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**AGRICULTURAL WASTE
MANAGEMENT (AWM) SYSTEM IN
CAMERON HIGHLANDS,
PAHANG**

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MSc

March 2022

ABSTRACT

The illegal dumping of agricultural waste around Cameron Highlands is becoming a growing concern to environmentalists and government. This is because Cameron Highlands is one of the agricultural hubs for fruits and vegetable cultivation in peninsular Malaysia and is also listed as an eco-tourism site. The problem of agricultural waste management here cannot be solved by mere provision of more waste dumping stations or transportation alone. To address the indiscriminate dumping of agricultural wastes by farmers, there is an urgent need for innovation, to better understand the current and potential role of formal and informal stakeholders, so as to effectively manage the large chunk of agricultural wastes generated daily. Thus, this study examines the processes farmers adopt in management of wastes generated from their farms and the role played by various stakeholders. Through non-probabilistic purposive sampling, 62 farm owners and 13 representatives from various government agencies, service providers and local authority were selected for the interview. The in-depth interview session involved writing down of responses on sheet of paper and audio recording. Qualitative data analysis was applied using NVivo 12 pro software. Text files containing responses from respondents were created and exported into NVivo for further analysis. Findings from the study revealed that waste management processes such as waste separation, waste storage and recycling are not being practised by framers. Only very few (21%), occasionally separate their waste before disposal. In terms of waste transportation, findings showed that the farmers are solely responsible for transporting waste from their farms to waste collection points or dumpsites. Those that have trucks use them, while those that don't have hire one and some others dump their wastes along road paths or nearby water bodies. For the role played by various stakeholders in waste management in the study area, representatives from Ministries of Agriculture and Environment stated that their ministries are not fully involved in decision making on how wastes generated in Cameron Highlands are managed. Similarly, representative from waste collectors said that their services are only limited to residential, commercial and industrial, and that collection of agricultural waste is outside their scope. On the other hand, representatives from local authority and MARDI (Malaysian Agriculture Research and Development Institute) agreed that they are fully involved in decision making regarding waste management in Cameron Highlands. In general, the study found that there is no proper synergy in terms of role of each stakeholder in agriculture waste management in the study area. Some of the constraints to proper management of agricultural waste in the study area identified include: low level of awareness, lack of proper enforcement, many illegal dumping sites, poor knowledge on how to handle and manage wastes generated and no government agency to coordinate how agricultural wastes should be collected from farms. In order to address the challenges highlighted, a framework on agricultural waste management system (AWMS) was developed by the study. This framework takes into account the role of various actors or stakeholders in achieving a sustainable and efficient management of agricultural waste from farms in Malaysia.

ACKNOWLEDGEMENT

Bismillahirrahmanirrahim and Alhamdulillah, first, I wish to thank Allah S.W.T for giving me the good opportunity to embark on my Masters study and to successfully complete this long and challenging journey, which I have undertaken since March 2018.

My gratitude and thanks also go to my supervisor; Gs. Dr Nor Eeda Hj Ali and Co Supervisor; Sr. Dr Alia Abdullah Saleh for their prayer, valuable motivation spirits, advice, guidance, and suggestions.

I give thanks to my families, especially my husband, _____, and my daughter, _____, for their continuous and unfailing love, endless support, and encouragement, patience, and understanding.

I am also grateful to my parents and siblings, especially my mother, _____, and father, _____ and my in-laws especially my late father-in-law, _____ and mother-in-law, _____ who always asked about my graduation day. My thanks also to _____ who were also completing their PhDs and Masters at the time.

I extend special thanks to all AP763 lecturers for their very meaningful help, quality teaching, sharing their in-depth knowledge, and the valuable advice that provided the foundation and guided me on the right path for this study.

My appreciation goes to all the participants involved in the interviews and discussion sessions for their kind assistance in providing information, connections, and valuable feedback, even though they were very busy. Alhamdulillah, we have now become good friends and I hope this relationship will last forever.

Special thanks to my classmates, friends, and colleagues for their helping hands, encouragement, and knowledge sharing. This piece of victory is dedicated to all of you. Alhamdulillah.

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

Inorganic pesticides and fertilisers have greatly contributed to the much-needed development and stability in agricultural production throughout the previous century, as has the effective control of pathogens and pests, as well as the adequate delivery of vital plant nutrients. However, a situation has arisen in which issues such as agricultural waste, human health, and environmental safety, as well as the goal of regulating global food demand, require consideration (Prashar & Shah, 2016). Agricultural wastes include fruits, vegetables, meat, poultry, dairy products, and crops, among other things. The material that can benefit man but has a lower economic worth than the expense of gathering, transporting, and processing it for beneficial use. They might be in the form of liquids, slurries, or solids, and their composition will vary depending on the system and type of agricultural activity (Obi et.al., 2016).

Intensified agriculture pressure from cropping, livestock systems and aquaculture aimed at meeting increasing food demand related to population growth and change in dietary patterns have increased agriculture related wastes. The total number of livestock has more than tripled from 7.3 billion units in 1970 to 24.2 billion units in 2017, while available land for irrigation has more than doubled from 139 million hectares in 1961 to 320 million hectares in 2018 (Food and Agriculture Organization, 2018). The effort towards boosting agricultural practices around the world, has greatly increased agriculture wastes generation including manure, and these have serious implications for the environment and human health. The use of synthetic pesticides, herbicides, fertilizers and other inputs to boost agriculture production have gained prominence over the years. Though these inputs have helped in boosting agricultural produce, they have given rise to environmental threats including pollution of ecosystems and some potential human health challenges.