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Eco-Friendly Pineapple Bag

Nur Hidayah Zulkifli¹
Wan Rosnani Wan Mohamad²

¹Department of Tourism and Hospitality, Politeknik Ibrahim Sultan (PIS), Malaysia, (E-mail: hidayah_zulkifli@pis.edu.my)

²Department of Tourism and Hospitality, Politeknik Ibrahim Sultan (PIS), Malaysia, (E-mail: wanrosnani@pis.edu.my)

Abstract: The main purpose of this project is to spread awareness among the public about the use of plantation waste which is pineapple leaves as one of the innovative materials that can be incorporated in the production of daily products and traditional handicrafts. This is also to reduce the usage of non-biodegradable materials such as plastic, in which after the reduction can help in conserving and preserving the environment. Other than that, it can reduce open burning activity that has been widely practice among the farmer to clear up the land for new plantation. The implementation of this project was made possible through the collaboration with Nictar Farm - Honey Bee, and Pineapple, Pontian and Kompleks Kraf Johor, Johor Bahru. Nictar Farm – Honey Bee and Pineapple provided the pineapple leaves from their farm meanwhile Kompleks Kraf Johor provided the basic lesson of weaving in order to make the two products; a clutch and a sling bag. A one-to-one interview was conducted with both parties to see how effective the usage of pineapple leaves in making products and a questionnaire was distributed to the public through a Google Form link in which targeted one hundred 100 respondents.

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1. Introduction

From the last decade onwards, people became more concerned about their health as a result of which they are using more of green products. According to Albino, Balice and Dangelico (2009), they defined eco-friendly products as product designed to minimize its environmental impacts during its whole life-cycle. In particular, non-renewable resource use is minimized, toxic materials are avoided and renewable resource use takes place in accordance with their rate of replenishment. Meanwhile, D'Souza, Taghian and Khosla (2007) stated that One that has to represent a significant achievement in reducing environmental impact; they may also have to incorporate strategies of recycling, recycled content, reduced packaging or using fewer toxic materials.

Eco-friendly products can be stated as having less of an impact on the environment and are less damaging to human health than conventional products, and hence are also called as sustainable or green products. Eco-friendly products are produced from recycled components, for example, the decomposition of residues of food, food products instead of chemical fertilizers and plantation waste are manufactured in a more energy-conservative way, or are supplied to the market with more environmentally friendly way. So, people are becoming more aware about the concept of environment.

An eco-friendly bag was made out of this material. The product was made through collaboration with Nictar Farm – Honey Bee and Pineapple with Kompleks Kraf Johor. The waste that was used is from Nictar Farm which is MD-2 pineapple leaves and the weaving process has been helped by the representative of Kompleks Kraf Johor. MD2 pineapple leaves are found to have no major leaf veins with shiny color and no color anthocyanin (red-brown color like pineapple on varieti Morris). The lower surface of the leaves has trichomes or significant white dust and the leaves are greener than other pineapple varieties.

2. Problem Statement

Abundant of waste from the MD-2 pineapple such as the leaves which it can be used for other purposes

3.0 Objectives

- i. To suggest the use of pineapple leaves as one of an innovative material by making an eco-friendly bag.
- ii. To promote an eco-friendly concept by using plantation waste and avoid the use of non-biodegradable materials.
- iii. To have a collaboration with Nictar Farm – Honey Bee and Pineapple and Kompleks Kraf Johor.

3. Literature Review

3.1 Pineapple leaves

Pineapple is perennial herbaceous plant with 1-2 m for height and width belongs to family Bromeliaceae (Van, 2006). It is chiefly cultivated in coastal and tropical regions, mainly for its fruits purpose. Productions of Pineapple leaf fibres are plentiful for industrial purpose without any supplementary addition and annually renewable and of easy availability (Rahmat, Hassan, Mokhtar, 2007). Pineapple is known as Nanas in Malaysia; basically they use different varieties for different purpose; for commercial purpose they use red pineapple and green pineapple; for edible purpose, they prefer Sarawak pineapple and Morris pineapple.

3.2 Handicraft

Handmade (or handcrafted, handicraft and homemade) refers to products made either entirely by hands, or with support of hand-tools or even mechanical means, under the condition that the most crucial component of the finished products is contributed manually by the makers (Sunita and Shiware, 2013). According to UNESCO (1997) traditional handicraft is handmade with distinctive features such as being produced by generations of skillful workers in a forming craft villages or areas; using raw materials from sustainable resources and containing artistic/ creative/ culturally attached/ religious/ socially symbolic value.

3.3 Environmentally friendly

Impact of humans on the environment has been given more and more concerns, in part due to the production and consumption of harmful consumer products. Growing demand for environmentally friendly alternatives created a variety choice for green product (Grohmann & Bodur, 2014). Handmade products could be classified as green products since they are made with organic, recycled and renewable materials in a much smaller scale than machine-made. These environment friendly products have been researched from numerous perspectives including eco-conscious product purchasing (Schlegelmilch, Bohlen & Diamantopoulos, 1996), and willingness to pay higher price (Laroche, Bergeron & Barbaro, 2001).

4. Methodology

Data collection was done through premier data obtained by interview and questionnaire distribution to the public. A quantitative study approach was used by a total of 100 respondents were chosen through random sampling among the public. The questionnaire was divided into two (2) sections, Section A and Section B where in Section A consists of questions related to respondents' demographics while in Section B consists of survey for respondent understanding on eco-friendly concept. The survey was distributed and analyzed using Google Form. Meanwhile the interview session were done with Lim Yong Wah, co-founder of Nictar Farm – Honey Bee and Pineapple as well as Miss Fatiha, representative of Kompleks Kraf Johor.

5. Recommendation

A further discussion was made with Nictar Farm-Honey Bee and Pineapple to finalize the project. Therefore, two designs were chosen which is a clutch and a sling bag. The measurements for the sling bag are as below;

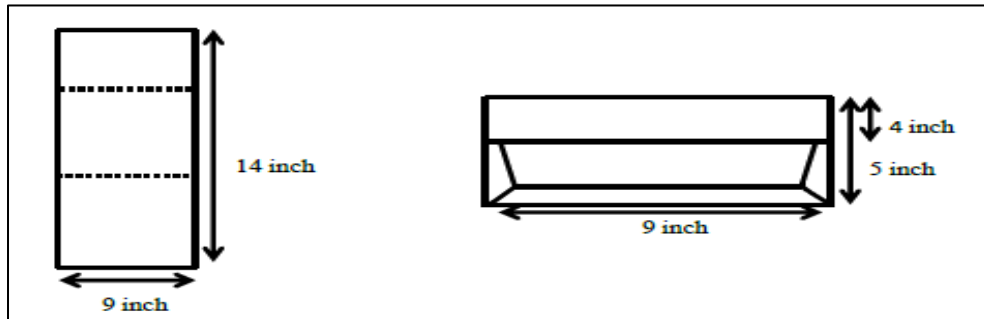


Figure 1: Design of Clutch

The length of the clutch will be 9 inches (~22.86cm) and the height is 9 inches (~22.86cm) too, including the cover. Since sling bag is trendy nowadays, the co-owner also suggested to come out with a sling bag. The measurements for the sling bag are as below;

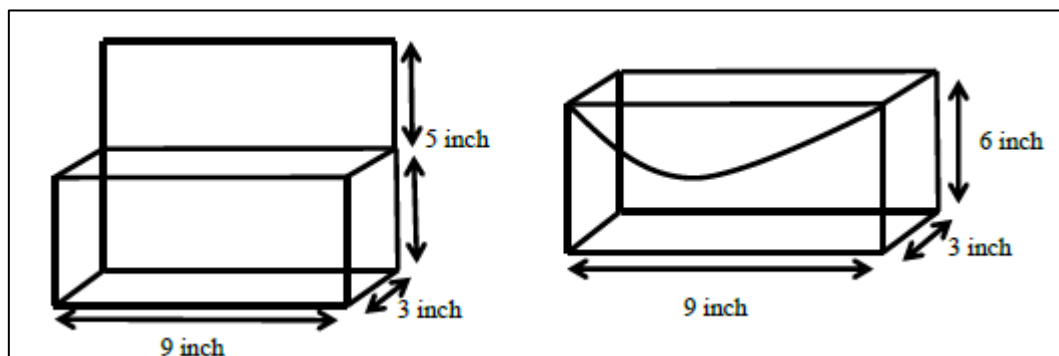


Figure 2: Design of the Sling bag

The length of the sling bag is the same as the clutch, which is 9 inches (~22.86cm), with a width of 3 inches (~7.62cm) and a height of 11 inches (~27.94cm), including a 5 inches (~12.7cm) cover.

6.1 Process Of Obtaining And Drying Pineapple Leaves



Figure 3: Obtaining and Drying pineapple leaves

There were 6 steps in obtaining and drying the pineapple leaves. Below are the details on how to obtained and dry the pineapple leaves;

Step 1: Harvesting pineapples leaves

The process of harvesting and collecting pineapple leaves were made at Nictar Farm - Honey Bee and Pineapple. It takes approximately 3 hours to collect 150 pieces pineapple leaves which is equal to 7 kilograms. However, not every leaf is suitable to be used in weaving process. The selection of the leaf depends on the thickness, width and length to make sure that the product is durable and can endure extreme weight load.

Step 2: Cut the leaves for shaping

After finish collecting the leaves, it needs to be cut to get it into the right shapes and equal measurements.

Step 3: Removing the thorn

The thorns were removed from the leaves to avoid any injuries during the cutting and scrapping process. Other than that, to beautify the leaves shape.

Step 4: Removing the wax with scrapper

Using the scrapper, the wax was removed from the leaves to fasten the drying process. If the wax is not removed out from the pineapple leaves it will slow down the drying process and the weaving process.

Step 5: Cutting the leaves with handmade cutter

To produce an equal size of the leaves, a handmade cutter is created with a measurement of 4.5 cm divided into three part which is 1.5 cm for each part. The leaves were cut into equal sizes to get the suitable measurement for the weaving process.

Step 6: Drying the leaves

Lastly, the leaves were left to dry under a room temperature (23°C) for about a week until the leaves are rolled both side. The leaves should be completely dry to prevent fungus and unpleasant odor. Pineapple leaves cannot be dried directly under the sun as they can damage leaf structure as they are fragile, not durable, and cannot hold weight.

6.2 Process Of Weaving Clutch

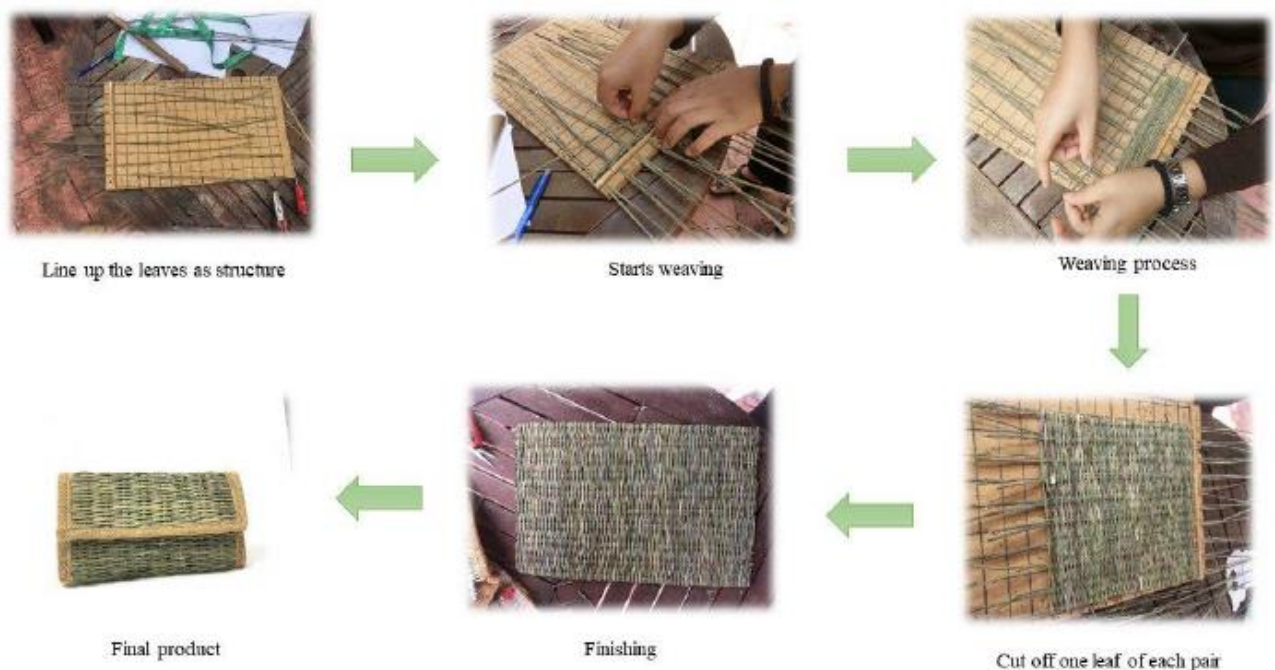


Figure 4: Process of Weaving Clutch

There are 4 steps on how to weave the clutch. Below are the details on how to weave the clutch;

Step 1: Line up the leaves as structure

Nine pairs of leaves were lined up to make the structure of the clutch. It is to make sure that the clutch is able to withstand weight.

Step 2: Starts weaving

The weaving process started by inserting the leaves from the side and then leaves are arranged intervalley between the front and the back side of the structure until the end of the clutch.

Step 3: Cut off one leaf of each pair

After weaving, one leaf of every pair was cut off and the remaining leaf was inserted in the space between the nine pairs of leaves to make the structure even stronger

Step 4: Finishing

Lastly, for the finishing, calico cloth is sewn inside the clutch to cover up the defect after the weaving process. In addition, each side of the clutch sewn with jute cloth to improve the design of the clutch to make it more attractive. Final touch, a pair of button are put in the clutch to make sure the cover is attached to the front side of the clutch.

6.3 Process of Weaving Sling Bag

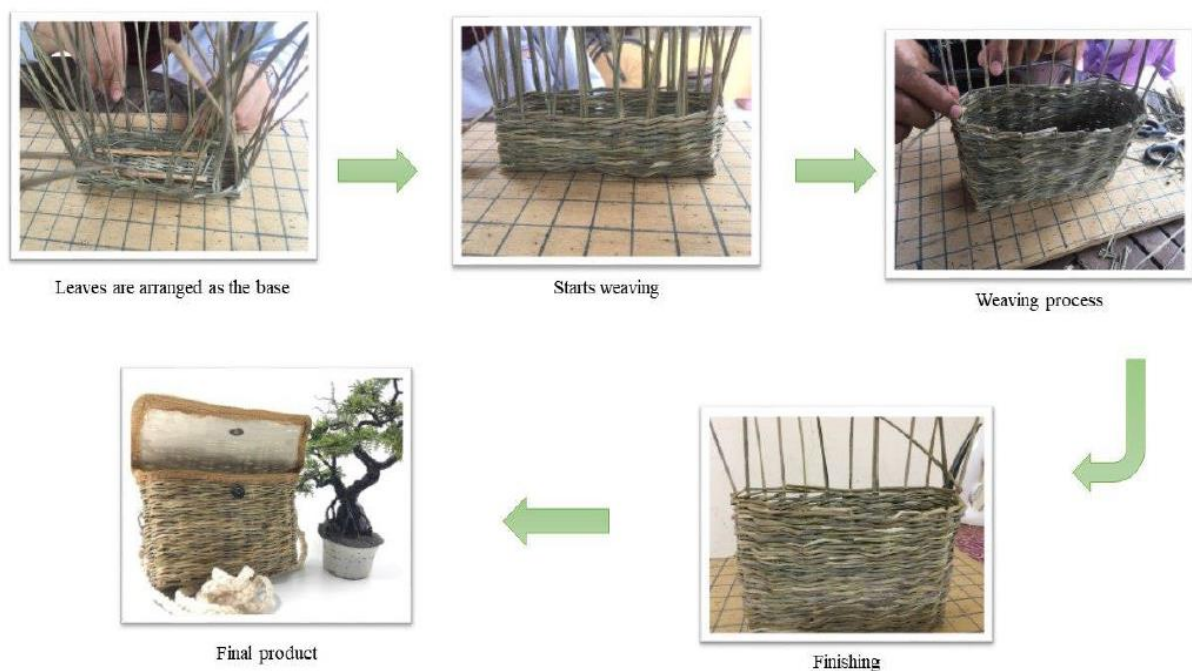


Figure 5: Process of Weaving Sling Bag

There are 3 steps on how to weave the sling bag. Below are the details on how to weave the sling bag;

Step 1: Leaves are arranged as the base

The leaves are arranged and weaved at the bottom to make the base for the sling bag so that it has extra space to put other things such as, purse, handphone and car key.

Step 2: Starts weaving

After the base has completed, the structure of the bag is lifted up by weaving intervals around the base. Next, twelve leaves were lined up to make the cover of the sling bag. Then, the leaf was inserted in the space between the leaves to make it secure.

Step 3: Finishing

Lastly, for the finishing, calico cloth is sewn inside the sling bag to cover up the defect after the weaving process. Next, sewn the end of the cover with jute cloth to make it more eye catching and braid the string using cotton material to make it easier for the consumer to bring the bag anywhere. Final touch, a pair of button are put in the sling bag to make sure the cover is attached to the front side of the sling bag.

6. Finding

6.1 Questionnaire survey

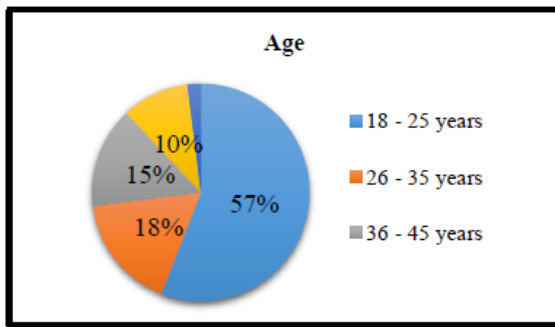


Figure 6: Age

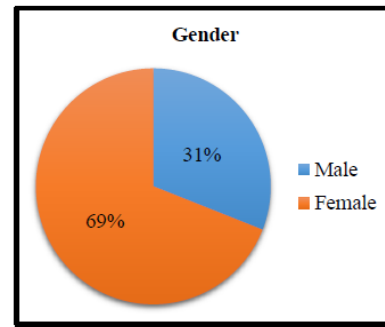


Figure 7: Gender

Based on the pie chart in Figure 6, 57% of the respondents were aged between 18 – 25 years old followed by 18% were aged between 26 – 35 years old. The result in Figure 7 also shown 69% of the respondents were female while 31% were male.

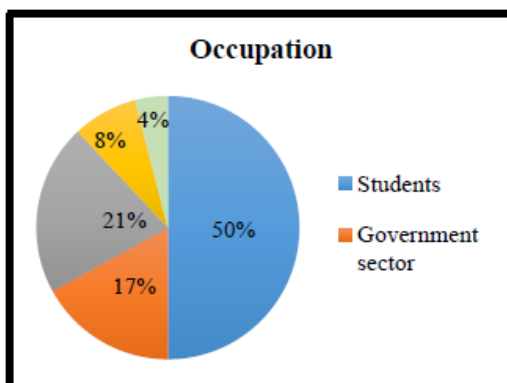


Figure 8: Occupation

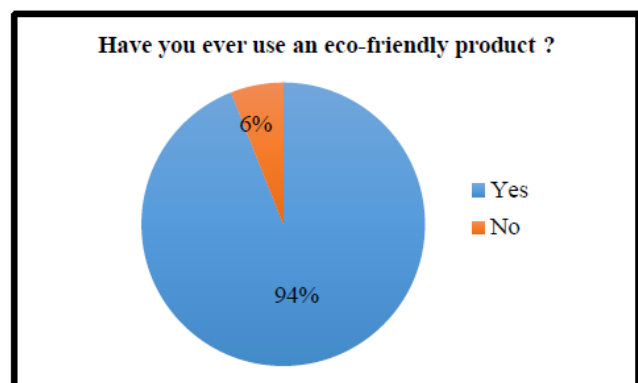


Figure 9: Experience using eco-friendly product

Figure 8 had shown the occupations of the respondents. Half of the number of respondents, which is 50% were students. 21% of the respondents are working in the private sector while 17% of them are in the government sector. The number of self-employed respondents is 8 and for the category of 'others', there are 4 respondents who might be unemployed or are involved in farming.

In the other hand, Figure 9 had shown 94% of the respondent had use eco-friendly product before this. This is because the concept of eco-friendly has been introduced to the public many years ago. As the consumers, the respondents are invited to be able to choose products that are not only useful to meet the needs and in accordance with the standards of consumption feasibility, but also its environmentally friendly production process.

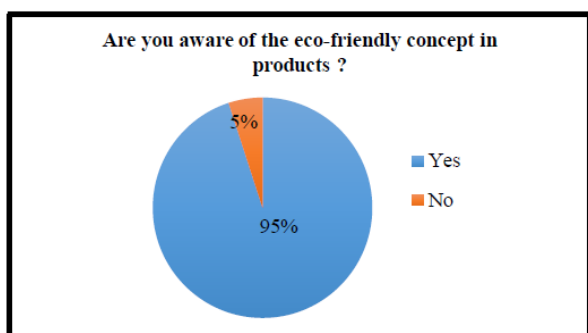


Figure 10: Awareness of eco-friendly concept

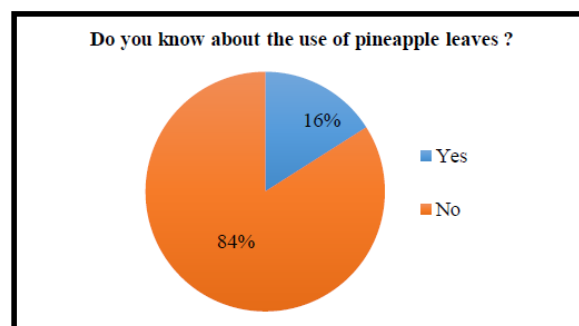


Figure 11: usage of pineapple leaves

The result shown as in Figure 10 that the respondents awareness towards the concept eco-friendly products was high which is 95%. It is because people nowadays are concern about the materials used in making products and also ensure that the product purchased were safe for the environment.

Meanwhile, as shown in Figure 11, majority of the respondents had no idea about the usage of pineapple leaves. It represent 84% of total respondent. The public has been exposed about the fibres that can be obtained from the inner and deeper part of the pineapple leaves and had no idea about the use of the pineapple leaf as a whole. The other 16% answered “Yes” probably because the respondents had heard about it but never thought it can be used to produce products.

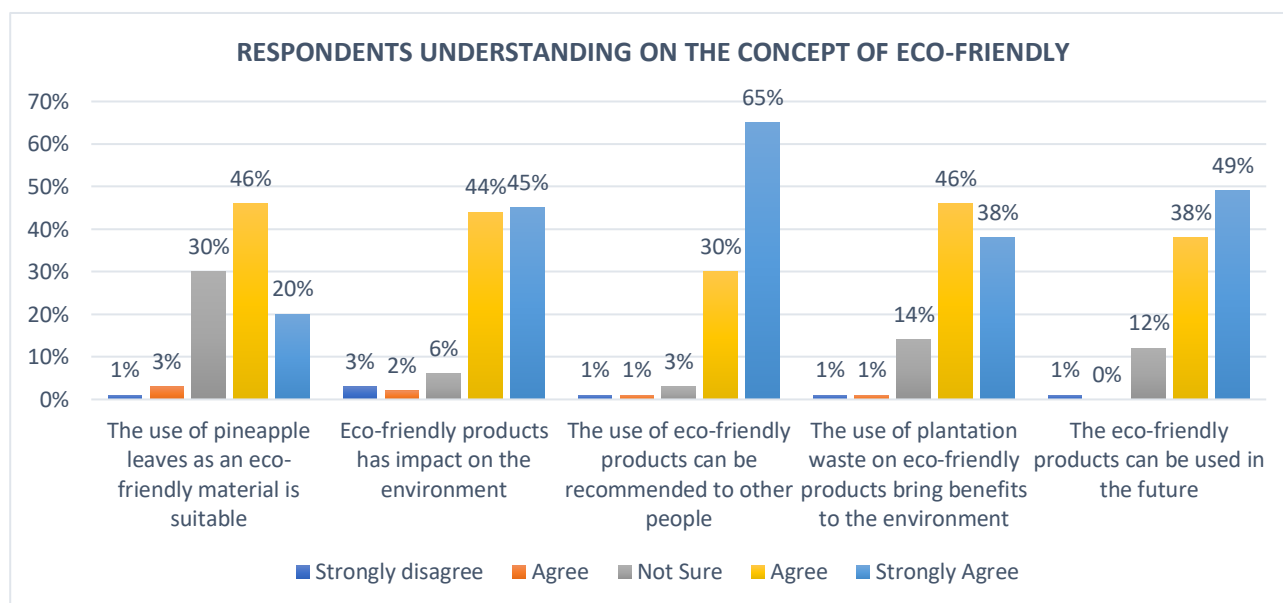


Figure 12: Respondents Understanding On The Concept Of Eco-Friendly

The result shown in Figure 12 indicated the scale and therespondents percentage who strongly disagree, disagree, not sure, agree and strongly agree. 46 of the respondents agreed, while 20 of the respondents strongly agreed that the use of pineapple leaves as an eco-friendly material is suitable. This is probably because the leaves are still part of the waste obtained from the plantation, and it is safe to be used in products development. While 30% of the respondents are unsure of this statement because the respondents are being hesitated on the endurance and durability of the leaves.

Other than that, the results also shown that 44% and 45% of the respondents agreed and strongly agreed respectively that eco-friendly products has impact on the environment. It is because by using more eco-friendly products, the pollution and contamination of the natural resources such as the air, water, and soil can be reduced. While 3% respondents strongly disagree maybe because of no exposure about using eco-friendly products.

Besides that, 65% of the respondents strongly agreed while 30% respondents agreed that the use of eco-friendly products can be recommended to other people. It is an advantage for any individual who wishes to contribute to the environmental sustainability to promote the use of eco-friendly product as it can safe mother nature. The rest of the respondents are either not sure (3%), disagreed (1%) or strongly disagreed (1%) towards the idea of introducing eco-friendly products to other people.

On the other hand, 46% of the respondents agreed that the usage of plantation waste in eco-friendly products can bring benefits to the environment and 38% strongly agreed with this statement. The use of plantation waste in making eco-friendly products can reduce the amount of waste at the plantation field thus can indirectly reducing the number of

open burning activities practised by the farmers in order to clear the land for a new batch of plantation. Remaining 14% of the respondents are unsure about the statement because it seems like the reduction of plantation brings no benefit towards the environment.

Besides that, 49% respondents strongly agreed that the eco-friendly products can be used in the future” as shown in Figure 12. People nowadays are health conscious and practicing towards the conservation and preservation of the environment for the sake of the future generation. Other than that, by promoting the use of eco-friendly products in can indirectly help to safe the environment since the issues of climate change is on the rise and it is worrying many parties, including the public. 12% respondents are not sure and only 1% strongly disagreed because the respondents might not aware the effectiveness of eco-friendly products towards the environment.

6.2 Interview Session

Based on the video recordings, analysis has been made based on the question given to the interviewer.

1. Nictar Farm - Honey Bee & Pineapple

Q: May we know the amount of waste obtained after every harvest?

A: *Satu pokok ah, saya ingat ah, boleh dapat sepuluh ke lime belas daun. Satu pokok tau, kalau satu ekar tu boleh dapat 10,000 pokok. 10,000 pokok X 10 daun you boleh dapat 100,000 daun tau.*

Q: Can we know if they are any event that will be held within this year and next year?

A: *Mungkin kita akan buat launching lah. Soft launching. Kita akan jemput ada vip dan mungkin kita akan buat satu carnival. Small pestalah or maybe kita jemput orang makan nenas free kat sini untuk satu hari. Makan la sampai kau muak.*

Q: Is there any reduction in the amount of waste free we harvest it for our product?

A: *Sure la ada sikit kurang. Kalau tak kita bakar je.*

Q: In your point of view, can this product be commercialized to the public?

A: *Satu benda tu you nak commercialize kan, first aspect you kena tengok dia punya cost. Second, workmanship. Third, kalau dah ada kualiti tu you kena tengok macam mana komen dan acceptability you punya targetmarket. Mungkin kalau kau jual dekat Singapore kat high end market dia orang kata unik bawa balik as a souvenir okaylah. You know kalau nak jual kat Pekan Nenas matilah satu pedalaman jual nenas. Nictar kalau anytime you minta kita boleh jual.*

2. Kompleks Kraf Johor

Q: In your point of view, can this product be commercialized to the public?

A: *Dia boleh InshaAllah. Tapi, cuma kita nak kena experiment dulu. Sebab kita tak tahu bahan dia macam mana. Tak pernah buat kan. Kan kita dah cakap hari tu kan, nak tengok dia kecut ke tak kan. Buat masa ni tengok dia tak kecut, so kira ok la.*

Q: In terms of durability, is this product durable?

A: *Ketahanan kalau macam (berfikir sejenak) dia tengok finishing juga. Sebab dia ni licin senang apa, (berfikir sejenak) senang bergerak.*

Q: Is it possible that this pineapple leaf can be one of the innovations to produce handicraft products?

A: *Boleh (angguk dua kali). Sebab benda ni sesuatu yang baru sebelum ni orang guna serat yang ni dia pakai daun dan serat sekali so benda ni baru la.*

7. Conclusion

The survey found that the respondents has different opinions and point of views towards this eco-friendly concept. Positive feedbacks about the concept of eco-friendly were obtained and this shows that the respondents are actually aware about the environment. Despite not knowing about the use of pineapple leaves, the respondents still give a good feedback about this project. To make sure this project can be continued in the future, a lot of improvements and research should be made especially on the durability and the endurance of this product.

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