UNIVERSITI TEKNOLOGI MARA

AUTOMATED MONITORING SYSTEM IN VERTICAL FARMING

MUHAMMAD ALIFF RUZAIL BIN ROZAINAL

MUHAMAD HAZIQ BIN SHAMSUL IZRAN

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ABSTRACT

Pressure on agricultural land from the arising global population is pushing towards necessitating the maximisation of food production per unit area of cultivation. Attention is increasingly turning to the implementation of vertical farming approaches. The vertical farming is an advanced level of agriculture technology that practices growing crops in vertically stacked layers. Tradition farming's arable land requirements are indeed too large and invasive to sustain for future generations to come. With the ever-so-rapid population growth, vertical farming allows for, in some cases, over ten times crop yield per acre in comparison to traditional methods. Vertical farming also allows the production of a larger variety of harvestable crops over the reason of its usage of isolated crop sectors which also allows for multitude of different crops to be grown and harvested simultaneously due to their individual land plots. This project will see the implementation of vertical farming while monitoring several aspects and requirements for the crops planted such as pH level, surrounding temperature, surrounding relative humidity and light intensity to produce the best quality of food as well as conserving the local flora and fauna. Vertical farming is normally done within a huge compound such as building-based vertical farms over at any abandoned buildings and even shipping-container vertical farms which is seemingly popular nowadays. From this project itself, it is believed to prove that vertical farming can be done over in any places especially in households to allow anyone to be able to implement such methods of farming and save the environment at the same time.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1. Introduction

Heading into a future powered artificial intelligence world where technology plays a huge role in succeeding things, modern problems requires modern solutions. As mentioned, Vertical Farming will change traditional farming and will continue to improve the world of modern farming significantly. Vertical farming finds its origin in the desire of farmers to be able to better protect crops against external weather influences. There is a wide range of benefits of vertical farming which can vary from the producers. Newest development shows the integration of small vertical farming systems into supermarkets. Possible benefits from vertical farming are reduction of water demands, healthy food provision, recycling of organic waste and most importantly energy saving. Main parts such as background study, general problems that occur, objectives and also the purview of this project will be covered in this chapter.

1.2. Background study

The understanding of knowledge and skills in making things work in farming or generally known as agriculture is gargantuan. Take science, technology, engineering and put it all together, it can definitely achieve anything that is beyond imagination as for example, controlling the pH level of solutions, surrounding temperature even the