UNIVERSITI TEKNOLOGI MARA

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PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)

"Flourish and Nurturing Sustainable Innovation for a Prosperous Nation"

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Editorial Board

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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 International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. 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 and get some ideas to develop future innovation products.

Foreword Rector

Assalamualaikum warahmatullahi Wabarakatuh, Salam Sejahtera, Salam Malaysia MADANI and Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most Merciful.

It is a great honor to welcome you to the Johor International Innovation, Invention, Competition, and Symposium 2024 (JIIICaS 2024). This event connects various disciplines, focusing on education and engaging educators, students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and determination to turn those ideas into reality. The remarkable projects showcased today highlight the dedication and spirit of all participants. Initiatives like this not only explore new technologies but also cultivate skills and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor Branch, we are fully committed to fostering a dynamic culture of innovation, promoting the commercialization of new products, and encouraging meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all sponsors, judges, the College of Computing, Informatics and Mathematics, UiTM Pasir Gudang Campus as the event organizer, as well as to the researchers and participants for their hard work in making this event a success. Let us continue striving for innovation and excellence. May the ideas presented today inspire us and lay the groundwork for future achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
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(A-ST061) ECO-GARDEN POT (EGP) A SUSTAINABLE APPROACH TO HOME GARDEN

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ABSTRACT

The reuse and recycling rates for agricultural plastic waste are alarmingly low, with Malaysia recycling only 12% of its 1,070,064 tonnes of plastic waste (WWF-Malaysia, 2020). To address this issue, we developed the Eco-Garden Pot (EGP), a biodegradable plant pot that nurtures plants and reduces waste. Made from natural ingredients like eggshell powder, banana peels, and dried leaves, EGP decomposes into the soil, enriching it with essential nutrients. This innovation supports sustainable gardening, reduces the ecological footprint of agriculture, and promotes the principles of a circular economy. EGP represents a significant advancement in eco-friendly agriculture, fostering a greener planet.

Keyword: Biodegradable plant pot, Sustainable gardening, Circular economy,Agricultural waste reduction

1.0 INTRODUCTION

The rate of reuse and recycling for agricultural plastic waste is currently at an all-time low of less than 10%. Plastic waste accumulates up to 1,070,064 tonnes in Malaysia alone, with only 12% of this plastic being recycled (WWF-Malaysia, 2020). In response to this pressing issue, we have created Eco-Garden Pot (EGP), a biodegradable plant pot designed to revolutionise the way we nurture plants and shape the future of eco-friendly gardening. Made from natural ingredients, these innovative pots decompose seamlessly into the soil, providing essential nutrients to your plants and significantly reducing waste. Whether you're a home gardener or a commercial grower, EGP offers a sustainable alternative to traditional plastic containers, helping you cultivate a greener world one pot at a time.

2.0 OBJECTIVE

1. Environmental Sustainability: Reduce plastic waste and promote eco-friendly gardening practices by using biodegradable materials.

2. Convenience and Efficiency: Simplify the planting process by creating pots that can be planted directly into the soil, saving time and reducing the need for transplanting.

3. Market Adoption: Introduce an innovative product that appeals to both home gardeners and commercial growers, encouraging widespread adoption of sustainable practices.

4. Education and Awareness: Raise awareness about the environmental benefits of biodegradable products and encourage sustainable gardening practices.

3.0 METHODOLOGY

The production process of EGP is very easy and cost effective as materials can be sourced out from local stores with affordable prices and not much energy is required to make them.

Table 1 : Materials for Production of EGP

Material	Description
Cardboard	Cardboard holds and absorbs the nutrients.
Water	Water helps to soften the cardboard and makes it moldable to shape the pots.
Chicken Eggshell powder	Organic pH level controller to help plants grow in acidic soil by neutralising it.
Banana peel	Banana peels naturally contain potassium and phosphorus. Potassium aids in water regulation, enzyme activation, and overall plant vigour. As for phosphorus, it helps plants with photosynthesis.
Completely dried leaves	Dried leaves release nitrogen which is essential for leaf and stem growth.
Starch Glue	Non-toxic glue that binds all the materials together.

Table 2 : Production Process of EGP

Steps	Description
1.	Cut the cardboard into smaller pieces using scissors to increase the rate of absorption of water and nutrients.
2.	Soak the cardboard pieces completely in water.
3.	Grind the eggshells using a mortar and pestle until it achieves a powder state.
4.	Cut the banana peel into smaller sizes that are then mashed up into a paste.
5.	Cut the dried leaves and grind it using the mortar and pestle.
6.	Using the starch glue, bind the dry and wet materials.
7.	Shape the pot into desirable shape and size using a container.
8.	Lastly, leave it to dry in the sun for a few days before use.

4.0 RESULT

EGP offers an innovative solution for eco-friendly gardening, combining environmental sustainability with enhanced plant health. Unlike traditional plastic pots that contribute to landfill waste, EGP decomposes naturally, enriching the soil with organic and nutrient rich ingredients such as eggshells, banana peels and dried leaves. This innovative approach ensures healthier plant growth while improving soil fertility. By promoting sustainable gardening practices, EGP helps reduce the ecological footprint of gardeners and farmers, aligning with global efforts to combat the unnecessary over production of plastic. We also aim to make sustainable gardening accessible to a broader demographic to ensure that not only will people be able to garden but also do it sustainably . The novelty of EGP lies in their unique ability to integrate biodegradability with nutrient enrichment, embodying the principles of a circular economy. This dual functionality sets them apart from conventional gardening containers, offering both environmental and agricultural benefits. Ultimately, EGP represents a significant advancement in sustainable agriculture, providing an impactful alternative that fosters a greener, healthier planet.

5.0 CONCLUSION

In a nutshell, we hope to spread more awareness on the importance of sustainability in agriculture as the rate of reuse and recycling for agricultural plastic waste is currently at an all time low. Thus, we created EGP to combat the detrimental and critical issue that is getting worse each year.

6.0 REFERENCE

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