

# **COBIN-20: THE EFFECTIVE AND AFFORDABLE COMPOST BIN FOR GREEN BUILT ENVIRONMENT TO SUSTAIN QUALITY OF LIFE**

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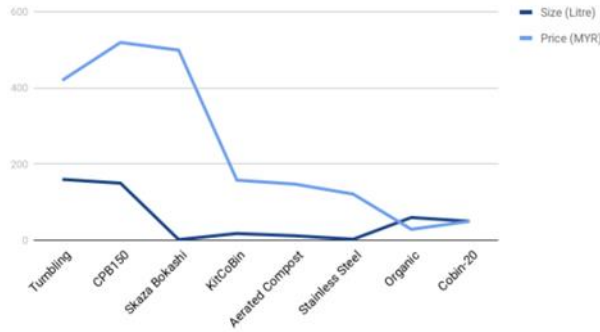
## **ABSTRACT**

Kitchen waste composting awareness is rising to Malaysian homeowners. Although the response of the awareness exists, the sustainable consciousness is not celebrated due to its limited choice in the market of composting bins. The available bins in the market do not fit users' consumption and are marketed at high prices. Homeowners with landed homes have the potential and ability to become accustomed with the affordable and innovative food waste composting bin, 'Cobin-20'. The aim of the innovation is to design an easy-to-use outdoor compost bin for Malaysian households, as a key basis for improving sustainable waste management. The product is made of a polypropylene (PP) plastic with a standard 66-liter size with a lid. It is able to withstand heat and moisture hence suitable with the composting process adapting with Malaysia's hot humid climate. The novelty of the innovation is that 'Cobin-20' is a compost bin that comes with permeable holes on the side and bottom for aeration and leachate absorption directly to the ground. The design also allows the surrounding soil to be fertile. The product innovated with efficient size for domestic household consumption, durable material, number and location of holes provided on the bottom bin. It is also innovated to be affordable for everyone, convenient and simple to support a sustainable quality of life.

**Keywords:** compost bin, affordable, effective size, outdoor, quality of life

## **1. INTRODUCTION AND OBJECTIVE**

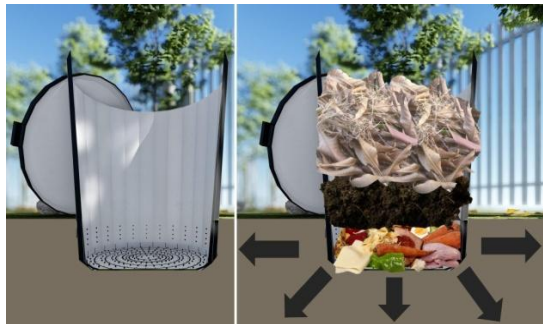
Past studies showed households have basic recycle knowledge, know about recycling food remnants and understood the main objective of recycling but surprisingly only a quarter of them practice recycle regularly (Othman & Yuhaniz, 2018). Most of their reasons for it are no facility for waste separation, no space at home and fussy (Othman & Yuhaniz, 2018). The existing compost bins have few challenges related to choice and affordability. This statement is supported by Jayaprakash, et.al, (2018) as cost issues exist not only to automatic and high-end compost bins. Burguillos & Caldona (2020) highlighted, the process can be expensive as the site and equipment preparations have to be taken into consideration seriously and properly to avoid environmental concerns such as odors and dust emission. Consequently, the treatment period can be lengthy, which, depending upon the composting technique used, could take several weeks to attain a stable product. Foul odor emitted in the vicinity can attract cockroaches, flies and other disease causing organism (Burguillos & Caldona, 2020). Past study reveals true to our market study on existing composting bins as in Figure 1. Thus, the aim of the innovation is to design an easy-to-use outdoor compost bin for Malaysian households, as a key basis for improving sustainable waste management.



**Figure 1.** Market of Domestic Compost Bin

## 2. METHOD

Design considerations were deliberate with Jayaparrakash, et al (2018) works such as the frequency of waste input which is suitable with a weekly urban lifestyle. Comparison from various bin sizes were conducted in identifying the size of the bin. The study viewed 66 litre as an optimal size mainly for domestic homes. It is not too big nor too small, allowing a modular concept compost bin and to determine the ability to be afforded. Observations from monthly compost activity were conducted in identifying the effectiveness of the bin design. As the size of the bin is identified, the holes are design to permit leachate directly to the ground soil as illustrated in diagram 1.



**Figure 2.** Cobin-20 in soil bin composter

## 3. FINDINGS AND ARGUMENT

The product is made of polypropylene (PP) plastic, able to withstand heat and moisture, suitable with the composting process and Malaysia's hot humid climate. It comes with a standard 66-liter size with a lid and permeable holes on the side and bottom for aeration and leachate absorption directly to the ground. The design allows the surrounding soil to be fertile. The novelty of the innovation is the design of the holes provided on the bottom and side bin. The benefit of the product is to support the best practice of effective kitchen waste management with efficient size and affordability with durability of its material for domestic household consumption.

#### 4. CONCLUSION AND SUGGESTIONS

There is a high potential for commercialization as other composting bins in the market (Figure 1) will only attract high end users. The product innovated is set to be affordable for everyone, this is due to the fact that it can be mass produced with injection molding. Thus, ‘Cobin-20’ is convenient and simple to support a sustainable quality of life.

#### REFERENCES

1. Othman, A. R., and Yuhaniz, M. (2018). Awareness among Terrace House Residents in Shah Alam towards Domestic Waste Recycling. *Journal of ASIAN Behavioural Studies*. <https://doi.org/10.21834/jabs.v3i7.252>
2. Burguillos, J. D., and Caldona, E. B. (2020). Journal of King Saud University – Engineering Sciences Design and development of a novel waste container from HDPE-layered bins. *Journal of King Saud University – Engineering Sciences*, 32, 1, 85–90. <https://doi.org/10.1016/j.jksues.2018.06.00>
3. Jayaprakash, S., Hs, L., and Bs, A. (2018). Of Waste Resources Design and Development of Compost Bin for Indian Kitchen. 8, 1, 1–5. <https://doi.org/10.4172/2252-5211.1000323>.



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Kelulusan daripada pihak YBhg. Profesor dalam perkara ini amat dihargai.

Sekian, terima kasih.

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