Research Article

Bird Nest Harvesting Tools (BNHT)

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***Abstract**: Edible bird's nest (EBN) is a valuable bioproduct used as food and medicine. EBN is known for its effectiveness in treating various diseases and is widely consumed in Chinese cultures. The saliva of swifts and swallows is the main component of EBN, which is harvested in Southeast Asia. Traditional harvesting methods are laborious and can damage nests, reducing yield and quality. To overcome these challenges, an innovative multi-function tool has been developed that combines various tools into one device, increasing efficiency and safety while maintaining nest quality. The modern multitool offers bird nest farmers a more effective, safer, and quality alternative, despite its drawbacks. Farmers usually harvest bird nests using various tools, which requires two to three people to do the task. Based on our research, the previous harvesting tools resulted in low-quality yield due to the difficulty in handling different tools, especially when only one harvester is available. In this project, we aim to create a bird nest harvesting tool that combines all the necessary tools, such as mirror, PVC pipe, scraper, netting, torchlight, and pole, into one. Our product aims to reduce harvesting time by extending the size of the netting attached to the harvesting pole, enabling the collection of multiple nests at once and reducing the time taken during the harvesting process. Meanwhile, our product is quite heavy compared to the previous tools and can only be used in birdhouses, not in caves. Therefore, our target market is farmers who have birdhouse to increase their yield quality.*

Keyword: Edible bird's nest (EBN); harvesting methods; harvesting tools.

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1. INTRODUCTION

One of the most widely consumed foods in Chinese cultures for health benefits is the edible bird's nest (EBN). In traditional Chinese medicine, EBN is renowned for its effectiveness in treating various diseases, including bronchial diseases, asthma, dry cough, stomach ulcers, emphysema, and consumption. Due to its medicinal and nutritional properties, EBN is a valuable animal by-product

used as both food and medicine, making it extremely expensive and giving rise to a thriving industry in Southeast Asia.

The term "EBN" refers to the dried saliva of swallows and swifts, which are widely distributed in Southeast Asian countries such as Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Swifts are small, insectivorous birds that catch insects in flight from dawn to dusk. Of the various species of swifts in the genus Collocalia, only the nests of Collocalia foliophage, Collocalia germannis, Collocalia maxima, and Collocalia unicolor are of commercial importance because they are consumed by humans.

Different languages have various names for the edible bird's nest (EBN), e.g., Yan Wo in Chinese, Sarang Wallet in Indonesian, and Enso in Japanese. The main component of the nests is the saliva that swifts secrete from their lingual salivary glands during the breeding and nesting season. The sublingual salivary glands of swifts typically weigh between 2.5 and 160 mg and are most active during the breeding and rearing season. The saliva is used to hold feathers and other plants together during nest construction. It also ensures that the vertical walls of the cavity are securely attached.

The farming of bird nests, particularly swift nests, is a lucrative industry in Asia due to their nutritive and medicinal properties. However, traditional harvesting methods are labour-intensive, require multiple tools, and can damage the nests, resulting in reduced quality and yield. To overcome these challenges, an innovative multi-function tool has been developed that combines a mirror, PVC pipe, scraper, net, flashlight, and pole into one device, making harvesting more efficient and safer while maintaining nest quality. The key benefits of this all-in-one tool include better protection of nests during harvest, easier handling by reducing the number of tools, increased safety by minimizing precarious positions, and higher yield per harvest cycle.

However, the multitool also has some disadvantages: it is heavier, perhaps less durable, more expensive, and only suitable for birdhouses. Despite these drawbacks, the modern multitool for bird nest removal offers bird nest farmers a more effective, safer, and higher quality alternative. It is a worthwhile investment for bird nest optimization as it offers increased productivity, better nest quality, and greater safety.

2. METHOD & MATERIAL

2.1 Method

From the old bird nest harvesting tool, the tools are separated from each other, and it makes the harvester consume more time for the harvesting process. Then, the net where the nest drops is small, and it only can carry one nest at one time. So, we innovate the old harvesting tools become one which is we combining the tools become one tools. The scraper, torchlight, mirror, and net will be put in one adjustable pole. It can be adjustable to make the harvesting process go faster. When we want to see if the nest can be harvested or not, we can adjust the mirror out by pushing the adjustable pole up using the adjustable button that will be install on the pole. Then, if we want to harvest the nest, we will pull down the mirror and put up the scraper. Then, we will use the scraper to scrap the nest. The nest will drop in the net to avoid the nest breaking. The pole that will be use is the stainless-steel pole which is very light, and it can facilitate the harvester during harvesting process. The pole with 33mm diameter and 3m long will be use.

The old harvesting tools consume more time of harvesting for the bird nest farmer. It is because the tool is inconvenience for the harvesting process. The separating tools need to be taken during the

harvesting process ongoing make more time consuming. So, by combining all the tools, we can do the harvesting process in one time and the time consuming is less than before.

2.2 Material

The materials that we use are mirror, scraper, net, stainless-steel pole, and PVC pipe. The mirror, scraper, and net will be installed and attach to the PVC pipe with diameter of 34mm. It is because, we want to make the mirror, and scraper to be adjustable. This will be the first section of the Bird Nest Harvesting Tool, which is the upper part of the tool. Then, the second section which is lower part will be stainless-steel pole which will be attached to the upper part just now. The stainless-steel with diameter 33mm will be use with 3m long. The function of lower part is as the holder and facilitate the harvesting process of the high nest. The adjustable button for adjustable mirror, and scraper also will be installed on the side of the stainless-steel pole. The diameter of netting that will be installed or attached to the pole is 0.5 metre to make the quantity yield per time increasing.

3. FINDINGS

This project objective is to innovate the previous bird nest harvesting tools by combining the tools become one. To make this project successful, we had done the qualitative survey by using google form survey for people to acknowledge our product. The question that has been asked is about their background, whether they are from plantation background. Then, we also asked about their age and their experience before this, whether they have been exposed to bird nest farming or not. Lastly, we asked who the target market of this BNT product is.

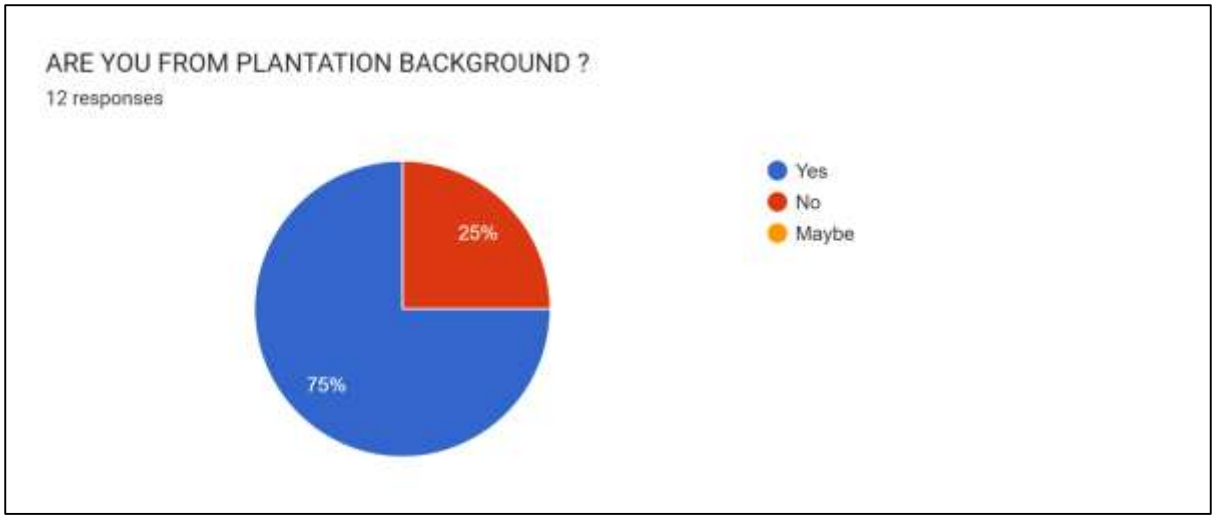

Figure 1. 75% of the respondent background is from the plantation background.

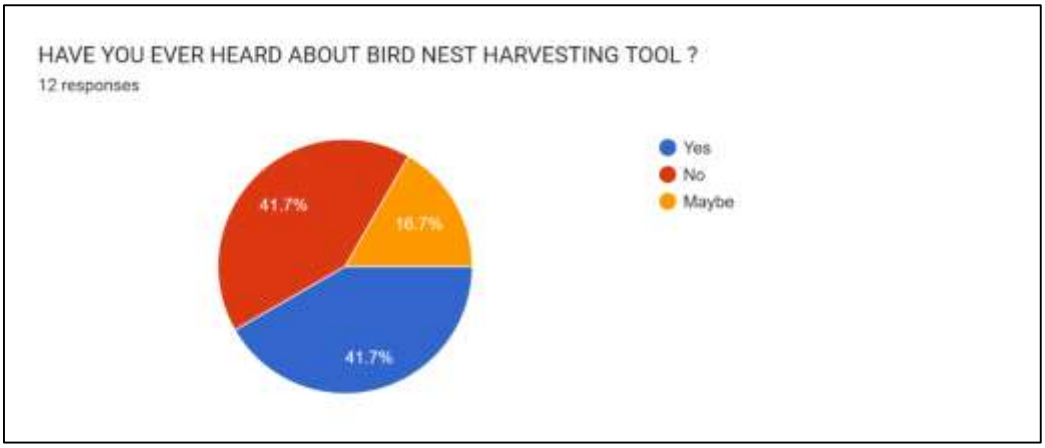

Figure 2. Percentage of the respondent that familiar with bird nest harvesting tool is equal for respondent that know about the tool and the respondent that never heard about the tool.

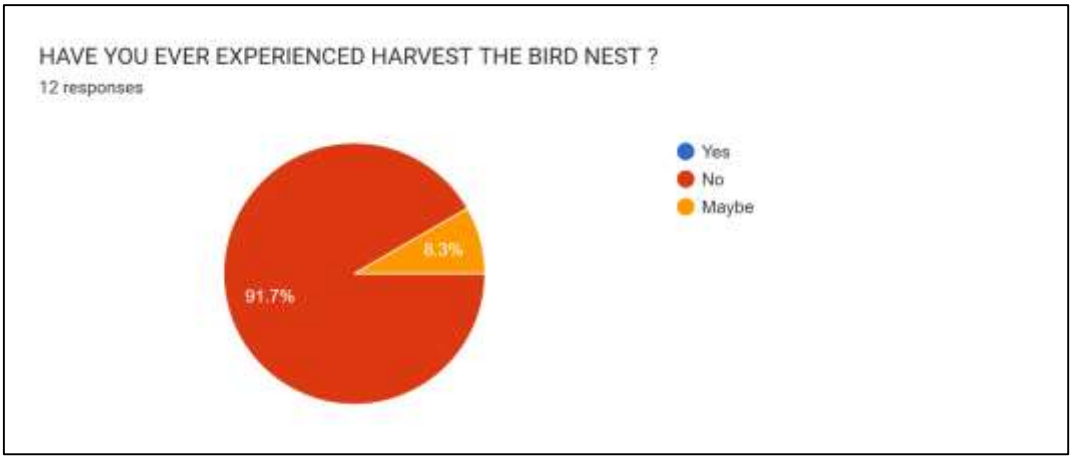

Figure 3. Percentage of respondent that never have experience on the bird nest harvesting is 91.7% meanwhile 8.3% for the neutral respondent.

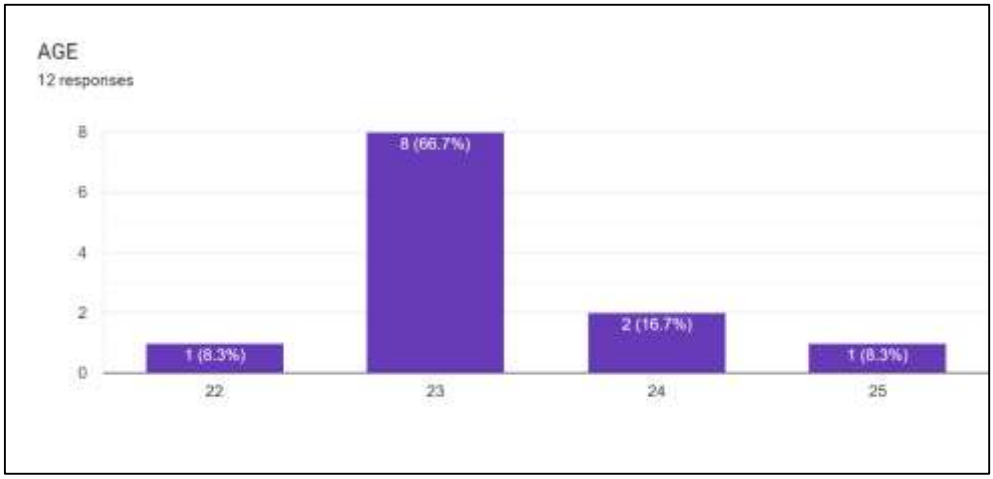

Figure 4. There are 66.7% of the respondent age is 23 years old which is majority of the respondent meanwhile 16.7% is 24 years old and respectively 8.3% is 22 and 25 years old among the 12 respondents.

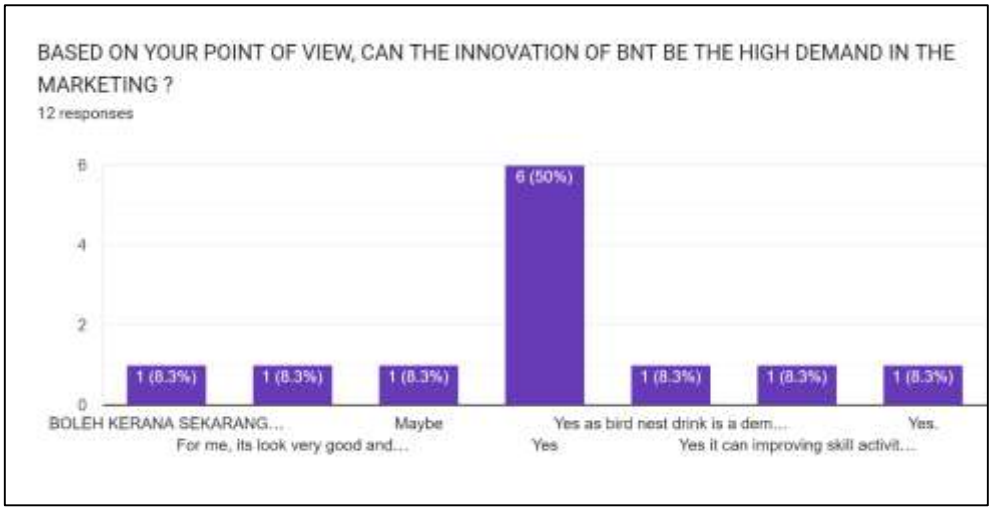

Figure 5. 50% of the respondents agree that the BNT will be high in demand in the marketing because they said, it can improve the farmers harvesting skill using current innovation.

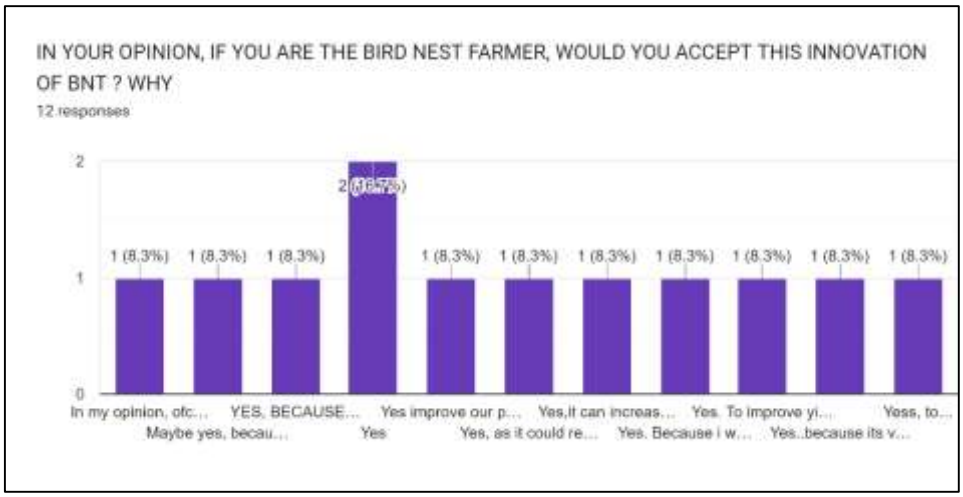

Figure 6. All the respondents agree that the bird nest farmers can accept and adapt to this bird nest tool.

This Google form survey is a great platform for us to know the respondents are ready to accept the Bird Nest Tool (BNT). Most of the respondents said they agree that this BNT will help to increase the farmers' skill in harvesting process of bird nest. Other than that, majority of the respondents said that BNT will be high demand in the marketing especially among the new generation of bird nest farmers.

4. DISCUSSION

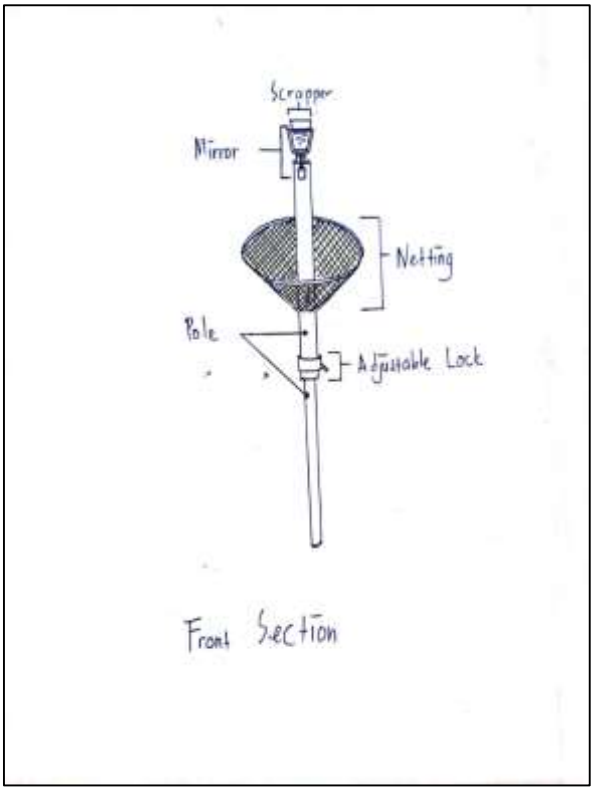

Figure 7. The draft sketch front section of Bird Nest Harvesting Tool

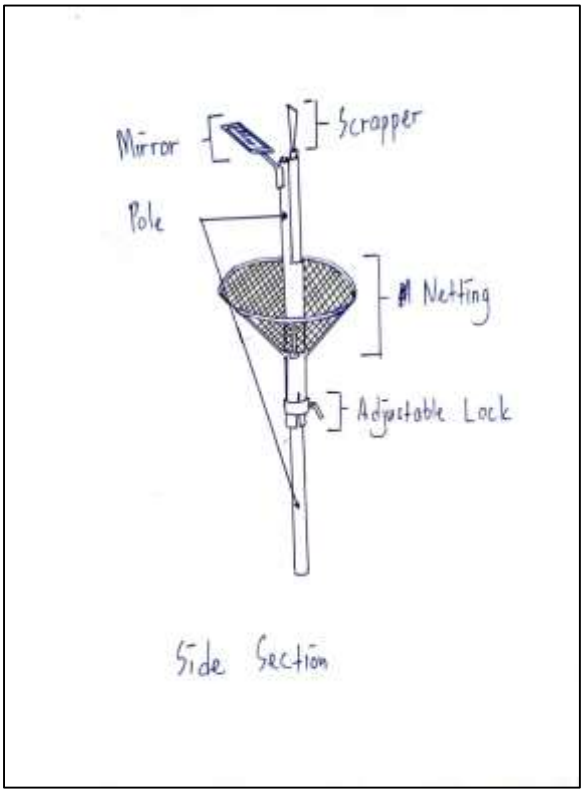

Figure 8. The draft sketch side section of Bird Nest Harvesting Tool

For our entrepreneurship project our group will choose bird nest technology to innovate where we combine all the materials to harvest bird nest in one such as (scapple, fish net, mirror, and torch

light) the reason we choose to combine this tech because we want to reduce the worker energy at the same time make the harvesting process become more efficient. Our BNT (Bird Nest Tool) provide a few advance materials, this is due to a lot of material was used to harvest bird nest might have a hight potential of damaging the bird nest, this will cause the grade of bird nest quality become lower and it will cause no profit toward smallholder.

4.1 Advantage of BNT (Bird Nest Tool)

First, combining tools will enhance the probability of harvesting bird nests in a good condition. This is because if too many tools were used in harvesting bird nest it might cause bird nest to break down because the eyesight of harvester might get distracted by other support member. Then, this tool is easy to handle. If there are too many tools was used to harvest bird nest, then, why not we combined all of them so that it will make harvester easy to harvest because using this technology that we will innovate there will be a lot easier for harvester to harvest the bird nest because all the materials already put in place. Furthermore, this tool can make efficient in time of harvesting bird nest and low in workers supply energy. Before this technology was introduce, it takes longer time and a lot of workers' energy because it takes at least three workers just to harvest a single bird nest, with this technology that going to be introduce, it will take only one worker to harvest one bird nest at the time, and if there three workers at the place, they can harvest three bird nest at the time.

However, no matter how advanced technology will be innovated there will always be a few hindrances in the technology. These are a few hindrances of our BNT technology.

4.2 Disadvantages of BNT (Bird Nest Tool)

First, this tool price will be expensive a little bit than the current tools. Then, durability of BNT might be less durable. This tool also will be a little bit heavier in weight because we choose to combine all the tools in one place. Last but not least, the application of these tools is limited where it can be only use in bird nest house.

If we set aside the drawbacks of these tools, we can see the usefulness of this technology, where it offers efficient work while harvesting the bird nest. It also has a high percentage of the harvested bird nest will be in good condition. This technology will give a huge assistance to smallholder because the bird nest quality will not be affected due to the high security of this harvesting tools. Also, this technology will give profit to smallholder because the lower percentage of bird nest getting damage the more profitable the bird nest is.

5. CONCLUSION

To summarise, combining all materials such as scraper, fish net, mirror, and torch light into one that will be our entrepreneurship project, new bird nest equipment, will make the bird nest harvesting process more effective and worthwhile. Despite the negative aspects, there are numerous benefits that will facilitate the farmer's job. In fact, one of the goals of this project is to minimize issues such as damage to bird nests during harvesting and this multi-tool will produce higher nest quality. Based on our survey, the innovation of bird nest tools will have high demand in marketing. Indirectly, this project will become the technology that will help to improve plantation and agrotechnology industry. Furthermore, by establishing the purpose of creating this bird nest equipment as a tool to improve the performance of swiftlet farmers it is also important to receive great results and overall improvement including for future smallholder generations.

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