the need to simplify rambutan harvesting from tall trees, reduces risks, minimizes fruit loss, and enhances overall productivity. Previous attempts at addressing this problem have resulted in the development of various tools and equipment, such as extendable pole and fruit pickers. However, these solutions often lack versatility and convenience required for efficient fruit harvesting [7]. There remains a need for a comprehensive tool that combines the ability to reach high branches, cut unwanted branches, and collect fruits without causing damage.

The project takes the advantage of telescopic mechanisms commonly used in extendable pole to provide the required reach for tall trees [8]. Using a branch cutter function, it adds an extra dimension of versatility to the device, allowing for simultaneous pruning and fruit harvesting. Furthermore, the inclusion of an attached container ensures that the harvested fruits are collected safely and remain intact throughout the process. Through this project, the aim is to modernize fruit harvesting mainly on rambutan trees practices, providing farmers and orchard owners with an