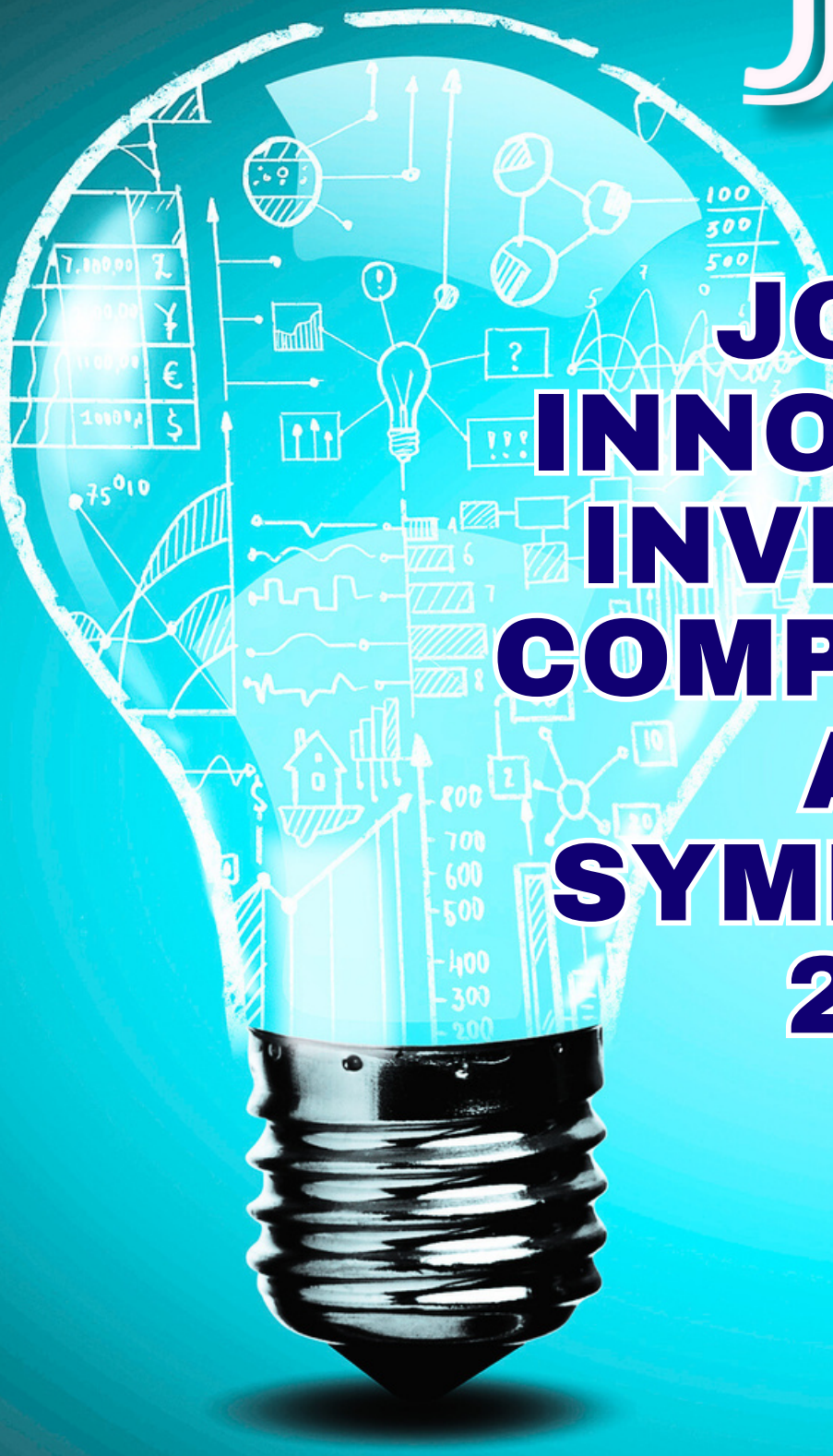
UNIVERSITI TEKNOLOGI MARA

2023

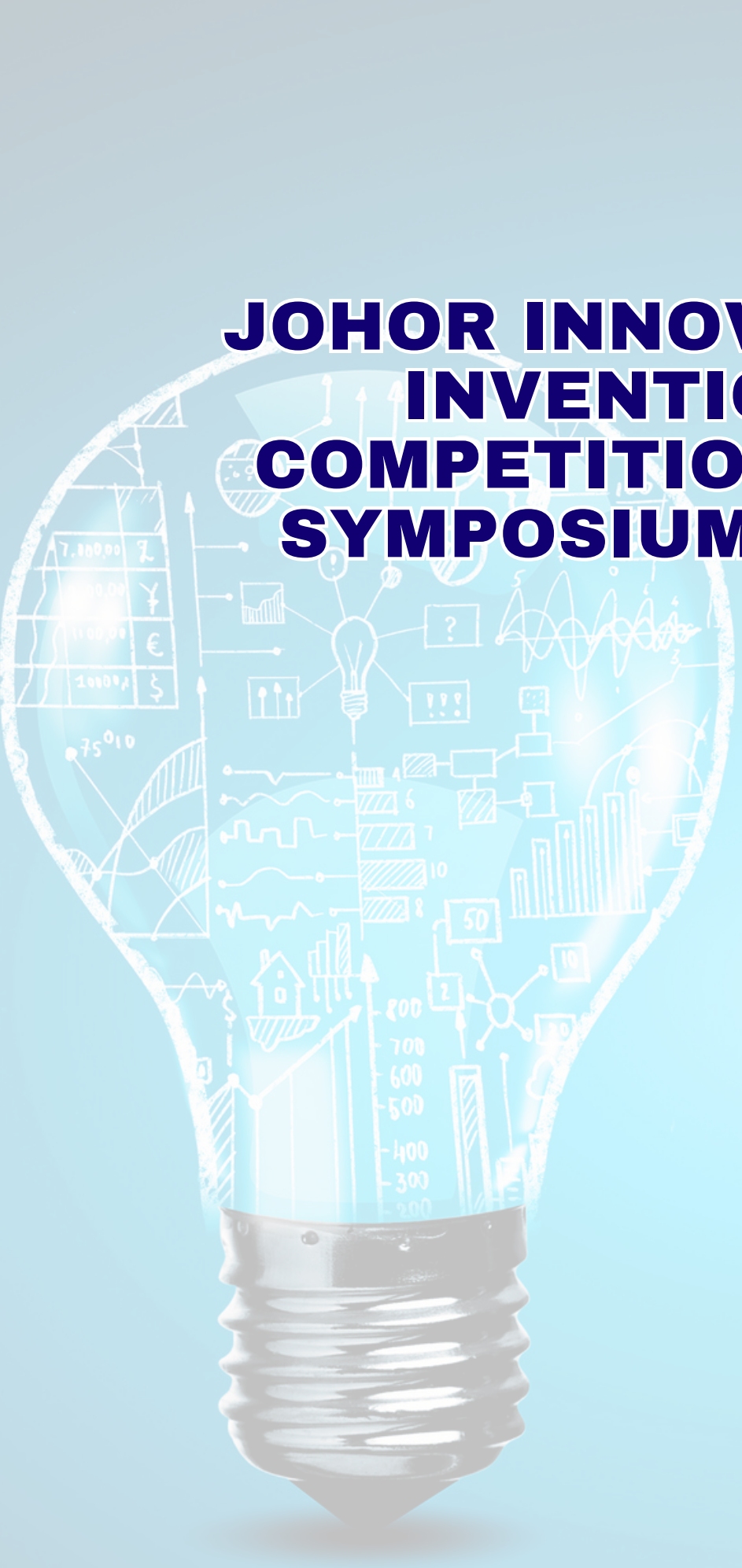
JIICaS



JOHOR INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2023

" Innovation Inspires a Society to be Critical and Creative"

JOHOR INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2023



JOHOR INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2023

" Innovation Inspires a Society to be Critical and Creative"

Editors-in-Chief

AHMAD KHUDZAIRI KHALID

NUR INTAN SYAFINAZ AHMAD

UNIVERSITI TEKNOLOGI MARA

Cawangan Johor

Kampus Pasir Gudang

2023

First Edition 2023

e ISBN: 978-967-0033-17-4

Editors-in-Chief: AHMAD KHUDZAIRI KHALID & NUR INTAN SYAFINAZ AHMAD

Art & Cover Designer: DR. WAN MUNIRAH WAN MOHAMAD & DR. NUR IDAYU ALIMON

Published in Malaysia by
Universiti Teknologi MARA Cawangan Johor
Kampus Pasir Gudang
81750 Masai

Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor Innovation Invention Competition and Symposium 2023 (JIICaS2023), where JIICaS2023 is a virtual platform for all creative minds to share and present their invention and innovation. The extended abstracts are divided into two categories, which are Category A (Higher Educational Student/ Any Recognized Institutional Students in Malaysia) and Category B (Primary/ Secondary School Students / Special Education School Students in Johor). Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students from both categories and get some ideas to develop future innovation products.

A061

3E MINI AQUAPONIC

Muhammad Naqib Afiq Hanuar[1], Ahmad Hakim Khamis[2], Mohamad Syahmeer bin Sha'izan[3], Siti Rafhanah Suwandi[4]

[1,3] Sekolah Kejuruteraan Awam, Kolej Pengajian Kejuruteraan, Universiti Teknologi MARA UiTM Shah Alam, Malaysia
[2] Sekolah Kejuruteraan Mekanikal, Kolej Pengajian Kejuruteraan, Universiti Teknologi MARA UiTM Shah Alam, Malaysia
[4] Sekolah Kejuruteraan Mekanikal, Kolej Pengajian Kejuruteraan, Universiti Teknologi MARA Cawangan Johor Kampus Pasir Gudang, Malaysia

Corresponding author: naqibhanuar20@gmail.com (Muhammad Naqib Afiq Hanuar)

ABSTRACT

3E MINI AQUAPONIC is our project name which we want to introduce The Revolution for Digitalize Agriculture. The concept of this innovation is 3E which is Environmentally, Easy, and Empowering. Aquaponic is an agricultural technology that combines aquaculture which is activities of water animal husbandry with hydroponic activities which is plant cultivation without soil medium but by water medium like kale, spinach, and chili in an integrated system. The important element in aquaponics is fish, plant, and bacteria. All three elements will form a reciprocal cycle of beneficial or mutualistic symbiosis. Our country always faces a main problem which is water pollution which has caused serious problems in our country and harms the sustainability of our water resources. Besides, the other problem is excessive use in agriculture is the main cause of freshwater shortage and can increases pollution. The objective of this innovation is to overcome problems if water pollution occurs to maintain agriculture and irrigation and to introduce an aquaponic system. Besides, giving knowledge of the aquaponic process and its advantages. The advantages of aquaponic for the environment are water and nutrients are recycled in an economical closed-loop manner water, protects our rivers & lakes which is no harmful fertilizers run into the water, and soil conservation which it can grow six times more than traditional agriculture.

Keywords: Environmentally; Agricultural technology; Freshwater shortage; Aquaponic system; Harmful fertilizers

1.0 INTRODUCTION

Aquaponics is an agricultural technology that combines aquaculture with hydroponics activities in an integrated system. The important element in aquaponics is fish, plants, and bacteria will form a reciprocal cycle beneficial or mutualistic symbiosis.

2.0 OBJECTIVE

To overcome problems if water pollution occurs to maintain agriculture and irrigation. Besides, it also want to reduce water use in agriculture through the concept of the water cycle and as a teaching aid.

3.0 DESCRIPTION OF INNOVATION/METHODOLOGY

Water pollution which has caused serious problems in our country and has a negative impact on the sustainability of our water resources. Excessive use in agriculture is the main cause of freshwater shortage and can increase pollution. Requirement by Johor State Government to be implemented at the school level. The concept for this project are combination aquaculture and hydroponic. The material for this project are aquaculture, hydroponic, wasted material.

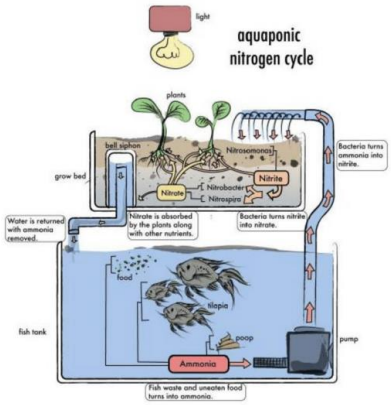


Figure 1: The process involved in Mini Aquaponic.

4.0 ADVANTAGE/IMPACT/RESULTS/NOVELTY

Advantages of aquaponic techniques are the uses of 90% less water than traditional farming, can grow at any time of the year, in any weather even, anywhere on the planet.Besides, Aquaponics recycles water in the system can grow in seasons drought and in areas with little water.

Advantages of aquaponics for the environment are the water and nutrients are recycled in any economical closed-loop manner water. Besides, aquaponics can protects our rivers and lakes which is no harmful fertilizers run into water and the soil conservation which is it can grow six times more from traditional agriculture.

The novelty for this project are integrated vegetables and fish in one period, easy and cheap and agriculture in wherever.

5.0 CONCLUSION

The commercialization for this project are 3M Farmonic Modules and 3E Mini Aquaponic can be commercialized throughout Malaysia online or directly to the target group (community). Besides, by using 4P strategy which are product (3M Farmonic Module, 3E Mini Aquaponic), place (Housing Park, Apartment Community, Village, school, Surau community), price (Cheap) and promotion (Website, Facebook, Instagram, Target Group (Community), Teaching Center).