

SimplyCoco: A Business Plan to Find Economic Value from Waste



Abstract

SimplyCoco is a sustainable eco-friendly business project that aims to repurpose a common waste material in Thailand, coconut husks. Coconut husk is a problem in the Muang Mai Subdistrict, Amphawa because it is discarded and burned once the coconut meat is extracted. The Amphawa municipality seeks to mitigate this problem by adding value to the coconut husks for economic development. Through economic calculations and financial forecasting we identified what products will be profitable to generate a source of income for the elderly and community members looking for jobs. The recommended products for Simply Coco are coconut husk flower pots with mulch and coconut fiber material.



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Bringing Economic Value to Waste

Material

Many countries in Asia are major global exporters of coconut, including Thailand, where coconut is a major agricultural crop. Although about 80% of Thailand's coconut production is consumed domestically, Thailand is the world's third largest coconut exporter due to the large volume produced.¹ Moreover, Thailand is exporting coconut milk worth 13 million baht in 2019.² The abundance of this fruit brings income to many farmers in Thailand and coconut product industries. Not only does the livelihood of local farmers depend on these fruits due to the ability to be cultivated year round, but they also create jobs for refreshment merchants.

The coconut palm is a versatile resource in Thailand and the fruits are used in connection with traditional beliefs. Coconut water is extracted from the coconut and used to wash the face and body of the corpse before a funeral in Thai culture.³ It is also rich with minerals and can be used in Thai food and medicines. The shells of the coconut can be used for decorations, bowls, and souvenirs.

Once the meat and liquid are extracted from the coconut, the thick middle layer of the coconut fruit known as mesocarp is discarded as waste. The name of this fibrous material is coir and it is typically burned or buried.⁴ About 50% of a whole coconut consists of husk waste.⁵ The district, Amphawa, has become one of the most suitable areas for growing coconut in Thailand due to the favorable climate and location which ensures brackish water.

There are a large number of coconut trees in the Muang Mai subdistrict next to the Amphawa floating market. In Muang Mai, the coconuts' meat and liquid are extracted so they can be taken to Bangkok. The husk of the coconut is discarded and then burned (Figure 1).



Figure 1. Coconut husk waste in Muang Mai

The Amphawa Chaipattananurak Conservation Project is located in Amphawa and was established in 2008. Chaipattananurak Foundation aims to preserve a traditional lifestyle where the culture and many traditions of Amphawa are preserved. Amphawa promotes entrepreneurship and sustainability in order for local people to benefit from the economy. Repurposing coconut husks to be used can help increase income for farmers and the Amphawa riverfront market community. In order to achieve this goal our objectives were to:

1. Identify current resources and skills required to operate machines
2. Investigate potential product ideas
3. Develop a business structure for it

We first evaluated the supply of raw material coconut husk waste, assessed machinery and skills, and assessed the current market size in the municipality of Amphawa. Consequently, we brainstormed potential product ideas through interviews with market owners of the community in Amphawa. As a result, we developed a business plan in order to repurpose the coconut husks and decided on products where a potential market exists.

Coconut husk is an abundant waste and resource

The coconut palm, *Cocos nucifera*, is one of the most cultivated fruits in the tropics. People in more than 93 countries thrive on coconut cultivation and other coconut related industries.⁶ Coconut palm trees are found most abundantly in India, the Philippines, Thailand, and Indonesia. Many of these countries produce over a million metric tons of coconuts. Indonesia is the leading producer of coconuts with a production rate of 17.13 million metric tons of coconuts annually.⁷ Coconut palm trees are known as the “tree of life” and “tree of wealth” in other parts of the world because they can be used for basic needs like food, shelter, and fuel. Globally, the plant is used for ornamental and souvenir purposes in tourist locations; its leaves, shells, and husks can be made into baskets, jewelry, coir, brooms, mulch, and other agricultural products.⁸ Various other coconut by-products range from clothes and beauty creams to plates and bowls. One of its most important resources is its oil that is extracted for culinary, medical, and cosmetic uses. There are various other coconut by-products that range from clothes and beauty creams to plates and bowls.

One of its most important resources is its oil that is extracted for culinary, medical, and cosmetic uses. Coconuts are multi-purposed as there are many by-products from it that provide a significant amount of income to other industries and businesses. The versatility of this resource gives entrepreneurs the opportunity to add economic value to every part of the coconut.

Coconut Husk Problem

There are mainly two types of coconuts around the world. These two types of coconut only differ in maturity. In figure 2, the green coconuts are not completely ripe and are sold as drinks in street markets. However, the brown husk coconuts are fully mature and contain less water compared to the green ones. The three layers of the coconut are the exocarp, the mesocarp, and the endocarp as presented in figure 3. The exocarp is the thin outermost layer, the mesocarp is the middle fibrous husk layer, and the endocarp is the hard shell that surrounds the coconut meat and water. Even though every part of the coconut can be repurposed for economic means, the mesocarp is usually discarded.

Once the coconut meat and liquid are extracted from the coconut, the coconut husk is thrown away and discarded. The coconut husk, also known as the coir, is traditionally burned or buried because it is seen as having no value or use.



Figure 2. Young coconuts (green coconuts) and mature ripe coconuts (brown coconuts)⁹



Figure 3. Layers of a coconut¹⁰

Abundance of Coconut Husk Waste is a Global Problem

Since many countries economically thrive from coconut cultivation and other coconut related industries, coconuts are considered a valued commodity. About 50% of the coconut is made up of fibrous husk and about 85% of husks are discarded.¹¹ Common methods for discarding coconut husks are landfilling or burning. This builds up to environmental problems because it leads to air pollution and attracts mosquitoes. Furthermore, during the rainy season, once the coconut husk absorbs the rain, tannin is extracted from the husks. Tannin, a chemical, is released to the environment in liquid form and is harmful, causing water pollution. Moreover, the excess of coconut husks will induce pests such as coconut beetles and fungi which destroy the coconut trees. The discarding of this material has a huge impact on the global economy. Estimates suggest that 95% of the coconuts grown globally are owned by 10 million farmers who earn an average income of less than 60 baht a day.¹¹ If countries discover the economic potential for the uses of the coconut husks, the average income of these farmers could increase in Thailand.

Thailand's Problem with Coconut Husks

Coconuts are cultivated in many parts of Thailand and have been an important crop for centuries. Coconut groves and farms extend over landscapes from Surat Thani through Chumphon and Prachuap Khiri Khan, up through Phetchaburi.¹² Coconuts are used in Thai products and Thai food. Many of these products are made by using the raw meat of the coconut that is processed in factories. However, the coconut husks are left as unused material. In some parts of Thailand, coconut shells and husks are burned to make charcoal.

A Lhong is a place where coconuts from Amphawa and southern regions of Thailand have their meats and liquid extracted. When the coconut husks are delivered to the Lhong, the Lhong workers discard the husks into piles outside of the facilities, where they are burnt as waste material. The dust from the burning will disperse to the surrounding households and the people who live nearby the Lhong can be negatively affected.

The Application of the Coconut Waste with the Circular Economy

A circular economy focuses on careful resource management where no parts are wasted; products and materials are stored, reused, reproduced and recycled in the most efficient ways. This restoration and reformation process is aimed at creating an endless looped supply chain where there is no waste.¹³ The concept of a circular economy has been developed in order to solve long term problems with resource management and environmental impacts. It is a new alternative for economic development towards sustainability in the future to add value to valueless materials like coconut husk waste.¹⁴ The circular economy makes recommendations for designing processes, products, services and business models that can drive sustainable business growth as the resources are managed more efficiently. There is a transformation of resources or materials; therefore, this will reduce the amount of waste generated. Since most of the farmers eliminate the coconut husk by burning, the application of a circular economy can reduce the amount of carbon emitted into the atmosphere. In addition, creating a value for the waste can reduce the use of non-renewable resources.¹⁵

Since every part of the coconut has a use, it's possible to apply a circular economy concept to the coconut sector. The most used parts include the coconut meat and the coconut water which can be used for drinking, food processing, and cosmetics. The part that is used less often is the shell which can be used for artistic souvenirs, flower pots, and bowls. The part that is rarely used is the coconut husk, although still has potential to be used in numerous ways.

Coconut Husk Waste Repurposed Globally

Coconut husks are reported as underutilized resources causing environmental pollution around the world. Various studies have shown that coconut husks can be used as raw material for food preservation¹⁶, cattle food supplements¹⁷, coolers¹⁸, and agricultural mulch¹⁹. The most plausible uses for coconut husks globally would be for agriculture purposes.

Coconut Husks in Agriculture

There are many benefits that come from using the coconut husks as a raw material for agriculture purposes. It can be used in multiple forms depending on the product that needs to be produced (figure 4).

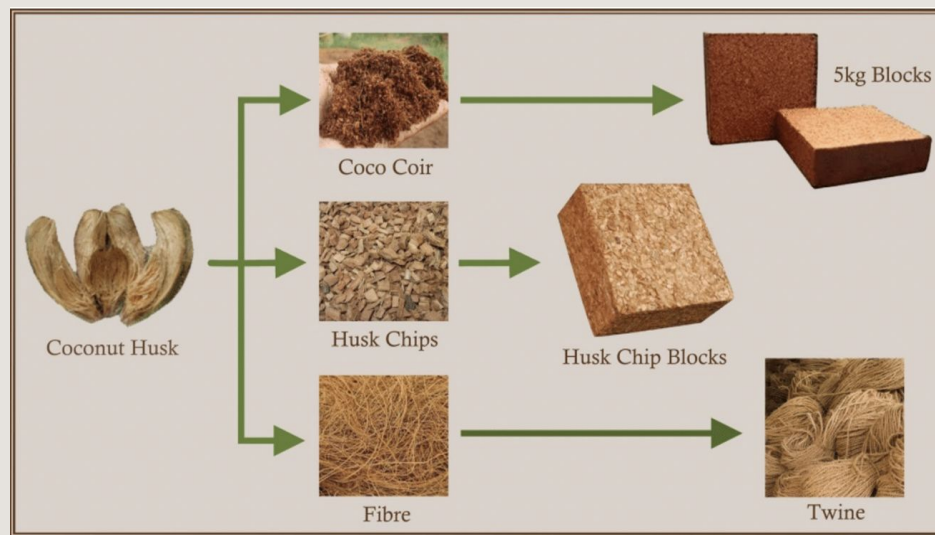


Figure 4. Coconut Husk by-products²³

The use of coconut husks as a growing medium for plants date back to the late 1940s. It was not until the early 1990s where coconut husks really made a breakthrough in being used in horticulture.²⁰ Coconut husks are used by commercial flower growers to help the roots of their flowers to thrive. The coconut fibers are extracted from the husks surrounding the coconuts by a machine. The use of husks in gardening became more popular and the majority of coconut husk suppliers are now based in the Philippines, India, Indonesia, Sri Lanka, and Brazil.⁷ These four countries have big factories that are set up to repurpose the coconut husk material.

The raw husk of the coconut contains lignin which is a naturally occurring chemical that promotes the growth of good bacteria for the plant's root system.²¹ The coir or coconut fiber, is the fibrous material extracted from the outer husk of the coconut. Coco coir is widely used as a plant substrate and growing medium as its water retention ability helps retain moisture for the plant for long periods of time.²² Pictured in figure 4, the coco coir is shredded to an extremely fine material so that it can be spread out evenly. Its high fiber and low cellulose content allows the material to be strong and durable. For growing mediums, the coco coir is usually compressed into blocks for the soil to retain water.

Coconut husks can also be cut to be made into husk chips to increase the stability of the soil; for bedding ground in a terrarium or potting soil. Pictured in figure 4, husk chips are larger chunks that can be used for different purposes. They can store water up to 9 times their weight.²⁰ Like coconut coir, they can come in pressed or unpressed forms.

The third most common thing that coconut husks are processed into is fiber. As one can see in figure 4, the coconut fiber is straw-like and is the least absorbent compared to other husk products. Coconut fiber can be used for other purposes than for agriculture. They can be made into brooms, dish scrubbers, rope, scrunchies, and decorative products.²⁴ They are also used to make coconut husk flower pots that are biodegradable.

Coconut Husks used as Composting

The Chiang Mai municipality recycles coconut husks into compost because of the large amount of coconut husk waste that is generated. Farmers in this district discard 10 tons of coconut shells and husks everyday (figure 5).

The price the municipality pays to hire a contractor to dispose of the waste is 30,000 baht per month. Burying the waste would cost the municipal office 900 baht per ton.²⁵ Both of these methods are costly for the district, so most of the farmers end up burning the coconut husk which negatively impacts the environment and the economy. In order to avoid high expenses and negative impacts to the environment, the municipality has taken composting into account. The district takes discarded coconut husks from local markets and communities and uses it for composting. The compost is distributed for free to communities and other municipal units for use in gardens.²⁵



Figure 5. Waste from the coconut husks in Lanna Rama 9 Park in Muang district, Chiang Mai²⁵

Coconut Cooler

In the Philippines, a company called Fortuna claims that styrofoam coolers negatively impact the environment.¹⁸ The two founders of Fortuna saw this as an opportunity to apply the research they have been conducting on design and sustainable development.¹⁸ After designing multiple prototypes, they decided to insulate their coolers with fiber from coconut husks. They found that insulating their coolers with this natural resource was more durable and insulative than the foam alternatives.¹⁸ The discarded styrofoam coolers quickly pile up in landfills and wash out to the sea, so using the coconut husk coolers would reduce land and ocean pollution.

Amphawa

Amphawa is the largest district in the Samut Songkhram province. The Mae Klong River flows through the northern part of this district and is located at the tip of the Gulf of Thailand. As seen in figure 6, the Amphawa Municipality is a subdistrict of the Amphawa district. The Floating Market is a large tourist attraction in the Amphawa Municipality.

Coconuts are grown all across Amphawa. There are many coconuts that are grown on the land along the Amphawa Floating Market. The coconuts are cultivated in groves and sold as various goods in the district.²⁶ Coconut groves and coconut meat extraction places are also located in Muang Mai. Muang Mai is a subdistrict in the Amphawa District and is 10 kilometers away from the Amphawa Municipality. There are three locations we considered in the Amphawa district; Muang Mai Subdistrict, Amphawa Chaipattananurak Foundation, and the Amphawa Floating Market.

Muang Mai Subdistrict

The general geography of Muang Mai is a river basin where the weather is suitable for coconut cultivation. Due to Muang Mai's geography being perfect for coconut cultivation, it also holds many Lhongs. The Lhongs are located near the coconut groves, so it is easy to transport coconuts being grown in Amphawa to the Lhongs. The coconuts in the Lhong are ripe coconuts that are not only grown in the Amphawa district, but also transported from the southern region of Thailand.

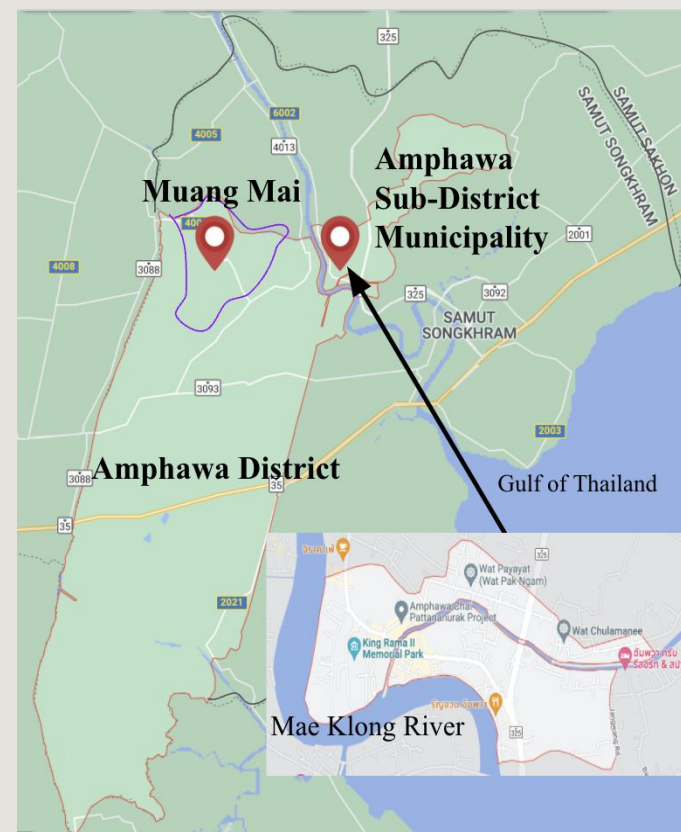
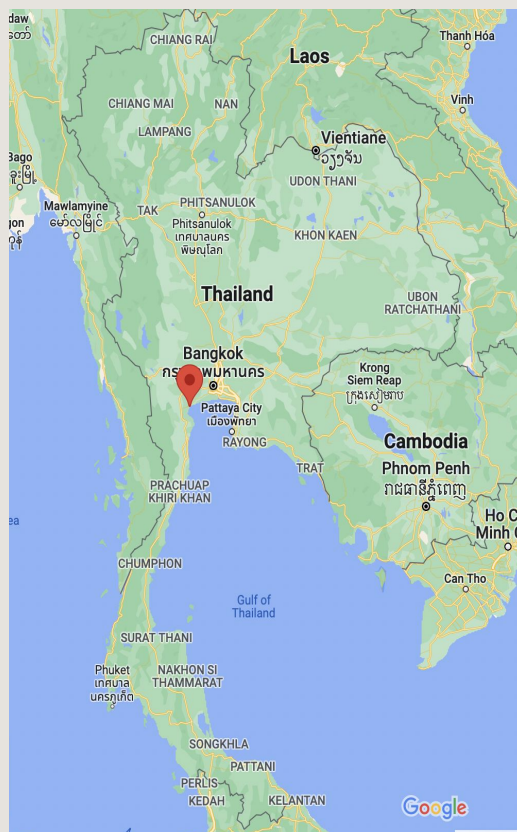


Figure 6. Samut Songkhram Province in Thailand (Google Maps)

The ripe mature coconuts are transported here because the Amphawa district is closer to Samut Sakhon and Bangkok, where there are abundant food processing manufacturers. From the southern region of Thailand, The exocarp of the coconuts are removed before the coconuts are delivered to the Lhong in Amphawa.

The husk surrounding the coconuts stay intact to prevent leakage of the coconut water and damage to the coconut meat during transportation. After the rest of the coconut has been extracted in the Lhong, the manufacturing industries will collect each part of the coconut.

Riverfront Market

The Amphawa riverfront market community is known as the “Floating Market” because of traditional uses of boats for transportation (figure 7). As a tourist floating market, its community works together to attract outsiders all year long. The locals run their own businesses and markets, so they play a huge role in the success of the market’s economy. Many locals who live in Amphawa have their own coconut farm because the geography allows them to grow easily and successfully.



Figure 7. Amphawa Floating Market ²⁷

Amphawa Chaipattananurak Foundation

The Amphawa Chaipattananurak Foundation is a royal project under the initiative of a member of the royal family. They designated the land, donated from a villager of Amphawa, to preserve traditional lifestyles while benefiting the community.²⁶ The foundation has coconut production businesses that produce coconut sugar, coconut shell paintings, coconut shell bird nests (figure 8), and more. To promote these products and preserve the traditional lifestyle, the foundation helps fund events to teach the local people in the community how to make some of the products. For example, the coconut sugar production unit helps teach local people how to make the sugar by using the coconut nectar from the palm tree. The foundation’s goals are to promote sustainable products that use the abundance of natural resources in Amphawa to benefit the environment and the community. This sustainable way of life and preservation of traditional lifestyle is appreciated by tourists.



Figure 8. Coconut shell business in Amphawa Chaipattananurak Foundation

The Coconut Business Plan Process

The main goal of this project is to create a business plan that repurposes coconut husk waste to increase economic growth in Amphawa. This project encompasses three main objectives, which are stated below.

Objectives:

1. Identify current resources and skills required to operate machines
2. Investigate potential product ideas
3. Develop a business structure for it

Objective 1: Identify skills required and current resources

We first needed to identify the available resources and skill-sets of the target workforce. Through interviews with members of the Lhongs, we learned about the supply and extraction of the coconuts. The other resources that were identified and evaluated are machinery and skills to use the machines. We then assessed the resources and the potential market to determine the product to implement for the business plan.

Evaluate the supply of raw material coconut husk waste

Miss Napat Chaturas is the director of the community in the Muang Mai Subdistrict and the director of the large Lhong that was interviewed.

We used semi-structured interviews and observation strategies as we visited one of the large Lhong to observe the process of how coconuts are extracted and how much is left to burn. The interview questions directed towards Miss Napat Chaturas can be found in Appendix B of the supplementary materials.

We then interviewed the director of one of the large Lhongs in Muang Mai to understand the abundance of the supply of the coconut husks. We planned to understand exactly what part of the coconut is considered waste and the process of the meat extraction. We learned this information through not only discussion, but also through observation.

Assess Machinery and Skills

The raw material of the coconut husks will have to be extracted with machines before using it to make a product. In order to identify the machinery, we interviewed experts of the machines from the companies, KSM and Siamdiecut. Their agriculture machines are mainly focused on making flower pots and plates out of coconut husks (figure 9). We conducted two interviews by phone that were semi-structured. We asked about the machines' uses, cost, training, and machine performance. For training, we learned about the level of training and the cognitive skills needed. We also wanted to know the amount of time it takes to make a product in the machine and the supply of raw material needed.

Through these interviews, we analyzed different manual and semi-manual machines. A weighted decision matrix was used to assess the cost, labor, and machine performance. The purpose of the decision matrix was to decide which machine would be used.

Assess Current Market Size

To learn about the market community in the Amphawa municipality we interviewed community leaders, which included our sponsor or deputy mayor, Krit Meetavee. The goal for our first interview with a community leader when visiting the Amphawa municipality, was to learn about the current situation of the market community and how has COVID affected the economy. These interviews were semi-structured in depth and face-to-face. The deputy mayor helped direct us to other community members and schedule interviews with them.



Figure 9. Coconut Husks

Objective 2: Investigate potential product ideas

We are investigating product ideas to successfully repurpose the coconut husks. The first part of this objective is aimed to understand the current potential markets and the logistics of Amphawa's markets. The second part of this objective was to decide on the potential products that would thrive.

Potential Markets

Before we investigated potential product ideas, we first needed to understand the potential markets. This was done by evaluating the products and strategies of the current successful markets in the Amphawa Chaipattananurak Foundation. We conducted interviews of five different business owners that consisted of selling souvenirs, art work, herbs, coconut related products, and flower pots. The interviews were done in person and were semi-structured. The aim was to understand the value of their product and their business strategy. The questions revolved around the logistics of their business and their marketing strategies. Through these interviews we were able to assess the potential markets and what products would thrive in it.

These products were selected based on data from interviews, price analysis, amount of raw materials, market potential, resources, and the startup cost.

Potential Products

After we interviewed some local business owners, we brainstormed a few product ideas and used a decision matrix to select our deliverable. The 5 main criteria we came up with for the matrix were cost, demand, other essential resources, manufacturability, and product performance. Some of the main products evaluated involved flower pots (figure 10), coconut plates, coconut mulch, and coconut fiber.

After understanding the expenses and income of creating each product, we are one step closer to giving a successful recommendation. Calculating the costs helped us estimate the profits and conduct break even analysis. For each product a list of expenses was created, the list included equipment, supplies, utilities, inventory, employee salaries, advertising, and marketing costs. After adding up the capital expenses for a full financial picture, a concrete number was found for funding requests. Calculating the break-even point helped us set revenue targets.

To find the break-even point meant we needed to find the level of production where the cost of production equals the revenues for our products. Completing this analysis let us know exactly how much the product needed to sell for in order for it to be profitable.

Estimating the market demand of each product was important because even the best product will fail in an inhospitable market. The Law of Demand states that the demand for the product decreases as the price increases.²⁸ We kept this law in mind when we were choosing the profiting prices that we were deciding between. We also compared these prices to the prices of our competitors because our they also play a role in our products demand.



Figure 10. Coconut husk flower pot

Objective 3: Develop a business structure

To develop a business structure, the first decisions had to be what type of business structure to create. This decision was simple due to the excess of coconut husks, as well as the Chaipattana Foundation preferring environmentally friendly products. A business structure that revolved around coconut husks was built. However, the first difficult decision that was made was choosing the products that were going to be sold. This objective helped us choose products that would create the most economic value for coconut husks.

A product decision matrix was made with the five main criteria being cost, demand, product performance, additional resources, and manufacturability. Evaluation of these products began and they were scored them on a scale from 1-5 based on the criteria that was created. The first criterion evaluated the ROI (Return on Investment) where 1 represents the products' ROI being below 25% and 5 represents the products' ROI being over 100%.

The second criterion evaluated the need or demand for the products where 1 represents there being no need for the products and 5 represents there being a necessity for the products. For this rubric, the demand of similar products in the rural region of Amphawa and the urban region of Bangkok were compared. For the third criterion, the longevity and sustainability of the products were evaluated. 1 represented the products lasting for one year and 5 represented the product being able to not wear down over time. The next criterion evaluated the cost for additional resources where 1 represents costs being over 75% of the profit and 5 represents no additional costs. This rubric called for extensive research on each product to make sure that nothing was left out of the decision. The final criterion evaluated the level of training required to create the product where 1 represents there being over one week of training required and 5 represents there being no requirement of training.

For each of these criteria, a weight value was added based on what was believed to be most important for running a business in Amphawa. The cost criteria was given the highest weight out of all the criteria.

This was done because citizens in Amphawa are less wealthy than the citizens in the city of Bangkok, so it was known that cost should have the largest impact on the decision. Demand was the second highest criteria in terms of weight, while product performance, additional resources, and manufacturability all tied for the lowest weight.

With these criteria, five different products were evaluated: Flower Pots, Cushioning Material, Coconut Mulch, Scrunchies, and Coolers. The sources of information that contributed to the picking of these specific products included case studies, sponsor recommendations, and additional research. Products such as these made from recycled agricultural waste are new to the marketplace, making it difficult to estimate costs and revenue. Therefore, assumptions were made based on data from comparable, competitive products such as plastic flower pots and coolers.

From this analysis it was concluded that flower pots were the best product with a score of seventy, however, mulch was a close second with a score of sixty nine. Since the mulch score was so close, it was decided to sell the mulch along with the flower pots. The final product decisions matrix can be found in the supplementary folder.

Machinery and Skills

Two different machine companies (KSM and Siamdiecut) that sold machines that could be used for modeling materials such as coconut husks were interviewed. The interview questions and information from these interviews can be found in Appendix F of the supplementary materials. To decide on a machine, another decision matrix was created to evaluate four molding machines from two different companies. To evaluate each machine three main criteria were used, the criteria being Cost, Operation Training, and Machine Performance.

The first set of criteria that were created for the machine decision matrix evaluated the cost of the machines where 1 represents the machine costing over 200,000 baht to purchase and 3 represents the machine costing

less than 75,000 baht to purchase. This criteria was important because we need to include machine costs in our capital expenses. The next set of criteria that was created for the machine decision matrix evaluated the training needed for the machines. 1 represents over a day of training required and 3 represents no additional training required. The final set of criteria evaluated the time it takes for each machine to mold the coconut husks. Criterion 1 represents the machine needing over two minutes to mold the coconut husks, while 3 represents the machine needing less than 1 minute to mold. Due to a limited budget, cost was the highest weight in our matrix and it was decided that labor and machine performance should be the same weight.

KSM Company

More interviews were conducted with two experts from KSM. There were two machines from KSM that were being looked into. These machines were the Bamboo 2L and the Bamboo 4 (figure 11). The Bamboo 2L costs around 80,000 baht while the Bamboo 4 costs over 200,000 baht to purchase. KSM also provides training when the machines are bought.

It takes around half a day to one whole day to learn how to use the machine properly. It is a less cognitive skill and is more reliant on the ability to follow instructions. A pot can be created from either of these machines every 1-2 minutes.



Figure 11. Bamboo 4 machine

Siamdiecut Company

With regards to Siamdiecut, a machine that can be used with the natural adhesive was ideal. As stated before, Siamdiecut provided us with 2 types of machines that can be used with coconut husk. The first type of machine shown in figure 12, requires a worker to press the controlling handle. The price is 55,000 baht, this includes the mold which is circular in shape. However, the pattern of the mold on this machine can be changed. The second type of the machine is an electric hydraulic machine. This machine is widely used for flower pots and the price of this machine was 110,000 baht including the mold in a circular shape. The pattern of the mold can also be changed.

After analyzing all factors of the matrix, the 55,000 baht Siamdiecut Manual machine was the machine of choice.



Figure 12. Siamdiecut Machine

Coconut Husk Supply

Through observation and interviewing Lhong members information was collected about the coconut extraction process. Observations were made about the amount of discarded coconut husks that were left to burn in front of the Lhongs as depicted in figure 14. The information collected is visually represented in figure 13. There are about 50 Lhongs (10 large Lhongs, 40 small Lhongs). 5,000 coconuts are extracted for its meat and liquid per day in the big Lhongs and about 1,000 coconuts are extracted per day in the small Lhongs. Once the meat is extracted from the ripe mature coconuts it is then sent to Bangkok for food processing. The husks of the coconut are discarded in front of the Lhongs to later be burned.



Figure 14. Coconut Husk Waste

However, every 3-4 months, a farmer visits the big Lhong to fit as many coconut husks as possible in a truck in order to reuse it for mulch. Nonetheless, this infrequent occurrence has a very miniscule effect on the supply of the coconut husk waste. The shells of the coconuts from Amphawa are used to make coconut flower pots that are sold in the market in Muang Mai that will be discussed later on.

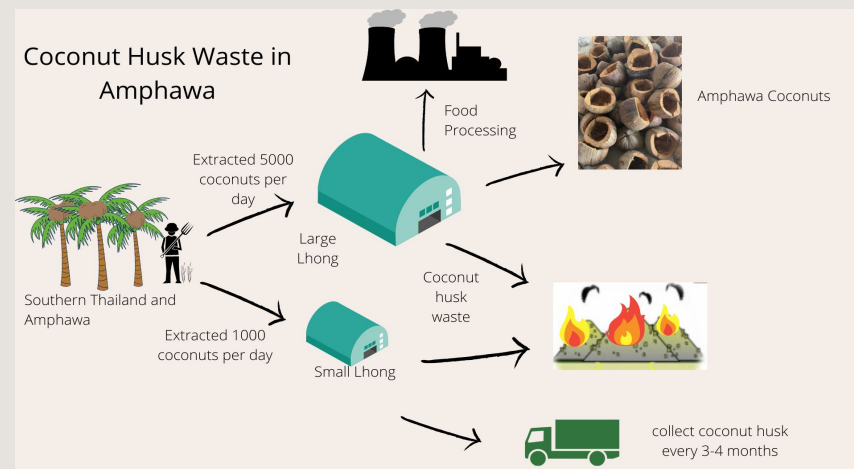


Figure 13. Coconut Husk Waste Process in Amphawa

Amphawa's Economy and Market Potential

Many entrepreneurs in the market are well experienced with having a direct relationship with their customers. The markets in the Chaipattana foundation even have hand crafters directly teach locals how to make their product. We interviewed some of the well-known business owners of the market and key community leaders to learn more about the business in the market and the customers.

Amphawa's Economy

There are many entrepreneurs and business owners who offer a variety of products. However, in the context of the current situation, COVID has played a big role in Amphawa's economy. In order to learn about the current situation about the floating market, an active member of the community working alongside the deputy mayor was interviewed. Satit Jiarasuksakul is a community leader of the market community. His experience helped give an insight of COVID's effect on the market. There are now 500 shops in Amphawa, Chaipattananurak Foundation included.

However because of COVID many of the shops had to close and only 60-70% of them are open. The shops have shut down because the income is nearly 0 baht most of the time. The Chaipattananurak Foundation mostly consists of 30-40 fruit shops and 4-5 coconut by-product shops. The floating market consists of clothing stores, restaurants, food, and other accessories.

In the beginning, rental cost for the area of floating market is 700 baht and now it has increased to 4500 baht per month. The rental cost for markets in the foundation is much less than the ones in the floating market, costing about 2,000 baht.

Markets in the Chaipattana Foundation

The Amphawa Chaipattananurak Foundation is a separate entity from the riverfront floating market. It includes small businesses and projects that are funded by the foundation (figure 15). They include coconut palm sugar products and allow locals to learn how to make them as well. They also have a coconut husk bird's nest shop where locals can paint their own coconut pendants.

They use every part of the coconut tree where the leaves can be woven into baskets and hats and the bark of the tree is used as well. Many of the small businesses in the Chaipattananurak foundation use natural resources for their products and are hand made.



Figure 15. Shop in Amphawa Chaipattananurak Foundation

We spoke with a famous artist and souvenir shop owner, Kriengsak Srichanrat, to discuss the success of his business and his future plans (Figure 16).

Kriengsak Srichanrat opened up his own shop in the Chaipattananurak Foundation more than three years ago where he sells souvenirs and art work. Most of his work is handmade, including souvenirs and his art work. However, some of the souvenirs are bought from other stores to be sold at his. Srichanrat and many other market owners believe that eco-friendly products are a trend and usually sell well.

Srichanrat used to make 200,000 baht monthly from his market in the Chaipattana Foundation, but now hardly makes 100 baht a month. He is a very active entrepreneur and does much of his business outside of the market where he sells coconut drinks and his artwork.

As an artist and farmer, Srichanrat is always looking for new ways to create art and use his resources. His next new product involves making lamps out of coconuts and has mentioned that coconut fiber could also play a role shades. Coconut fiber is not locally accessible, it needs to be extracted using a machine from the coconut in order to be of use. The interview questions for Srichanrat can be found in Appendix D of the supplementary materials.

The government and the foundation hold events for their businesses where experts teach local people how to make their products.

After speaking with K. Kittit, a herb seller in the foundation, it was learned that the government asked experts with skills to share their knowledge to the local people of Amphawa. K. Kittit is an expert on Thai herbs and shares his knowledge of production of these herbs with the local people. Many other markets in the foundation also hold events like this to share knowledge, preserve the traditional lifestyle, promote products, and inspire others to create their own business. Locals can also learn how to make coconut sugar at a coconut sugar farm. Coconut palm sugar making events have experts teach locals about using the nectar of the coconut palm to make sugar (figure 17). This method of marketing is why the Amphawa Chaipattananurak Foundation was chosen as a target location for the proposed business. Not only is this a good marketing strategy, but it can help train those who want to learn.

The Amphawa Chaipattananurak Foundation has many benefits when starting a business that uses natural resources. The abundance of natural resources and coconut markets make the foundation the perfect location to sell coconut products. The market is filling with eco-friendly products, which seem to be trending



Figure 16. Interviewing the souvenir shop owner

The low cost of the rental space in the foundation will benefit the owner with a storefront. After assessing the resources, skills, and deciding on a product, a business plan was proposed.



Figure 17. Coconut Palm Sugar Making

Conclusion

With a collaboration between the Municipality of Amphawa, Chulalongkorn University, and Worcester Polytechnic Institute, a business plan that repurposes coconut husk waste to increase the economic growth in Amphawa was created. With many of the natural resources coming from coconuts in Amphawa, Lhongs in Muang Mai Subdistrict also receive coconuts from southern regions of Thailand. Thousands of coconut husks are discarded as waste and burned in front of these Lhongs in Muang Mai daily (figure 18).

In order to eliminate the coconut husk waste by burning and burying, the plan was to add economic value to waste material. The Amphawa Municipality community is growing with entrepreneurs and business owners to attract locals, domestic tourists, and international tourists. The government and locals of Amphawa encourage sustainable products because of Amphawa's abundance of natural resources. These natural resources influence eco-friendly products trendy, where businesses that use natural resources and traditional processes of production can thrive. Although the decrease of pollution is miniscule even with the business plan, it is a step in the right direction. This plan will require labor, therefore indirectly generating a source of income for the potential business owner. With extensive research done in the Amphawa markets as well as the Chaipattana Foundation, this business plan does have potential to bring success to whoever is given the opportunity.

The business proposed is SimplyCoco, where the recommended products are coconut flower pots, mulch and coconut fiber. Not only does this business add value to a waste material, but it brings income and jobs to community members of Amphawa.



Figure 18. Coconut Husk Waste in Muang Mai

Addendum

Business Plan

With the data gathered, a business plan was created. The plan is based on a lean business, which is a type of business structure based around saving money, simplicity, and efficiency. The reason for focusing on a lean plan versus a traditional plan is because it seems that in Thai business, the plan and execution is as simple as possible. There will be many opportunities to eliminate costs as well. The following shows the logistics of the business plan:

Executive Summary

In Thailand, there is an ongoing trend to shift to more sustainable products and materials. Many citizens are beginning to see the damage that pollution can do to a city, and feel it is time for change.



Flower pots and plants can be seen as a staple for many Thai people, however this staple is beginning to harm the environment due to excessive use of plastic flower pots. SimplyCoco is proposing an alternative option using coconut husks. With Thailand being one of the world's largest producers of coconuts there are always plenty to be used. Most of the parts of the coconut have some type of use, the interior for eating and drinking, and the shell is very versatile and can be sculpted and used for many things. However, the husk is rarely used and is often burned or buried as waste. The product looks to take those husks and turn them into something profitable.

Business Objectives:

1. Create successful products from coconut husk waste.
2. Make the product profitable to help economic growth in the Municipality of Amphawa.
3. Promote these products through a facebook page to minimize advertising costs.

Unique Selling Point:

The products are completely biodegradable and environmentally friendly. This provides consumers an alternative to using plastics. Another selling point is that three products are being offered in three different ways, the coconut husk flower pots, the coconut husk mulch, and the coconut husk flower pots paired with the mulch to promote plant growth.

About SimplyCoco:

SimplyCoco is an environmentally friendly company aimed at finding a way to reduce plastic usage. This business plan was created for someone with experience in the Amphawa Market, it is also expected to be a single family business just like a majority of businesses in the market. The goals include creating economic value for the municipality of Amphawa and fighting the war on plastic waste to help the community become more environmentally friendly.

Key Partners:

The key partner for the business plan is Chaipattana Foundation which the foundation will help to reduce rental cost, and provide a storefront in Amphawa. The main key supplier is the coconut Lhongs, where there is an abundance of unused coconut husks. Another key partner is the machine suppliers. The machines being supplied are the fiber separator and the pot molding machine.

Key Resources:

The key resources are going to include coconut husks, necessary machinery, and natural adhesive. Another plan is to have a hatchet to chop additional husks into mulch. The main resource, coconut husk, is always going to be in abundance. The other two necessary resources are easily obtainable as well.

In terms of non material resources, the future owner of the business will ideally have valuable experience in Thai business ventures.

Key Activities:

The business's key activity is going to be creating flower pots and mulch from coconut husks. Coconut fibers will also be an output of the company, which can be sold as raw materials. The owner of the business is expected to be a former business owner with experience as an entrepreneur. To expand the business and market the products, the plan is to teach community members how to make some of the products such as the flower pots.

Value Proposition:

The product is going to hold a value in the community for many reasons. The first reason is that sustainability is becoming a trend in the community. The product is extremely eco friendly compared to the rival plastic. Through some interviews with flower vendors, it was learned that they purchase plastic flower pots for 10 baht each. The business should be able to compete with this since 10 baht per pot was the planned price. However, the one disadvantage to the product is it does not last as long as plastic, but the pots still last well over a year.

Customer Relations:

The plan to communicate with consumers matches the advertising plan, through Facebook. Also, if a grant is received from the Chaipattana Foundation, a storefront will be given, however, rent is not included. When working with the Chaipattana Foundation, it is possible to grow a relationship with customers and locals by teaching them how to make flower pots.

Marketing:

As stated above, all of the marketing will be done through Facebook to eliminate any additional advertising costs. This means that there is only need for one form of marketing to get the product noticed in both Amphawa and the entire country of Thailand. Furthermore, this is a Facebook Page, not Facebook ads. A page is completely free to develop and run whereas ads must be paid for.

Target Market:

The target market is the farmers, market goers, tourists, and flower shop owners of Thailand. Based on interviews with 9 farmers in Muang Mai Subdistrict, it was found that most of the farmers are using plastic pots.

Thus, coconut husk pots meet the needs of farmers as the coconut husk pots are cheaper than the plastic pots. Also, when the mulch is sold with the coconut husk pots, this can reduce the plastic packages of the mulch. Moreover, the market goes and tourists will show interest in the flower pots, for many coconut product vendors have seen great success in the market pre-covid. Selling to flower vendors will help us attain the goal of selling the flower pots in bulk. The Facebook page will give the opportunity to reach out to general citizens of Thailand who are already interested in sustainable planting. Currently, Thai citizens and tourists are interested in sustainable products because they have started to realize the effect of plastic on the environment. They are seeking alternative ways to save the environment. Therefore, the eco-friendly product is one of the choices that can answer the customer's needs.



Opportunity:

The biggest opportunity is to obtain funding from the Chaipattana Foundation, which grants local businesses an initial fund and business plot in their foundation. The ideas of sustainability fit directly into the foundation's ideologies of environmentally friendliness and economic growth.

Cost Structure:

The largest cost concern is going to be the one time purchase of all of the machines necessary to make the pots. However, since this is a one time purchase once enough money is made back to cover the costs of the machines, all other money made is a profit. So like any startup business there will be substantial debt to begin with.

Revenue Streams:

Customers are going to pay for the product versus plastic because many consumers are looking for environmentally friendly alternatives to products that they currently purchase. According to Srichanrat, many people in Thailand are searching for more environmentally friendly answers to plastics, as he is one of the top vendors in the market, his input should be valued. The product is providing eco-friendly value that similar companies and products are not. If a plastic pot is thrown away as waste it will take thousands of years to biodegrade, whereas the eco-friendly product would be significantly shorter.

SWOT Analysis Strengths	Weaknesses	Opportunities	Threats
Environmentally friendly product	Some people may not want to switch from plastic	Availability of freelancers that are well-versed in traditional marketing	Well established companies with strong products
Plenty of raw materials to use	Coconut husk flower pots will not last as long as plastic	The potential growth for a startup business in the Chaipattana Foundation	Plastics

Marketing Plan

Since the marketing strategies for every market owner in the Municipality of Amphawa is rather untraditional, the owner will have to match their marketing schemes to find profit.

The plan is to promote the product through Facebook (figure 19). Many market owners that have success in the Floating Market have one thing in common; they eliminate marketing costs by solely marketing their product through Facebook. For the business in terms of sales, ideally it will be mostly through wholesales, meaning the product should be sold in bulk.

Responsibility

The business owner will be operating the machine 4 days a week at 8 hour shifts each day. On the days off the owner will be responding to the Facebook Page, as well as traveling to Bangkok to try and get additional sales with the flower pots. The business owner will get paid minimum wage for the four days a week of labor, as well as the profit of the business as well.

Location Analysis

The business will be located at the Amphawa Chaipattananurak Foundation. The strategy should follow another successful business owner in Amphawa and travel to Bangkok to sell additional products on off days and send out deliveries from Facebook.

Marketing Strategies.

Distribution will be done through the store fronts and Facebook page. Costs of distribution have already been added to the financial feasibility sheet.

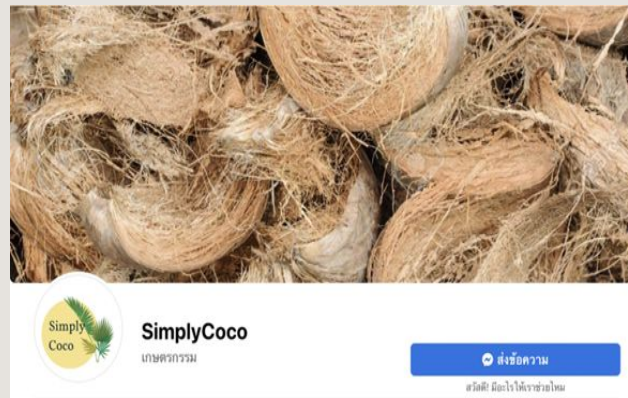


Figure 19. SimplyCoco Facebook Page

Pricing Scheme And Sales Volume Potential

The setting price of the flower pots have to match with the plastic flower pots at about 10 baht per pot in bulk and 20 baht per individual pot purchased. The reason for this is that the product is meant to be bought and sold in bulk, so doing this would encourage buyers to purchase the product in wholesale.

Economic Calculations

To get proper forecasting predictions for our unit sales there first had to be a calculation for how long it takes to create a single flower pot. In a time study that was devised, a member observed the process of creating a coconut husk flower pot ten times. It was learned that it takes on average two minutes and ten seconds to create a single flower pot.

With the results from the time study, single unit production calculations were made. The outcome was that it is possible to make 775 flower pots a week, on average. The average includes a 4 day work week with 8 hours of work per day with a 1 hour break per day, resulting in 28 hours per week. This data is going to be used in the production and sales forecast.

There are various assumptions to go with the unit calculations. Turning the husks into fibers and mixing the fibers with the adhesive was not included in the time study, therefore, additional time is needed for these operations. It is also assumed that the worker is skilled with their hands for trimming the excess fibers.

To evaluate costs of products and the logistics of profitability, a production and sales sheet was created to forecast production sales. Forecasting is an important part of creating a startup product. It is worth noting that financial projections will never be 100% accurate but they will help us identify which products will be profitable and which products will lose money. The sheet was created through single unit calculations. This means the average time was calculated to make one pot, then it was divided into the hours of work per week.

Three sheets were created, the first was a lowball sheet to anticipate what happens if units created go below average production. The second was a highball sheet to anticipate what happens if units go above average production. The third was an average sheet, where the unit calculations are true projections.

The units sold section includes the amount of coconut husk flower pots, flower pots with mulch, and coconut fiber sold.

The capital income section assumes that the business will receive a grant from the Chaipattana Foundation, which would pay for the molding machine but not the shredder. The foundation will cover 55,000 baht of the initial capital cost.

The capital cost section includes the two necessary machines for the product, the coconut fiber machine and the fiber molding machine. It also accounts for additional hand tools necessary, including a hatchet to chop the mulch and scissors to trim the excess off of the pots. The capital cost is expected to be 75,000 baht.

The operating cost, or recurring cost, accounts for all of the expected costs of production. The first cost is labor, based on the assumption that the owner can pay themselves minimum wage, which is 300 baht per day in Thailand.

Costs also include the adhesive glue necessary to create the pot, transportation and delivery costs (shipping and handling), and rent.

The Production and Sales sheet also includes the following assumptions:

1. The majority of the revenue will be made through wholesale.
2. The business will sell a week's production every month.
3. The business will get a Chaipattana grant to cover the cost of the molding machine.
4. The business will purchase machines at list price.
5. It takes two minutes and ten seconds to create a pot.

All of this data is combined and formulated to give the business owner their projected profit, if they are able to sell what is expected on the sheet. After running the projected production through the product and sales sheet, it came to the conclusion that the owner would be able to recoup the cost of the fiber machine and earn a profit of around 30,000 baht over the first two years on top of their minimum wage payment. The goal is to sell 775 pots, or one week's production, in one month. The full calculations and all of the excel sheets can be found in the supplementary files.

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