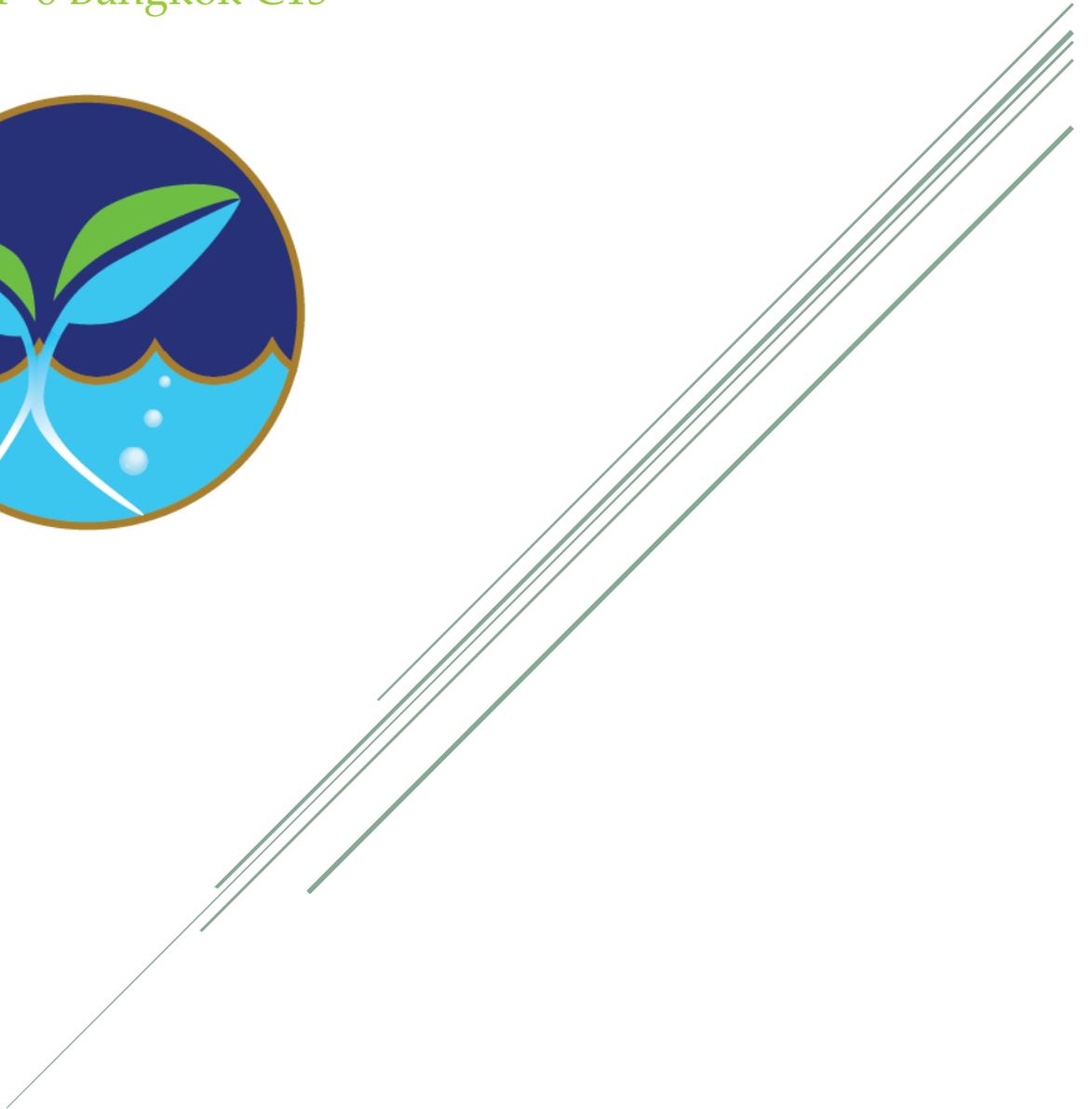


# PROMOTING THE HYDROPONICS PROJECT OF THE CHAIPATTANA FOUNDATION IN PRACHINBURI, THAILAND

IQPSSP-6 Bangkok C15





**WPI**



**จุฬาลงกรณ์มหาวิทยาลัย**  
**Chulalongkorn University**  
Pillar of the Kingdom

# Promoting the Hydroponics Project of the Chaipattana Foundation in Prachinburi, Thailand

An Interactive Qualifying Project Report submitted to the faculty of Worcester Polytechnic Institute  
in partial fulfillment of the requirements for the Degree of Bachelor of Science in cooperation with  
Chulalongkorn University

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*This report represents the work of four WPI and four Chulalongkorn University undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review. The opinions presented in this report do not necessarily represent the opinions of WPI, Chulalongkorn University or the Chaipattana Foundation.*

## Abstract

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This project aided the Hydroponics Project of the Chaipattana Foundation in raising awareness of hydroponics, itself, and its learning program within the Muang district in Prachinburi, Thailand. The team conducted three sets of both surveys and interviews with local market consumers, vendors, schools, and farmer organizations and analyzed the data qualitatively and quantitatively to verify low awareness and determine effective methods for raising awareness. Based on the results, the team developed a public relations strategy consisting of a business card, brochure, poster, website, and Facebook strategy. Additionally, the team developed guidelines for distributing printed materials, editing the website, and improving Facebook outreach to sustain the strategy following project completion.

## Executive Summary

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In rural areas in developing countries such as Thailand, agriculture is the main source of poverty reduction, income, and employment. The agricultural sector is important to the country's economy because it provides employment and income to a large portion of Thailand's population, as evidenced by the fact that 46% of the 39 million people in the labor force worked in agriculture as of 2013 (FAO, 2014; Singhapreecha, 2014). In order to sustain agriculture, His Majesty King Bhumibol Adulyadej founded the Chaipattana Foundation in 1988 with the mission to improve the quality of life of farmers in Thailand ("The Chaipattana Foundation," 2014). The primary focus of the over 3,000 Royal development projects funded by the foundation is to combat poverty and promote self-sufficiency in rural communities (Kukarja, 2007). Specifically, the foundation develops projects based on the following objectives: focus on helping farmers; promote and support sustainable development and self-sufficiency; and encourage local participation in initiatives ("The Chaipattana Foundation," 2014).

The Chaipattana Foundation is exploring hydroponics an alternative farming technique. Hydroponics is a soilless farming technique that uses a nutrient solution to nourish plants with roots submerged in water (Kao, District, Improvement, & Hsiang, 1989). Benefits of this technique include reduced water consumption and increased product quality and yield. However, hydroponics often requires a high initial investment and can grow a limited number of plant types in comparison to soil-based agriculture (Carruthers, 2005; Resh, 2012).

One of the projects initiated by the Chaipattana Foundation is the Hydroponics Project of the Chaipattana Foundation (HPCF), located in the Muang district of the Prachinburi province. The HPCF is a farm and learning center that utilizes hydroponics to grow its produce and teaches the technique through its learning program (Parmornsood, n.d.). Although the HPCF is currently self-sufficient, the farm manager, Patcharin Puttharit, expressed one of her visions for the center to "Have more people to learn and be interested in hydroponics ... to make this farm more well-known to the local people in Prachinburi and others who are interested..." (P. Puttharit, personal communication, January 14, 2015). The HPCF is limited in its ability to promote itself as a valuable resource for hydroponics learning.

In order to help achieve Patcharin Puttharit's vision of making the HPCF better known to the local people in Prachinburi, our project goal was to raise awareness of hydroponics, the HPCF, and its learning program in the Muang district where the HPCF is located. To accomplish this goal our team developed the following objectives targeting hydroponics, the HPCF, and its learning program in the local community:

1. Determine the current awareness.
2. Identify effective communication mediums to raise awareness.
3. Develop a public relations (PR) strategy to increase awareness.

Figure 0-1 outlines the three step process our team followed to complete our objectives and achieve our goal:

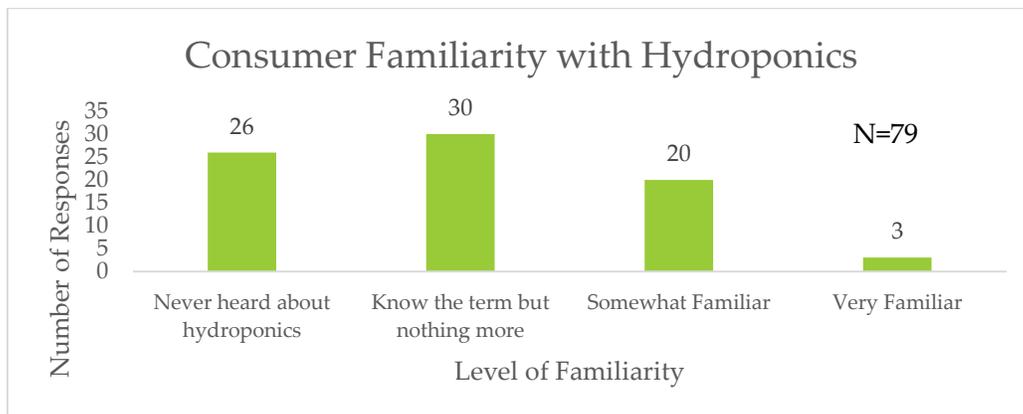


**Figure 0-1: Methodology Overview**

In step 1, Collect Information, we iteratively developed three surveys and three sets of interview questions. The team developed these data collection vehicles in English and the Chulalongkorn teammates translated them into Thai. The three surveys were the Market Consumer Survey, Market Vendor Survey, and the HPCF Consumer Survey and the three sets of phone interviews were the School Interview, Farmer Organization Interview, and the Previous Attendees of HPCF Learning Program Interview. Our team collected 101 consumer surveys in the Muang district. Additionally, we interviewed agriculture teachers from four local schools and leaders from three local farmer communities. The Chulalongkorn teammates administered the surveys and interviews and recorded the respondent’s answers for both types of data collection. The information we collected from surveys and interviews enabled us to complete our first two objectives. Using the data collected from these surveys and interviews, we answered the following research questions:

1. What is the current level of awareness of hydroponics?
2. What is the current level of awareness of the HPCF and its learning program?
3. What is the current satisfaction of the HPCF?
4. What is the community interest in hydroponics?
5. What are effective communication mediums?

In step 2, our team compiled and analyzed results from all of our data collection methods to address each of these questions using coding and statistical analysis. The results from our analysis revealed an overall low familiarity with hydroponics as depicted in Figure 0-2 below:



**Figure 0-2: Consumer Familiarity with Hydroponics**

Coupled with the low familiarity of hydroponics is a low level of awareness of the HPCF and its learning program. From our results we determined that 59 of 85 (69%) respondents were not aware of the HPCF. However, 50 consumers (60%) responded that they were interested in growing their own produce. Our team found a significant positive association between consumer interest in growing produce and familiarity with hydroponics. This association suggested that consumers in the local community were a potential target for an increased HPCF public relations effort.

Our team surveyed current customers of the HPCF and interviewed previous learning program attendees to determine their satisfaction with the produce grown by HPCF and the learning program. We asked consumers to rate the quality of the HPCF produce and 10 out of 10 respondents ranked the produce as superior quality. Additionally, when assessing the quality of the learning program, 17 out of 22 (77%) interviewed previous attendees chose the highest ranking (very satisfied) with the learning program and no one said they were unsatisfied. These high quality ratings led us to believe that the HPCF did not need to focus on internal improvements.

In order to increase the awareness of the HPCF, our team investigated effective mediums of communication in the local community. When analyzing the consumer access to and use of the Internet we found that a total of 52 out of the 85 consumers (61%) had access to the Internet through different devices, as shown by Figure 0-3.

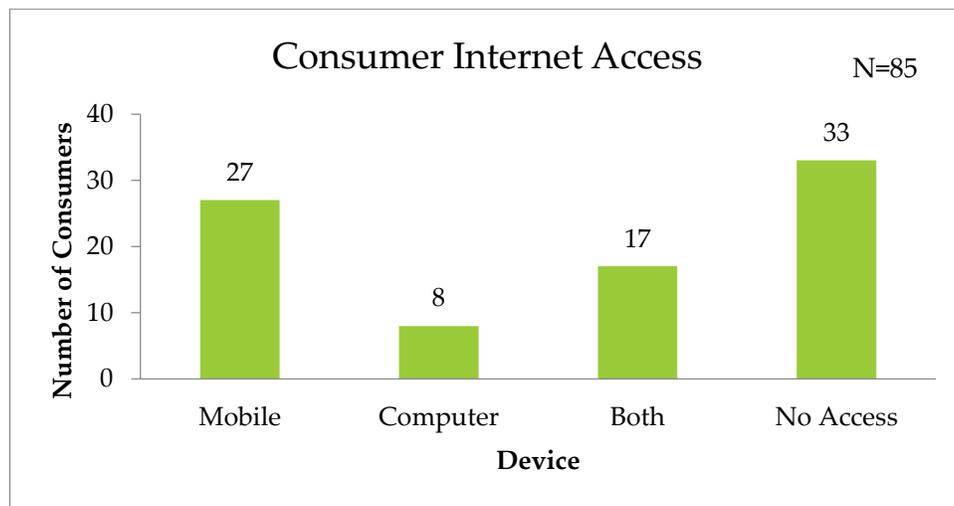


Figure 0-3: Consumer Internet Access

If a respondent had Internet access, we proceeded to ask them which social media platforms they used. Figure 0-4 shows that almost all respondents with Internet access used social media with Facebook and Line being the most prevalent platforms. Many consumers used more than one type of social media.

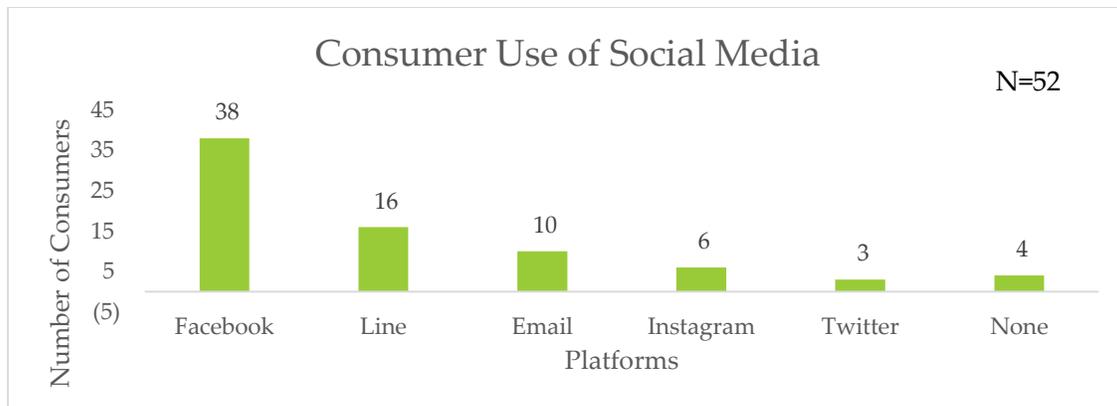


Figure 0-4: Consumer Use of Social Media

In step 3, our team used PR strategy background research to develop six components of the strategy: objectives, target audience, message, budget, efficacy measurement, and medium. We used the results from our surveys and interviews to determine the objectives and target audience and employed a strengths, weaknesses, opportunities, and threats (SWOT) analysis to define the message. We then considered the abilities of the HPCF to determine the budget and available tools for measuring the efficacy of the PR strategy.

We consulted Thawatchai Saengthamchai, a PR expert from WHY NOT Enterprise to organize the message to convey through effective communication mediums. From this meeting our team developed a three phase process for our PR strategy: generate initial interest in hydroponics and the HPCF, provide detailed information to increase knowledge, and direct target audience to the HPCF as a resource for further learning.

We developed offline and online materials in Thai and English for the first two phases of the PR strategy because our target audience contained community members with and without access to the Internet. The first phase PR materials consisted of a brochure, a poster, and business cards as displayed in Figures 0-5, 0-6, and 0-7 below.

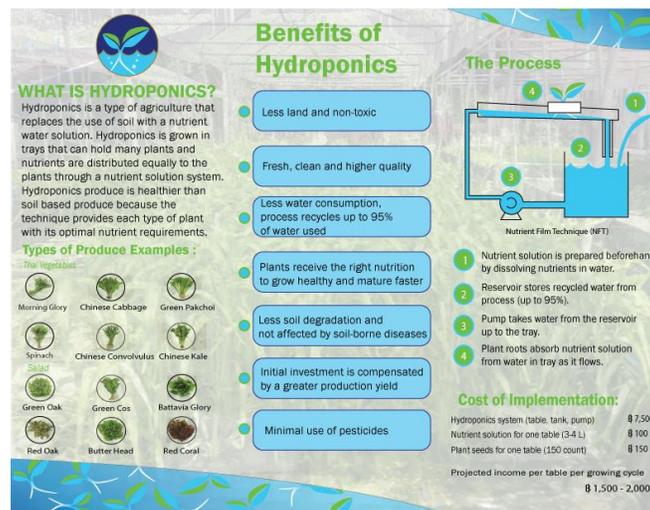


Figure 0-5: Brochure

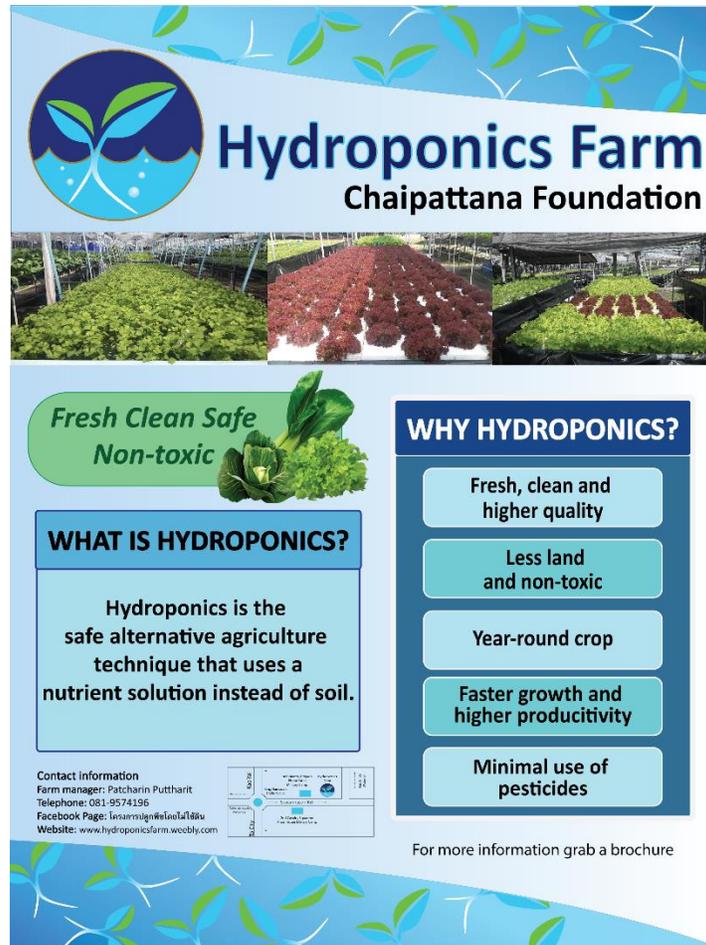


Figure 0-6: Poster



Figure 0-7: Business Cards

The second phase PR materials included a website (<http://hydroponicsfarm.weebly.com/>) as shown in Figure 0-8 and a Facebook page strategy. In addition to the PR materials, our team developed PR strategy implementation guidelines in Thai and English that pertain to each communication medium including distribution guidelines for printed materials, a website editing guide, and Facebook page strategy. We developed these guidelines to ensure that the HPCF employees will be able to sustain and further develop the PR strategy following the project completion.



Figure 0-8: Screenshot of Website Homepage

Our team recommended that the HPCF implement the developed PR materials to achieve our goal to raise awareness of hydroponics, the HPCF, and its learning program within the local community. Based on our background research, field work, and results our team is confident that local awareness of hydroponics, the HPCF, and its learning program in the Muang district of Prachinburi will increase and this improved awareness aligns with the goal of the Chaipattana Foundation to promote sustainable development.

## Acknowledgements

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Our team would like to thank the numerous parties that helped us through the completion of this project.

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Last but not least, we would like to thank our families for their love and support throughout the project.

Without the help of those mentioned above, this project would not have been possible.

## Authorship Page

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# 1 Introduction

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Agriculture is the main source of income and employment in rural areas of developing countries around the world and its economic and social importance in Southeast Asia is widespread (Kasem & Thapa, 2012; Norton, 2004). In Thailand, agriculture has played a significant role in the reduction of poverty, which historians primarily attribute to the high agricultural growth in the 1980s. This role is made evident by the fact that the poverty rate decreased from 57% in 1962 to 10% in 2002 (Kasem & Thapa, 2011). Moreover, historians consider the agricultural sector of Thailand to be the backbone of the country's economy because it provides employment and income to 46% of the 39 million people in the labor force (FAO, 2014; Singhapreecha, 2014). In addition to the economic significance, agriculture has a profound social importance to Thai people because a total of 51% of Thailand's population live in rural areas and their lifestyles revolve around agriculture ("Rural population," 2015). Furthermore, agriculture is seen as a way of life - an occupation with important traditions and values for rural people who have long lived in harmony with nature (Jitsanguan, 2001).

In order to sustain agriculture as the backbone of Thailand's economy, His Majesty King Bhumibol Adulyadej founded the Chaipattana Foundation in 1988 with the mission to improve the quality of life of farmers ("The Chaipattana Foundation," 2014). The primary focus of the over 3,000 Royal development projects implemented by the foundation is to combat poverty and promote self-sufficiency in rural communities (Kukarja, 2007). Specifically, the foundation develops projects based on the following objectives: focus on helping farmers; promote and support sustainable development and self-sufficiency; and encourage local participation in initiatives ("The Chaipattana Foundation," 2014).

One of the projects initiated by the Chaipattana Foundation is the Hydroponics Project of the Chaipattana Foundation (HPCF), located in the province of Prachinburi. The HPCF is a farm that utilizes hydroponics to grow its produce and teaches the technique through its learning program. Hydroponics is a sustainable agricultural method that uses nutrients dissolved in water to replace the use of soil in traditional farming practices (Dreschel, 2014). Some advantages of this technique include reduced consumption of water, minimal need for pesticides, and increased maturity rate, yield, and quality of products. However, hydroponics often requires a high initial investment and can grow a limited number of plant types in comparison to soil-based agriculture (Jones, 2014).

Promoting hydroponics through the HPCF aligns with the objectives of the Chaipattana Foundation with regard to sustainability, self-sufficiency, and its focus on agriculture. Although the HPCF is currently self-sufficient, the farm manager, Patcharin Puttharit, expressed one of her visions for the farm to "Have more people to learn and be interested in hydroponics... to make this farm more well-known to the local people in Prachinburi and others who are interested..." (P. Puttharit, personal communication, January 14, 2015).

In order to help achieve Patcharin Puttharit's vision of making the HPCF more well-known to the local community in Prachinburi, our team's goal was to raise awareness of hydroponics, the HPCF, and its learning program in the Muang district where the HPCF is located. To accomplish

this goal our team developed the following objectives targeting hydroponics, the HPCF, and its learning program:

1. Determine the current awareness.
2. Identify effective communication mediums.
3. Develop a public relations (PR) strategy.

In order to complete these objectives, our team surveyed and interviewed various groups in the community. From our Market Consumer Survey, our team determined that there was low awareness of hydroponics, the HPCF, and its learning program but a high interest in growing produce. By interviewing local schools and farmer organizations we found that there was interest in learning more about hydroponics. In order to determine whether the HPCF needed to focus on internal improvements, our team interviewed previous HPCF attendees and surveyed HPCF customers. We found a high level of satisfaction of both the learning program and produce, and used these results to develop materials for the HPCF PR strategy. The focus of the PR strategy was to provide the local community with information they lacked about hydroponics, such as its general process and the production and environmental benefits of using the technique. We also included the HPCF's availability as a learning resource as well as its contact information and location to raise awareness of the farm and learning program. Lastly, we developed implementation guidelines for the use of each PR material to ensure the sustainability of the strategy.

Chapter 2 of this report presents background knowledge related to the context of our project. Chapter 3 then provides detailed information on the methods we used to achieve our objectives. Chapter 4 discusses the results of our data analysis from the surveys and interviews. Lastly, chapter 5 includes our conclusions and recommendations for the HPCF.

## 2 Background Information

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This chapter begins by establishing the importance of agricultural productivity in Thailand and discusses programs developed by the Thai Royal government which seek to sustain and expand the sector. The next section describes how these initiatives improve agricultural production through promoting hydroponics as a more sustainable alternative farming technique than soil-based agriculture as well as the limitations of such initiatives. Additionally, this chapter provides guidelines for developing a PR strategy. Finally, this chapter discusses case studies exploring how hydroponics learning can apply to various subgroups of the community.

### 2.1 Importance of Agriculture in Thailand

Agriculture in Thailand has been central to the nation's development throughout its history. In the 1960s, the agricultural sector was the main driver of the economy and the sector employed 70% of the labor force. Thailand's rapid economic growth led by manufacturing in the 1980s transformed the agricultural sector by slowing its growth but increasing its productivity. The agricultural sector became more mechanized and capital intensive, assisted by an increase in credit availability. In addition, the emergence of high value markets resulted in a diversification and specialization of agriculture (Leturque & Wiggins, 2010). The resulting increase in agricultural productivity helped decrease the poverty rate from 57% in 1962 to 10% in 2002 (Kasem & Thapa, 2011). Furthermore, food poverty<sup>1</sup> decreased from affecting 2.55 million households in 1988 to 418,000 households in 2007. Child malnutrition also decreased from 17% to 7% in the same time period (Leturque & Wiggins, 2010). In 2013, 46% of the 39 million people in the labor force in Thailand worked in agriculture and the sector contributed 12% to the country's GDP (FAO, 2014; Singhapreecha, 2014).

### 2.2 The Chaipattana Foundation

Due to the strong influence of agriculture in the Thai economy and society, the Thai Royal Government has made it a goal to improve the quality of life of farmers throughout the country. To accomplish this goal, His Majesty King Bhumibol Adulyadej established many organizations such as the non-profit Chaipattana Foundation. Referring to this foundation, the King stated in a royal speech in 1996 that, "We [committee members] are public-spirited developers joining to contribute to national and social development. Our joy comes when such progress is realized. That is truly 'Chaipattana' or the Victory of Development" ("The History of Chaipattana Foundation," n.d.). The King founded the foundation in 1988 with the purpose of increasing agricultural development to improve the farmers' livelihoods and increase their self-sufficiency, or ability to maintain oneself without outside aid ("Self-Sufficient," n.d., "The Chaipattana Foundation," 2014). The foundation has since initiated over 3,000 Royal development projects, the majority of which are dedicated to combating poverty and encouraging greater self-sufficiency within rural communities (Kukarja,

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<sup>1</sup> Food poverty: the inability to have an adequate and nutritious diet due to issues of affordability and access to food with related impact on health, culture, and social participation ("Food Poverty - Healthy Food for All/Healthy Food for All," n.d.).

2007). The foundation also focuses on simplicity and the conservation of natural resources, which not only benefit Thai people but also promote sustainable development on a country-wide scale.

His Majesty the King believes that all people have the freedom to make their own decisions regarding their livelihoods and culture. Similarly, the Chaipattana Foundation encourages farmers to make educated decisions to become self-sufficient through methods that require minimal to no assistance from outside resources. The King also promotes local participation to create harmony within communities leading to increased economic success and happiness. One advantage for rural farmers working with the Chaipattana Foundation is that due to its non-governmental status, it can provide educational resources faster than the Thai government (“The Chaipattana Foundation,” 2014).

Presently, the Chaipattana Foundation funds and manages its projects with the following main objectives:

1. Focus on helping farmers
2. Promote and support sustainable development and self-sufficiency
3. Encourage local participation in initiatives

One way the Chaipattana Foundation is accomplishing its goals is by promoting hydroponics as a more sustainable agricultural technique than soil-based techniques.

### 2.3 Hydroponics Agricultural Technique

Hydroponics is a soilless farming technique. Even though historians consider soil-based farming to be a traditional agricultural method throughout history, soilless agricultural practices such as hydroponics date back to the ancient Hanging Gardens of Babylon and the floating gardens of the Aztecs in Mexico. Professor W.F. Gericke, from the University of California, suggested that hydroponics can be used commercially for the first time in an article for a scientific magazine in 1937 (Jones, 2014). Since the 1980s, the global commerce of hydroponically grown vegetables has expanded and hydroponics technology has improved.

There are multiple types of hydroponics systems with different levels of complexity. Therefore, farmers can customize their system based on specific requirements such as the type of produce grown, availability of materials, and cost (Dreschel, 2014). One source summarizes this range in complexity in the following quotation:

“[Hydroponics systems range] from a single plant supported above an aerated jar of nutrient solution to thousands of plants above a large area of flowing solution in which pH, temperature, and nutrient concentrations are controlled by using a sophisticated computer system and automated chemical analysis” (Dreschel, 2014, para. 2).

As of 2010, Thailand had 188 registered hydroponics farms for commercial production and home consumption. Hydroponics is a promising alternative agricultural technique due to the fact that 30% of arable land in Thailand has soil problems such as sandiness, salinity, or high concentration of acid-sulfate soils. Two common hydroponics techniques currently used in Thailand

are the Nutrient Film Technique (NFT) and Dynamic Root Floating Technique (DRFT) systems (Wattanapreechanon & Sukprasert, 2012).

The standard NFT, shown in Figure 2-1, pumps the nutrient solution from a reservoir to a container. A tray supports the plants above the container and the dangling roots come in contact with the nutrient solution. A table supports the main container at a slight angle to drain the nutrient solution back into the reservoir for reuse (Dreschel, 2014).

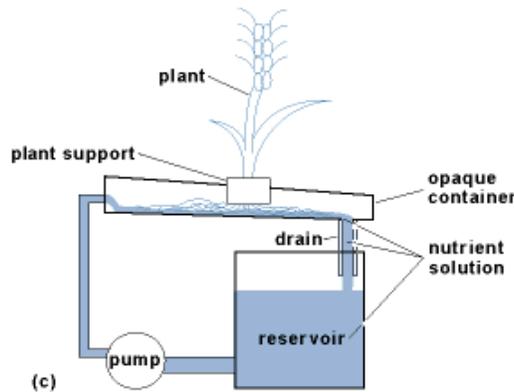


Figure 2-1: Nutrient Film Technique. Adapted from "Hydroponics," by T. Dreschel, 2014, *AccessScience*, para. 6.

The DRFT demonstrates the customizability of hydroponics systems because it is a hybrid of several hydroponics techniques as shown in Figure 2-2 (Dreschel, 2014). Similar to the NFT, this system pumps nutrient solution from a reservoir to a container that supports the plants. This system fully submerges the plant roots in the nutrient solution. The pump turns off when the nutrient solution reaches a certain depth and the nutrient solution circulates back to the reservoir through the overflow pipe or drain for reuse (Kao, District, Improvement, & Hsiang, 1989).

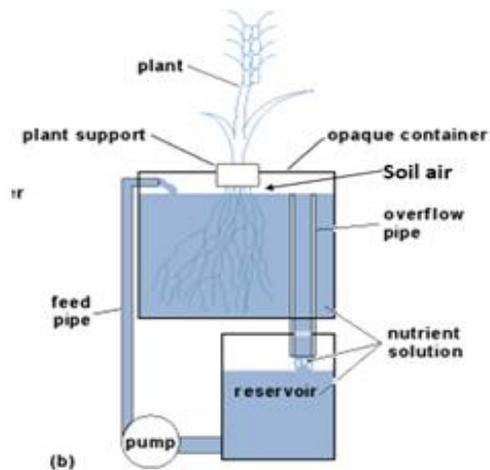


Figure 2-2: Dynamic Root Floating Technique. Adapted from "Hydroponics," by T. Dreschel, 2014, *AccessScience*, para. 6.

Table 2-1 compares the production and environmental factors for hydroponics with soil-based agriculture.

<b>Production</b>	
<b>Plant Nutrition</b>	The ability to control precise nutrition consumption for plants through the nutrient solution in hydroponics, in comparison to soil-based agriculture, permits farmers to grow healthier produce (Resh, 2012).
<b>Production Yield and Quality</b>	Hydroponics production can yield 50% more produce with higher quality than soil-based agriculture and can continue year-round (Resh, 2012).
<b>Plant Growth Rate</b>	Since the system controls the plant's growth in the right conditions with hydroponics, the product matures faster than by soil-based agriculture (Jones, 2014).
<b>Investment</b>	Due to the technical aspects of infrastructure and trained labor, hydroponics agriculture can require a high initial investment. Nevertheless, the increase in product yield can compensate for the high initial investment over time (Jones, 2014). For example, a study conducted at Luk Phra Dabos Agricultural Training and Development Center in Samutprakarn Province in 2009 compares the investment and profit of lettuce grown in soil culture and NFT hydroponics. The investment of soil-based technique was 9.64 baht/m <sup>2</sup> and returned a profit of 21.96 baht/m <sup>2</sup> . The investment of NFT was 116.8 baht/m <sup>2</sup> and returned a profit of 58.2 baht/m <sup>2</sup> (Wattanapreechanon & Sukprasert, 2012).
<b>Land Use</b>	Hydroponics uses less land than soil based techniques because it does not require soil to grow. This advantage also means that farmers can use hydroponics in places where soil fertility is not sufficient for soil-based techniques ("Hydroponics Training Manual," n.d.).
<b>Labor Use</b>	Hydroponics requires less physical labor because soil does not need to be tilled or sowed ("Hydroponics Training Manual," n.d.).
<b>Environmental</b>	
<b>Soil Degradation</b>	In soil based agriculture, soil degradation decreases the nutrient content and crop yield on farms over time, making it progressively harder to maintain a high level of production. In hydroponics, soil degradation is not an issue (Resh, 2012).
<b>Pest Control</b>	Soil based produce normally needs pesticides to protect from soil-borne diseases. Hydroponics usually requires little to no use of pesticides (Resh, 2012).
<b>Fertilizer</b>	Fertilizer salts can contribute to pollution in waterways because rain water can carry salt water into storm drains and surface waters (Traunfeld & Nibali, 2013). The nutrient solution in hydroponics contains the necessary nutrients and does not require additional fertilizer (Resh, 2012).
<b>Water Consumption</b>	Hydroponics recycles up to 95% of the water used in the system, whereas soil agriculture inefficiently uses water and it must be constantly re-supplied (Carruthers, 2007).

Table 2-1: Comparison of Hydroponics and Soil-Based Techniques

As evidenced by the advantages outlined in the table above, the promotion of hydroponics directly aligns with the goals of the Chaipattana Foundation to promote self-sufficiency of farmers and sustainable development.

## 2.4 The Hydroponics Project of the Chaipattana Foundation (HPCF)

One example of a Chaipattana Foundation development project that uses hydroponics is the Hydroponics Project of the Chaipattana Foundation (HPCF) located in the Muang district of Prachinburi province, shown on the map of Thailand in Figure 2-3. The Muang district is one of 13 districts in Prachinburi and the primary occupations of its population of 113,519 are agriculture and working in factories. There are 11 schools and 3 universities in the Muang district (“ข้อมูลอำเภอ-สถานที่ท่องเที่ยว-ติดต่อราชการ,” n.d.). Her Royal Highness Princess Maha Chakri Sirindhorn asked the Chaipattana Foundation to establish the hydroponics farm in 2007 on a suitable plot of land with the objective of enabling income diversification through hydroponics in the local community (Parmornsood, n.d.). Currently, the HPCF is the only hydroponics learning center in the district.



Figure 2-3: Prachinburi Province

(Map: Google, 2015)

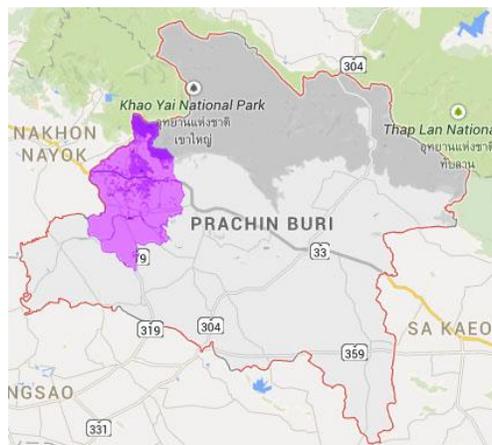


Figure 2-4: Muang District

(Map: Google, 2015)

The HPCF demonstrates the potential benefits of hydroponics through its farm production and free learning program. The HPCF utilizes hydroponics to grow plants such as morning glory, celery seed, kale, and Chinese flowering cabbage (Parmornsood, n.d.). Patcharin Puttharit, the HPCF manager, was instrumental in founding the project and she still oversees day-to-day operations of the farm and runs the learning program. Patcharin Puttharit learned about hydroponics by studying agricultural botany at Maejo University in Chiang Mai, Thailand, where her graduation thesis was on hydroponics (P. Puttharit, personal communication, January 14, 2015).

The HPCF is at full production capacity, using all available hydroponics trays and producing an average of 50 kilograms of produce per day. The farm uses both the NFT and DRFT systems to grow its produce, as explained in the previous section. In order to maintain this maximum level of production, the manager and four other workers spend all of their time managing the farm, the learning program, and tending to the produce.

The HPCF manager expressed that she would like the HPCF to be more well-known in Prachinburi and to engage more people from the local community to learn and be interested in hydroponics. In order to do so, Patcharin Puttharit wants to expand the HPCF’s public relations (PR). The current extent of PR at the HPCF is an entrance sign, a Facebook page last updated in June 2014, and a vendor stand at the Naresuan market in the Muang district where they sell their produce. Due to this limited PR, the goal of this project was to aid the HPCF in raising awareness of hydroponics, the HPCF, and its learning program in the local community.

## 2.5 PR Strategy Guidelines

A PR strategy is a communication tactic that focuses on exposing a company, product, or individual to a target audience. Table 2-2 lists common components of a PR strategy and the remainder of this section describes each component.

Variable	Description
<b>Objectives</b>	Define the drive to develop a PR strategy
<b>Target Audience</b>	Determine the target audience
<b>Message</b>	Delineate the points to address
<b>Budget</b>	Outline the investment for the strategy
<b>Measurement</b>	Assess the impact of the campaign
<b>Medium</b>	Identify effective methods of communication

Table 2-2: Variables for PR Campaign Development. Adapted from “Note of Marketing Strategy” by R. Dolan, 2000, *Harvard Business Review*, p.11.

### 2.5.1 Objectives

The objectives of a PR strategy outline the purpose of the strategy and what it intends to accomplish. Objectives also specify the expected level of goal attainment within a certain time frame. Furthermore, public relations objectives should align with organizational objectives and clearly defined goals (Hon, 2009). Creating and following objectives ensures that each component of the strategy is relevant to the goal and minimizes wasted resources on components outside of the scope of the goal (Dolan, 2000). Without a clear statement of the current situation and objectives for the future, a company cannot determine whether or not it has succeeded in its PR strategy (Ehrlich & Fanelli, 2012).

### 2.5.2 Target Audience

The target audience is the specific group(s) of people that the strategy seeks to reach out to with the information the team is attempting to communicate. An effective PR strategy reflects detailed knowledge of its audience with regard to their motivation for taking interest in the strategy's message (Dolan, 2000). In addition, since a product or service may appeal to a variety of buyers, a "one size fits all" marketing approach may not work because it may not be specific enough ("The Importance of Really Knowing Your Target Audiences," n.d.). Targeting a specific audience can benefit the PR strategy by identifying the media that can best reach the target in order to increase success. Defining a target audience early on in the development process also helps narrow the focus to the information the audience wants to hear, increasing the likelihood that they will respond to the strategy. One way of narrowing down the audience is using geographic segmentation, which is a technique that picks a target audience based on geographic location (Ehrlich & Fanelli, 2012).

### 2.5.3 Message

After setting PR goals and objectives and determining the target audience, the next step is to craft the intended message. One method for determining the message is through a strength, weakness, opportunity, and threat (SWOT) analysis. Strengths are capabilities or resources of the company or product that it can use to improve its competitive position. Opportunities and threats come from outside the organization. Opportunities are favorable conditions in the environment that can produce rewards, while threats are external barriers that can prevent a company from achieving its objectives (Ehrlich & Fanelli, 2012). Table 2-3 shows an example of a SWOT analysis.

<b><u>Strengths &amp; Weaknesses:</u></b>	<b><u>Opportunities &amp; Threats:</u></b>
<ul style="list-style-type: none"><li>• Size of organization</li><li>• Reputation of organization</li><li>• Current market share of product</li><li>• Current market segments</li><li>• Ability to meet target market wants and needs</li><li>• Product or technological advantages/disadvantages</li><li>• Pricing advantages/disadvantages</li></ul>	<ul style="list-style-type: none"><li>• Industry trends (industry growth, maturity, or decline)</li><li>• Economic factors (interest rates, business cycle, inflation)</li><li>• Political forces (wars, changes in leadership, new legislation, or court decisions)</li><li>• Regulatory forces (new or changing regulations)</li><li>• Technology demographic changes</li></ul>

<ul style="list-style-type: none"> <li>• Market perception of product: positioning or brand image</li> <li>• Operational strengths and weaknesses</li> <li>• Budgetary constraints and types of resources available</li> </ul>	<ul style="list-style-type: none"> <li>• Societal changes (large-scale changes in attitudes or behaviors)</li> </ul>
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Table 2-3: SWOT Analysis Example. Adapted from “Financial Services, Marketing Handbook: Tactics and Techniques That Produce Results” by E. Ehrlich & D. Fanelli, 2012, Dolan, 2000, *Bloomberg Financial*, p. 48-50.

A SWOT analysis does not have significant value unless a company uses the identified factors for each component to contribute to the development of the PR strategy. After completing an initial analysis, it is beneficial to prioritize the most important factors in each category. This enables a company to avoid balancing strong threats with weak opportunities (Harrison, 2013). A company can also use a SWOT analysis to identify factors that set itself apart from the competition in order to further appeal to the specified audience.

#### 2.5.4 Budget

Before developing tactics for meeting objectives, a company needs to determine their available resources to fund the PR strategy. The available budget determines the marketing options available, but a limited budget does not necessarily restrict the success of a PR strategy (Ehrlich & Fanelli, 2012). The first step in determining a budget is to organize financial information. A company can do this by measuring its disposable income and dividing that between the company’s goals, including a PR strategy. After determining the amount of income available to allocate to the PR strategy, the company can then decide how to spend the allotted funds. The third step is to iteratively assess how the company is using the funds and make appropriate changes. If the strategy does not bring in new revenue in excess of the cost, it might be better to remove the strategy and try something else (Lavinsky, 2013).

#### 2.5.5 Measurement

The evaluation and measurement of a PR strategy determines the strategy’s effectiveness. One tool that measures the effectiveness is a Key Performance Indicator (KPI). KPIs are typically numeric measurements that serve as goals for the implementation of the strategy based on a certain time frame. An example of a KPI for a hypothetical ice cream shop would be a 20% increase in sales within three months (Dolan, 2000; “PR Campaign Guidelines,” n.d.).

#### 2.5.6 Medium

The medium for communicating a PR strategy consists of the methods by which the strategy can effectively distribute information such that it reaches and appeals to the target audience (Dolan, 2000). One common medium through which companies can distribute information is the Internet. Two examples of ways that audiences use the Internet to obtain information are by visiting websites and through social media. In Thailand, approximately 24 million people have access to the Internet. Additionally, about 18 million people in Thailand use social media (Millward, 2013). On average, Thai people spend around 3.7 hours per day on social media. However, Thailand’s Internet access is

not consistent nationwide (Pongvitayapanu, 2014). Therefore, for PR strategies in Thailand, it may be important to consider offline mediums to communicate with those not connected to the Internet.

## 2.6 Relevant Case Studies

To explore potential applications for a PR strategy related to hydroponics in Thailand, our team researched three case studies that identified potential target audiences that may benefit from an increase in hydroponics awareness: farmers, non-farmers, and schools. We investigated farmers because they may be interested in learning about the potential benefits of hydroponics versus their current technique. Non-farmers include everybody who do not rely on agriculture as their main source of income, such as consumers and hobbyists. Our team also researched schools as a potential target because they could benefit from hands-on learning. The following section outlines each case study and describes how hydroponics can apply to these target audiences.

### 2.6.1 Farmers

One potential target audience that could benefit from implementing hydroponics is farmers. One case study evidencing this is a hydroponics micro-farm project in Mexico that targeted small-scale and subsistence farmers in the local areas. The project stemmed from a need for more efficient water and nutrient use and hydroponics posed to be a viable self-sustaining solution. The project considered 51,124 farmers with an average estimated annual salary of \$11,000 while cultivating a farm on 10 hectares of land. They consumed 3.7 billion cubic meters of mostly irrigated water per year through the use of soil-based agricultural techniques.

The project sponsor calculated that farmers who converted to a simplified hydroponics technique contributed to a reduction in total water consumption by approximately 1.8 billion cubic meters per year. The project assumed that each farm started with one gravity-fed drip system operating on 144 cubic meters of water per year. This system produced 10 kilos of food per day, which feeds a family of up to seven. In addition, the micro-farm project reduced land use from 10 hectares to one hectare per farm. The upfront cost was \$400 and the annual nutrients required to sustain each farm cost \$160, which loan programs could cover. In addition to these benefits, the project also resulted in an annual salary rise for farmers to \$14,600-\$51,000, depending on the type of crop they sold (Bradley & Katzir, 2004). This study demonstrated the benefits farmers can have from switching to hydroponics, such as reducing total land use, maintaining or increasing production per capita, and preserving natural resources such as water and soil.

### 2.6.2 Non-Farmers

The potential benefits of implementing hydroponics are not limited to farmers, but can also apply to non-farmers. One case study illustrating this potential is the implementation of simplified hydroponics systems in the La Paloma-Chuy region in Uruguay to improve living standards. The project strategy was to create a desire in families to home-grow vegetables. The project sought to improve the standard of living of families by first raising awareness of simple hydroponics. The project team then trained the families to use the technique while the government provided initial setup equipment for the systems and nutrients for the nutrient solution. Lastly, they incorporated a

moral commitment where whomever received training also agreed to start up their farm/garden within 20 days.

Through this project, families in the La Paloma-Chuy community reaped the benefits of improved family diet and increased income. In addition to these tangible results, the project brought families closer together. They could take pride in the results of their garden, raising families' self-esteem as a whole. Once other families observed the benefits of having a hydroponics garden, they became eager to start their own in order to become benefactors of the self-sustaining technology (Caldeyro, 2003).

### 2.6.3 Primary and Secondary Schools

Implementing hydroponics in the classroom is not new for Thailand or the HPCF. For example, the Wat Pathumwanararm School in Bangkok started a hydroponics program as an elective and built a hydroponics garden with advice from Patcharin Puttharit and the HPCF in 2008. To learn about this program, our team visited the school to interview Lalita Prasart, the agricultural teacher. The school created the program because its curriculum previously did not adequately cover nature and agriculture (Prasart, 2015). Currently, their hydroponics garden is an educational resource where students can experience the agricultural process as a hands-on activity. In addition to education, the school uses the produce grown through the program for lunch at the school's cafeteria and sells any surplus after school to parents. Figures 2-5 and 2-6 show the hydroponics farm and students at the Wat Pathumwanararm School.



Figure 2-5: Wat Pathumwanararm Hydroponics Program Site



**Figure 2-6: Students at Wat Pathumwanararm School with Team Hydro**

The Thai government requires all students from grades 1-9 to learn agriculture as a subject for a minimum of two hours a week. This agriculture requirement gives Thai educators an opportunity to implement hydroponics into the curriculum (Ministry of Education, 2008).

Through these three case studies, our team established that hydroponics can be beneficial to various audiences if they are aware of its benefits. However, it was not clear what the current awareness of hydroponics was in the HPCF's local community. For the purpose of this project, our team needed additional information about the community in the Muang District.

### 3 Methodology

The goal of this project was to raise awareness of hydroponics, the HPCF, and its learning program in the local community. Our team accomplished this goal by completing the following objectives targeting hydroponics, the HPCF, and its learning program in the local community:

1. Determine the current awareness.
2. Identify effective communication mediums.
3. Develop a public relations (PR) strategy.

Our team learned in a preliminary interview with the HPCF manager, Patcharin Puttharit, that one of her visions for the HPCF was for it to be better known in its local community. Appendix A contains the transcript for this interview. Our team began by determining the current awareness of hydroponics, the HPCF, and its learning program through surveys and phone interviews. Next, we analyzed the information gathered from our surveys, interviews, and background research to identify effective communication mediums to distribute knowledge. Lastly, our team developed a PR strategy by clarifying its objectives, target audience, message, budget, and tools for measurement, and utilizing the identified mediums in an effort to raise awareness of hydroponics, the HPCF, and its learning program in the community. Figure 3-1 outlines our methodology.

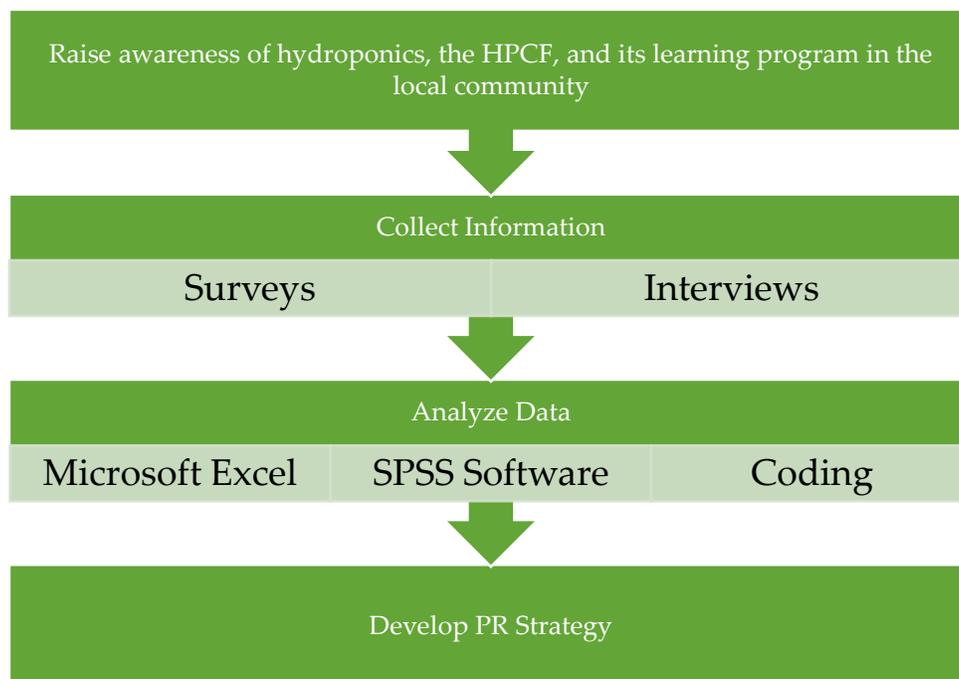


Figure 3-1: Methodology Overview

This chapter describes the methods our team used to accomplish the project goal by discussing the steps we took to complete our objectives.

#### 3.1 Step 1: Collect Information

To collect information for objectives 1 and 2, we conducted three different surveys: a Market Consumer Survey, an HPCF Consumer Survey, and a Vendor Survey. The team also conducted

three sets of phone interviews: one with local farmer organizations, one with local schools, and one with previous attendees of the HPCF learning program. Each of the surveys and interviews was semi-structured and contained both quantitative and qualitative questions because based on our background information, we could expect particular responses from certain questions and needed to leave others open-ended. This section first provides an overview of each data collection instrument and then describes details specific to each.

### 3.1.1 Surveys Overview

The purpose of the Market Consumer Survey and Vendor Survey was to gather information about current knowledge of hydroponics, the HPCF, and its learning program. In addition, our team captured the consumers' perception of hydroponics through the Market Consumer Survey. By conducting this survey, we determined whether consumers were interested in growing their own produce. In the Vendor Survey, we investigated the survey subject's interest in switching to hydroponics and their reasoning. Appendix B contains the questions we asked in the Market Consumer Survey, and Appendix C contains the questions for the Vendor Survey.

The purpose of the HPCF Consumer Survey was to gather information about how these consumers heard about the HPCF. We gained knowledge pertaining to the reasons for purchasing hydroponics produce and whether the consumer was aware of the learning program at the HPCF. Appendix D contains the questions we asked in the HPCF Consumer Survey.

For all three surveys, we also explored potential mediums of communication by inquiring about Internet access and use of social media platforms.

Our team drafted and revised each of the surveys in English and then translated them into Thai. In addition, the Chulalongkorn teammates tested each survey on random Chulalongkorn University students for question comprehension prior to field use.

### 3.1.2 Survey Details

This section includes the specific survey information that differentiates each survey including the location, constraints, procedure, and sample size for each survey. The exception to this is that the first section refers to the Market Consumer and Vendor Surveys together due to their large number of similarities.

#### 3.1.2.1 Market Consumer and Vendor Surveys

We administered the Market Consumer and Vendor Surveys in three different locations: the Naresuan Market, the Prachinburi Municipal Market, and Chao Phya Abhaibhubejhr Hospital Market. We chose these locations because they were all within 15 km of the HPCF and Patcharin Puttharit suggested that they were high traffic areas. Based on the locations' proximity to the HPCF and potential for high traffic, we expected that our team would gather information from a wide variety of consumers and vendors in an effort to capture data that would ideally represent the Muang district as a whole given our constraints. Figure 3-2 shows a map of these locations relative to the HPCF.

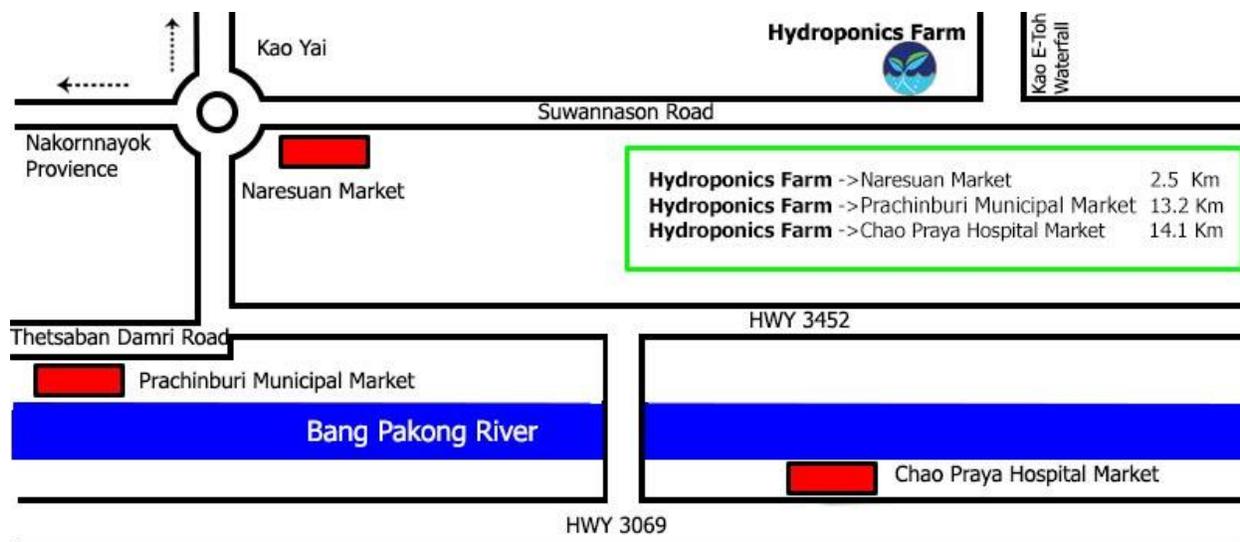


Figure 3-2: Map of Survey Locations

The constraints for these surveys were the travel distance from Bangkok to Prachinburi, the number of days that we could dedicate to surveying, and the likelihood of participants taking the time to complete the survey. The Chulalongkorn teammates administered the surveys at each location by reading each question to the survey subject and filling in the answers for them. Meanwhile, the WPI teammates assisted by collecting the completed surveys. Our team chose to administer the survey ourselves because our surveys contained a number of embedded and conditional questions that could have resulted in misinterpretations of the questions. Our team set a target to collect 100 Market Consumer Surveys, expecting that obtaining at least 100 surveys would give us a sufficient sample to divide into categories, such as specific demographic groups, when performing analyses.

The markets that our team visited contained a limited number of vendors that sold produce. Our team visited the Naresuan Market to initially observe the market and estimate our potential sample size for the Vendor Survey. Based on the initial observation, our team estimated that there were 30 vendors selling produce at the market. Since we conducted surveys at three similar locations, we set a goal of 30 total surveys from all three locations combined because it was not realistic to assume that all of the vendors would complete the Vendor Survey.

### 3.1.2.2 HPCF Consumer Survey

Our team only administered the HPCF Consumer Survey at the HPCF because the questions pertained to information that only the consumers at the HPCF would know as previously explained in the Surveys Overview. The two major constraints for this survey were the limited number of consumers that go to the HPCF and the time we had to administer surveys. Patcharin Puttharit informed our team that not many people visited the HPCF on average per day to buy produce so it would not be an effective use of our time to personally administer the surveys at that location. As a result, we left these surveys at the HPCF for two weeks for consumers to individually fill out. We chose the two week timeframe based on the time needed to develop and refine the surveys for field

use and the project deadlines. In order to clarify the survey to HPCF consumers, we highlighted the embedded and conditional questions.

### 3.1.3 Interviews Overview

In addition to surveys, our team utilized interviews to gather information for Step 1. Similar to the surveys, the purpose of the interviews with local schools and farmer organizations was to gather information about the organizations' awareness of hydroponics, the HPCF, and its learning program. We chose interviews over surveys for these groups in order to obtain more detailed, complete information that we were unable to predict. In the School Interviews, we determined whether schools had already implemented hydroponics in their curriculum and whether they wanted to incorporate a system for classroom use. In the Farmer Organization Interviews, our team identified whether or not these organizations had considered using hydroponics before and whether they had an interest in learning more about hydroponics. Appendix E contains the questions we asked for the School Interview, and Appendix F contains the questions for the Farmer Organization Interview.

The purpose of the interviews with previous HPCF learning program attendees was to learn how they found out about the HPCF in order to determine what communication mediums had already been effective. In addition, we gathered information about whether or not these people implemented hydroponics for their own use after attending the program and why or why not. Finally, we determined their level of satisfaction with their learning experience. Appendix G contains the questions we asked in the Previous Attendees of HPCF Learning Program Interview.

Similar to the survey questions, we drafted and reviewed the sets of interview questions in English and translated them into Thai. A Chulalongkorn teammate conducted each interview over the phone and filled in the answers from the respondent to the predetermined questions. The reason our team chose phone interviews was because, given the time frame of our project and the distance between each attendee, it was not practical to conduct physical interviews at each location.

### 3.1.4 Interviews Details

The following section includes details of how we conducted each interview, the sample size, and the identity of each interview subject.

#### 3.1.4.1 School Interview

Through research, our team found that there were 11 primary and secondary schools in the Muang district (“ข้อมูลอำเภอ-สถานที่ท่องเที่ยว-ติดต่อราชการ,” n.d.). Our team attempted to contact each school based on available contact information via phone. We conducted these interviews with an agriculture teacher at each school because they had knowledge about the agriculture curriculum at the school.

#### 3.1.4.2 Farmer Organization Interview

Our team discovered that there were 24 farmer organizations in the Muang district (“สำนักงานจังหวัดปราจีนบุรี,” n.d.). We included these organizations due to the potential benefits of hydroponics for current farmers as discussed in the Background chapter. Similar to the School Interview, we attempted to contact each organization based on available contact information via phone. Our team

conducted the Farmer Organization Interview with the leader of each organization because they were qualified to speak on behalf of the organization.

### 3.1.4.3 Previous Attendees of HPCF Learning Program Interview

Patcharin Puttharit provided our team with a list of contact information for previous HPCF learning program attendees. The list contained 79 names and we called every phone number in an effort to obtain as much feedback for the learning program as possible to determine the perception of the HPCF and its learning program.

## 3.2 Step 2: Data Analysis

After collecting information from the surveys and interviews in Step 1, our team analyzed the information through two different approaches. The first approach described in this section was the procedure we performed to analyze the quantitative data collected from closed-ended questions. We used the second approach to analyze the qualitative data from open-ended questions.

### 3.2.1 Approach 1: Quantitative Data Analysis

Our team organized the surveys and interviews by type and location in order to compare them with one another. Next, we assigned an ID number to each survey or interview to keep track of specific responses throughout the analysis steps. We developed a numbering system to organize the surveys and interviews into the following categories: type, location, and unique ID. Table 3-1 illustrates the numbering system.

Data Collection Method	ID	Location	Letter ID	Unique ID
Market Consumer Survey	1	Prachinburi Municipal Market	A	1-150
		Naresuan Market	B	
		Chao Phya Abhaibhubejhr Hospital Market	C	
Vendor Survey	2	Prachinburi Municipal Market	A	1-150
		Naresuan Market	B	
		Chao Phya Abhaibhubejhr Hospital Market	C	
HPCF Consumer Survey	3	HPCF Farm	D	1-150
Previous Attendees Interview	4	Not Applicable	-	1-150
School Interview	5	Not Applicable	-	1-150

Table 3-1: Numbering System for Surveys and Interviews

A sample identification code for the 15th vendor survey at the Prachinburi Municipal Market was “2-A-15”, where the “2” identified the survey as a Vendor Survey, the “A” identified the survey location as the Prachinburi Municipal Market, and the “15” represented the unique ID number of the survey.

Following the survey and interview classification, our team created a template for each survey and interview type to input the closed-ended data in a Microsoft Excel spreadsheet that lists all possible responses to each question in the first row by column. We included a legend to keep track of the lettered options on the surveys and interviews and their corresponding numerical

designations for data input. This spreadsheet organization provided the flexibility to insert data from each individual survey in rows. Lastly, we utilized SPSS software to statistically analyze the data in Microsoft Excel. SPSS is a statistical analysis tool that generates reports in multiple forms such as charts, correlations, and plot distributions (“Spss, Data Mining, Statistical Analysis Software, Predictive Analysis, Predictive Analytics, Decision Support Systems,” n.d.).

### 3.2.2 Approach 2: Qualitative Data Analysis

Our team used coding to analyze the information gathered from open-ended responses from the surveys and interviews. Coding is a method of analyzing qualitative data by identifying themes (Saldana, 2009). A code is a word or short phrase that symbolically assigns a summative attribute for a portion of language-based data. We used this technique because we wanted to identify recurring themes from the open-ended responses we collected in an attempt to quantify them and analyze them in SPSS.

We created a template for inputting the coded data in tables through a Microsoft Excel spreadsheet through a similar process as in Approach 1. Instead of inputting numerical data in each row like in Approach 1, we added a short phrase representing the particular response in the spreadsheet rows to simplify our analysis. We then coded the responses, assigned them a number, and analyzed them through SPSS software.

## 3.3 Step 3: Develop Public Relations (PR) Strategy

After analyzing the information we collected in steps 1 and 2, we chose the topics of information to focus on in the PR materials with regard to hydroponics, the HPCF, and its learning program. We also clarified the strategy objectives, target audience, budget, and tools for measurement. We identified effective communication mediums for distributing the information based on community access to the Internet, social media usage, and other background research. Step 3 involved organizing the information into the identified communication mediums to create the materials for the PR strategy and developing implementation guidelines for the strategy. We consulted Thawatchai Saengthamchai, an expert in creating PR materials from WHY NOT Enterprises Company located in Bangkok, to determine how to effectively organize and distribute the information for our PR materials. We created initial questions to begin the discussion based on our preliminary results, but during this discussion we decided it was more beneficial to provide Thawatchai Saengthamchai with a general overview of our project and a brief outline of the results we found from our data analysis. Appendix H contains the preliminary questions we created, and Appendix I contains a summary of the actual discussion.

We then requested feedback regarding how he believed we could organize the information to best achieve our project goals. The discussion was informal and semi-structured and we based follow-up questions on the answers we received to previous questions. Once our team created a first draft, we sent them to Thawatchai Saengthamchai via email for professional review, but never received feedback. Our team also sent drafts of our materials to Patcharin Puttharit in order to receive feedback from our sponsor. This review process was iterative, and we revised the materials

based on Patcharin Puttharit's comments multiple times until we were satisfied with the final deliverables.

In addition to the PR materials, we developed guidelines for the HPCF employees to enable them to implement and maintain the PR strategy that we developed. These guidelines contained clear and in depth step-by-step instructions in Thai and English that pertain to the use of each medium that we included in our PR strategy. We based the information included in the guidelines on background research, expert consultation, and previous experiences of team members.

## 4 Results and Discussion

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This chapter describes the results of our data analysis with regard to the community's awareness of hydroponics, the HPCF, and its learning program. In addition, we learned about the access to the Internet, the most used social media platforms in the community, and the perception of the HPCF and its learning program. We collected information from the following groups: consumers and vendors located at the Naresuan Market, Prachinburi Municipal Market, and Chao Phya Abhaibhubejhr Hospital Market, schools and farmer organizations located in the Muang district, and previous learning program attendees and consumers at the HPCF. The following chapter first describes the samples obtained from each of the three surveys and three interviews, as previously described in the Methodology chapter. Then, we present the primary results that pertain to our project goal and objectives from the Consumer Survey, Vendor Survey, School Interview, and Farmer Organization Interview and supplemental results from the HPCF Consumer Survey and Previous HPCF Learning Program Attendees Interview. Finally for each results section, we discuss how the results informed our PR strategy.

### 4.1 Samples Breakdown

The Market Consumer Survey sample from the three markets was 49 participants at the Naresuan Market, 43 participants at the Prachinburi Municipal Market, and 9 participants at the Chao Phya Abhaibhubejhr Hospital Market. The reason that the number of participants at the Hospital Market was significantly less than the other two markets was because of the smaller size of the market, which contained only one vendor. We conducted a total of 101 surveys, but only 85 of the survey subjects were from the Muang district, which we defined as our target population based on the initial interview with the HPCF manager. Therefore, we only considered those 85 participants in our analysis.

Out of the 85 survey subjects, 49 were female and 34 were male. We ran two-tailed T-tests and found that there was no evidence of statistically significant differences between the mean responses related to familiarity with hydroponics, awareness of Chaipattana Foundation, awareness of HPCF, and consumer interest in growing their own produce based on gender ( $t = 1.458, p = 0.149$ ;  $t = 0.453, p = 0.652$ ;  $t = -1.714, p = 0.094$ ;  $t = -0.017, p = 0.987$ , respectively). However, we found that there was a statistically significant difference between the mean responses for awareness of the HPCF learning program based on gender ( $t = -2.55, p = 0.024$ ); a small sample size of 13 limits the conclusions that can be drawn from this. Going forward, we combined the answers from both genders.

With regard to differences between responses to the same five questions based on the three locations of the markets, we ran three sets of two-tailed T-tests to compare the means between the Prachinburi Municipal Market (1) and Naresuan Market (2), between the Naresuan Market and the Chao Phya Abhaibhubejhr Hospital Market (3), and between the Chao Phya Abhaibhubejhr Hospital Market and the Prachinburi Municipal Market. Table 4-1 shows the results of these three sets of T-tests.

Location	Familiarity with Hydroponics	Awareness of Chaipattana Foundation	Awareness of HPCF	Awareness of HPCF Learning Program	Interest in Growing Produce
1 & 2	t = -0.974, p = 0.333	t = 1.597, p = 0.115	t = 0.191, p = 0.85	t = 1.087, p = 0.297	t = -1.431, p = 0.157
2 & 3	t = -0.848, p = 0.401	t = -1.077, p = 0.287	t = 0.704, p = 0.52	t = 0.478, p = 0.645	t = -1.722, p = 0.114
3 & 1	t = -1.5, p = 0.141	t = -0.079, p = 0.937	t = 0.789, p = 0.468	t = 0.845, p = 0.437	<b>t = -2.651, p = 0.011</b>

Table 4-1: T-test Results for Response Differences by Market Location

The only statistically significant result for the three sets of T-tests was between locations 3 & 1 with regard to consumers interested in growing their own produce, as bolded in Table 4-1. However, the number of responses for that question was 36 from location 1 and 8 from location 3. This large difference in sample sizes limited the implications of the result. Therefore, we continued our analysis with the consumer surveys from each of the locations combined, resulting in a final consumer sample size of 85. Appendix J contains the data from the Consumer Surveys.

The Vendor Survey sample was composed of 31 surveys from the three markets: 18 at the Naresuan Market, 12 at the Prachinburi Municipal Market, and 1 at the Chao Phya Abhaibhubejhr Hospital Market. Our team developed the Vendor Survey assuming that vendors in the community were farmers. However, only 5 out of 31 vendors surveyed were farmers. Therefore, many of the questions in the Vendor Survey were not useful. Consequently, our team decided to exclude the results from this survey from our analysis. Appendix K contains the data from the Vendor Surveys.

We also collected 11 surveys from consumers at the HPCF using the HPCF Consumer Survey. Although 4 out of the 9 consumers that answered the question were from the Muang district (44%), they were not truly random samples like the survey subjects at the previously described markets. Therefore, the team only used this data to learn about how customers perceived and heard about the HPCF. Appendix L contains the data from the HPCF Consumer Surveys.

Our team interviewed 4 out of the 11 schools in the Muang district. We could not reach the other seven schools because three schools required a permission letter and four had outdated contact information. The names of the schools we interviewed were: Prachin-ratsadorn-amroongs, Prachin-ratsadorn-amroongs II, Chakrabongse-pittayalai, and Prachin-kallayanee. Due to the small sample size, we qualitatively assessed each interview individually. Appendix M contains the transcripts from the School Interviews.

Out of the 24 farmer organizations with listed contact information online, we conducted interviews with three of them because the contact information for the other organizations was outdated. The first organization we interviewed was Suan-Baan-Pra, which grows fruit and contains over 200 members. The second organization was Dong-Kee-Lhek, which grows garden flowers and contains over 100 members. The third organization was the Organic Farmer Organization, which grows organic produce and contains 12 members. Similar to the School Interviews, we qualitatively

assessed each Farmer Organization Interview individually. Appendix N contains the transcripts from the Farmer Organization Interviews.

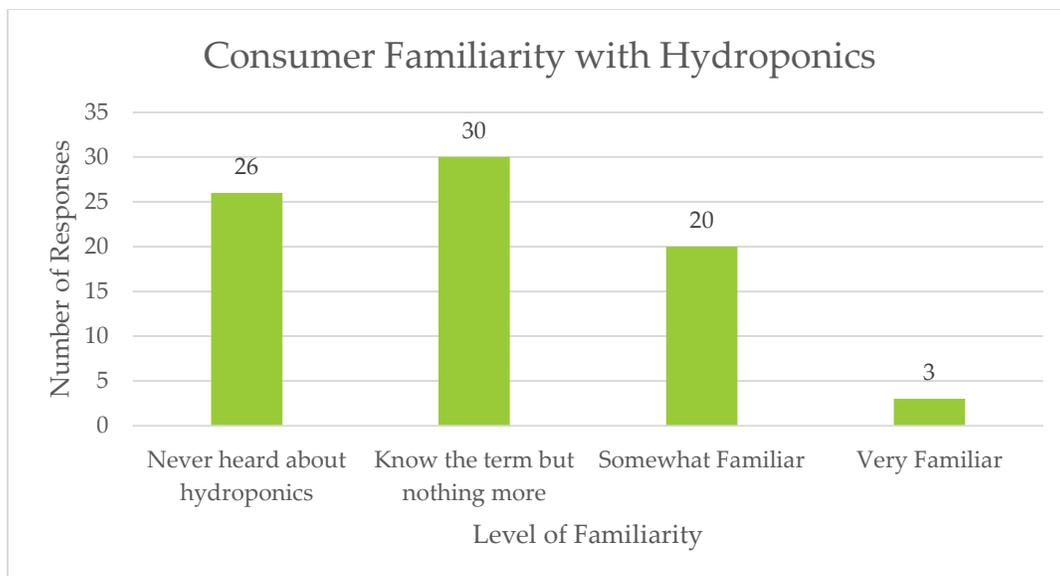
Out of the 79 previous attendees of the HPCF learning program, we were able to contact 22 (28% response rate) because 10 of the phone numbers were invalid and the remaining 47 did not have time or did not want to complete the interview. Appendix O contains the transcripts from the Previous Attendees of the HPCF Learning Program Interviews.

## 4.2 Primary Results Related to the Project Goal and Objectives

This section describes the results we obtained from the Consumer and Vendor Surveys and the School and Farmer Organization Interviews with regard to Objectives 1 and 2. Specifically, this section covers six topics: community familiarity with hydroponics, awareness of the HPCF and its learning program, community interest in growing produce, perception of hydroponics, and effective communication methods.

### 4.2.1 Community Familiarity with Hydroponics

Out of the 85 consumers surveyed from the Muang district, 79 answered the question about their level of familiarity with hydroponics. Our survey asked respondents to classify their familiarity with hydroponics into four categories: “Never heard about hydroponics,” “Know the term but nothing more,” “Somewhat familiar,” and “Very familiar.” As illustrated in Figure 4-1 only 3 out of 79 consumers (4%) were “Very familiar” with hydroponics. The most prevalent response was “Know the term but nothing more” with 30 responses (38%).



**Figure 4-1: Consumer Familiarity with Hydroponics**

The fact that the two most frequent responses were “Never heard about hydroponics” and “Know the term but nothing more” suggested that there was low familiarity of hydroponics among local consumers. This result implied that generally, the consumers in the community were unfamiliar with hydroponics. Furthermore, consumers could be a target for the PR strategy and the strategy would need to focus on overcoming this lack of knowledge.

The results from our school phone interviews showed that all four schools were familiar with hydroponics. The Prachin-ratsadorn-amroongs II and Chakrabongse-pittayalai schools already taught hydroponics theory in their curriculum, but none of the schools interviewed had an active hands-on hydroponics learning program like the Wat Pathumwanararn School previously discussed in the Background chapter. However, the Chakrabongse-pittayalai School used to have a functional hydroponics system for educational purposes, but it was no longer functional at the time of the interview. From the Market Consumer Survey analysis, our team found a statistically significant correlation that a consumer respondent's familiarity with hydroponics increased with their level of education ( $r = 0.320$ ,  $p = 0.008$ ). This could have had implications for schools because this meant that someone with a low level of education was less likely to know about hydroponics, which implied that if primary and secondary schools increased hydroponics education in the classroom, consumers could become more aware of hydroponics.

The analysis of the Farmer Organization Interviews showed that Suan-Baan-Pra (fruit growing) had never heard about hydroponics before. On the other hand, the contacts from Dong-Kee-Lhek (flower growing) and the Organic Farmer Organization stated that both organizations were familiar with hydroponics. The fact that the Suan-Baan-Pra community leader revealed that the organization was unaware of hydroponics could mean that over 200 farmers in that community shared this same level of awareness. Thus, these farmer organizations could be a target for increasing the community's awareness of hydroponics.

#### 4.2.2 Community Awareness of the HPCF and its Learning Program

With regard to the consumer awareness of the HPCF and its learning program, we analyzed the sample of 85 consumers in the Muang district. Of the 85 consumers surveyed, our analysis showed that 46 were aware of the Chaipattana Foundation (54%) and 26 of those 46 (57%) were also aware of HPCF. Combining this number with the respondents unaware of the Chaipattana Foundation, we determined that 26 of 85 (31%) respondents were aware of the HPCF. If a respondent stated that they were aware of both the Chaipattana Foundation and the HPCF we continued to ask whether or not they were aware of the HPCF's learning program. Of the 26 people who said that they were aware of the HPCF, 11 out of 13 who answered the question (85%) answered that they were aware of the learning program. We did not find a significant correlation between consumers who were aware of the HPCF and consumers who were aware of the HPCF learning program, which could be due to the small sample size of 13. Additional analysis revealed two statistically significant positive correlations: between the awareness of the HPCF and the likelihood of visiting the HPCF ( $r = 0.460$ ,  $p = 0.004$ ), and between the awareness of the HPCF and familiarity with hydroponics ( $r = 0.438$ ,  $p = 0.005$ ). Therefore, the data suggested that by raising awareness of hydroponics our team could increase awareness of the HPCF and the number of HPCF visitors, which could in turn increase local consumer participation at the HPCF.

Three out of four schools: Prachin-ratsadorn-amroongs II school, Prachin-ratsadorn-amroongs school, and Chakrabongse-pittayalai school were aware of the HPCF and two schools, the Prachin-ratsadorn-amroongs and the Chakrabongse-pittayalai schools, were also aware of the learning program at the HPCF.

The Farmer Organization Interview data analysis showed that Suan-Baan-Pra (fruit growing) was not aware of the HPCF or its learning program. However, both Dong-Kee-Lhek (flower growing) and the Organic Farmer Organization were aware of the HPCF and its learning program. Therefore, raising awareness of the HPCF and its learning program through the Suan-Baan-Pra organization could increase awareness for over 200 people.

#### 4.2.3 Community Interest in Growing Produce and Hydroponics

In relation to the consumer interest in growing their own produce, 83 out of 85 respondents answered the question. From the 83 responses, 50 (60%) consumers said they were interested in growing their own produce. Our team found a statistically significant positive correlation between consumer level of familiarity and interest in growing produce ( $r = 0.292$ ,  $p = 0.01$ ). This correlation suggested that if our team could increase familiarity with hydroponics, consumers could be more interested in growing their own produce, or vice versa. Therefore, consumers could be a viable target audience for the PR strategy for the HPCF and its learning program because consumers could go to the HPCF to learn how to grow their own produce.

From our school interviews, all four schools stated that they were interested in implementing a hydroponics farm on their campus. The interviews with the Prachin-ratsadorn-amroongs II and Chakrabongse-pittayalai schools indicated that they had already integrated hydroponics theory into their academic curriculum. On the other hand, the Prachin-ratsadorn-amroongs and Prachin-kallayanee schools had not integrated hydroponics into their curriculum. The combination of the schools' interest in implementing hydroponics and the positive correlation between consumer level of education and familiarity with hydroponics discussed in the previous section showed primary and secondary schools would be willing to incorporate hydroponics in their curriculums at this lower level of education, which could increase the consumer familiarity with hydroponics. In addition, the HPCF could offer its learning program as a resource to local schools because all four of the surveyed schools were interested in implementing hydroponics and aware of the HPCF. By doing this, schools could serve as a medium for raising awareness of hydroponics and the HPCF through students who are the future generation of the community.

Since the farmer organizations represented people who were already growing their own produce, we did not ask the interviewees about their interest in growing produce. However, the Suan-Baan-Pra (fruit growing) and Dong-Kee-Lhek (flower growing) organizations both stated that they were interested in hydroponics and would allow the HPCF to distribute PR materials at their community centers. Therefore by targeting these two organizations, the HPCF could raise awareness of hydroponics, itself, and its learning program to the over 300 community members represented between the two organizations.

#### 4.2.4 Perception of Hydroponics Quality

In addition to inquiring about consumer interest in growing produce, we asked respondents if they believed hydroponics produce was safe to consume. We included this question to help determine if there was a misperception about the safety of hydroponics. Our team excluded the respondents who answered "Know nothing about hydroponics" when asked about their familiarity with hydroponics in our analysis because we decided they did not know enough to give a valid

answer. We analyzed the remaining 44 survey responses to find that 36 subjects (82%) perceived hydroponics to be safe to consume.

Our team did not ask any questions regarding the perception of hydroponics in our interviews of local schools.

We asked the three farmer organizations about their perception of hydroponics. The Suan-Baan-Pra (fruit growing) organization was unfamiliar with hydroponics and therefore could not provide additional information on the subject. The Dong-Kee-Lhek (flower growing) organization stated that they thought hydroponics was safe to consume. We also found that although the Organic Farmer Organization only knew the term and nothing more, they believed that hydroponics was unsafe to consume due to the chemicals and pesticides used in the process. Due to only three farmer organizations participating in the interviews our team was unable to draw conclusions pertaining to whether there was a misperception of hydroponics among farmer organizations.

#### 4.2.5 Communication Methods

Our team investigated potential effective mediums to distribute knowledge in the local community. We asked consumers about their access to the Internet and their use of social media, but we did not ask the schools or farmer organizations those questions. A total of 52 out of the 85 consumers (61%) had access to the Internet. Figure 4-2 illustrates the distribution of consumer Internet access by device.

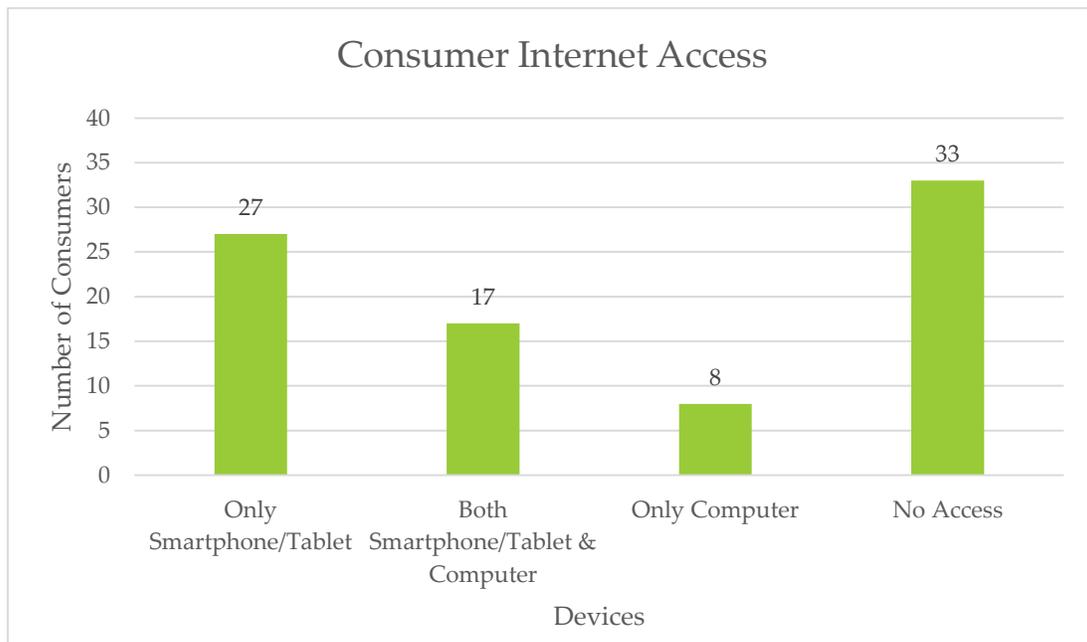
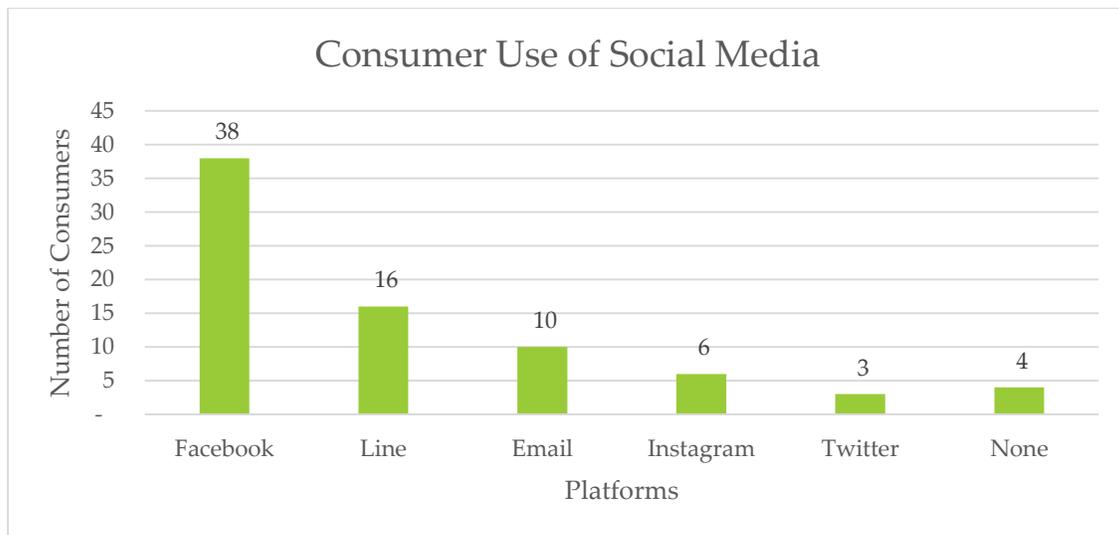


Figure 4-2: Consumer Internet Access

These results showed that our PR strategy needed both online and offline components to account for the balance between consumers who had access to the Internet and those who did not.

In order to determine the use of social media in the local community, our team investigated consumer use of social media platforms. Out of the 52 consumers that had access to the Internet, all

of them answered the question about social media use. However, some consumers answered that they use more than one type of social media, bringing the total number of social media use instances up to 77 as reflected in Figure 4-3. The possible responses to the survey question included “Other” in addition to “Facebook,” “Email,” “Instagram,” “Twitter,” and “None” to leave room for participants to provide additional platforms we did not consider. Our team coded the responses for “Other” and determined that “Line” was a frequent response we did not initially take into consideration. Our analysis showed that “Facebook” was the most used social media platform, used by 38 out of 52 respondents (73%) and “Line” was the second most used social media platform, used by 16 out of 52 respondents (31%). Figure 4-3 indicates the distribution of social media use among consumers.



**Figure 4-3: Consumer Use of Social Media**

These results suggested that with regard to social media, Facebook would be the most effective medium for the PR strategy.

### 4.3 Supplemental Results Related to HPCF and Learning Program

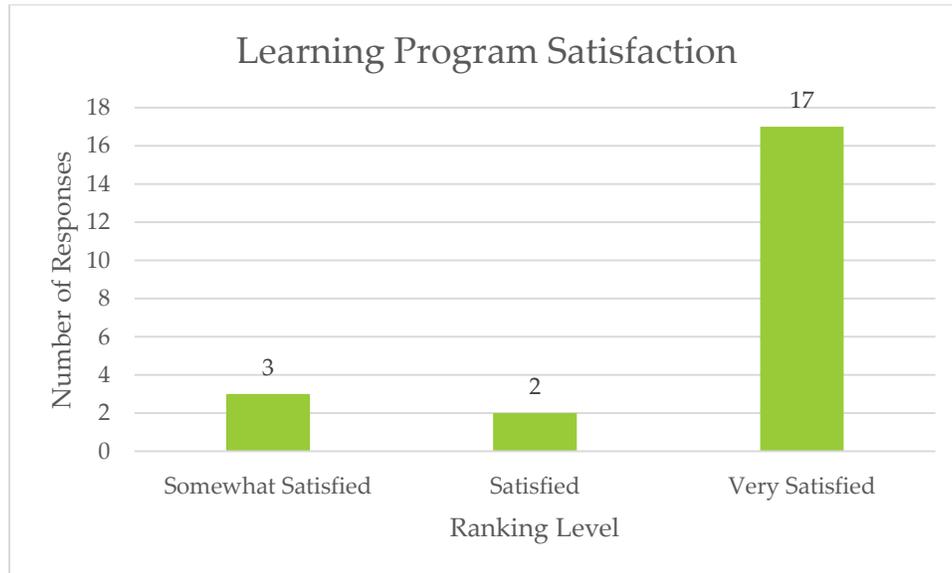
In addition to determining awareness of hydroponics, the HPCF, and its learning program, our team investigated HPCF visitors’ perception of the HPCF produce and learning program. This information did not directly pertain to our objectives, but the results provided the team with insight regarding potential causes for low community awareness.

#### 4.3.1 Perception of the HPCF Produce and Learning Program

Out of the 11 surveys collected from HPCF consumers, 10 ranked their perceived quality of HPCF produce in comparison to other produce. The rankings in the survey question were “Lower,” “Similar,” and “Superior” quality. The analysis indicated that 10 out of 10 respondents (100%) ranked the HPCF produce to be of superior quality.

Our team asked the previous learning program attendees to rank the satisfaction level of the learning program. The rankings were “Very unsatisfied,” “Unsatisfied,” “Somewhat satisfied,” “Satisfied,” and “Very satisfied.” Out of the 22 responses none of the interviewees answered “Very

unsatisfied” or “Unsatisfied.” Figure 4-5 below shows that 17 out of 22 responses (77%) ranked the training with the highest possible answer.



**Figure 4-4: Learning Program Satisfaction**

In addition, 10 of the 21 who answered the question about implementing hydroponics (48%) indicated they had implemented hydroponics following their completion of the training. In contrast, during our initial interview with Patcharin Puttharit, she had predicted that only 10% of the people who had gone through the training had implemented hydroponics.

These findings added value to our project by showing that the customers of the HPCF were satisfied with both aspects of the HPCF, the farm and its learning program, and that a poor image was not likely contributing to the low community awareness.

#### 4.3.2 Communication Methods

Our team combined the previous learning program attendees and consumers of the HPCF responses with regard to how they heard about the HPCF. We analyzed 24 responses out of 33 combined participants and identified the “HPCF entrance sign” and “Friends and Family” as the most frequent responses with 9 out of 24 responses (38%) aware of the HPCF through the entrance sign and 8 (33%) from friends and family. Furthermore, five respondents (21%) found out about the HPCF through online mediums including the Chaipattana Foundation website and the HPCF Facebook page. These results provided evidence that the HPCF has not been utilizing an extensive PR strategy.

### 4.4 Development of PR Strategy

To develop our PR strategy based on the results from our surveys and interviews, our team organized the information into the following components as explained in the Background chapter: objectives, target audience, message, budget, measurement, and medium. This section describes how our results apply to each component of the PR strategy.

#### 4.4.1 Objectives

The objective of the PR strategy aligned with our project goal to raise awareness of hydroponics, the HPCF, and its learning program in the local community because our results showed that the community is generally unfamiliar with those three entities. The team did not include the expected level of goal attainment due to limited time.

#### 4.4.2 Target Audience

The intended target audience of the PR strategy was the Muang district in Prachinburi, Thailand based on Patcharin Puttharit’s desire for the HPCF to become better known in the local community. We narrowed the target audience down to local market consumers, farmer organizations, and schools because each of these targets related to agriculture and the team could contact the groups in the project timeframe. The team further narrowed the target audience specifically to market consumers because the results of the analysis demonstrated the market consumers’ low awareness of hydroponics, the HPCF, and its learning program as well as their interest in growing produce. Due to time constraints, the team could not develop PR materials specific to the needs of the farmer organizations and schools.

#### 4.4.3 Message

To identify the message for our PR Strategy with regard to consumers as our target audience, our team conducted a SWOT analysis, as previously explained in the Background chapter, which included our relevant results and background information about the HPCF.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• HPCF is the only learning center for hydroponics in local community</li> <li>• Learning program is free</li> <li>• Consumers are interested in growing produce</li> <li>• There are benefits of hydroponics vs. soil-based agriculture</li> <li>• Chaipattana Foundation supports HPCF</li> <li>• HPCF is willing to share knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Community has low awareness of hydroponics, the HPCF, and its learning program</li> <li>• HPCF is in a remote location</li> <li>• Hydroponics has a high initial investment and requires technical knowledge</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Consumers can participate in sustainable development and improve standard of living</li> <li>• Hydroponics can decrease negative environmental impacts of farming</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of hydroponics knowledge could cause misperceptions</li> <li>• Competitors (soil-based agriculture)</li> </ul>

Table 4-2: Project SWOT Analysis

The following table outlines information we included in the PR materials based on the components we identified in the above SWOT analysis as the message for our PR strategy:

Topic of Information	SWOT Components Addressed
General information about hydroponics <ul style="list-style-type: none"> <li>• Overview</li> <li>• Outline of process</li> <li>• Benefits over soil-based technique</li> </ul>	<ul style="list-style-type: none"> <li>• Low awareness of hydroponics in community</li> <li>• Potential misperception of hydroponics</li> <li>• Technical knowledge requirement</li> <li>• Decreased negative environmental impact</li> </ul>
Hydroponics cost of implementation	<ul style="list-style-type: none"> <li>• High initial investment</li> </ul>
Background for HPCF development <ul style="list-style-type: none"> <li>• Chaipattana Foundation</li> <li>• HPCF goal</li> </ul>	<ul style="list-style-type: none"> <li>• Participate in sustainable development</li> <li>• Improve farmers' standard of living</li> </ul>
General HPCF information <ul style="list-style-type: none"> <li>• Location</li> <li>• Learning program</li> </ul>	<ul style="list-style-type: none"> <li>• Learning program is free</li> <li>• Consumers are interested in growing produce</li> <li>• Community has low awareness of HPCF and its learning program</li> <li>• HPCF is only learning center for hydroponics in local community</li> <li>• HPCF is in a remote location</li> </ul>

Table 4-3: Message for PR Strategy based on SWOT Analysis

4.4.4 Budget

Due to the time constraints of our project our team did not estimate the total budget before developing the PR materials. However, due the size of the HPCF, we assumed that the available budget for the PR strategy would be too small to pay for any components other than printed materials.

4.4.5 Measurement

A team can evaluate a PR strategy based on its effectiveness through a measurement technique known as KPIs or Key Performance Indicators as previously discussed in the Background chapter. However, due to the time constraint of this project our team did not determine KPIs to gauge the effectiveness of the strategy. Instead, to measure the outreach of the PR materials, we developed a visitor tracking sheet included in Appendix S. This tracking sheet contains spaces for visitors to enter their contact information, reason for visit, and how they found out about the HPCF. The sheet lists each component of the PR strategy as an option for how they found out about the HPCF and an "Other" option. This allows the HPCF to track how many people learned about the HPCF through the PR materials and whether this number increases over time.

4.4.6 Medium

In order to determine how to organize the information in the message of the PR strategy, we consulted an expert in public relations, Thawatchai Saengthamchai, as explained in Step 3 of the Methodology chapter (section 3.3). He advised us to consider the following three phases for our PR strategy:

**Phase 1:** Generate initial interest in the local community by showing them general information about hydroponics and the availability of the HPCF as a learning resource through accessible printed materials.

**Phase 2:** Provide resources where more information is available to supplement the previous phase. The materials that grab the initial interest of the target audience in Phase 1 must link to the components that contain more detailed information.

**Phase 3:** Direct the local community to the HPCF for its learning program and more information through Phase 1 and Phase 2 materials.

Specifically, Thawatchai Saengthamchai suggested that we create a business card, brochure, and poster for Phase 1. He also advised us to create a website and Facebook strategy for Phase 2. In order to connect these two phases to Phase 3, he recommended that all of our materials should contain contact information for and location of the HPCF. Thawatchai Saengthamchai's recommendations align with the results we obtained from our data analysis because evaluation of communication practices suggest the creation of both offline and online components, as our data showed that only 52 out of 85 (61%) have Internet access in the Muang district.

#### 4.4.7 Deliverables

Based on our results and Thawatchai Saengthamchai's suggestions, our team created a business card, brochure, poster, website and guidelines for distributing materials, editing the website, and updating the Facebook page and tracking its activity. We designed a logo for the HPCF using blue to represent the water used in hydroponics, green to represent the plants, and dark blue and gold to represent the Chaipattana Foundation. Based on our chosen PR materials and the target audience, we also included guidelines for distributing the printed materials, editing the website, and updating and tracking activity on the existing Facebook page.

##### 4.4.7.1 Business Card

Below is the business card our team created in English and Thai.



Figure 4-5: Business Card Front (English)



Figure 4-6: Business Card Back (English)

โครงการปลูกพืชโดยไม่ใช้ดิน  
มุสไนซ์พัฒนา

พัชรินทร์ พุทธิฤทธิ์ (กิ่ง)  
(หัวหน้าโครงการ)

โทร: 081-957-4196  
เว็บไซต์: www.hydroponicsfarm.weebly.com  
Facebook: โครงการปลูกพืชโดยไม่ใช้ดิน  
“สด สะอาด ปลอดภัย ไร้สารพิษ”

Figure 4-7: Business Card Front (Thai)

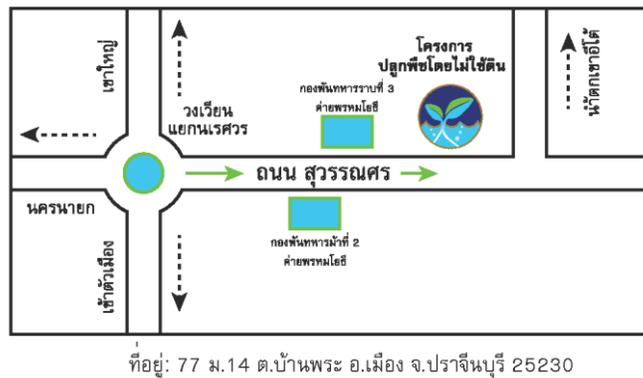


Figure 4-8: Business Card Back (Thai)

#### 4.4.7.2 Brochure

Below is the brochure our team created in English and Thai.

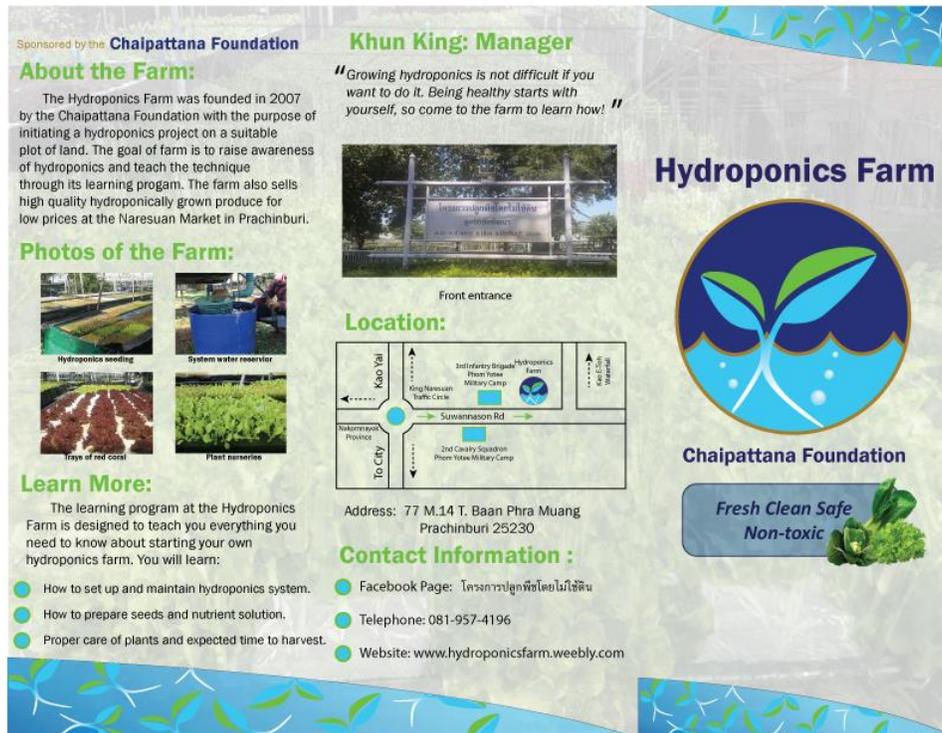


Figure 4-9: Brochure Outside (English)

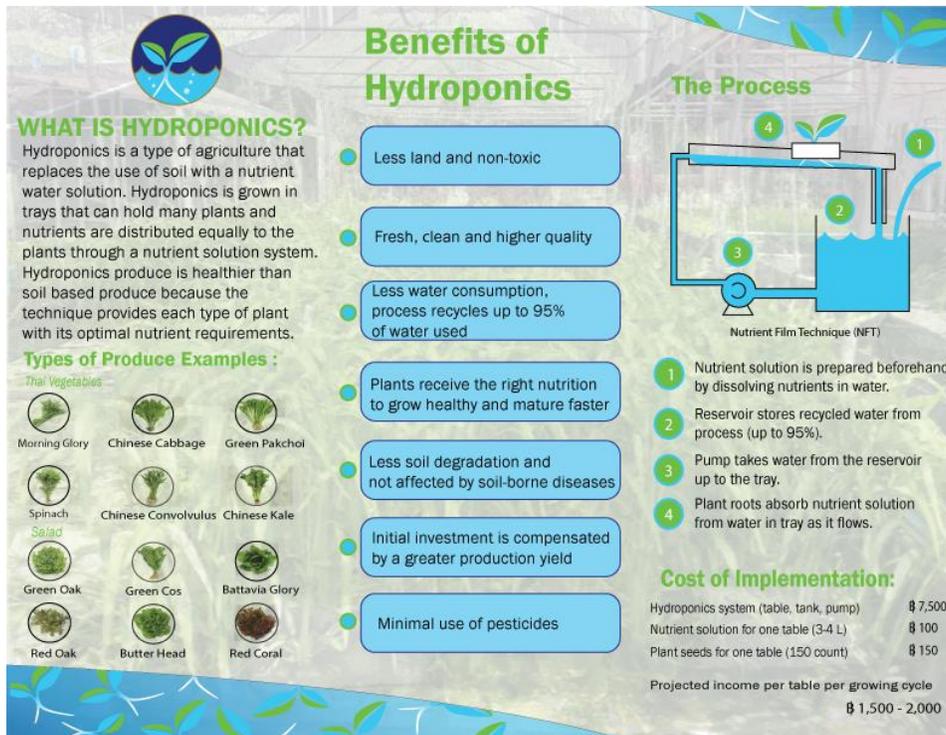


Figure 4-10: Brochure Inside (English)

**โครงการอันเนื่องมาจากพระราชดำรินิธิชัยพัฒนา**

**ข้อมูลเกี่ยวกับฟาร์ม**  
 มูลนิธิชัยพัฒนาได้ดำเนินการจัดทำโครงการปลูกพืชโดยไม่ใช้ดิน (hydroponics) ตามพระราชกระแสทรงสมมติพระพรหมวราสารัตถา สถาบันพระมหากษัตริย์ เมื่อปี พ.ศ. 2550 มีจุดประสงค์เพื่อเป็นโครงการนำร่องและฐานการศึกษาค้นคว้าวิจัยและพัฒนาการปลูกพืชแบบไฮโดรโปนิคส์ ได้เข้ามามีบทบาทสำคัญในการพัฒนาโครงการ มีบริการจำหน่ายผักสดที่ปลูกแบบไฮโดรโปนิคส์ ซึ่งมีความปลอดภัยและราคาเหมาะสมภายในโครงการ จังหวัดปทุมธานี

**รูปภาพโครงการ**  


**ข้อมูลเพิ่มเติม**  
 ท่านสามารถเข้ามาศึกษาดูงานในด้าน :  
 ● ขั้นตอนการสร้างและการบำรุงรักษาระบบไฮโดรโปนิคส์  
 ● ขั้นตอนการเพาะต้นกล้า และ เครื่องมืออาหาร  
 ● ขั้นตอนการดูแลพืชผัก และ เวลาที่ใช้ในการเก็บเกี่ยว

ในวันและเวลาดังกล่าว  
 เวลา 9.30 - 16.30 น.

**หัวข้อโครงการ:**  
 พัชรินทร์ พุทธิฤทธิ์ (คุณกิ่ง)  
 ปลูกผักไม่ยาก ถ้าอยากทำ  
 สุขภาพดี เริ่มที่ตัวคุณ  
 เข้ามาเรียนรู้กับเรา !

**แผนที่โครงการ**  


ที่อยู่ : 77 ม.14 ต.บ้านพระ อ.เมือง จ.ปทุมธานี 25290

**ข้อมูลติดต่อ**  
 ● Facebook: โครงการปลูกพืชโดยไม่ใช้ดิน  
 ● เบอร์โทร: 081-957-4196  
 ● Website: www.hydroponicsfarm.weebly.com

**โครงการปลูกพืชโดยไม่ใช้ดิน**  
  
 มูลนิธิชัยพัฒนา  
 สด สะอาด ปลอดภัย  
 ไร้สารพิษ

Figure 4-11: Brochure Outside (Thai)

**ผักไฮโดรโปนิคส์คืออะไร?**  
 ไฮโดรโปนิคส์เป็นทางเลือกในการปลูกพืชที่ใช้แทนการปลูกพืชในดิน กล่าวคือเป็นระบบการปลูกพืชในน้ำที่มีสารละลายธาตุอาหารที่อุดมสมบูรณ์ ซึ่งทำให้พืชเจริญเติบโตได้อย่างปกติ และเพื่อเป็นการลดข้อจำกัดและปัญหาต่างๆ ที่เกี่ยวกับดินหรือพื้นที่การปลูก โดยการสร้างและควบคุมสภาวะต่างๆ ให้เหมาะสมกับการเจริญเติบโตของพืชที่ปลูก เพราะฉะนั้นผักที่ปลูกในระบบนี้จะมีรสชาติดี หวาน กรอบปลอดภัยต่อผู้ผลิตและผู้บริโภคและยังเป็นมิตรกับสิ่งแวดล้อมอีกด้วย

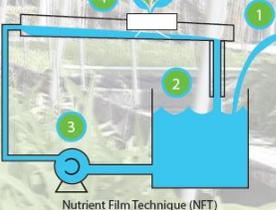
**ชนิดผักที่สามารถปลูกโดยไม่ใช้ดิน**

**ผักไทย**  


**ผักฝรั่ง**  


**ข้อดีของไฮโดรโปนิคส์**

- ใช้พื้นที่น้อย และ ปลอดภัย
- ผลผลิตที่ได้มีความสะอาด สด รสชาติดี
- การปลูกพืชไฮโดรโปนิคส์ช่วยประหยัดน้ำได้มากกว่าการปลูกพืชในดินถึง 95 %
- พืชได้รับธาตุอาหารที่ดีทำให้เจริญเติบโตได้เร็วและมีคุณภาพดี
- ไม่ต้องไถพรวนดิน สามารถลดการทำลายหรือชะล้างหน้าดิน
- มีผลผลิตสม่ำเสมอและมียาเกี่ยวกับเชื้อราทำให้สามารถคืนต้นทุนในการลงทุนได้เร็วขึ้น
- ไร้สารเคมีในการกำจัดแมลง

**ระบบที่ใช้ในการปลูกพืชแบบไฮโดรโปนิคส์**  
  
 Nutrient Film Technique (NFT)

1. เตรียมธาตุอาหารก่อนนำไปละลายรวมลงในน้ำ
2. น้ำจะผ่านท่การกรองและเติมออกซิเจนแล้วจึงเก็บไว้ที่บ่อเก็บน้ำ
3. น้ำจากอ่างเก็บน้ำ จะถูกปั๊มขึ้นไปบนโต๊ะปลูก
4. รากจะดูดซึมธาตุอาหารที่ไหลเวียนรอบๆโต๊ะปลูก

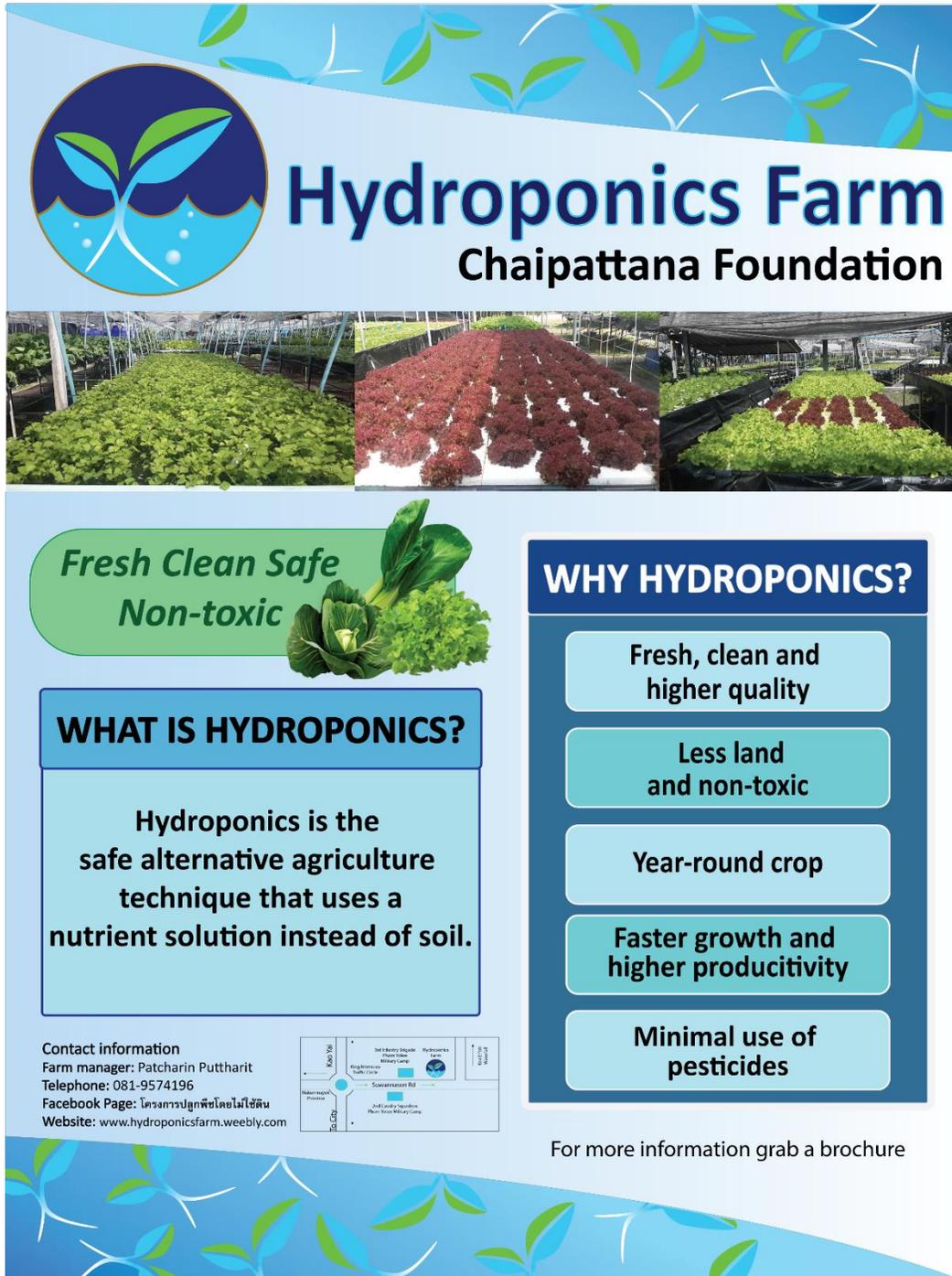
**เงินลงทุนเริ่มต้น**  
 ชุดปลูกพืชแบบไฮโดรโปนิคส์ (โต๊ะ, แท่งน้ำ, ปั๊มน้ำ) 7,500 บาท  
 ธาตุอาหารสำหรับ 1 โต๊ะปลูก (3-4 ลิตร) 100 บาท  
 เมล็ดพันธุ์พืช 150 บาท / รอบ

รายได้จากผลผลิตต่อ 1 รอบ  
 1,500 - 2,000 บาท

Figure 4-12: Brochure Inside (Thai)

#### 4.4.7.3 Poster

Below is the poster our team created in English and Thai.



The poster features a blue and green leaf pattern at the top and bottom. The central logo is a circular emblem with a green leaf and a blue water droplet. To the right of the logo, the text reads "Hydroponics Farm" in a large, bold, blue font, with "Chaipattana Foundation" in a smaller, bold, black font below it. Below the text are three photographs of hydroponic farms: one with green leafy vegetables, one with red leafy vegetables, and one with green leafy vegetables in a different setup. The poster is divided into several sections:

- Fresh Clean Safe Non-toxic**: A green rounded rectangle with a green leafy vegetable illustration.
- WHAT IS HYDROPONICS?**: A blue rounded rectangle containing the text: "Hydroponics is the safe alternative agriculture technique that uses a nutrient solution instead of soil."
- WHY HYDROPONICS?**: A dark blue rounded rectangle containing five light blue rounded rectangles with the following text: "Fresh, clean and higher quality", "Less land and non-toxic", "Year-round crop", "Faster growth and higher productivity", and "Minimal use of pesticides".
- Contact information**: A white rounded rectangle containing the text: "Farm manager: Patcharin Puttharit", "Telephone: 081-9574196", "Facebook Page: โครงการปลูกพืชโดยไม่ใช้ดิน", and "Website: www.hydroponicsfarm.weebly.com".
- Map**: A small map showing the location of the farm in Chaipattana, with labels for "Kalyan", "Sukhaveson Rd", "Jit Land & Garden Plant Store & Nursery Camp", and "Hydroponics Farm".

Figure 4-13: Poster (English)



# โครงการปลูกพืชโดยไม่ใช้ดิน (ไฮโดรโปนิกส์) มูลนิธิชัยพัฒนา



สด สะอาด ปลอดภัย  
ไร้สารพิษ



## ไฮโดรโปนิกส์คืออะไร?

การปลูกพืชโดยไม่ใช้ดิน  
หรือการปลูกพืชในน้ำที่มีธาตุอาหารพืช  
ละลายอยู่ นับเป็นวิธีการปลอดภัยที่ใช้  
ทดแทนการปลูกพืชโดยใช้ดิน  
ที่เราใช้กันในปัจจุบัน

วิทยุสมัคร  
พันธุ์ไม้โครงการ: พืชไร่น้ำ พืชสวน (คุณกิ่ง)  
เบอร์โทร: 081-9574196  
Facebook: โครงการปลูกพืชโดยไม่ใช้ดิน  
เว็บไซต์: www.hydropicfarms.weekly.com



## ทำไมต้องไฮโดรโปนิกส์ ?

ผลผลิตที่ได้มีความ  
สะอาด สด คุณภาพดี

ปลอดภัยและสามารถปลูกได้  
แม้ในที่ที่ไม่มีพื้นที่

สามารถปลูกพืชได้ตลอดทั้งปี

พืชเจริญเติบโตเร็วและมีผลผลิตสูง

ลดการใช้สารเคมี  
เนื่องจากสามารถควบคุมสภาพแวดล้อมสารเคมีได้

เชิญหยิบเอกสารแจกฟรี

Figure 4-14: Poster (Thai)

#### 4.4.7.4 Website

We created English and Thai versions of the website at the following URL:



<http://www.hydroponicsfarm.weebly.com>

#### 4.4.7.5 Implementation Guidelines

Based on our chosen PR materials, we included guidelines for the HPCF to use for implementation. This included the distribution of the printed materials, the procedure for editing the website, and the steps to update and track activity on the previously existing Facebook page. The HPCF manager, Patcharin Puttharit, was already aware of where to print the offline materials. Therefore, we did not include those details in this section. Our team recommended that Patcharin Puttharit print sufficient business cards and brochures to have a constant supply available at the HPCF and at their vendor stand at the Naresuan market. In addition, each HPCF employee should have business cards with them to hand out to whomever they meet that is interested in hydroponics or the HPCF. We also suggested that the HPCF hang the informational poster at their vendor stand at the Naresuan market and at the HPCF itself. We also recommend that the HPCF print the poster using waterproof or laminated paper to ensure durability in outdoor conditions.

With regard to the online materials, our team developed a Website Editing Guide and Facebook Page Measurement Guide. Even though our intent was for the website to be static, we included a step-by-step website editing guide in both English and Thai in Appendix P explaining how to make changes to the website if necessary.

From our assessment of the current HPCF Facebook page, we noticed incorrect contact information and that the last post was in June 2014. We recommended that Patcharin Puttharit update the HPCF address, phone number, and add the link to the website. Furthermore, we recommended that the HPCF post photos and relevant updates about the HPCF and/or hydroponics on a weekly basis. Our team based this suggestion on the average frequency with which consumers use Facebook and the realistic expectations of the farm employees, as previously explained in the Results and Discussion chapter. In order to increase the engagement with the Facebook page, the HPCF employees should also ask their customers and training program attendees to like the Facebook page and encourage visits to the website by word of mouth. We assumed that because the HPCF already has a Facebook page, they know how to edit the contact information. Therefore, our Facebook Page Measurement Guide only includes how to track visitors over time. Appendix Q includes the Facebook Page Measurement Guide in English and Thai. [Click here to visit the Facebook Page.](#)

## 5 Conclusion and Recommendations

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Our team aided the HPCF in achieving its goal to “Have more people to learn and be interested in hydroponics ... to make this farm more well-known to the local people in Prachinburi and others who are interested...” (P. Puttharit, personal communication, January 14, 2015). In order to help the HPCF achieve this goal, our team first investigated the current awareness of hydroponics, the HPCF, and its learning program in the local community. Our team conducted surveys and phone interviews with market consumers and vendors, HPCF consumers, previous HPCF learning program attendees, local schools, and farmer organizations with a focus on the local community of the Muang district. Our team determined through the analysis of the data that the current awareness of hydroponics, the HPCF, and its learning program was low. Therefore, we decided to develop a PR strategy to raise awareness. We determined the message of the strategy through a SWOT analysis. We also clarified the objectives, target audience, and measurement tools for the strategy and determined effective communication mediums using background information and by contacting a PR expert who recommended a three phase strategy. Phase 1 was to generate initial interest in the message, phase 2 was to provide detailed information, and phase 3 was to direct the target audience to the HPCF for further learning.

To achieve the first phase our team developed a business card, brochure, and poster. These materials contained general information about hydroponics and the HPCF in order to stimulate initial interest to lead the target to the second phase of the strategy and directly to the HPCF for further learning. The results from our analyzed data influenced the content in these materials. Since only 23 out of 79 consumers (29%) were familiar with hydroponics we included basic information about hydroponics. In addition, we included contact information and content about the services of the HPCF and its location because our results showed that only 26 out of 85 subjects (31%) were aware of the HPCF.

We developed a website for the second phase of the strategy and provided recommendations to enhance the use of the existing HPCF Facebook page. We chose to include these online mediums because 52 out of 85 consumers (61%) had Internet access and 38 out of 52 respondents (73%) used Facebook, making it the most popular social media platform among consumers we surveyed. The local community members could access the online materials in Phase 2 from the URL addresses provided on the Phase 1 materials. The online materials contained more information about hydroponics, the HPCF, and its learning program. The first two phases could raise awareness and provide sufficient information to further engage the audience with hydroponics, the HPCF, and its learning program, thus completing the third phase.

Finally, our team developed implementation guidelines with recommendations to ensure that the PR strategy would be sustainable and successfully implemented by the HPCF manager and employees. The guidelines include content about the recommended distribution locations for the printed materials, a step-by-step procedure to edit the website, strategies to enhance the use of the existing HPCF Facebook page, and methods to measure the effectiveness of the PR materials by the HPCF employees. Our team determined the centers of distribution based on the results in relation to

interest and lack of awareness of hydroponics and the HPCF such as the four interviewed local schools, the three farmer organizations, and at the HPCF produce stand at the Naresuan Market in the Muang district.

Although our team was able to develop materials for the PR strategy, we were not able to implement the PR strategy. Since we did not implement the strategy, we were unable to measure its effectiveness. Due to this limitation, our team was only able to evaluate our strategy from a review of our materials by the HPCF manager. Additionally, in comparison to the population of the Muang district, our sample sizes for surveys and interviews were too small to be statistically significant and therefore were not representative of the local community.

## 5.1 Recommendations for Future Work

In addition to the recommended implementation steps in section 4.4.7.5, our team suggests that the HPCF explore the opportunity to reach out to local schools and farmer organizations in the Muang district. Our results reflected interest in implementing hydroponics from the schools that we contacted. Furthermore, pursuing schools could be one way to increase awareness of sustainable farming to the younger generation, their families, and to the faculty. The farmer organizations also revealed their interest in learning more about hydroponics and they contain a large number of community members. Agriculture directly affects their lives and therefore they could potentially benefit from hydroponics education. In order to pursue these two target groups, our team recommends that the HPCF allocate future resources to modify or recreate PR materials to specifically focus on the informational needs of the schools and farmer organizations. Appendix R contains the contact information for the local schools and farmer organizations in the Muang district.

Although our team contacted a professional PR organization to review our PR materials we were unable to obtain feedback. Therefore we recommend that the HPCF contact WHY NOT Enterprises or another professional PR firm in order to refine the PR materials and to obtain advice for how to better measure the strategy's effectiveness.

Furthermore, this project only considered the local community and since our team interviewed previous attendees of the HPCF learning program from outside of the Muang district it is clear that the farm has influence outside of the local community. Due to this, our team recommends that the HPCF expand the target audience to outside the Muang district. This would allow for the HPCF to cater its services to other audiences to further raise awareness of hydroponics, the HPCF, and its learning program.

Through the implementation of our PR strategy, our team is confident that the HPCF would improve the awareness within its community and become better known as a resource for hydroponics learning. This increase in awareness will result in increased knowledge of hydroponics as a sustainable alternative farming technique which directly aligns with the Chaipattana Foundation's goal of promoting sustainable development in Thailand.

## 6 References

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- Bradley, P., & Katzir, R. (2004). Microfarm Project Using Simplified Hydroponics and Fertigation in the Lerma Chapala Basin. *Sustainable Communities*, 7(2), 65–75.
- Caldeyro, M. (2003). Simplified Hydroponics in Uruguay. *Practical Hydroponics & Greenhouses*, 31–34.
- Carruthers, S. (2007). Challenges Faced By The Hydroponics Industry Worldwide. *International Society for Horticulture Science*, 742, 23–27.
- Dolan, R. (2000). Note on Marketing Strategy. *Harvard Business Review*, (November), 1–17.
- Dreschel, T. (2014). Hydroponics.
- Ehrlich, E., & Fanelli, D. (2012). *Bloomberg Financial : Financial Services Marketing Handbook : Tactics and Techniques That Produce Results (2nd Edition)* (2nd ed.). Hoboken, NJ, USA: John Wiley & Sons.
- FAO. (2014). *Aquastat Thailand Country Fact Sheet* (Vol. 2014).
- Food Poverty - Healthy Food for All. (n.d.). Retrieved March 4, 2015, from <http://healthyfoodforall.com/food-poverty/>
- Harrison, K. (2013). Make the most of SWOT analysis for communication projects. Retrieved February 24, 2015, from <http://www.cuttingedgepr.com/articles/swot-analysis-communication-projects.asp>
- Hon, L. C. (2009). Demonstrating Effectiveness in Public Relations: Goals, Objectives, and Evaluation. *Journal of Public Relations Research*, 10(2), 103–135. Retrieved from [http://www.tandfonline.com/doi/abs/10.1207/s1532754xjpr1002\\_02#.VOvVdHyUcpU](http://www.tandfonline.com/doi/abs/10.1207/s1532754xjpr1002_02#.VOvVdHyUcpU)
- Hydroponics Training Manual. (n.d.). Retrieved February 23, 2015, from <http://web.sut.ac.th/csu/new/add/training/D1.pdf>
- Jitsanguan, T. (2001). Sustainable Agricultural Systems for Small-Scale Farmers in Thailand : Implications for the Environment. *Food and Fertilizer Technology Center*, 11.
- Jones, J. B. (2014). *Complete Guide for Growing Plants Hydroponically*. GroSystems, Inc. (pp. 1–20). Anderson, SC.
- Kao, T., District, T., Improvement, A., & Hsiang, T. (1989). The dynamic root floating hydroponic technique: year-round production of vegetables in roc on taiwan, (Kao 1987).
- Kao, Te-chen, Tatsuen, H., & Changhua, R. O. C. (1991). The dynamic root floating hydroponic technique: year-round production of vegetables in roc on taiwan. *ASPAC Food & Fertilizer Technology Center*.

- Kasem, S., & Thapa, G. B. (2011). Crop diversification in Thailand: Status, determinants, and effects on income and use of inputs. *Land Use Policy*, 28(3), 618–628. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0264837710001213>
- Kasem, S., & Thapa, G. B. (2012). Sustainable development policies and achievements in the context of the agriculture sector in Thailand. *Sustainable Development*, 20(April 2010), 98–114. doi:10.1002/sd.467
- Kukarja, A. (2007). King's Projects Promote Sustainable Development. *Thailand Investment Review*.
- Lavinsky, D. (2013). Three Steps To A Solid Marketing Budget. Retrieved February 24, 2015, from <http://www.forbes.com/sites/davelavinsky/2013/06/07/three-steps-to-a-solid-marketing-budget/>
- Leturque, H., & Wiggins, S. (2010). Thailand's Progress in Agriculture: Transition and Sustained Productivity Growth. *Overseas Development Institute*, 1–30.
- Millward, S. (2013). Thailand Now Has 18 Million Social Media Users (INFOGRAPHIC). Retrieved March 3, 2015, from <https://www.techinasia.com/thailand-18-million-social-media-users-in-2013/>
- Ministry of Education. (2008). *Towards a Learning Society in Thailand* (pp. 1–12). Bangkok, TH.
- Norton, R. D. (2004). *Agricultural development policy: concepts and experiences*. Hoboken, NJ: John Wiley & Sons.
- Parmornsood, P. (n.d.). Open a Gateway to the Royal Development Project Prachinburi Hydroponic Demonstration Plot. Retrieved February 21, 2015, from [http://www.ourking.in.th/data/article/file\\_1308197301.pdf](http://www.ourking.in.th/data/article/file_1308197301.pdf)
- Pongvitayapanu, P. (2014). Thailand and Asia Social Media Data 2014 by Zocial, inc. Retrieved February 24, 2015, from <http://www.slideshare.net/pawoot/for-share-thailand-zocial-award-2014-eng-version>
- PR Campaign Guidelines. (n.d.). Retrieved February 3, 2015, from [http://www.citiesengage.eu/en/IMG/pdf/ENGAGE\\_PR\\_campaign\\_guidelines.pdf](http://www.citiesengage.eu/en/IMG/pdf/ENGAGE_PR_campaign_guidelines.pdf)
- Prasart, L. (2015). Personal Interview. (H. Takahashi, Ed.).
- Resh, H. M. (2012). *Hydroponic Food Production: A Definitive Guidebook for the Advanced Home Gardener and the Commercial Hydroponic Grower, Seventh Edition* (p. 560). CRC Press.
- Rural population. (2015). Retrieved from <http://data.worldbank.org/indicator/SP.RUR.TOTL/countries>

- Saldana. (2009). Introduction to Codes and Coding. In *The Coding Manual for Qualitative Researchers* (pp. 1–31). Retrieved from [http://www.sagepub.com/upm-data/24614\\_01\\_Saldana\\_Ch\\_01.pdf](http://www.sagepub.com/upm-data/24614_01_Saldana_Ch_01.pdf)
- Self-Sufficient. (n.d.). Retrieved February 22, 2015, from <http://www.merriam-webster.com/dictionary/self-sufficient>
- Singhapreecha, C. (2014). Economy and Agriculture in Thailand(FFTC Agricultural Policy Database). *Asia-Pacific Information Platform on Agricultural Policy*.
- Soil Amendments and Fertilizers. (n.d.). Retrieved February 22, 2015, from [http://extension.umd.edu/sites/default/files/\\_images/programs/hgic/Publications/HG42\\_Soil\\_Amendments\\_and\\_Fertilizers.pdf](http://extension.umd.edu/sites/default/files/_images/programs/hgic/Publications/HG42_Soil_Amendments_and_Fertilizers.pdf)
- Spss, Data Mining, Statistical Analysis Software, Predictive Analysis, Predictive Analytics, Decision Support Systems. (n.d.). Retrieved February 3, 2015, from <http://www.spss.co.in/index.aspx>
- The Chaipattana Foundation. (2014). Retrieved from [http://www.chaipat.or.th/chaipat\\_english/](http://www.chaipat.or.th/chaipat_english/)
- The History of Chaipattana Foundation. (n.d.). Retrieved January 28, 2015, from [http://www.chaipat.or.th/chaipat\\_english/index.php?option=com\\_content&view=article&id=4068%3Achaipattana-foundation-history&catid=717%3Aabout-us&Itemid=275&lang=](http://www.chaipat.or.th/chaipat_english/index.php?option=com_content&view=article&id=4068%3Achaipattana-foundation-history&catid=717%3Aabout-us&Itemid=275&lang=)
- The Importance of Really Knowing Your Target Audiences. (n.d.). Retrieved February 24, 2015, from <http://www.forbes.com/sites/markevans/2013/03/20/the-importance-of-really-knowing-your-target-audiences/>
- Wattanapreechanon, E., & Sukprasert, P. (2012a). Development of soilless culture for crop production in Thailand. *Kasetsart Journal - Social Sciences*, 33, 475–485.
- Wattanapreechanon, E., & Sukprasert, P. (2012b). Development of soilless culture for crop production in Thailand. *Kasetsart Journal - Social Sciences*, 33, 475–485.
- ข้อมูลอำเภอ-สถานที่ท่องเที่ยว-ติดต่อราชการ. (n.d.). Retrieved February 24, 2015, from <http://www.amphoe.com/menu.php?mid=1&am=345&pv=29>
- สำนักงานจังหวัดปราจีนบุรี. (n.d.). Retrieved February 24, 2015, from <http://webhost.cpd.go.th/prachinburi/download/database/%E0%B8%AA%E0%B8%AB%E0%B8%81%E0%B8%A3%E0%B8%93%E0%B9%8C%E0%B9%81%E0%B8%A5%E0%B8%B0%E0%B8%81%E0%B8%A5%E0%B8%B8%E0%B9%88%E0%B8%A1.pdf>

## 7 Appendices

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### 7.1 Appendix A: Transcript for Preliminary Interview with Patcharin Puttharit

**Interview Date:** 14th January 2015

**Interviewee:** Patcharin Puttharit (HPCF Manager)

**Interviewers:** Kik and Nutt

**Translators:** Mimi and Be

**Participants:** Eric, Nicolas, Karen, Aj. Supawan and Aj. Fabienne

**Location:** Hydroponics Project of the Chaipattana Foundation (At Prachinburi)

**Purpose:** To collect more information about the hydroponics farm and general information about hydroponics which will provide clarification for our project and expectations.

#### Permission Statement:

1. **Can we use your name to refer to this interview? May we please record this interview?**
  - Yes.
2. **How much time do we have for this interview? We have approximately 30 questions.**
  - I'm free all day and will be able to answer all the questions.
3. **Could you discuss your position within the company as well as your level of education? Where did you study?**
  - I am the leader of this farm. I graduated from Maejo University, I studied agricultural botany, and I did a thesis about Hydroponics.

#### Purpose of Project:

4. **Why was the HPCF located in Prachinburi?**
  - His Majesty the King gave this land to initiate the hydroponics farm. At first there were three places and I chose Prachinburi because in Prachinburi there are good public utilities and it is located near the community and market. In addition, in the future, this farm is near the tourist area, so many people might come to visit here.
5. **What are the demographics of Prachinburi?**
  - People in this area do agriculture and seed or sexual reproduction. Also many people in this area are military.
6. **What is the social issue that the HPCF is trying to address?**
  - In this area there is no social issue that HPCF is trying to address.
7. **What are the expectations and goals from the Chaipattana Foundation for the HPCF?**
  - To become the leading of hydroponics learning centers. The leading of the hydroponics is the main policy of this farm. Also, the main purpose is that I want the community in Prachinburi to be interested in the hydroponics learning center and I want to help the local people in this area. In addition other communities can come to visit and learn hydroponics too. However, many businessmen come to participate in this farm instead of the local people.
  - **What are the expectations for Team Hydro?**

- I would like to have more people to learn and be interested in hydroponics, I prefer team to do PR or to make this farm to be more well-known to the local people in Prachinburi. In the past, many people came to this farm, but there was nothing happening after they visited. In addition, the team should more focus on the local people in Prachinburi, it might be more effective.

#### **Current Status of HPCF:**

**8. What is the current economic status of the farm? Is it self-sufficient?**

- It is already at full capacity and this farm can produce 50 kilogram on average per day. All the trays are full, there is no additional space to grow hydroponics.

**9. What is the current marketing strategy of the HPCF?**

- I sell the hydroponics at the farm and at the market place near the farm. But if customer wants to buy hydroponics at farm, the customer has to order first. For one pack of vegetable (200grams) is 15baht and all products are all sold every day.

**10. What is the consumer awareness and perceptions of hydroponics?**

- The products from the farm are better and fresher than other farms. And hydroponics is fresher than other types of traditional vegetables.

**11. How is the produce priced at the market? Is there a price difference, if so why?**

- Hydroponics is a little bit more expensive than the traditional vegetables because it is fresher and better quality. Hydroponics is an alternative way for the customers to choose which kind of vegetable they prefer. Also farm gets 20-30% profit from selling the hydroponics. Anyway, the private company sells more expensive than this farm. This farm makes an average of 2000 baht per day and I want more market to sell products from the farm. All earning goes to the foundation.

**12. What is the supply/demand relationship for hydroponics at the local market? At the HPCF itself? Is it consistent throughout the year?**

- Supply meets demand of the consumers. The farm produces the products at maximum capacity. In the winter there is a lot of supply but the farm cannot produce as much as the customers want. In the summer there is less supply and more demand because of the weather.

**13. What is the investment/funding relationship between the HPCF and Chaipattana Foundation?**

**a. What process does Patcharin Puttharit have to go through to get more funding?**

- I have to ask for the funding for one year and also if the farm wants more funding I have to give the reasons why the farm needs more.

**b. Is the Foundation willing to increase the budget for the HPCF?**

- I do not want more funding because it is enough for farm now.

**c. If budget was increased, what could it be used for?**

- It could be used for PR the farm and the learning center to be more well-known in Prachinburi and Thailand. I do not want to hire more workers.

#### **Learning Center:**

**14. What materials are used in the curriculum and how is it taught?**

- I attempt to teach by participating in the farm which is not by the theory. I let the participants try to practically do the hydroponics while I teach.
- 15. Is the learning curriculum fully developed?**
  - Yes, this farm already developed.
- 16. Who is the target audience for the learning program?**
  - Everyone who is interested in hydroponics. Many participants know the farm by the website of the foundation. This farm also has Facebook.
- 17. Who currently participates in the learning program? Where do they come from? Why are they interested?**
  - Many of the participants are business men who already have the funding to initiate the business because they want to sell the hydroponics produce. Last year there were 1000 participants, 50% of them were businessmen and groups of students.
- 18. What income is generated from the learning program?**
  - The learning program costs 500 baht but I do not get any profit from the learning program.
- 19. Is the program comprehensive/extensive?**
  - The program takes one day.
- 20. What percentage of people that go through the program actually implement hydroponics?**
  - It is just 10% of participants.
- 21. How is the program followed up? Does Patcharin Puttharit keep in contact with local farmers?**
  - Yes, just 3 participants that I have followed up with.
- **If the unemployed people want to do hydroponics, will the learning center help them?**
  - I can teach them hydroponics but I cannot help them with the funding. I suggest that they should have plan maybe loan money from the bank.

#### Local Community:

- 22. Are local community members interested in hydroponics? If so, why, if not, why not?**
  - The local people are not very interested in hydroponics. People like to come in the farm for relaxing and walking.
- 23. Are local farmers small scale or large scale?**
  - Small scale
- 24. What is the economic status of local farmers, what resources do they need? Are they self-sufficient?**
  - Yes, they are self-sufficient. I give 8,000 baht per month for the workers (it can be increased depending on how long that the workers have been working here and if I need the extra workers I will pay 300 baht per day. Everyone has a different way of life, it is fine if they are happy with their life. We just want people to come and learn more hydroponics.
- 25. What are the economics of adopting hydroponics?**
  - a. **What is the start-up cost?**
    - The investment for the beginner costs 12,000 baht for one tray and roof included.
  - b. **How long does it take to break even?**
    - 5 months and it depends on the type of the plant.
- 26. What marketing techniques are being used to reach out to the local farmers and community members?**

- I sell hydroponics at market and customers can buy fresh hydroponics from the farm.

#### **HPCF Management:**

**24. What is the HPCF structure? Who does what? How are tasks distributed?**

- I do everything in the farm and learning center. Workers just do the farm.

**25. What are the current schedules? Is there a need for improvement?**

- The schedule depends on the tasks that I have to do day-by-day.

**26. Are there management issues? If so, what are they?**

- No

**27. How much does it cost to increase the number of employees?**

- I do not want new employees because there are enough now.

**28. Do new employees need to be trained? What is the training program?**

- Yes. New employees need to be trained by following the instruction of me.

#### **Concluding Questions:**

**29. On what areas should our project team focus?**

- To become learning center and to make this farm to be better known.

**30. Feedback on project goals and objectives.**

## 7.2 Appendix B: Market Consumer Survey Questions

### 7.2.1 English Version

Surveyor Name: \_\_\_\_\_

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project of the Chaipattana Foundation (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and transcribe answers.

1. Do you visit any other markets in the area?
  - a. Yes
    - i. Where?  
\_\_\_\_\_
  - b. No
2. Do you have any interest in growing your own produce, why or why not?
  - a. Yes
  - b. No
    - i. Reason  
\_\_\_\_\_
3. How familiar are you with hydroponics agriculture?
  - a. Very familiar
  - b. Somewhat familiar
  - c. Know the term but nothing more
  - d. Never heard about hydroponics

*If answered d, skip to question 6*
4. If 3.a, b, or c, what do you think hydroponics is?  
\_\_\_\_\_  
\_\_\_\_\_
5. Do you believe hydroponics produce is safe to consume?
  - a. Yes
  - b. No
6. Do you know about the Chaipattana Foundation in Prachinburi province?
  - a. Yes
    - i. Do you know about the Hydroponics Project of the Chaipattana Foundation?
      1. Yes  
If yes, how did you find out about it? (circle all that apply)
        - a. Friends or family

- b. Social media
  - i. Facebook
  - ii. Twitter
  - iii. Instagram
  - iv. Other: \_\_\_\_\_
- c. The Chaipattana Foundation
- d. Website
- e. Entrance sign
- f. Other: \_\_\_\_\_

2. No

- b. No
7. **If 5.a.i.1, have you visited the Hydroponics Project of the Chaipattana Foundation?**
- a. Yes
  - b. No
8. **If 6.a, do you know there is a hydroponics technique learning program at the HPCF?**
- a. Yes
    - i. **Have you considered going through the hydroponics training at the HPCF?**
      - 1. Yes
      - 2. No
  - b. No
9. **If 6.a, why did you visit the HPCF (circle all that apply)?**
- a. To go through the training
    - i. **How did you find out about the HPCF learning program?**
      - 1. Friends or family
      - 2. Social media
      - 3. Facebook
      - 4. Twitter
      - 5. Instagram
      - 6. Other: \_\_\_\_\_
    - ii. **What interested you in learning about hydroponics?**


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    - iii. **How long ago did you go through the training?**
      - 1. In the past 6 months
      - 2. In the past year
      - 3. In the past 3 years
      - 4. Greater than 3 years ago
    - iv. **How satisfied are you with the training you received?**
      - 1. Very unsatisfied
      - 2. Unsatisfied
      - 3. Somewhat satisfied
      - 4. Satisfied

5. Very satisfied

v. **Can you suggest any improvements to the learning program?**

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- b. To buy produce
- c. For leisure
- d. Other: \_\_\_\_\_

**10. If 8.b, why do you buy produce at the HPCF?**

- a. Prefer hydroponics
- b. Convenience
- c. Prefer to buy in bulk
- d. Better quality and taste
- e. Other: \_\_\_\_\_

**11. If 8.b, how would you rate the quality of the HPCF hydroponics produce in comparison to non-hydroponics produce?**

- a. Superior quality
- b. Similar quality
- c. Lower quality
- d. Other: \_\_\_\_\_

**12. Do you have access to the Internet? If so, which device(s) do you use?**

- a. No access
- b. Smartphone/tablet
- c. Computer
- d. Other: \_\_\_\_\_

**13. Do you currently use any form(s) of social media? If so, pick how often you use each one.**

- a. Facebook
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- b. Twitter
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- c. Instagram
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- d. Email

- i. Multiple times a day
- ii. Once a day
- iii. Once a week
- iv. Less than once a week
- e. None
- f. Other (list): \_\_\_\_\_
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week

**14. What is your profession?**

- a. Farmer
- b. Business Person
- c. Student
- d. Homemaker
- e. Government Employee
- f. Other: \_\_\_\_\_
- g. Prefer not to answer

**15. What is your education level?**

- a. Lower than high school degree
- b. High school degree
- c. Bachelor's degree
- d. Greater than a Bachelors
- e. Prefer not to answer

**16. What is your gender?**

- a. Female
- b. Male
- c. Prefer not to answer

**17. What is your age range?**

- a. Younger than 25 years old
- b. 26-40 years old
- c. 41-60 years old
- d. 61 or older
- e. Prefer not to answer

**18. Which district do you live in?**

- a. Muang District
- b. Other District: \_\_\_\_\_
- c. Prefer not to answer

**19. What is your average monthly income?**

- a. Less than ₱10,000
- b. ₱10,000 to ₱25,000

- c. ฿25,000 to ฿50,000
- d. Greater than ฿50,000
- e. Prefer not to answer

Thank you for taking the time to complete this survey

## 7.2.2 Thai Translation

ผู้ทำแบบสอบถาม: \_\_\_\_\_

- จุดประสงค์ของการทำแบบสอบถามนี้คือการช่วยสนับสนุนมูลนิธิชัยพัฒนาในการส่งเสริมการทำเกษตรแบบยั่งยืน
- การตอบคำถามของคุณจะมีส่วนช่วยให้พวกเราได้รับรู้เกี่ยวกับทัศนคติของคนในชุมชนที่มีต่อการปลูกพืชแบบไฮโดรโปนิกส์และศูนย์การเรียนรู้มากยิ่งขึ้น  
 ถ้าคุณรู้สึกไม่สบายใจที่จะให้ข้อมูลในคำถามบางคำถาม คุณสามารถเลือกที่จะไม่ตอบคำถามนั้นได้  
 (การตอบแบบสอบถามของคุณจะไม่ถูกเปิดเผยต่อสาธารณะ)

คำชี้แจง: โปรดให้ข้อมูลโดยการวงกลมคำตอบที่ตรงกับความเป็นจริง

1. คุณเคยไปตลาดที่อื่นในพื้นที่นี้บ้างหรือไม่
  - a. ใช่
    - i. ที่ไหน?  
 \_\_\_\_\_
  - b. ไม่
2. คุณมีความสนใจในการปลูกพืชเองหรือไม่
  - a. สนใจ    b. ไม่สนใจ
    - i. ทำไม?  
 \_\_\_\_\_
3. คุณคุ้นเคยกับผักที่ปลูกโดยวิธีไฮโดรโปนิกส์มากน้อยแค่ไหน?
  - a. คุ้นเคยมาก
  - b. ก่อนข้างคุ้นเคย
  - c. รู้จักแค่ชื่อ แต่ไม่รู้อะไรไปมากกว่านั้น
  - d. ไม่เคยรู้จักไฮโดรโปนิกส์เลย  
 ถ้าตอบ d กรุณาข้ามไปที่ข้อ 6
4. คุณคิดว่าไฮโดรโปนิกส์คืออะไร?  
 \_\_\_\_\_
5. คุณคิดว่าพืชผักแบบไฮโดรโปนิกส์ปลอดภัยต่อการบริโภคหรือไม่?
  - a. ปลอดภัย

- b. ไม่ปลอดภัย
6. คุณรู้จักมูลนิธิชัยพัฒนาที่จังหวัดปราจีนบุรีหรือเปล่า?
- a. รู้จัก
- i. คุณรู้จักศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร่นา (ไฮโดรโปนิกส์) หรือเปล่า?
1. รู้จัก
- ถ้ารู้จัก คุณรู้จักได้อย่างไร?
- a. เพื่อนหรือครอบครัวบอก
- b. สื่อออนไลน์
- i. Facebook (เฟซบุ๊ก)
- ii. Twitter (ทวิตเตอร์)
- iii. Instagram (อินสตาแกรม)
- iv. Other (อื่นๆ)
- 
- c. จากมูลนิธิชัยพัฒนา
- d. เว็บไซต์
- e. ป้ายบอกทาง
- f. อื่นๆ: \_\_\_\_\_
2. ไม่รู้จัก

- b. ไม่รู้จัก
7. ถ้าคุณตอบว่ารู้จักในข้อ 6.a.i.1 คุณเคยไปที่โครงการปลูกพืชไร่นามูลนิธิชัยพัฒนาหรือไม่?
- a. เคย
- b. ไม่เคย
8. ถ้าคุณตอบว่าเคยในข้อ 7.a คุณรู้หรือเปล่าว่าที่ศูนย์การเรียนรู้บริการสอนวิธีปลูกพืชแบบไฮโดรโปนิกส์ด้วย?
- a. รู้
- i. คุณเคยคิดที่จะไปเรียนการปลูกพืชไฮโดรโปนิกส์จากศูนย์การเรียนรู้หรือไม่?
1. เคย
2. ไม่เคย
- b. ไม่รู้
9. ถ้าตอบเคยในข้อ 7.a ทำไมคุณถึงไปที่นั่น?
- a. ไปเรียนการปลูกพืชแบบไฮโดรโปนิกส์
- i. คุณรู้ว่าที่นี่มีการสอนวิธีการการปลูกพืชแบบไฮโดรโปนิกส์มาจากไหน?
1. เพื่อนหรือครอบครัว

2. สื่อออนไลน์
  - a. Facebook (เฟซบุ๊ก)
  - b. Twitter (ทวิตเตอร์)
  - c. Instagram (อินสตาแกรม)
  - d. อื่นๆ \_\_\_\_\_

3. อื่นๆ \_\_\_\_\_

ii. ทำไมคุณถึงสนใจที่จะศึกษาวิธีการปลูกพืชแบบไฮโดรโปนิกส์?

\_\_\_\_\_

iii. คุณเคยผ่านการฝึกอบรมมานานแค่ไหน?

1. ในช่วง6เดือนที่ผ่านมา
2. ในช่วง1ปีที่ผ่านมา
3. ในช่วง3ปีที่ผ่านมา
4. มากกว่า3ปี

iv. คุณมีความพึงพอใจมากน้อยแค่ไหนกับการเรียนรู้ที่ได้รับ?

1. ไม่พึงพอใจเป็นอย่างมาก
2. ไม่พอใจ
3. ค่อนข้างพึงพอใจ
4. พึงพอใจ
5. พึงพอใจเป็นอย่างมาก

v. คุณมีคำแนะนำอะไรบ้างในการที่จะพัฒนาศูนย์การเรียนรู้นี้?

\_\_\_\_\_

\_\_\_\_\_

b. ไปซื้อของ

c. ไปพักผ่อน

d. อื่นๆ \_\_\_\_\_

10. ถ้าใช่ข้อ 9.b ทำไมคุณถึงซื้อผักที่ศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร้ดิน (ไฮโดรโปนิกส์)

- a. อยากซื้อผักที่ปลูกแบบไฮโดรโปนิกส์ (ผักที่ปลูกแบบไม่ใช้ดิน)
- b. สถานที่สะดวกต่อการมาซื้อ
- c. ต้องการซื้อจำนวนเยอะ
- d. ถูกกว่าตลาดอื่นๆ
- e. มีคุณภาพดีกว่า

f. อื่นๆ : \_\_\_\_\_

11. ถ้าใช้ข้อ 9.b, คุณคิดว่าคุณภาพของผักที่ปลูกโดยศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร้ดิน (ไฮโดรโปนิกส์) ดีแค่ไหนเมื่อเปรียบเทียบกับผักทั่วไป?

- a. คุณภาพดีกว่า
- b. คุณภาพเหมือนกัน
- c. คุณภาพน้อยกว่า
- d. อื่นๆ :

12. คุณสามารถเข้าถึงอินเทอร์เน็ตได้หรือไม่ ถ้าใช่คุณใช้อะไรในการเข้าอินเทอร์เน็ต? (สามารถตอบได้มากกว่าหนึ่งข้อ)

- a. ไม่ได้ใช้อินเทอร์เน็ต
- b. โทรศัพท์มือถือ/ แท็บเล็ต
- c. คอมพิวเตอร์
- d. อื่นๆ :

13. ตอนนี้คุณได้ใช้สื่อออนไลน์อะไรบ้าง ถ้าใช่ แล้วใช้บ่อยแค่ไหน? (สามารถตอบได้มากกว่าหนึ่งข้อ)

- a. ไม่ได้ใช้
- b. Facebook (เฟซบุ๊ก)
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง
- c. Twitter (ทวิตเตอร์)
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง
- d. Instagram (อินสตาแกรม)
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง
- e. Email (อีเมล)

- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์ละครั้ง
- f. อื่นๆ \_\_\_\_\_
- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์ละครั้ง

**คำถามส่วนตัว**

**14. คุณประกอบอาชีพอะไร?**

- a. เกษตรกร
- b. ธุรกิจส่วนตัว
- c. นักเรียน/นักศึกษา
- d. แม่บ้าน
- e. รับราชการ
- f. อื่นๆ \_\_\_\_\_
- g. ขอไม่ตอบ

**15. การศึกษาสูงสุดของคุณอยู่ในระดับไหน?**

- a. ต่ำกว่าระดับมัธยม
- b. ระดับมัธยม
- c. ปริญญาตรี
- d. สูงกว่าปริญญาตรี
- e. ขอไม่ตอบ

**16. เพศของคุณคืออะไร?**

- a. เพศหญิง
- b. เพศชาย
- c. ขอไม่ตอบ

**17. คุณมีอายุอยู่ในช่วงไหน?**

- a. อายุน้อยกว่า 25ปี
- b. 26-40 ปี
- c. 41-60 ปี

- d. 61 หรือมากกว่านั้น
- e. ขอไม่ตอบ

**18. คุณอาศัยอยู่ที่ไหน?**

- a. อำเภอเมืองปราจีนบุรี
- b. อำเภออื่นในปราจีนบุรี: \_\_\_\_\_
- c. ขอไม่ตอบ

**19. คุณมีรายได้เฉลี่ยประมาณเท่าไร?**

- a. น้อยกว่า 10,000 บาท
- b. 10,000 ถึง 25,000 บาท
- c. 25,000 ถึง 50,000 บาท
- d. มากกว่า 50,000 บาท
- e. ขอไม่ตอบ

คณะนิสิตคณะวิทยาศาสตร์ หลักสูตรเคมีประยุกต์ (นานาชาติ) จุฬาลงกรณ์มหาวิทยาลัยและคณะนักศึกษาจาก WPI

(Worcester Polytechnic Institute) ประเทศสหรัฐอเมริกา ขอขอบพระคุณผู้ที่มีส่วนเกี่ยวข้องกับการทำแบบสอบถามนี้เป็นอย่างมาก

## 7.3 Appendix C: Vendor Survey Questions

### 7.3.1 English Version

Surveyor Name: \_\_\_\_\_

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project of the Chaipattana Foundation (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and fill in lines.

1. What agricultural practice(s) are used to grow your produce?
  - a. Soil based farming
  - b. Hydroponics
  - c. OtherIf so, which one?  
\_\_\_\_\_

*If b, answer 2 and 3 then skip to question 8*

*Otherwise, skip to question 4*

2. Where did you learn about hydroponics?  
\_\_\_\_\_
3. Why did you choose to use hydroponics?  
\_\_\_\_\_
4. Do you have any challenges with your current farming practice?
  - a. Yes
    - i. What kind of challenges do you encounter?  
\_\_\_\_\_
  - b. No
  - c. Not sure
5. Are you interested in improving any aspects of your farm? If so, what aspects do you want to improve?
  - a. Product volume
  - b. Quality
  - c. Nutritional value
  - d. Profit
  - e. Environmental impact
  - f. Not sure
  - g. No

- h. Other : \_\_\_\_\_
6. **How familiar are you with hydroponics agriculture?**
- Very familiar
  - Somewhat familiar
  - Know the term but nothing more
  - Never heard about hydroponics
7. **If 6.a, b, or c, what do you think hydroponics is?**
- \_\_\_\_\_
- \_\_\_\_\_
8. **If 6.a or 6.b, have you or your farm considered using the hydroponics technique? Why or why not?**
- Yes
    - Reason? \_\_\_\_\_
  - No
9. **Do you know about the Chaipattana Foundation in Prachinburi province?**
- Yes
    - Do you know about the Hydroponics Project of the Chaipattana Foundation?**
      - Yes
 

**If yes, how did you find out about it?**

        - Friends or family
        - Social media
          - Facebook
          - Twitter
          - Instagram
          - Other \_\_\_\_\_
        - The Chaipattana Foundation
        - Website
        - Entrance sign
        - Other: \_\_\_\_\_
      - No
  - No
9. **If 8.a.i.1, have you visited the Hydroponics Project of the Chaipattana Foundation?**
- Yes
  - No
10. **If 9.a, do you know there is a hydroponics technique learning program at the HPCF?**
- Yes
    - Have you considered going through the hydroponics training at the HPCF?**
      - Yes
      - No
  - No
11. **If 9.a, why did you visit the HPCF (circle all that apply)?**

- a. To go through the training
  - i. **How did you find out about the HPCF learning program?**
    1. Friends or family
    2. Social media
    3. Facebook
    4. Twitter
    5. Instragram
    6. Other \_\_\_\_\_
  - ii. **What interested you in learning about hydroponics?**  
\_\_\_\_\_
  - iii. **How long ago did you go through the training?**
    1. In the past 6 months
    2. In the past year
    3. In the past 3 years
    4. Greater than 3 years ago
  - iv. **How satisfied are you with the training you received?**
    1. Very unsatisfied
    2. Unsatisfied
    3. Somewhat satisfied
    4. Satisfied
    5. Very satisfied
  - v. **Can you suggest any improvements to the learning program?**  
\_\_\_\_\_  
\_\_\_\_\_

- b. To buy produce
- c. For leisure
- d. Other: \_\_\_\_\_

**12. Do you have access to the Internet? If so, which device(s) do you use? (circle all that apply)**

- a. No access
- b. Smartphone/Tablet
- c. Computer
- d. Other : \_\_\_\_\_

**13. Do you currently use any form(s) of social media? If so, pick how often you use each one. (circle all that apply)**

- a. Facebook
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- b. Twitter

- i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- c. Instagram
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- d. Email
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- e. None
- f. Other (list): \_\_\_\_\_
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week

**14. What is your occupation?**

- a. Farmer
- b. Business Person
- c. Student
- d. Homemaker
- e. Government employee
- f. Other
- g. Prefer not to answer

**15. What is your education level?**

- a. Lower than high school degree
- b. High school degree
- c. Bachelor's degree
- d. Greater than a Bachelors
- e. Prefer not to answer

**16. What is your gender?**

- a. Female
- b. Male
- c. Prefer not to answer

**17. What is your age range?**

- a. Younger than 25 years old
- b. 26-40 years old

- c. 41-60 years old
- d. 61 or older years old
- e. Prefer not to answer

**Thank you for taking the time to complete this survey**

### 7.3.2 Thai Translation

**Surveyor Name:** \_\_\_\_\_

- จุดประสงค์ของการทำแบบสอบถามนี้คือการช่วยสนับสนุนมูลนิธิชัยพัฒนาในการส่งเสริมการทำเกษตรแบบยั่งยืน
- การตอบคำถามของคุณจะมีส่วนช่วยให้พวกเราได้รับรู้เกี่ยวกับทัศนคติของคนในชุมชนที่มีต่อการปลูกพืชแบบไฮโดรโปนิคส์และศูนย์การเรียนรู้มากยิ่งขึ้น  
ถ้าคุณรู้สึกไม่สบายใจที่จะให้ข้อมูลในคำถามบางคำถาม คุณสามารถเลือกที่จะไม่ตอบคำถามนั้นได้  
(การตอบแบบสอบถามของคุณจะไม่ถูกเปิดเผยต่อสาธารณะ)

คำชี้แจง: โปรดให้ข้อมูลโดยการวงกลมคำตอบที่ตรงกับความเป็นจริง

1. คุณมีวิธีการปลูกผักแบบไหน?
  - a. ใช้ดินในการปลูกพืช
  - b. ปลูกพืชแบบไฮโดรโปนิคส์ (ปลูกพืชไร้ดิน)
  - c. วิธีอื่นๆ  
วิธีอะไร?

\_\_\_\_\_

ถ้าตอบ ข้อ b ให้ตอบข้อ 2,3 แล้วข้ามไปตอบที่ข้อ 8 ต่อ

ถ้าไม่ใช่อย่างนั้นให้ข้ามไปตอบข้อ 4

2. คุณเรียนการปลูกพืชแบบไฮโดรโปนิคส์มาจากที่ไหน?

\_\_\_\_\_

3. ทำไมคุณถึงเลือกที่จะใช้การปลูกพืชแบบไฮโดรโปนิคส์?

\_\_\_\_\_

4. ตอนนี้คุณมีอุปสรรคในการปลูกผักหรือไม่?

- a. มี
  - i. อุปสรรคอะไรบ้างที่คุณเจอ?

\_\_\_\_\_

- b. ไม่มี
- c. ไม่แน่ใจ

5. คุณอยากพัฒนาฟาร์มของคุณหรือไม่? ถ้าใช่ คุณอยากพัฒนาอะไร?

- a. ขนาดของผลผลิต
  - b. คุณภาพ
  - c. คุณค่าทางอาหาร
  - d. กำไร
  - e. สิ่งแวดล้อม
  - f. ไม่มั่นใจ
  - g. ไม่
  - h. อื่นๆ :
- 

6. คุณคุ้นเคยกับวิธีการปลูกแบบไฮโดรโปนิคส์มากน้อยแค่ไหน?

- a. คุ้นเคยมาก
- b. ค่อนข้างคุ้นเคย
- c. รู้จักแค่ชื่อ แต่ไม่รู้อะไรไปมากกว่านั้น
- d. ไม่เคยรู้จักไฮโดรโปนิคส์เลย

7. คุณคิดว่าไฮโดรโปนิคส์คืออะไร?

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8. ถ้าคุณตอบข้อ 6.a หรือ 6.b คุณหรือฟาร์มของคุณคิดจะเปลี่ยนมาใช้วิธีการปลูกพืชแบบไฮโดรโปนิคส์รึเปล่า? ทำไม?

- a. คิด      b. ไม่คิด
  - i. ทำไมคุณจึงคิดเช่นนั้น?
- 

9. คุณรู้จักมูลนิธิชัยพัฒนาที่จังหวัดปราจีนบุรีหรือเปล่า?

- a. รู้จัก
- i. คุณรู้จักศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร้ดิน(ไฮโดรโปนิคส์) หรือเปล่า?

1. รู้จัก

ถ้ารู้จัก คุณรู้จักได้อย่างไร?

- a. เพื่อนหรือครอบครัวบอก
- b. สื่อออนไลน์
  - i. Facebook (เฟซบุค)
  - ii. Twitter (ทวิตเตอร์)
  - iii. Instagram (อินสตราแกรม)

iv. Other (อื่นๆ)

---

c. จากมูลนิธิชัยพัฒนา

d. เว็บไซต์

e. ป้ายบอกทาง

f. อื่นๆ: \_\_\_\_\_

2. ไม่รู้จัก

b. ไม่รู้จัก

10. ถ้าคุณตอบว่ารู้จักในข้อ 9.a.1 คุณเคยไปที่โครงการปลูกพืชไร่นานาชาติชัยพัฒนาหรือไม่?

a. เคย

b. ไม่เคย

11. ถ้าคุณตอบว่าเคยในข้อ 10.a คุณรู้หรือไม่ว่าที่ศูนย์การเรียนรู้บริการสอนวิธีปลูกพืชแบบไฮโดรโปนิกส์ด้วย?

c. ใช่

i. คุณเคยคิดที่จะไปเรียนการปลูกพืชไฮโดรโปนิกส์จากศูนย์การเรียนรู้หรือไม่?

1. เคย

2. ไม่เคย

d. ไม่รู้

12. ถ้าตอบเคยในข้อ 10.a ทำไมคุณถึงไปที่นั่น?

e. ไปเรียนการปลูกพืชแบบไฮโดรโปนิกส์

i. คุณรู้ว่าที่นี่มีการสอนวิธีการการปลูกพืชแบบไฮโดรโปนิกส์มาจากไหน?

1. เพื่อนหรือครอบครัว

2. สื่อออนไลน์

a. Facebook (เฟซบุ๊ก)

b. Twitter (ทวิตเตอร์)

c. Instagram (อินสตาแกรม)

d. อื่นๆ \_\_\_\_\_

3. อื่นๆ

ii. ทำไมคุณถึงสนใจที่จะศึกษาวิธีการปลูกพืชแบบไฮโดรโปนิกส์?

---

iii. คุณผ่านการฝึกอบรมเมื่อไหร่?

1. ในช่วง6เดือนที่ผ่านมา

2. ในช่วง1ปีที่ผ่านมา
3. ในช่วง3ปีที่ผ่านมา
4. มากกว่า3ปี

iv. คุณมีความพึงพอใจมากน้อยแค่ไหนกับการเรียนรู้ที่ได้รับ?

- i. ไม่พึงพอใจเป็นอย่างมาก
- ii. ไม่พอใจ
- iii. ค่อนข้างพึงพอใจ
- iv. พึงพอใจ
- v. พึงพอใจเป็นอย่างมาก

v. คุณมีคำแนะนำอะไรบ้างในการที่จะพัฒนาศูนย์การเรียนรู้นี้?

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f. เพื่อซื้อผัก

g. เพื่อพักผ่อน

h. อื่นๆ \_\_\_\_\_

13. คุณสามารถเข้าถึงอินเทอร์เน็ตได้หรือไม่ ถ้าใช่คุณใช้อะไรในการเข้าอินเทอร์เน็ต?

- a. ไม่ได้ใช้อินเทอร์เน็ต
- b. โทรศัพท์มือถือ/ แทปเลต
- c. คอมพิวเตอร์
- d. อื่นๆ:

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14. ตอนนี้คุณสามารถใช้สื่อออนไลน์อะไรบ้าง ถ้าใช่ แล้วใช้บ่อยแค่ไหน?

- e. ไม่ได้ใช้
- f. Facebook (เฟซบุค)
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง
- g. Twitter (ทวิตเตอร์)
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง

iv. น้อยกว่าอาทิตย์ละครั้ง

**h. Instagram (อินสตราแกรม)**

i. มากกว่าหนึ่งครั้งต่อวัน

ii. วันละครั้ง

iii. อาทิตย์ละครั้ง

iv. น้อยกว่าอาทิตย์ละครั้ง

**i. Email (อีเมล)**

i. มากกว่าหนึ่งครั้งต่อวัน

ii. วันละครั้ง

iii. อาทิตย์ละครั้ง

iv. น้อยกว่าอาทิตย์ละครั้ง

**j. อื่นๆ \_\_\_\_\_**

i. มากกว่าหนึ่งครั้งต่อวัน

ii. วันละครั้ง

iii. อาทิตย์ละครั้ง

iv. น้อยกว่าอาทิตย์ละครั้ง

**คำถามส่วนตัว**

**15. คุณประกอบอาชีพอะไร?**

i. เกษตรกร

ii. ธุรกิจส่วนตัว

iii. นักเรียน/นักศึกษา

iv. แม่บ้าน

v. รับราชการ

vi. อื่นๆ \_\_\_\_\_

vii. ขอไม่ตอบ

**16. การศึกษาสูงสุดของคุณอยู่ในระดับไหน?**

i. ต่ำกว่าระดับมัธยม

ii. ระดับมัธยม

iii. ปริญญาตรี

iv. สูงกว่าปริญญาตรี

v. ขอไม่ตอบ

**17. เพศของคุณคืออะไร?**

- i. เพศหญิง
- ii. เพศชาย
- iii. ขอไม่ตอบ

**18. คุณมีอายุอยู่ในช่วงไหน?**

- i. เด็กกว่า 25 ปี
- ii. 26-40 ปี
- iii. 41-60 ปี
- iv. 61 หรือมากกว่านั้น
- v. ขอไม่ตอบ

คณะนิติศาสตร์ คณะวิทยาศาสตร์ หลักสูตรเคมีประยุกต์(นานาชาติ) จุฬาลงกรณ์มหาวิทยาลัยและคณะนักศึกษาจาก WPI (Worcester Polytechnic Institute) ประเทศสหรัฐอเมริกา ขอขอบพระคุณผู้ที่มีส่วนเกี่ยวข้องกับการทำแบบสอบถามนี้เป็นอย่างมาก

## 7.4 Appendix D: HPCF Consumer Survey Questions

### 7.4.1 English Version

Surveyor Name: \_\_\_\_\_

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project of the Chaipattana Foundation (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and transcribe answers.

**1. What do you think hydroponics is?**

---

---

**2. Why did you visit the HPCF (circle all that apply)?**

a. To go through the training

**i. How did you find out about the HPCF learning program?**

1. Friends or family
2. Social media
  - a. Facebook
  - b. Twitter
  - c. Instagram
  - d. Other: \_\_\_\_\_

**ii. What interested you in learning about hydroponics?**

---

**iii. How long ago did you go through the training?**

1. In the past 6 months
2. In the past year
3. In the past 3 years
4. Greater than 3 years ago

**iv. How satisfied are you with the training you received?**

1. Very unsatisfied
2. Unsatisfied
3. Somewhat satisfied
4. Satisfied
5. Very satisfied

**v. Can you suggest any improvements to the learning program?**

---

---

- b. To buy produce
  - c. For leisure
  - d. Other: \_\_\_\_\_
3. **Do you visit any other markets in Prachinburi province to buy produce?**
- a. Yes
    - i. **Where?**  
\_\_\_\_\_
  - b. No
4. **If 2.b, why do you buy produce at the HPCF?**
- a. Prefer hydroponics produce
  - b. Location convenience
  - c. Prefer to buy in bulk
  - d. Lower price than at other markets
  - e. Better quality and taste
  - f. Other: \_\_\_\_\_
5. **How would you rate the quality of the HPCF hydroponics produce in comparison to non-hydroponics produce?**
- a. Superior quality
  - b. Similar quality
  - c. Lower quality
  - d. Other: \_\_\_\_\_
6. **Do you have any interest in growing your own produce, why or why not?**
- a. Yes    b. No
    - i. **Reason?**  
\_\_\_\_\_
7. **Do you have access to the Internet? If so, which device(s) do you use? (circle all that apply)**
- a. No access
  - b. Smartphone/tablet
  - c. Computer
  - d. Other: \_\_\_\_\_
8. **Do you currently use any form(s) of social media? If so, pick how often you use each one. (circle all that apply)**
- a. None
  - b. Facebook
    - i. Multiple times a day
    - ii. Once a day
    - iii. Once a week
    - iv. Less than once a week
  - c. Twitter
    - i. Multiple times a day
    - ii. Once a day

- iii. Once a week
    - iv. Less than once a week
  - d. Instagram
    - i. Multiple times a day
    - ii. Once a day
    - iii. Once a week
    - iv. Less than once a week
  - e. Email
    - i. Multiple times a day
    - ii. Once a day
    - iii. Once a week
    - iv. Less than once a week
  - f. Other: \_\_\_\_\_
    - i. Multiple times a day
    - ii. Once a day
    - iii. Once a week
    - iv. Less than once a week

**9. What is your profession?**

- a. Farmer
- b. Business Person
- c. Student
- d. Homemaker
- e. Government Employee
- f. Other: \_\_\_\_\_
- g. Prefer not to answer

**10. What is your education level?**

- a. Lower than high school degree
- b. High school degree
- c. Bachelor's degree
- d. Greater than a Bachelors
- e. Prefer not to answer

**11. What is your gender?**

- a. Female
- b. Male
- c. Prefer not to answer

**12. What is your age range?**

- a. Younger than 25 years old
- b. 26-40 years old
- c. 41-60 years old
- d. 61 or older
- e. Prefer not to answer

**13. Where do you live?**

- a. Muang District
- b. Other District in Prachinburi Province: \_\_\_\_\_
- c. Other Province: \_\_\_\_\_
- d. Prefer not to answer

**14. What is your average monthly income?**

- a. Less than ฿10,000
- b. ฿10,000 to ฿25,000
- c. ฿25,000 to ฿50,000
- d. Greater than ฿50,000
- e. Prefer not to answer

**Thank you for taking the time to complete this survey**

**7.4.2 Thai Translation**

**Surveyor Name:** \_\_\_\_\_

- จุดประสงค์ของการทำแบบสอบถามนี้คือการช่วยสนับสนุนมูลนิธิชัยพัฒนาในการส่งเสริมการทำ การเกษตรแบบยั่งยืน
- การตอบคำถามของคุณจะมีส่วนช่วยให้พวกเราได้รับรู้เกี่ยวกับทัศนคติของคนในชุมชนที่มีต่อการปลูกพืชแบบไฮโดรโปนิกส์และศูนย์ การเรียนรู้มากยิ่งขึ้น

*ถ้าคุณรู้สึกไม่สบายใจที่จะให้ข้อมูลในคำถามบางคำถาม คุณสามารถเลือกที่จะ ไม่ตอบคำถามนั้นได้*

*(การตอบแบบสอบถามของคุณจะไม่ถูกเปิดเผยต่อสาธารณะ)*

คำชี้แจง: โปรดให้ข้อมูลโดยการวงกลมคำตอบที่ตรงกับความเป็นจริง

**1. คุณคิดว่าไฮโดรโปนิกส์คืออะไร?**

\_\_\_\_\_

**2. ทำไมคุณถึงมาที่นี่?**

**a. เพื่อเข้าร่วมเรียนในโครงการปลูกพืชไร้ดิน(ไฮโดรโปนิกส์)**

**i. คุณรู้จักศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร้ดิน(ไฮโดรโปนิกส์)ได้อย่างไร**

- 1. เพื่อนหรือครอบครัว
- 2. สื่อออนไลน์

- a. Facebook (เฟซบุ๊ก)
- b. Twitter (ทวิตเตอร์)
- c. Instagram (อินสตาแกรม)
- d. อื่นๆ \_\_\_\_\_

3. อื่นๆ \_\_\_\_\_

**ii. ทำไมคุณถึงสนใจเรียนปลูกพืชแบบไฮโดรโปนิกส์**

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**iii.** คุณผ่านการฝึกอบรมเมื่อไหร่?

1. ในช่วง6เดือนที่ผ่านมา
2. ในช่วง1ปีที่ผ่านมา
3. ในช่วง3ปีที่ผ่านมา
4. มากกว่า3ปี

**iv.** คุณมีความพึงพอใจมากน้อยแค่ไหนกับการเรียนรู้ที่ได้รับ?

1. ไม่พึงพอใจอย่างมาก
2. ไม่พอใจ
3. ค่อนข้างพึงพอใจ
4. พึงพอใจ
5. พึงพอใจเป็นอย่างมาก

**v.** คุณมีคำแนะนำอะไรบ้างในการที่จะพัฒนาศูนย์การเรียนรู้นี้?

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b. เพื่อซื้อผัก

c. เพื่อพักพ่อน

d. อื่นๆ \_\_\_\_\_

3. คุณได้ซื้อผักจากตลาดอื่นในปราจีนบุรีหรือไม่?

a. ใช่

**i.** ที่ไหน

---

b. ไม่

4. ถ้าใช่ข้อ 2.b, ทำไมคุณถึงมาซื้อผักที่ศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร้ดิน(ไฮโดรโปนิกส์)

a. อยากซื้อผักที่ปลูกแบบไฮโดร โปนิกส์ (ผักที่ปลูกแบบไม่ใช้ดิน)

b. สถานที่สะดวกต่อการมาซื้อ

c. ต้องการซื้อจำนวนเยอะ

d. ถูกกว่าที่ตลาดอื่นๆ

e. มีคุณภาพดีกว่า

f. อื่นๆ: \_\_\_\_\_

5. คุณคิดว่าคุณภาพของผักที่ปลูกโดยศูนย์การเรียนรู้ชุมชนโครงการปลูกพืชไร้ดิน(ไฮโดรโปนิกส์) ดีแค่ไหนเมื่อเปรียบเทียบกับผักทั่วไป?

a. คุณภาพดีกว่า

- b. คุณภาพเหมือนกัน
- c. คุณภาพน้อยกว่า
- d. อื่นๆ : \_\_\_\_\_

6. คุณสนใจที่ปลูกผักด้วยตัวเองหรือไม่?

- a. สนใจ    b. ไม่สนใจ
- i. ทำไม? \_\_\_\_\_

7. คุณสามารถเข้าถึงอินเทอร์เน็ตได้หรือไม่ ถ้าใช่โดยใช้อะไร?

- a. ไม่ได้ใช้อินเทอร์เน็ต
- b. โทรศัพท์มือถือ/ แทปเลต
- c. คอมพิวเตอร์
- d. อื่นๆ : \_\_\_\_\_

8. ตอนนี้คุณได้ใช้สื่อออนไลน์อะไรบ้าง ถ้าใช่ แล้วใช้บ่อยแค่ไหน?

- a. ไม่ใช่
- b. Facebook (เฟซบุค)
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์
- c. Twitter
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง
- d. Instagram
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง
- e. Email
  - i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง

- f. อื่นๆ \_\_\_\_\_
- i. มากกว่าหนึ่งครั้งต่อวัน
  - ii. วันละครั้ง
  - iii. อาทิตย์ละครั้ง
  - iv. น้อยกว่าอาทิตย์ละครั้ง

**คำถามส่วนตัว**

**9. คุณประกอบอาชีพอะไร**

- a. เกษตรกร
- b. ธุรกิจส่วนตัว
- c. นักเรียน/นักศึกษา
- d. แม่บ้าน
- e. รับราชการ
- f. อื่นๆ \_\_\_\_\_
- g. ไม่ขอตอบ

**10. การศึกษาสูงสุดของคุณอยู่ในระดับไหน?**

- a. ต่ำกว่าระดับมัธยม
- b. ระดับมัธยม
- c. ปริญญาตรี
- d. สูงกว่าปริญญาตรี
- e. ขอไม่ตอบ

**11. เพศของคุณคืออะไร**

- a. เพศหญิง
- b. เพศชาย
- c. ขอไม่ตอบ

**12. คุณอายุประมาณเท่าไร?**

- a. อายุต่ำกว่า 25 ปี
- b. 26-40 ปี
- c. 41-60 ปี
- d. 61 หรือมากกว่านั้น
- e. ขอไม่ตอบ

**13. คุณอาศัยอยู่ที่ไหน?**

- a. อำเภอเมืองปราจีนบุรี
- b. อำเภออื่นๆในปราจีนบุรี: \_\_\_\_\_

- c. จังหวัดอื่น: \_\_\_\_\_
- d. ขอไม่ตอบ

**14. คุณมีรายได้เฉลี่ยประมาณเท่าไร?**

- a. น้อยกว่า 10,000 บาท
- b. 10,000 ถึง 25,000 บาท
- c. 25,000 ถึง 50,000 บาท
- d. มากกว่า 50,000 บาท
- e. ขอไม่ตอบ

คณะนิติคณะวิทยาศาสตร์ หลักสูตรเคมีประยุกต์(นานาชาติ) จุฬาลงกรณ์มหาวิทยาลัยและคณะนักศึกษาจาก WPI (Worcester Polytechnic Institute) ประเทศสหรัฐอเมริกา ขอขอบพระคุณผู้ที่มีส่วนเกี่ยวข้องกับการทำแบบสอบถามนี้เป็นอย่างมา

## 7.5 Appendix E: School Interview Questions

### 7.5.1 English Version

Surveyor Name: \_\_\_\_\_

Name of School: \_\_\_\_\_

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project of the Chaipattana Foundation (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and fill in lines.

**1. How familiar are you with hydroponics agriculture?**

- a. Very familiar
- b. Somewhat familiar
- c. Know the term but nothing more
- d. Never heard about hydroponics

*Give brief explanation of hydroponics - view attached*

**2. Do you currently have a hydroponics learning program at your school?**

- a. Yes
- b. No

**If 2.a answer 3 and 4 then skip to 8. If 2.b, skip to 5**

**3. How many students participate in the hydroponics learning program?**

\_\_\_\_\_

**4. What does your hydroponics learning program consist of?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**5. How interested are you in implementing a hydroponics learning program?**

- a. Very interested
- b. Somewhat interested
- c. Not Interested

**Reason:** \_\_\_\_\_

\_\_\_\_\_

**6. If 6.a - What information would you need to know in order to implement a hydroponics learning program?**

- a. Benefits of using hydroponics in education
- b. How to set up a hydroponics farm

- c. Economics of hydroponics
  - d. Other
- 

7. Does your school currently offer any clubs, electives, or activities?

- a. Yes
  - i. How many students participate?

ii. Are there any related to agriculture?

---

- b. No

8. Do you know about the Chaipattana Foundation's Hydroponics Project of the Chaipattana Foundation in the Muang District of the Prachinburi Province?

- a. Yes

If yes, how did you find out about it? (circle all that apply)

- 1. Friends or family
- 2. Social media
  - a. Facebook
  - b. Twitter
  - c. Instagram
  - d. Other \_\_\_\_\_
- 3. The Chaipattana Foundation
- 4. Other school (which?): \_\_\_\_\_
- 5. Website
- 6. Entrance sign
- 7. Other: \_\_\_\_\_

- b. No

11. If 10.a, have you visited the Hydroponics Project of the Chaipattana Foundation?

- a. Yes
- b. No

12. If 11.a, do you know there is a hydroponics technique learning program at the HPCF?

- a. Yes
- b. No

13. If 11.a, why did you visit the HPCF (circle all that apply)?

- a. To go through the training
  - b. Take students for field trip
  - c. To buy produce
  - d. For leisure
  - e. Other: \_\_\_\_\_
- 

Thank you for taking the time to complete this survey

If interested in learning more about the HPCF or hydroponics agriculture - please fill out the following fields.

1. Name

---

2. School

---

3. Contact Number

---

4. Email

---

5. Best Time to Contact

---

6. Additional Comments

---

### 7.5.2 Thai Translation

Surveyor Name: \_\_\_\_\_

Name of School: \_\_\_\_\_

- จุดประสงค์ของการทำแบบสอบถามนี้คือการช่วยสนับสนุนมูลนิธิชัยพัฒนาในการส่งเสริมการทำ การเกษตรแบบยั่งยืน
- การตอบคำถามของคุณจะมีส่วนช่วยให้พวกเราได้รับรู้เกี่ยวกับทัศนคติของคนในชุมชนที่มีต่อการปลูกพืชแบบไฮโดรโปนิกส์และศูนย์การเรียนรู้มากยิ่งขึ้น

คำชี้แจง: โปรดให้ข้อมูล โดยการวงกลมคำตอบที่ตรงกับความเป็นจริง

1. ที่โรงเรียนมีการจัดการเรียนการสอนการปลูกแบบไฮโดรโปนิกส์หรือไม่

- a. ใช่
- b. ไม่

ถ้าตอบ 2.a ให้ตอบข้อ 3,4 ถ้าไม่ให้ตอบข้อ 7

2. จำนวนนักเรียนในการเข้าเรียนวิชาการสอนปลูกแบบไฮโดรโปนิกส์มีเท่าไร

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3. วิชาการสอนปลูกแบบไฮโดรโปนิกส์มีวิธีการสอนอย่างไร

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4. ทางโรงเรียนสนใจริเริ่มวิชาการปลูกแบบไฮโดรโปนิกส์กับนักเรียนหรือไม่

- a. สนใจมาก
- b. สนใจ
- c. ไม่สนใจ

Reason: \_\_\_\_\_

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5. ถ้าตอบ 6.a ทางโรงเรียนต้องการข้อมูลอะไรเพิ่มเติมในการจัดการเรียนการสอนการปลูกแบบไฮโดรโปนิกส์
- ประโยชน์ที่จะได้รับจากการสอนการปลูกแบบไฮโดรโปนิกส์
  - วิธีการสร้างฟาร์มไฮโดรโปนิกส์
  - รายได้เสริมจากการปลูกไฮโดรโปนิกส์
  - Other : \_\_\_\_\_
6. ทางโรงเรียนมีการจัดการเรียนการสอนวิชาชุมนุม, วิชาเลือก หรือ กิจกรรมแก่นักเรียนหรือไม่ ?
- ใช่
    - นักเรียนที่เข้าร่วมมีจำนวนเท่าไร  
\_\_\_\_\_
    - ชุมนุม หรือ วิชาเลือก เกี่ยวข้องกับวิชาการเกษตรหรือไม่  
\_\_\_\_\_
  - ไม่
7. คุณรู้จักมูลนิธิชัยพัฒนาที่จังหวัดปราจีนบุรีหรือปล่าว?
- รู้จัก
    - ถ้ารู้จัก คุณรู้จักได้อย่างไร? (circle all that apply)
      - เพื่อนหรือครอบครัวบอก
      - สื่อออนไลน์
        - Facebook (เฟซบุค)
        - Twitter (ทวิตเตอร์)
        - Instagram (อินสตราแกรม)
        - Other (อื่นๆ) \_\_\_\_\_
      - จากมูลนิธิชัยพัฒนา
      - เว็บไซต์
      - ป้ายบอกทาง
      - อื่นๆ: \_\_\_\_\_
    - ไม่รู้จัก
11. ถ้าคุณตอบว่ารู้จักในข้อ 10.a คุณเคยไปที่โครงการปลูกพืชไร้ดินมูลนิธิชัยพัฒนาหรือไม่?
- ใช่
  - ไม่
12. ถ้าคุณตอบว่าเคยในข้อ 11.a คุณรู้หรือไม่ว่าที่ศูนย์การเรียนรู้นี้มีบริการสอนวิธีปลูกพืชแบบไฮโดรโปนิกส์ด้วย?
- ใช่
  - ไม่
13. ถ้าตอบเคยในข้อ 11.a ทำใ้คุณถึงไปที่นั่น? (circle all that apply)
- ไปเรียนการปลูกพืชแบบไฮโดรโปนิกส์
  - นักเรียนไปทัศนศึกษา
  - เพื่อซื้อผัก
  - เพื่อพักผ่อน

e. อื่นๆ \_\_\_\_\_

คณะนิสิตคณะวิทยาศาสตร์ หลักสูตรเคมีประยุกต์(นานาชาติ) จุฬาลงกรณ์มหาวิทยาลัยและคณะนักศึกษาจาก WPI (Worcester Polytechnic Institute) ประเทศสหรัฐอเมริกา  
ขอขอบพระคุณผู้ที่มีส่วนเกี่ยวข้องกับการทำแบบสอบถามนี้เป็นอย่างมาก

ถ้าทางโรงเรียนมีความสนใจที่จะเข้าร่วมเรียนรู้เกี่ยวกับการปลูกพืชไร้ดิน (hydroponics) ที่ศูนย์การเรียนรู้ชุมชน กรุณากรอกข้อมูลตามข้อความด้านล่างนี้

1. ชื่อ: \_\_\_\_\_
2. โรงเรียน: \_\_\_\_\_
3. เบอร์ติดต่อ: \_\_\_\_\_
4. อีเมล: \_\_\_\_\_
5. เวลาที่สะดวกติดต่อ: \_\_\_\_\_
6. คำแนะนำ: \_\_\_\_\_

## 7.6 Appendix F: Farmer Organization Interview Questions

### 7.6.1 English Version

1. How familiar are you with hydroponics?
2. What is your perception of hydroponics?
3. How many people are in your farmer's community?
4. Are you aware of the HDC?
5. Are you aware of the HDC's hydroponics learning program?
6. How many hydroponics farmers are there in your community?
7. Are farmers in your interest in implement hydroponics?
8. If interested, do you mind if we leave informational resources at your center?
9. How often does this organization meet : why, how, where, when?
10. Do you share information on agricultural advances?
11. What mediums do you use to communicate among members of the community?

### 7.6.2 Thai Translation

- คุณคุ้นเคยกับผัก/การปลูกวิธีการปลูกพืชไร้ดิน(ไฮโดร โปนิกส์)มากน้อยแค่ไหน?
- คุณมีจำนวนสมาชิกเท่าไร?
- คุณรู้จักศูนย์การเรียนรู้ชุมชนการปลูกพืชไร้ดิน(ไฮโดร โปนิกส์) หรือไม่?
- ในกลุ่มเกษตรกรของคุณมีใครเคยปลูกพืชไร้ดิน(ไฮโดร โปนิกส์)หรือเปล่า?
- คุณมีความสนใจที่จะลองปลูกพืชไร้ดิน(ไฮโดร โปนิกส์)หรือไม่?
- ถ้าสนใจ, จะเป็นการรบกวนหรือเปล่าถ้าพวกเขาจะขออนุญาตแจกเอกสารเกี่ยวกับไฮโดร โปนิกส์ที่กลุ่มชุมชนของคุณ?
- กลุ่มชุมชน(องค์กร) ของคุณมีการประชุมกันบ่อยแค่ไหน: ทำไม, ที่ไหน และเมื่อไหร่?
- คุณได้มีการแบ่งปันความรู้เกี่ยวกับการเกษตรระหว่างคนในชุมชนบ้างหรือเปล่า?
- คุณใช้อะไรในการติดต่อสื่อสารกันระหว่างเกษตรกรในชุมชน?

## 7.7 Appendix G: Previous Attendees of HPCF Learning Program Interview Questions

### 7.7.1 English Version

Surveyor Name \_\_\_\_\_

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project of the Chaipattana Foundation (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

**1. How did you find out about the HPCF?**

- a. Friends or family
- b. Social media
  - i. Facebook
  - ii. Twitter
  - iii. Instagram
  - iv. Other \_\_\_\_\_
- c. The Chaipattana Foundation
- d. Website
- e. Entrance sign
- f. Other: \_\_\_\_\_

**2. What interested you in learning hydroponics at the HPCF?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**3. How long ago did you go through the training?**

- a. In the past 6 months
- b. In the past year
- c. In the past 3 years
- d. Greater than 3 years ago

**4. How satisfied are you with the training you received?**

- a. Very unsatisfied
- b. Unsatisfied
- c. Somewhat satisfied
- d. Satisfied
- e. Very satisfied

**5. Can you suggest any improvements to the learning program?**

\_\_\_\_\_  
\_\_\_\_\_

**6. What is your occupation?**

- a. Farmer
- b. Business Person
- c. Student
- d. Homemaker
- e. Government employee
- f. Other: \_\_\_\_\_

**7. Did you implement a hydroponics farm after attending the learning program?**

**a. If yes,**

**i. What was your reason for implementation?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ii. Why did you choose to learn hydroponics?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**iii. (If they are a farmer) Is it more profitable than your previous farming technique?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**iv. What were barriers or challenges you faced by implementing hydroponics?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**b. If not, why not?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**8. Do you have access to the Internet? If so, which device(s) do you use? (circle all that apply)**

- a. No access
- b. Smartphone/tablet
- c. Computer
- d. Other: \_\_\_\_\_

**9. Do you currently use any form(s) of social media? If so, pick how often you use each one. (circle all that apply)**

- a. None
- b. Facebook
  - i. Multiple times a day

- ii. Once a day
- iii. Once a week
- iv. Less than once a week
- c. Twitter
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- d. Instagram
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- e. Email
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week
- f. Other : \_\_\_\_\_
  - i. Multiple times a day
  - ii. Once a day
  - iii. Once a week
  - iv. Less than once a week

**10. What is your age range?**

- a. Younger than 25 years old
- b. 26-40 years old
- c. 41-60 years old
- d. 61 or older years old

**11. What is your gender?**

- a. Female
- b. Male
- c. Prefer not to answer

**12. Which province do you live in?**

- a. Muang District, Prachinburi
- b. Other: \_\_\_\_\_

**13. What is your average monthly income?**

- a. Prefer not to say
- b. Less than ฿10,000
- c. ฿10,000 to ฿25,000
- d. ฿25,000 to ฿50,000
- e. Greater than ฿50,000

Thank you for taking the time to complete this survey.

## 7.7.2 Thai Translation

Surveyor Name \_\_\_\_\_

- จุดประสงค์ของการทำแบบสอบถามนี้คือการช่วยสนับสนุนมูลนิธิชัยพัฒนาในการส่งเสริมการทำ การเกษตรแบบยั่งยืน
- การตอบคำถามของคุณจะมีส่วนช่วยให้พวกเราได้รับรู้เกี่ยวกับทัศนคติของคนในชุมชนที่มีต่อการปลูกพืชแบบ ไฮโดรโปนิคส์และศูนย์การเรียนรู้มากขึ้น  
ถ้าคุณรู้สึกไม่สบายใจที่จะให้ข้อมูลในคำถามบางคำถาม คุณสามารถเลือกที่จะไม่ตอบคำถามนั้นได้

(การตอบแบบสอบถามของคุณจะไม่ถูกเปิดเผยต่อสาธารณะ)

### 1. คุณรู้จักศูนย์การเรียนรู้ได้อย่างไร?

- เพื่อน หรือ ครอบครัว
- สื่อออนไลน์
  - Facebook (เฟซบุค)
  - Twitter (ทวิตเตอร์)
  - Instagram (อินสตราแกรม)
  - อื่นๆ \_\_\_\_\_
- มูลนิธิชัยพัฒนา
- เว็บไซต์
- ป้ายบอกทาง
- อื่นๆ \_\_\_\_\_

### 2. อะไรเป็นจุดสนใจที่ทำให้คุณมาเรียนวิธีการปลูกผักแบบไฮโดรโปนิคส์ที่ศูนย์การเรียนรู้?

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### 3. คุณผ่านการฝึกอบรมเมื่อไหร่?

- ในช่วง6เดือนที่ผ่านมา
- ในช่วง1ปีที่ผ่านมา
- ในช่วง3ปีที่ผ่านมา
- มากกว่า3ปี

### 4. คุณมีความพึงพอใจมากน้อยแค่ไหนกับการเรียนรู้ที่ได้รับ?

- ไม่พึงพอใจเป็นอย่างมาก
- ไม่พอใจ
- ค่อนข้างพึงพอใจ
- พึงพอใจ
- พึงพอใจเป็นอย่างมาก

### 5. คุณมีคำแนะนำอะไรบ้างในการที่จะพัฒนาศูนย์การเรียนรู้?

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6. คุณประกอบอาชีพอะไร

- a. เกษตรกร
- b. ธุรกิจส่วนตัว
- c. นักเรียน/นักศึกษา
- d. แม่บ้าน
- e. รับราชการ
- f. อื่นๆ \_\_\_\_\_
- g. ไม่ขอตอบ

7. หลังจากการอบรมวิธีการปลูกผักแบบไฮโดรโปนิคส์แล้ว คุณได้นำความรู้ที่ได้มาใช้ในการปลูกผักแบบไฮโดรโปนิคส์จริงหรือเปล่า ?

a. ถ้าใช่,

i. อะไรเป็นเหตุผลที่ทำให้คุณนำความรู้กลับมาใช้จริงต่อ?

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ii. ทำไมคุณถึงเลือกเรียนการปลูกแบบไฮโดรโปนิคส์

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iii. (ถ้าเป็นเกษตรกร) การปลูกผักแบบไฮโดรโปนิคส์ได้ผลกำไรมากกว่าการปลูกผักโดยใช้ดินใช่หรือไม่?

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iv. คุณมีอุปสรรคในการปลูกแบบไฮโดรโปนิคส์หรือไม่

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b. ถ้าไม่, ทำไม

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8. คุณสามารถเข้าถึงอินเทอร์เน็ตได้หรือไม่ ถ้าใช่ ใช้อะไร?

- a. ไม่ได้ใช้อินเทอร์เน็ต
- b. โทรศัพท์มือถือ/ แทปเลต
- c. คอมพิวเตอร์
- d. อื่นๆ : \_\_\_\_\_

9. ตอนนี้คุณได้ใช้สื่อออนไลน์อะไรบ้าง ถ้าใช่ แล้วใช้บ่อยแค่ไหน?

- a. ไม่ใช่
- b. Facebook (เฟซบุค)

- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์

c. Twitter

- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์

d. Instagram

- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์

e. Email

- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์

f. อื่นๆ \_\_\_\_\_

- i. มากกว่าหนึ่งครั้งต่อวัน
- ii. วันละครั้ง
- iii. อาทิตย์ละครั้ง
- iv. น้อยกว่าอาทิตย์

10. เพศของคุณคืออะไร

- a. เพศหญิง
- b. เพศชาย
- c. ขอไม่ตอบ

11. คุณอายุประมาณเท่าไร?

- a. อายุต่ำกว่า 25 ปี
- b. 26-40 ปี
- c. 41-60 ปี
- d. 61 หรือมากกว่านั้น
- e. ขอไม่ตอบ

12. คุณอาศัยอยู่ที่ไหน?

- a. ปราจีนบุรี
- b. จังหวัดอื่น: \_\_\_\_\_
- c. ขอไม่ตอบ

13. คุณมีรายได้เฉลี่ยประมาณเท่าไร?

- a. น้อยกว่า 10000 บาท
- b. 10,000 ถึง 25,000 บาท
- c. 25,000 ถึง 50,000 บาท
- d. มากกว่า 50,000 บาท
- e. ขอไม่ตอบ

คณะนิสิตคณะวิทยาศาสตร์ หลักสูตรเคมีประยุกต์(นานาชาติ) จุฬาลงกรณ์มหาวิทยาลัยและคณะนักศึกษาจาก WPI (Worcester Polytechnic Institute) ประเทศสหรัฐอเมริกา  
ขอขอบพระคุณผู้ที่มีส่วนเกี่ยวข้องกับการทำแบบสอบถามนี้เป็นอย่างมา

## 7.8 Appendix H: Preliminary Questions for Discussion with Thawatchai Saengthamchai

**Discussion Date:** 13th February 2015

**Interviewee:** Thawatchai Saengthamchai

**Interviewers:** Kik, Mimi, Nico, Halsey

**Place:** WHY NOT social enterprise company, BTS Udomsuk station

**This interview is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn how to increase the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Demonstration Center (HDC). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.**

### **Introductory Questions**

1. Can we use your name to refer to this interview? May we please record this interview?
2. How much time do we have for this interview? We have approximately 15 questions.
3. Present information about our current situation.

### **Social Media**

4. Do you have any suggestions to target the local people by using Facebook and Line?
5. Facebook is a widespread social media platform. Is there a way to specifically target the local people using Facebook? If so, how can we reach out to this target?
6. Is it possible to use Line as a tool for PR? In what way can we utilize Line to reach out to the local community?
7. Do you think it would be beneficial to also use Twitter and Instagram by linking them to Facebook?
8. Do you think that Facebook and Line are the best ways to communicate to the local people through social media? And do you have any other suggestions?

### **Non-Social Media**

9. Do you think that a website is an attractive and accessible medium to local people? What are aspects of creating a website that we must consider?
10. Do you have any suggestions to use other forms of communication to advertise to the local people?
11. Do you have any suggestions for a PR strategy that seeks to inform the local people about topics such as hydroponics and learning about the existence of the HDC and its learning program?
12. Do you have any suggestions on how to effectively use printed PR materials?

### **Concluding Questions**

13. How can we target groups of people in specific demographics?
14. What are your suggestions on creating a catchy slogan?
15. Given the information about our project, do you have any other suggestions to achieve our goal?

## 7.9 Appendix I: Summary of Discussion with Thawatchai Saengthamchai

**Discussion Date:** 13th February 2015

**Interviewee:** Thawatchai Saengthamchai

**Interviewers:** Kik, Mimi, Nico and Halsey

**Participants:** Kik, Mimi, Nico and Halsey

**Location:** WHY NOT enterprise company in Bangkok

First, we explained the background of our project and preliminary results from our surveys and interviews.

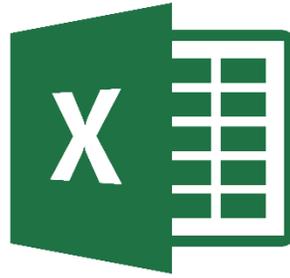
- Thawatchai Saengthamchai asked: So the target that you surveyed, what is their need? What are their difficulties in their life and do we need to solve it? What is the challenge in life for them? When you are saying that the target group is people in Prachinburi, think about what they want, maybe it's not the thing that the Chaipattana would like to say. You need to tweak it a little bit because you want appeal to them, you need to find a way to appeal to them maybe by telling them "this is the way to get rich in the more sustainable way." If they want to have their own food, you can talk how they can grow food.
- That's what communication campaigns look like. You have the goal and the goal is impossible but the thing is that you need to tweak it, you need to match it with the need of customer what they want to hear, they do not want to hear what you want to say, you need to understand that and then match it to your goal to make it fit. It's always like this, but you need to have an idea or communication technique to inspire them.
- If the target is the consumer you need to know what they want to buy and what their difficulties are in their life. I believe that people in Prachinburi easily get vegetables.
- I believe that you have 2 target groups, the first is the people who want to buy product and second is who we wants to be the producer. The thing is the producer needs consumers and based on the survey 64% of people in Prachinburi believe that hydroponics is unsafe, so this is the thing that you have to fix because if the misconception remains, there will be no more producer.
- Maybe this is the situation: If you do not have producers, you do not have people coming to the learning center and cannot sell it because people don't know how good it is. The worst is that people think that it's dangerous, maybe this is the point, the important point that you need to address first before you want people come to the learning center. When the awareness raise, people want to sell it. When people want to sell, you will get people want to produce it.
- Facebook is a platform, not social media. you cannot get your target group from Facebook. You need people that are engaged with that Facebook account and you need to know if people in Prachinburi look through their news feed or their follows. This determines whether or not your post will reach the target group.

- Website is good if the survey shows that people have access to the Internet. It should contain the kind of learning material to educate people about hydroponics, maybe the farm visit video, what is inside hydroponics, what makes it better than normal vegetable, if they want to know more about hydroponics, people can know the deeper information about hydroponics through the website, this is the second phase. The first phase, I believe you need to get some attention from people first. You can do this by opening shop, inviting people to come visit the farm, hold a concert at the farm, and also school field trips to visit farm. When they know about what hydroponics is in general, they are going want to know more about hydroponics, they might come to your website and see the video. An infographic is a good idea. Brochure is good for the first phase of the campaign, and for people who are interested you can take them further to the farm.
- You can open shop in the urban area and sell their product and use as the flagship store to communicate, this is the place where you can grow your own food, if you want to know more you can go to the farm visit.
- The first step is you need to fix the misconception of the people and when they are interested a little bit, they will seek more information from the media that we use.
- Line is a platform like Facebook, you can use it but learn how to use it. QR code is going to be the 2 or 3 phase.
- The first phase is to drive people to the second phase (Facebook or online components)
- Coupon (CRM), you can use this at farm because you want people come to the farm and bring people come to the farm. Also, if someone brings new friend, she/he can get discount for buying new equipment in order to get more people interested in learning at the farm.
- You need to calculate that one set of produce how many kg you can produce and how much they will get profit and initial cost.
- In the Facebook advertising you can select the target group, you need the influencer, social influencer among Prachinburi, who they follow or how they get their news.
- The wording needed to convince people, first you need to focus on Prachinburi people and how can they know you and to fix the misconception, then you will get more producer and people to get on your website and farm. You can give them info and turn/convert them to producer.
- The first thing before using social media, you need farm visitors, market stand in the public area (you can fix perception, communication channel and get money), car announce, radio, poster. Opening the shop is good that these can tell people that if you grow hydroponics product, you can sell in this price and people can buy it.
- It's kind of a franchise. Turn the consumer into your producer.
- To summarize, first, you really need to focus on people in Prachinburi and get their awareness, second, you will bring them to get more information, and last turn them to producer.
- At first, the material can be shop, poster, brochure, farm visit, concert, and school visit.
- Second phase can be infographic, Facebook, video, etc.

- You don't need your campaign to look very creative or fancy. If your target does not need it. You just need the information to get to your target. You just need it to be simple.

## 7.10 Appendix J: Consumer Survey Data

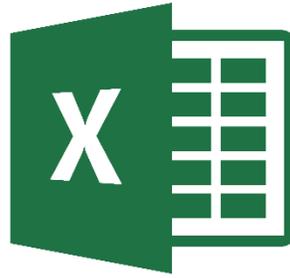
This appendix contains a link to an Excel Spreadsheet that contains all of the data collected for the Consumer Survey. The first sheet contains a legend for reading the data, the second contains the quantitative data, and the third contains the qualitative data for all three consumer survey locations with surveys numbered according to the numbering scheme outlined in Step 2 of the Methodology. Click on the Microsoft Excel icon or hyperlink below to open the spreadsheet. If the link does not work, the data file should be in the same folder as this report.



[ConsumerSurveyData.xlsx](#)

## 7.11 Appendix K: Vendor Survey Data

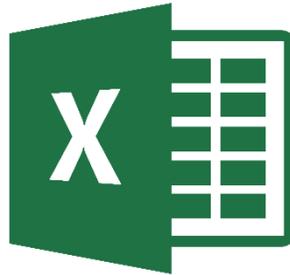
This appendix contains a link to an Excel Spreadsheet that contains all of the data collected for the Vendor Survey. The first sheet contains a legend for reading the data and the second contains the quantitative data for all three vendor survey locations with surveys numbered according to the numbering scheme outlined in Step 2 of the Methodology. Click on the Microsoft Excel icon or hyperlink below to open the spreadsheet. If the link does not work, the data file should be in the same folder as this report.



[VendorSurveyData.xlsx](#)

## 7.12 Appendix L: HPCF Consumer Survey Data

This appendix contains a link to an Excel Spreadsheet that contains all of the data collected for the HPCF Consumer Survey. The first sheet contains a legend for reading the data and the second contains the quantitative data with surveys numbered according to the numbering scheme outlined in Step 2 of the Methodology. Click on the Microsoft Excel icon or hyperlink below to open the spreadsheet. If the link does not work, the data file should be in the same folder as this report.



[HPCFConsumerData.xlsx](#)

## 7.13 Appendix M: Responses to School Interview Questions

This appendix contains the recorded interview responses of the four schools we interviewed. We highlighted the answers from each school in red.

### 7.13.1 Prachin-Ratsadorn-Amroongs School

Surveyor Name: Kik, Mimi

Name of School: Prachin-ratsadorn-amroongs

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and fill in lines.

1. Do you currently have a hydroponics learning program at your school?
  - a. Yes
  - b. No

If 2.a answer 3 and 4 then skip to 8. If 2.b, skip to 5

2. How many students participate in the hydroponics learning program?  
\_\_\_\_\_

3. What does your hydroponics learning program consist of?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. How interested are you in implementing a hydroponics learning program?
  - a. Very interested
  - b. Somewhat interested
  - c. Not Interested

**Reason:** Reduce canteen expense, good vegetable price, teacher have his own hydroponics garden

5. If answer 4.a,4.b - What information would you need to know in order to implement a hydroponics learning program?
  - a. Benefits of using hydroponics in education
  - b. How to set up a hydroponics farm
  - c. Economics of hydroponics
  - d. Other  
\_\_\_\_\_

6. Does your school currently offer any clubs, electives, or activities?
  - a. Yes

i. How many students participate?

Whole school

ii. Are there any related to agriculture?

Yes depend on subject

b. No

7. Do you know about the Chaipattana Foundation's Hydroponics Project in the Muang District of the Prachinburi Province?

a. Yes (Know Khun King)

If yes, how did you find out about it? (circle all that apply)

1. Friends or family

2. Social media

a. Facebook

b. Twitter

c. Instagram

d. Other \_\_\_\_\_

3. The Chaipattana Foundation

4. Other school (which?): \_\_\_\_\_

5. Website

6. Entrance sign

7. Other: \_\_\_\_\_

b. No

8. If 10.a, have you visited the Hydroponics Project?

a. Yes

b. No

9. If 11.a, do you know there is a hydroponics technique learning program at the HPCF?

c. Yes

d. No

10. If 11.a, why did you visit the HPCF (circle all that apply)?

e. To go through the training

f. Take students for field trip

g. To buy produce

h. For leisure

i. Other: \_\_\_\_\_

**Thank you for taking the time to complete this survey**

If interested in learning more about the HPCF or hydroponics agriculture - please fill out the following fields.

1. Name

**Aj.Sumrerng Chokerung**

2. School  
Prachin-ratsadorn-amroongs
3. Contact Number  
0865814933
4. Email  
-
5. Best Time to Contact  
-
6. Additional Comments  
-

7.13.2 Prachin-Ratsadorn-Amroongs II School  
Surveyor Name: Kik , Mimi

Name of School: Prachin-ratsadorn-amroongs II

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and fill in lines.

1. Do you currently have a hydroponics learning program at your school?
  - a. Yes
  - b. No

If 2.a answer 3 and 4 then skip to 8. If 2.b, skip to 5
2. How many students participate in the hydroponics learning program?  
3 students
3. What does your hydroponics learning program consist of?  
Teacher gives students homework by doing a report about hydroponics.
4. How interested are you in implementing a hydroponics learning program?
  - a. Very interested
  - b. Somewhat interested
  - c. Not Interested

**Reason:** Want to do If the school have investment because it's non toxic, it is popular now. therefore the school want student to growing hydroponics and also school will get income from this.

5. *If 4a, b* - What information would you need to know in order to implement a hydroponics learning program?

- a. Benefits of using hydroponics in education
  - b. How to set up a hydroponics farm
  - c. Economics of hydroponics
  - d. Other
- 

6. Does your school currently offer any clubs, electives, or activities?

- a. Yes
  - i. How many students participate?  
13 students
  - ii. Are there any related to agriculture?  
No
- b. No

7. Do you know about the Chaipattana Foundation's Hydroponics Project in the Muang District of the Prachinburi Province?

- a. Yes but do not know where it is.

If yes, how did you find out about it? (circle all that apply)

- 1. Friends or family
- 2. Social media
  - a. Facebook
  - b. Twitter
  - c. Instagram
  - d. Other \_\_\_\_\_
- 3. The Chaipattana Foundation
- 4. Other school (which?): \_\_\_\_\_
- 5. Website
- 6. Entrance sign
- 7. Other: \_\_\_\_\_

- b. No

8. If 10.a, have you visited the Hydroponics Project?

- a. Yes
- b. No

9. If 11.a, do you know there is a hydroponics technique learning program at the HPCF?

- c. Yes
- d. No

10. If 11.a, why did you visit the HPCF (circle all that apply)?

- e. To go through the training
- f. Take students for field trip
- g. To buy produce
- h. For leisure
- i. Other: \_\_\_\_\_

**Thank you for taking the time to complete this survey**

If interested in learning more about the HPCF or hydroponics agriculture - please fill out the following fields.

1. **Name**  
Aj. Tuangrat Vichianroj
2. **School**  
Prachin-ratsadorn-amroongs II
3. **Contact Number**  
0800993156
4. **Email**  
-
5. **Best Time to Contact**  
Anytime
6. **Additional Comments**  
-

7.13.3 Chakrabongse-Pittayalai School

Surveyor Name: Kik, Mimi

Name of School: Chakrabongse-Pittayalai school

**This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community’s awareness of hydroponics agriculture and the Chaipattana Foundation’s Hydroponics Project (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.**

Surveyor will circle responses and fill in lines.

1. **Do you currently have a hydroponics learning program at your school?**
  - a. Yes
  - b. No

If 2.a answer 3 and 4 then skip to 8. If 2.b, skip to 5
2. **How many students participate in the hydroponics learning program?**

Approximately 200 students

**3. What does your hydroponics learning program consist of?**

School use Power point as an instructional medium. School is already take the students to visit HPCF once and doing hydroponics at school. School is also buying the nutrient solution from the HPCF. However, the pump is already broken so the school stop doing hydroponics.

**4. How interested are you in implementing a hydroponics learning program?**

- a. Very interested
- b. Somewhat interested
- c. Not Interested

**Reason:** Instrument is broken

**5. If 4.a - What information would you need to know in order to implement a hydroponics learning program?**

- a. Benefits of using hydroponics in education
- b. How to set up a hydroponics farm
- c. Economics of hydroponics
- d. Other

It is hard to teach hydroponics, the instrument price is high, hard to find the nutrient solution and it is hard for student do hydroponics. However, school would like to teach hydroponics and it will be better if school has the solution for these problem.

**6. Does your school currently offer any clubs, electives, or activities?**

- a. Yes
  - i. How many students participate?  
Student grade 7-12
  - ii. Are there any related to agriculture?  
\_\_\_\_\_

b. No

**7. Do you know about the Chaipattana Foundation's Hydroponics Project in the Muang District of the Prachinburi Province?**

a. Yes

If yes, how did you find out about it? (circle all that apply)

- 1. Friends or family
- 2. Social media
  - a. Facebook
  - b. Twitter
  - c. Instagram
  - d. Other \_\_\_\_\_
- 3. The Chaipattana Foundation
- 4. Other school (which?): \_\_\_\_\_

- 5. Website
- 6. Entrance sign
- 7. Other: \_\_\_\_\_

b. No

8. If 7.a, have you visited the Hydroponics Project?

- a. Yes
- b. No

9. If 8.a, do you know there is a hydroponics technique learning program at the HPCF?

- c. Yes
- d. No

10. If 8.a, why did you visit the HPCF (circle all that apply)?

- e. To go through the training
- f. Take students for field trip
- g. To buy produce
- h. For leisure
- i. Other: \_\_\_\_\_

**Thank you for taking the time to complete this survey**

If interested in learning more about the HPCF or hydroponics agriculture - please fill out the following fields.

- 1. **Name**  
Aj.Lerdsilp Boonlerd
- 2. **School**  
Chakkabongse-Wittayalai school
- 3. **Contact Number**  
0885295174
- 4. **Email**  
-
- 5. **Best Time to Contact**  
-
- 6. **Additional Comments**  
-

7.13.4 Prachin-Kallayanee School  
Surveyor Name: Kik , Mimi

Name of School: Prachin-kallayanee school

This survey is intended to assist the Chaipattana Foundation in supporting sustainable practices of agriculture. Your participation is voluntary and your responses are confidential. With your responses, you will help us learn about the local community's awareness of hydroponics agriculture and the Chaipattana Foundation's Hydroponics Project (HPCF). Your participation is very much appreciated and we hope that you can take the time to answer the following questions. If you are uncomfortable answering any of the questions, please feel free to skip that question.

Surveyor will circle responses and fill in lines.

1. Do you currently have a hydroponics learning program at your school?

- a. Yes
- b. No

If 2.a answer 3 and 4 then skip to 8. If 2.b, skip to 5

2. How many students participate in the hydroponics learning program?

---

3. What does your hydroponics learning program consist of?

---

---

---

4. How interested are you in implementing a hydroponics learning program?

- a. Very interested
- b. Somewhat interested
- c. Not Interested

Reason: It's a method that don't need much space to do it.

5. If 6.a - What information would you need to know in order to implement a hydroponics learning program?

- a. Benefits of using hydroponics in education
- b. How to set up a hydroponics farm
- c. Economics of hydroponics
- d. Other

Want to know the easy way to set up the farm with low investment.

6. Does your school currently offer any clubs, electives, or activities?

- a. Yes
  - i. How many students participate?  
all the students in the school.
  - ii. Are there any related to agriculture?  
yes

- b. No

**7. Do you know about the Chaipattana Foundation's Hydroponics Project in the Muang District of the Prachinburi Province?**

a. Yes

**If yes, how did you find out about it? (circle all that apply)**

1. Friends or family
2. Social media
  - a. Facebook
  - b. Twitter
  - c. Instagram
  - d. Other \_\_\_\_\_
3. The Chaipattana Foundation
4. Other school (which?): \_\_\_\_\_
5. Website
6. Entrance sign
7. Other: \_\_\_\_\_

b. No

**8. If 10.a, have you visited the Hydroponics Project?**

a. Yes

b. No

**9. If 11.a, do you know there is a hydroponics technique learning program at the HPCF?**

c. Yes

d. No

**10. If 11.a, why did you visit the HPCF (circle all that apply)?**

- e. To go through the training
- f. Take students for field trip
- g. To buy produce
- h. For leisure
- i. Other: \_\_\_\_\_

**Thank you for taking the time to complete this survey**

If interested in learning more about the HPCF or hydroponics agriculture - please fill out the following fields.

**1. Name**

Aj.Bangorn Chaiyom

**2. School**

Prachin-kallayanee school

**3. Contact Number**

037211071

**4. Email**

-

**5. Best Time to Contact**

-

**6. Additional Comments**

-

## 7.14 Appendix N: Responses to Farmer Organization Interview

This appendix contains the recorded interview responses of the four schools we interviewed.

### 7.14.1 Suan-Baan-Pra

**Interview Date:** 16th February 2015

**Community Name:** Suan-baan-pra Farmer group

**Interviewer:** Kik

1. **How familiar are you with hydroponics?**  
Never heard about hydroponics before
2. **What is your perception of hydroponics?**  
No idea because they do only fruit (fruit community)
3. **How many people are in your farmer's community?**  
More than 200 members
4. **Are you aware of the HPCF?**  
Yes but he only knew that it was located around those area
5. **Are you aware of the HPCF's hydroponics learning program?**  
No
6. **How many hydroponics farmers are there in your community?**  
No
7. **Are farmers in your organization interested in implementing hydroponics?**  
We have to come to talk or offer the information to them first, and then they will consult about this thing in their annual meeting
8. **If interested, do you mind if we leave informational resources at your center?**  
Sure we can leave our information at the Village headman house
9. **How often does this organization meet: why, how, where, when?**  
They will meet on 10<sup>th</sup> of every month at village headman house
10. **Do you share information on agricultural advances?**  
No they emphasize more on the finance thing of the group members
11. **What mediums do you use to communicate among members of the community?**  
Phone call

**Contact information:** ก้านนพคุณ 081-9213548

## 7.14.2 Dong-Kee-Lhek

**Interview Date:** 16th February 2015

**Community Name:** Dong-kee-lhek Farmer group

**Interviewer:** Mimi

1. **How familiar are you with hydroponics?**  
Yes, and he has been to the HPCF once
2. **What is your perception of hydroponics?**  
Safe to eat
3. **How many people are in your farmer's community?**  
More than 100 people
4. **Are you aware of the HPCF?**  
Yes
5. **Are you aware of the HPCF's hydroponics learning program?**  
Yes
6. **How many hydroponics farmers are there in your community?**  
No. However, they actually plan to create a self-sufficient economy strategy based on hydroponics but they have to ask their group member first. If they are interested, the community can provide them an investment
7. **Are farmers in your community interested in implementing hydroponics?**  
They are very interested!
8. **If interested, do you mind if we leave informational resources at your center?**  
Sure we can leave information at their center
9. **How often does this organization meet: why, how, where, when?**  
The community center is located in Wat Dong-bung and they will meet on 15<sup>th</sup> of every month.
10. **Do you share information on agricultural advances?**  
Yes
11. **What mediums do you use to communicate among members of the community?**  
The leader said all of members will automatically know the date because they usually meet on every 15<sup>th</sup> as a routine

### 7.14.3 Organic Farmer Organization

**Interview Date:** 16th February 2015

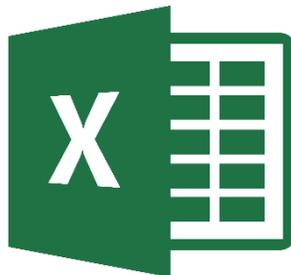
**Community Name:** Organic Farmer Organization

**Interviewer:** Mimi

1. **How familiar are you with hydroponics?**  
A little bit, just know name of it.
2. **What is your perception of hydroponics?**  
They think it is not safe because it uses chemicals and pesticides
3. **How many people are in your farmer's community?**  
12 people
4. **Are you aware of the HPCF?**  
I know Patcharin Puttharit.
5. **Are you aware of the HPCF's hydroponics learning program?**  
Yes
6. **How many hydroponics farmers are there in your community?**  
None
7. **Are farmers in your organization interested in implementing hydroponics?**  
Some of them have been to the hydroponics learning center, but they got less profit and it did not work.
8. **If interested, do you mind if we leave informational resources at your center?**
9. **How often does this organization meet: why, how, where, when?**  
Don't have much meeting.
10. **Do you share information on agricultural advances?**  
Yes, because this organization is for teaching to give people job by doing organic method.
11. **What mediums do you use to communicate among members of the community?**  
Telephone

## 7.15 Appendix O: HPCF Previous Learning Program Attendees Survey Data

This appendix contains a link to an Excel Spreadsheet that contains all of the data collected for the HPCF Previous Learning Program Attendees Survey. The first sheet contains a legend for reading the data, the second contains the quantitative data, and the third contains qualitative data with interviews numbered according to the numbering scheme outlined in Step 2 of the Methodology. Click on the Microsoft Excel icon or hyperlink below to open the spreadsheet. If the link does not work, the data file should be in the same folder as this report.



[PreviousAttendeesData.xlsx](#)

## 7.16 Appendix P: Website Editing Guide

### 7.16.1 English Version

# Website Editing Guide

## How to edit the website

1. Open [www.weebly.com](http://www.weebly.com)
2. Click Log in

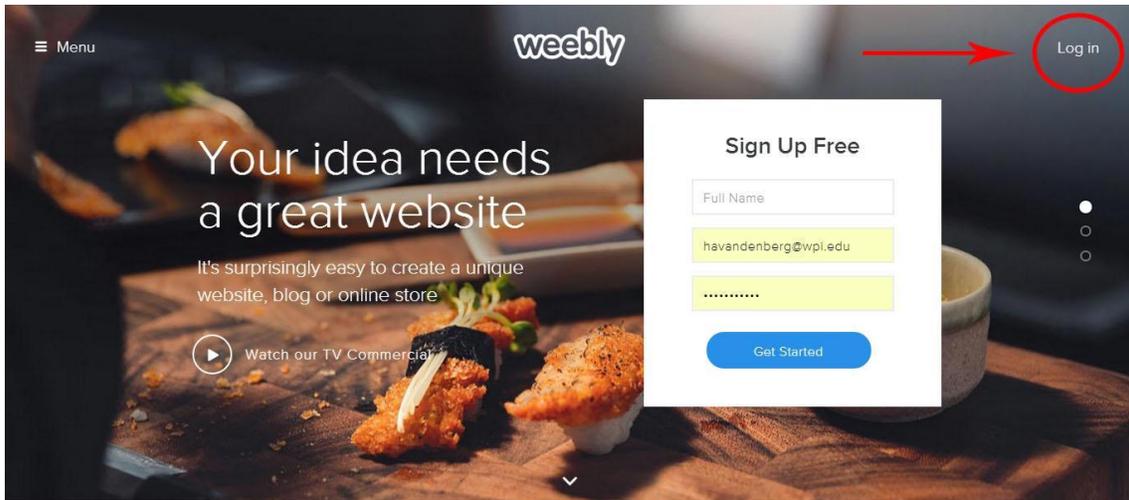


Figure 1

Login with      Username:  
                         Password:

3. Begin editing by clicking edit at Thai website

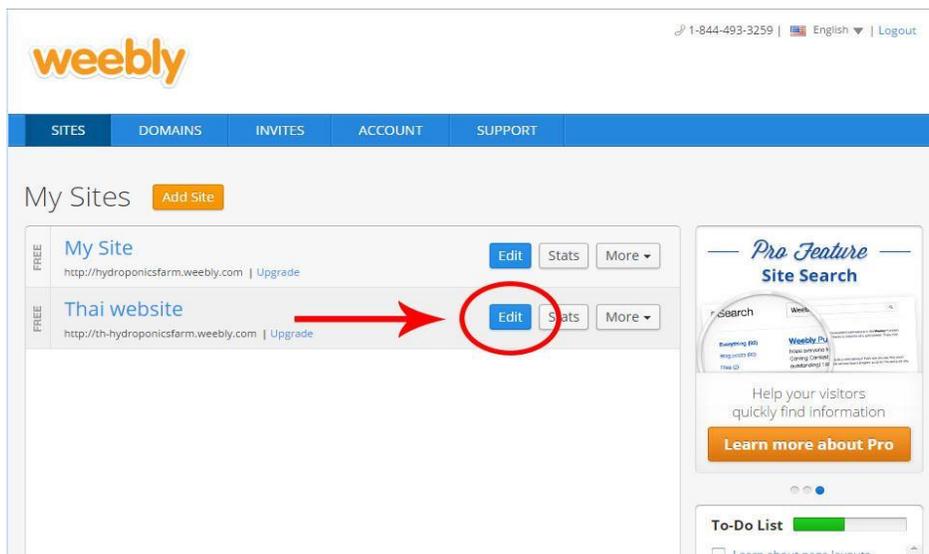


Figure 2

#### 4. How to edit text:

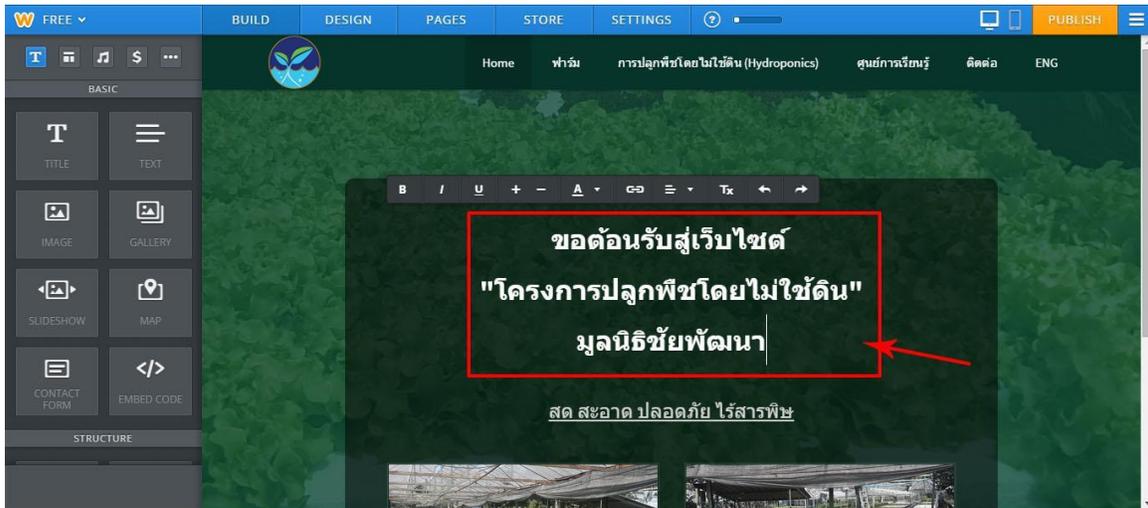


Figure 3.1

##### 4.1 Click at the text to edit

During edit the text, there is a shortcut function as show below



Figure 3.2

B bold, I Italic, U Underline

+ increase font size, - decrease font size

A change font color

#### 5. Change page by place mouse on the icon to select the page and click the icon as shown in the picture

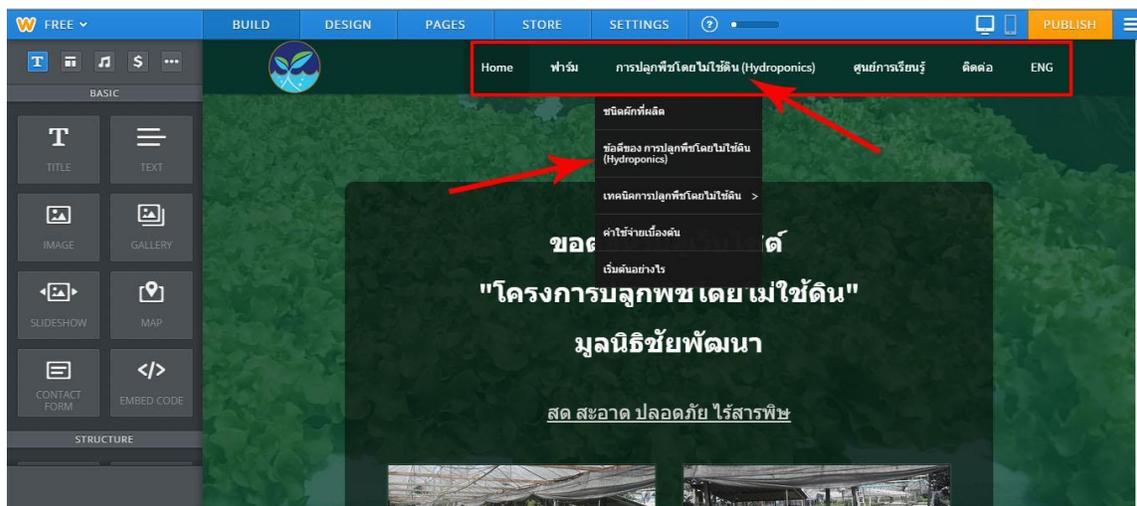


Figure 4

#### 6. Add title and text by drag icon Title and text to the page

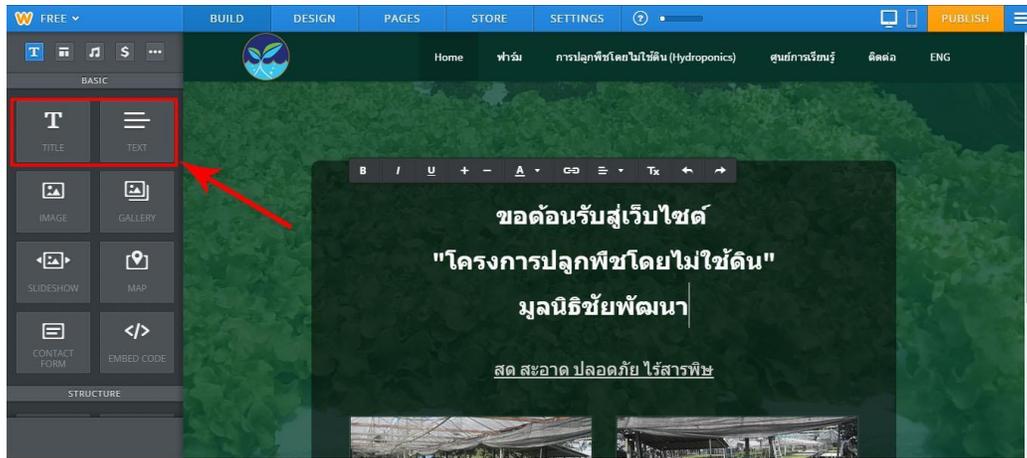


Figure 5.1

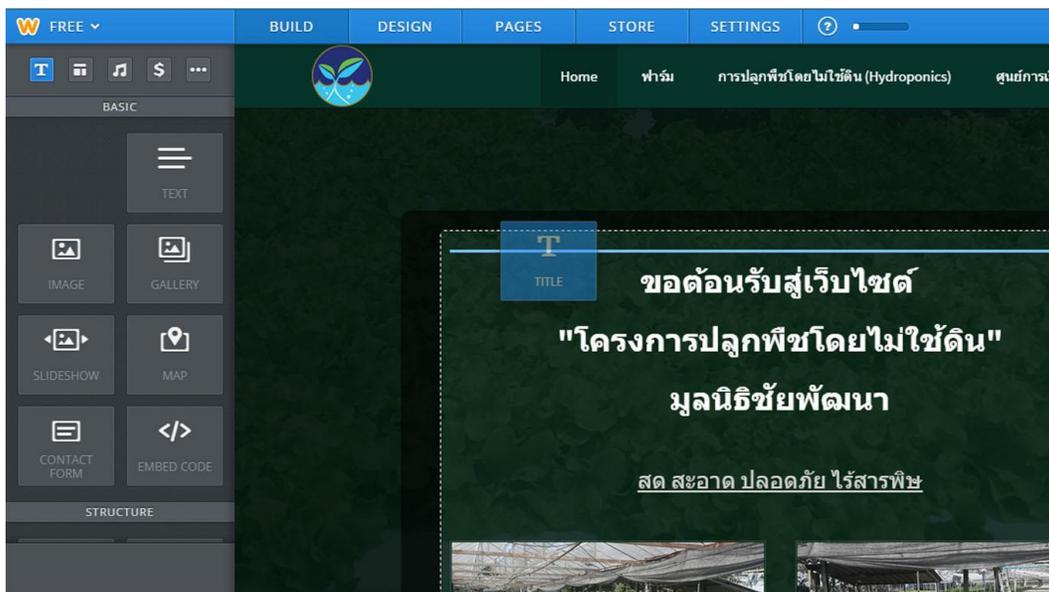


Figure 5.2

7. Add the photo by drag the image to the page the same way as how to add text.

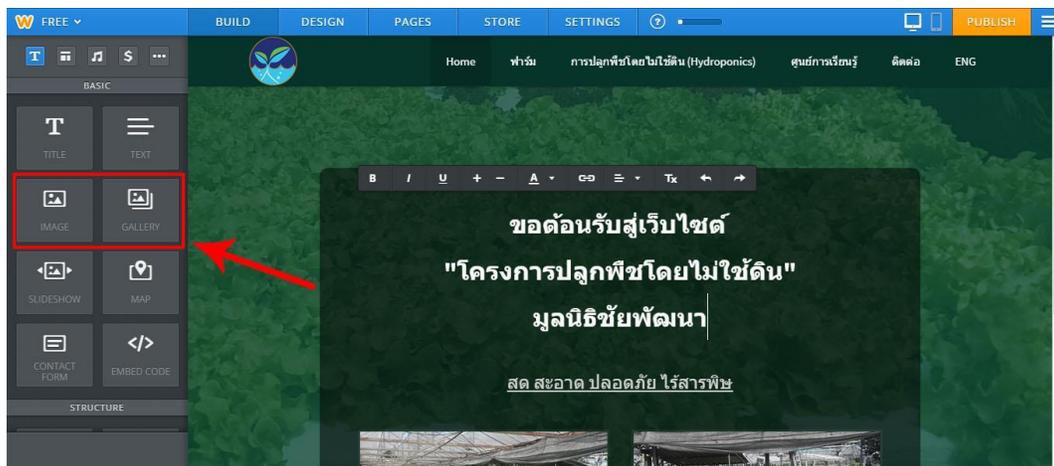


Figure 6.1

7.1 Click the Upload image and then click upload a photo from your computer. Then select the wanted photo and click open.

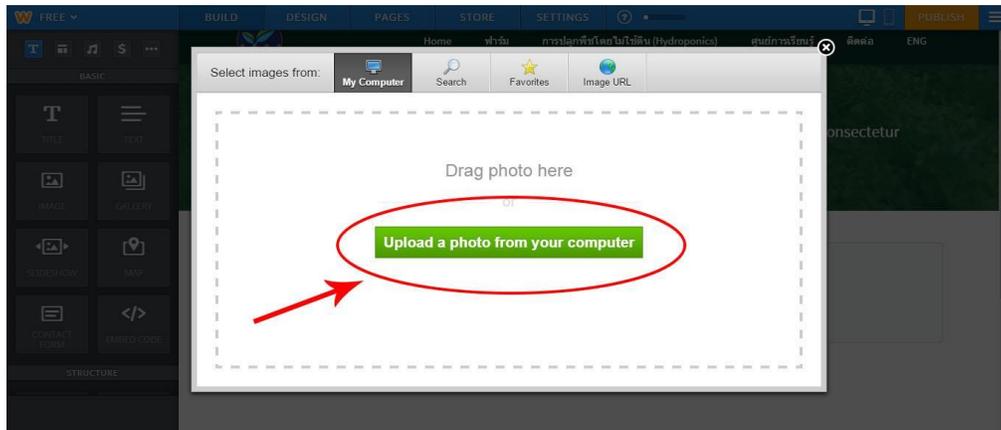


Figure 6.2

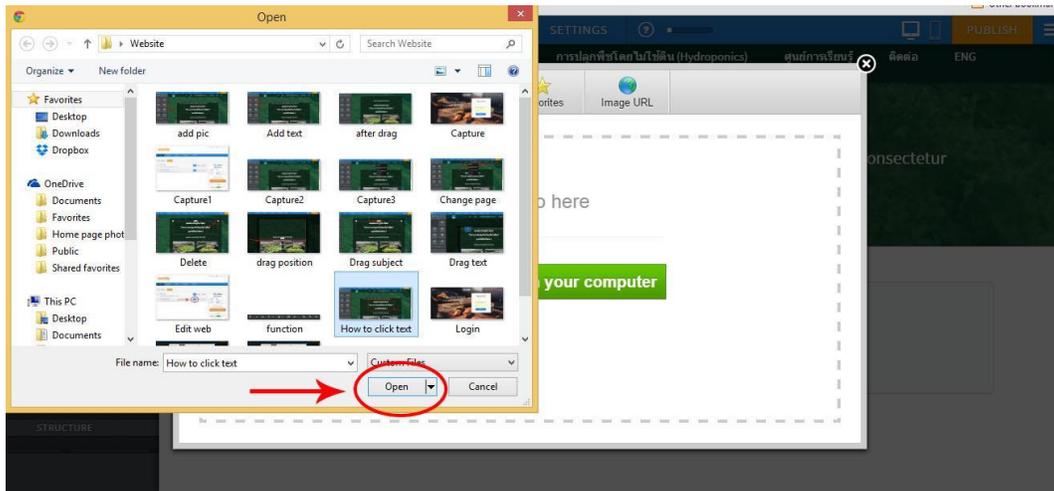


Figure 6.3

8. Any object in page can be deleted by placing the mouse on the subject and clickin the X in the right corner.



Figure 7

9. Change position of the subject by click and drag the square bottle to another place. The place which the subject change will be the blue line.



Figure 8

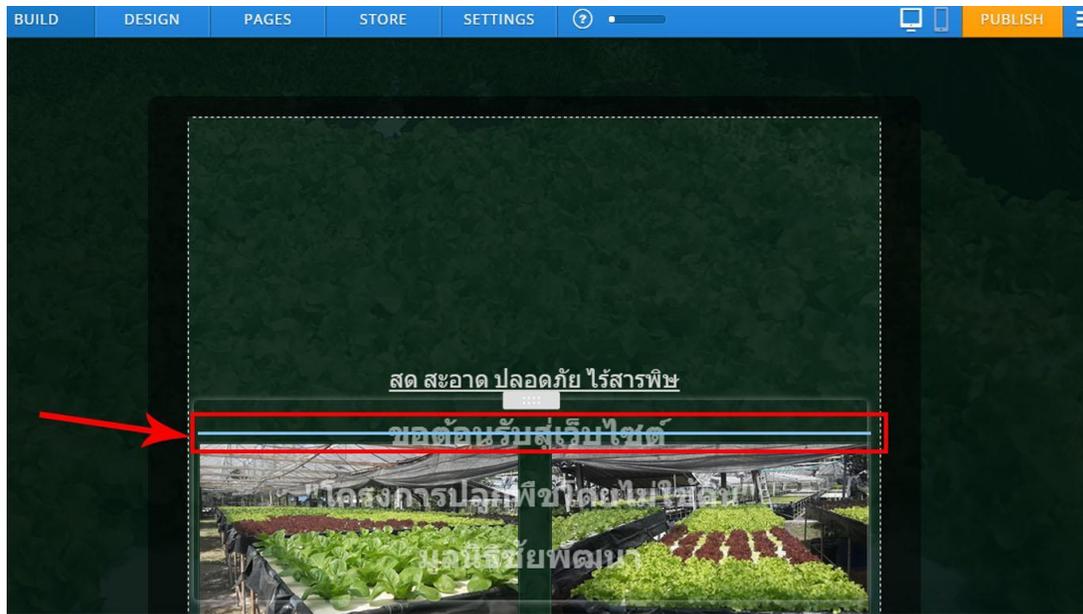


Figure 8.2



Figure 8.3

10. Add space between subjects by dragging spacer function to the page which you can resize as you desire by drag the square as in Figure 9.3.

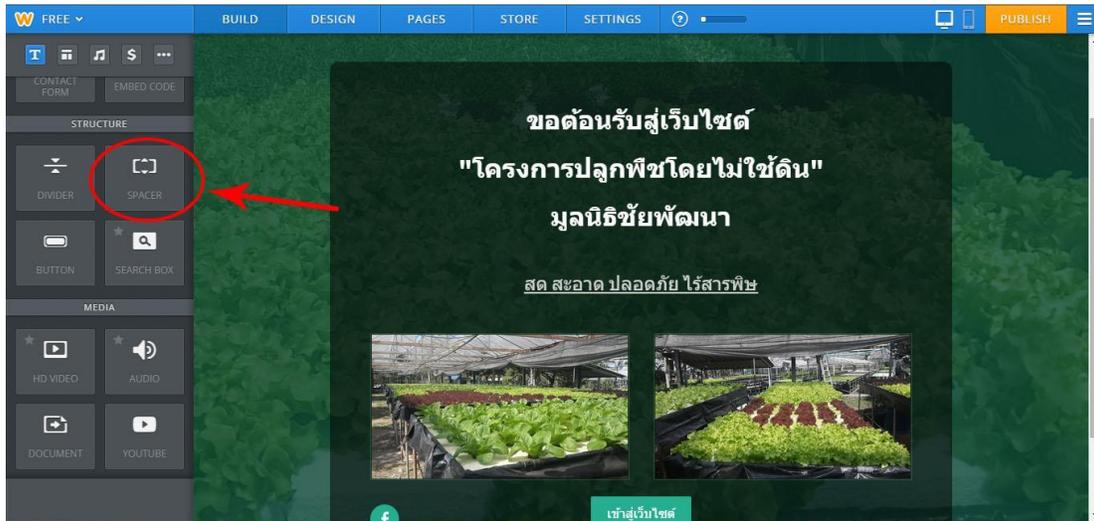


Figure 9.1



Figure 9.2

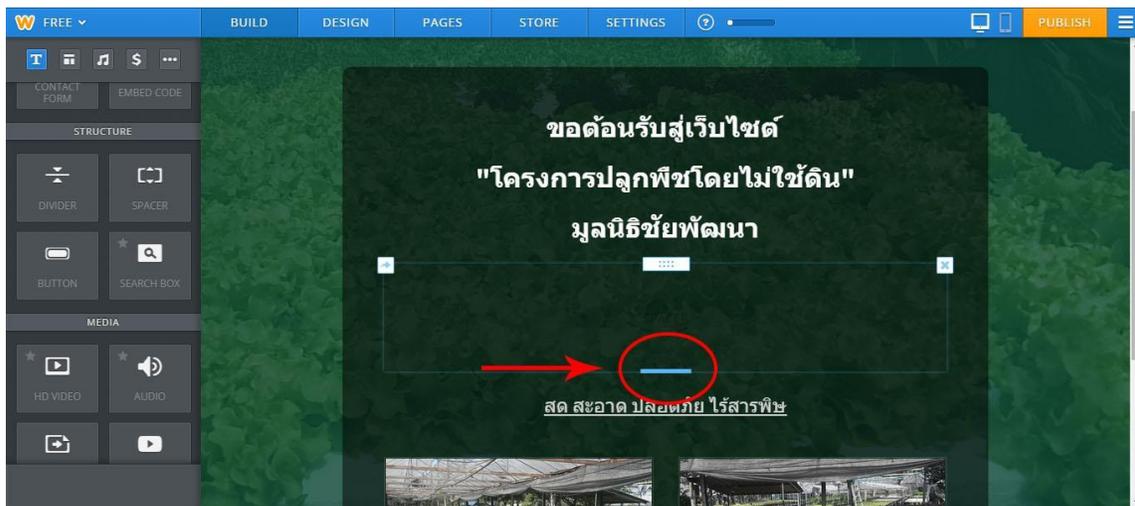


Figure 9.3

11. Pages can be added by selecting the PAGES function and clicking + Add function. The page can be renamed by changing the Page name as in the figure 10.3.

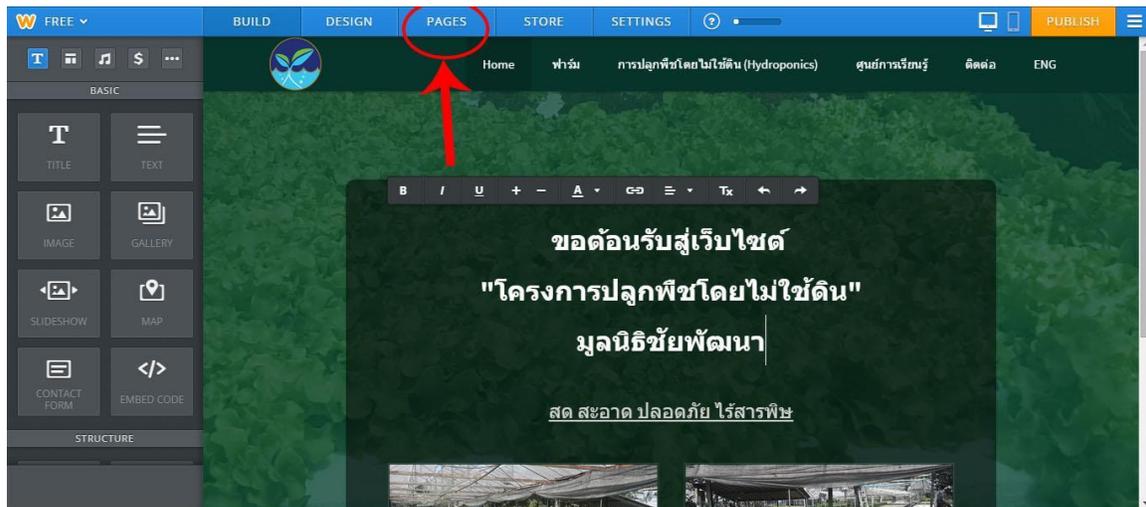


Figure 10.1

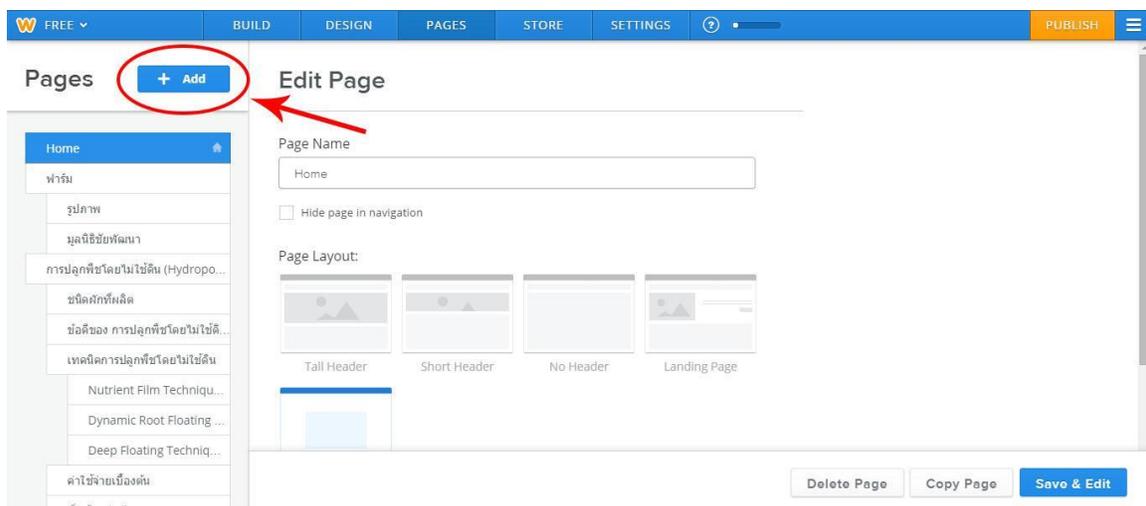


Figure 10.2

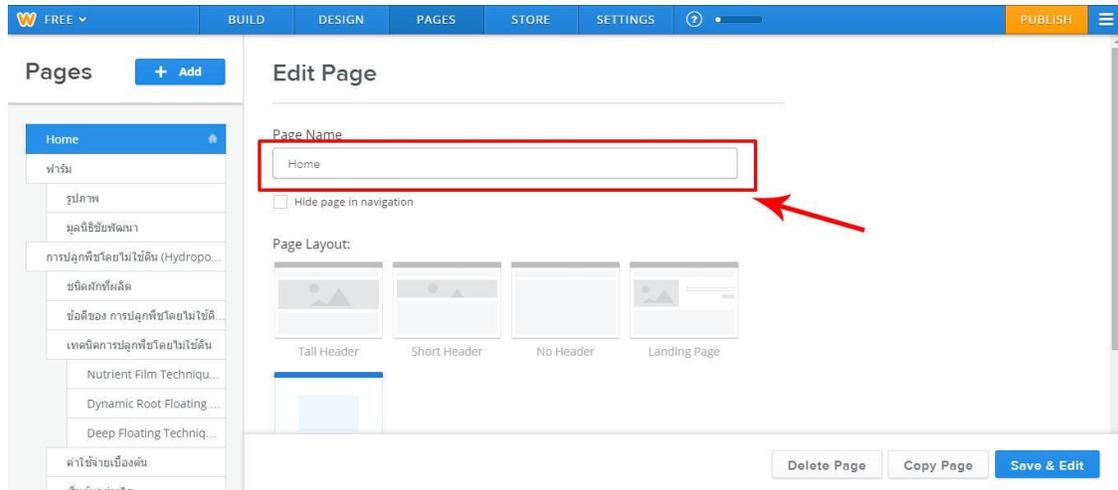


Figure 10.3

12. The comment section will be linked with the E-mail to check feedback and suggestion of the website

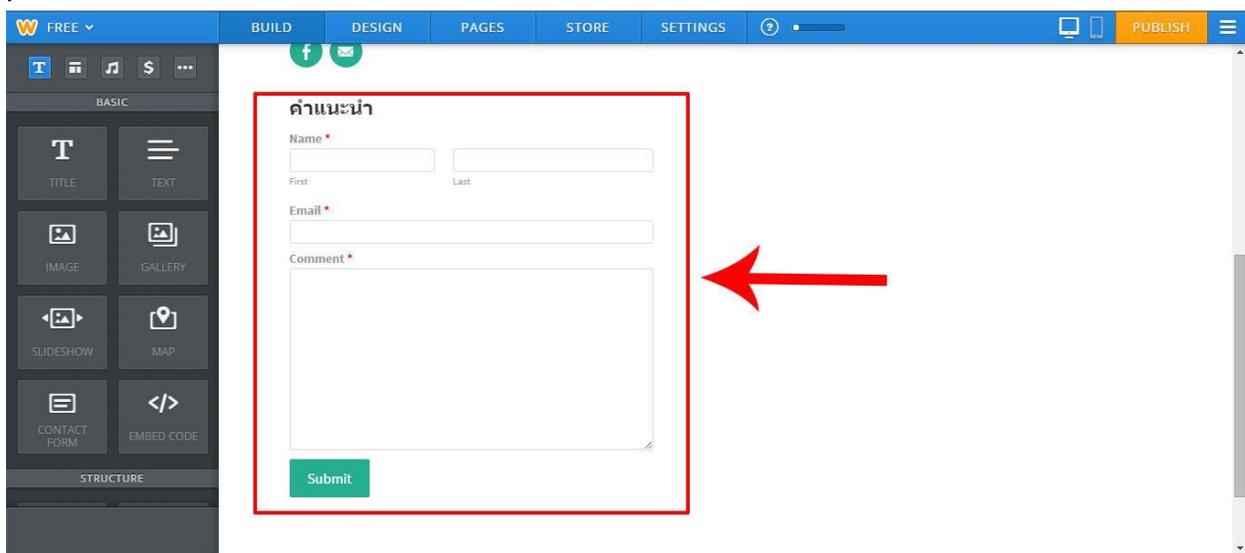
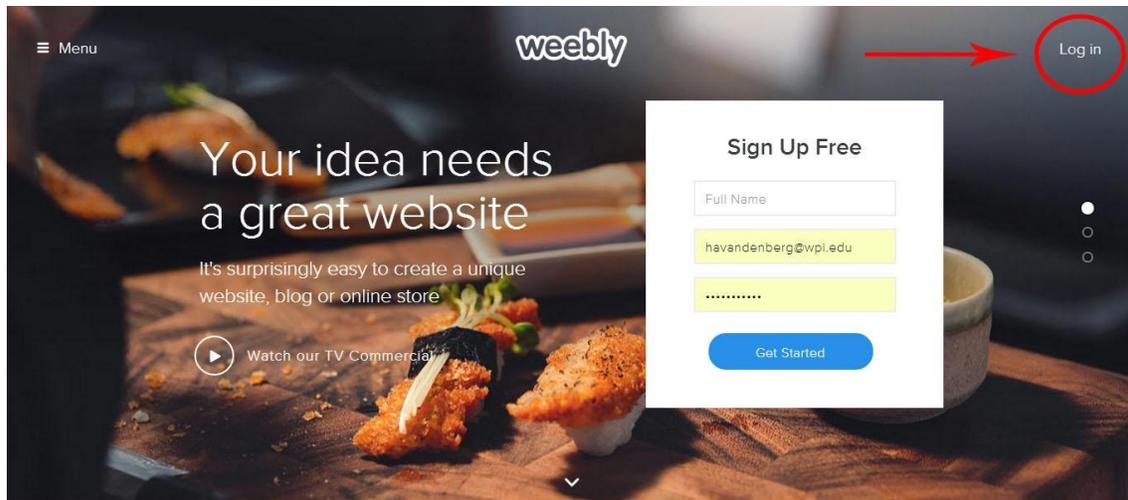


Figure 11

### 7.16.2 Thai Translation

วิธีการใช้เว็บไซต์

1. เปิด [www.weebly.com](http://www.weebly.com)
2. คลิก Login ตามรูปภาพที่ 1

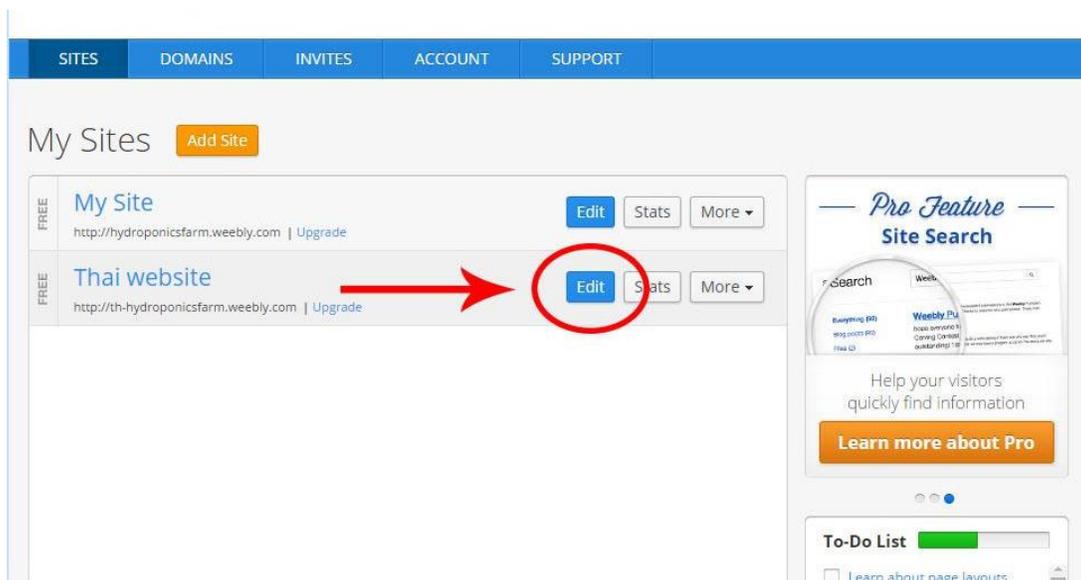


รูปภาพที่ 1

login ค้าง Username:

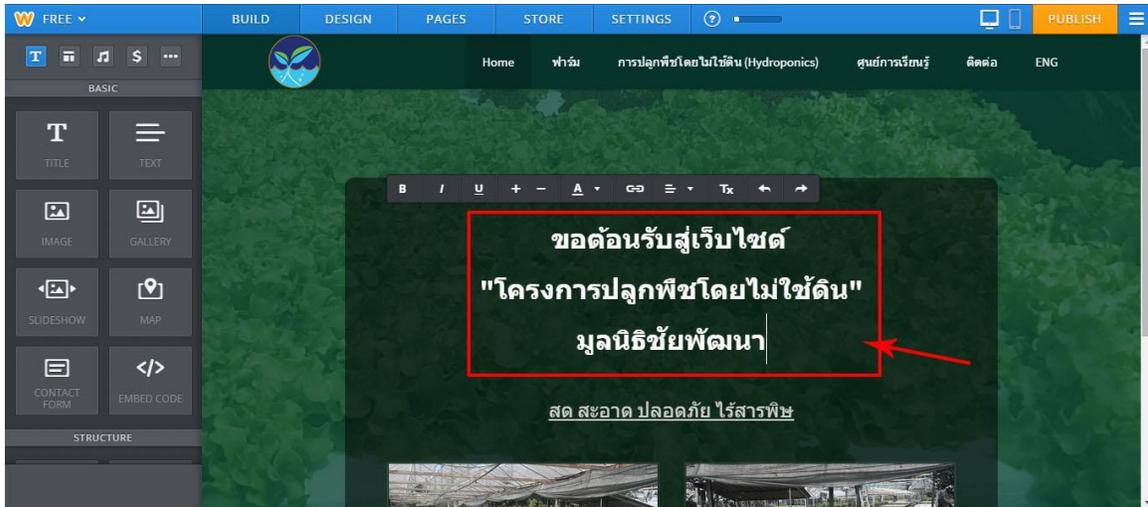
Password:

3. เริ่มต้นการแก้ไขเว็บไซต์โดยคลิก edit ที่ Thai website ตามรูปภาพที่ 2



รูปภาพที่ 2

4. การแก้ไขข้อความคำพูด สามารถทำได้โดยการใช้เมาส์คลิกที่ข้อความคำพูดตามรูปภาพที่ 3.1



รูปภาพที่ 3.1

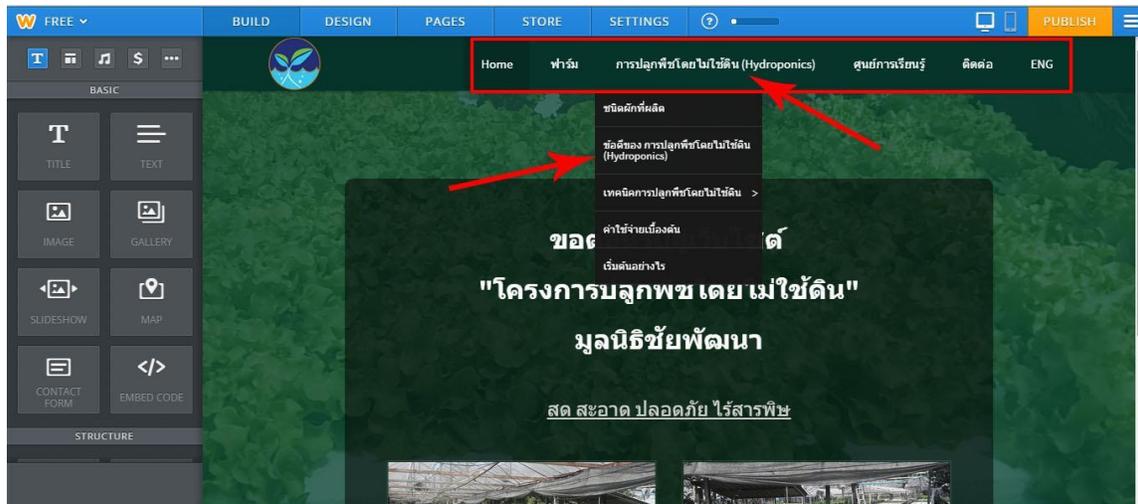
ระหว่างแก้ไขข้อความคำพูด ตัวเว็บไซค์จะโชว์ กล่องทางลัดที่จะสามารถแก้ไขคำพูดได้ตามรูปภาพ 3.2



รูปภาพ3.2

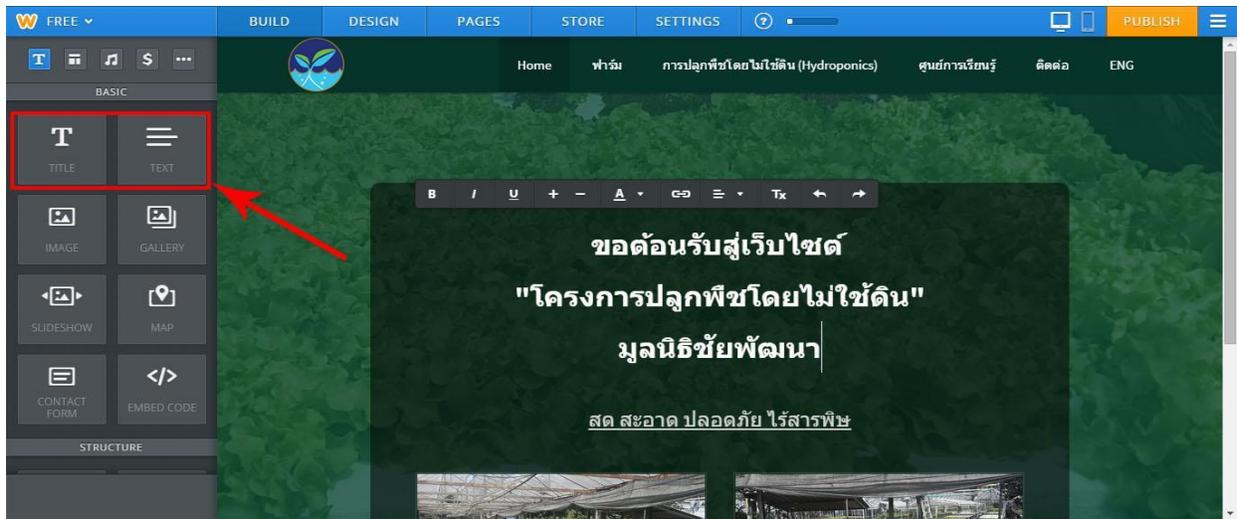
B ตัวหนา, I ตัวเอียง, U ซีดเส้นใต้, + เพิ่มขนาดตัวอักษร, - ลดขนาดตัวอักษร, A เปลี่ยนสีตัวอักษร

5. เปลี่ยนหน้าเว็บไซต์ไปหน้าอื่นโดยการวางเมาส์ไว้บนหน้าที่จะเปลี่ยน และคลิกหน้าที่ต้องการจะเปลี่ยน ตามรูปภาพที่ 4

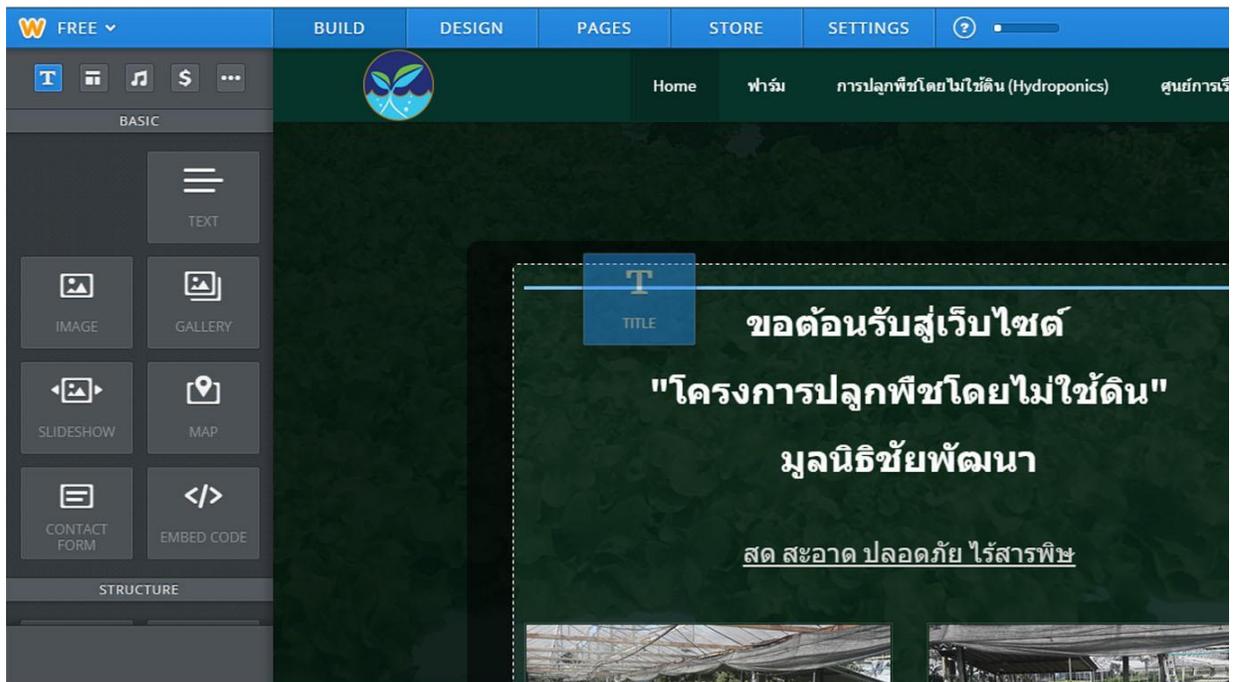


รูปภาพที่ 4

6. เพิ่มหัวและข้อความข้อโดยการลากฟังก์ชัน Title และ Text ไปวางไว้บนหน้าเว็บไซต์ให้ขึ้นแถบสีฟ้า ซึ่งแถบสีฟ้าที่ขึ้นคือตำแหน่งที่ Title และ Text จะลงไปอยู่เว็บไซต์ ตามรูปภาพ 5.1 และ,5.2

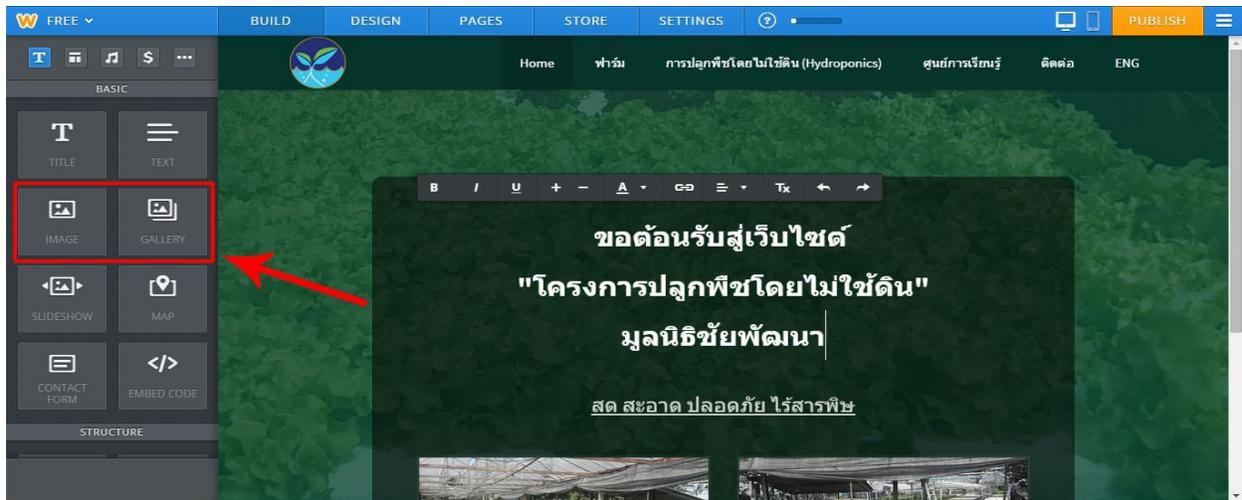


รูปภาพที่ 5.1



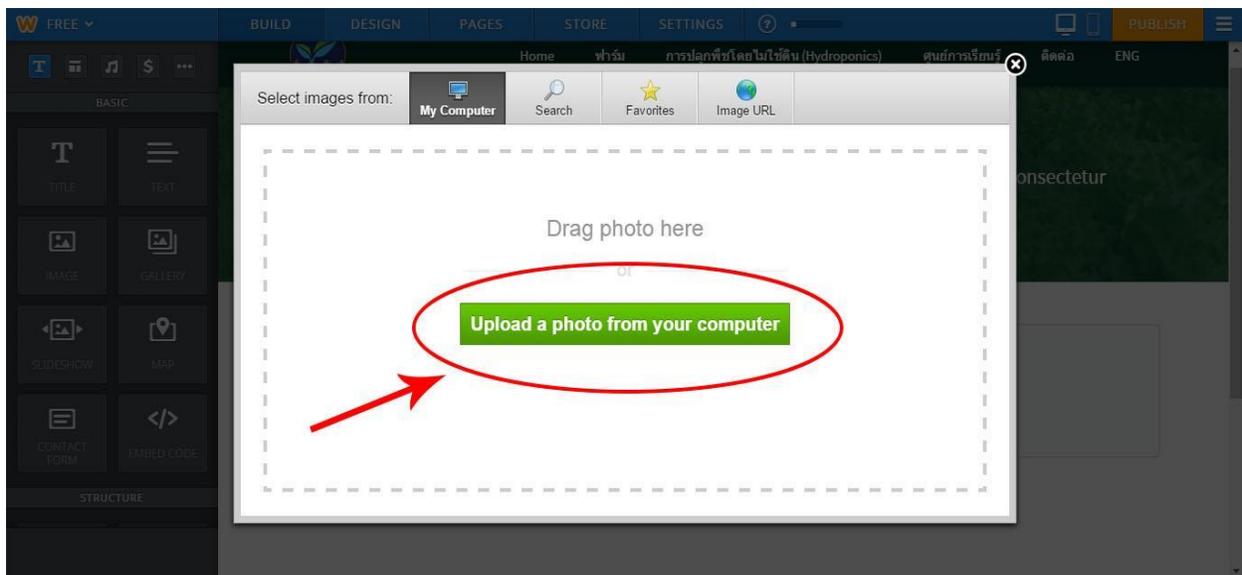
รูปภาพที่ 5.2

7.เพิ่มรูปภาพโดยลากฟังก์ชัน image ไปบนเว็บไซต์ เหมือนในหัวข้อ 6.

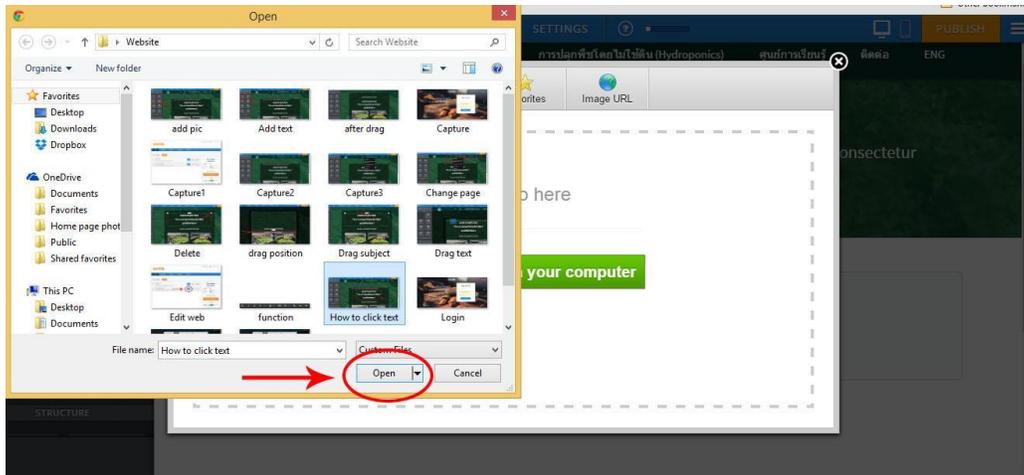


รูปภาพที่ 6.1

7.1 หลังจากข้อ 7. เราสามารถอัปโหลดรูปได้โดยการคลิก Upload image หลังจากนั้นคลิก upload a photo from your computer และเลือกรูปที่ต้องการโดยการ open ตามรูปภาพ 6.1, 6.2 และ 6.3.



รูปภาพที่ 6.2



รูปภาพที่ 6.3

8. ทุกอย่างในเว็บไซค์สามารถลบทิ้งได้โดยการเอาเมา์ไปวางไว้บนวัตถุที่อยากลบและคลิก เครื่องหมาย X ที่ขวามบนของวัตถุนั้น ตามรูปภาพที่ 7

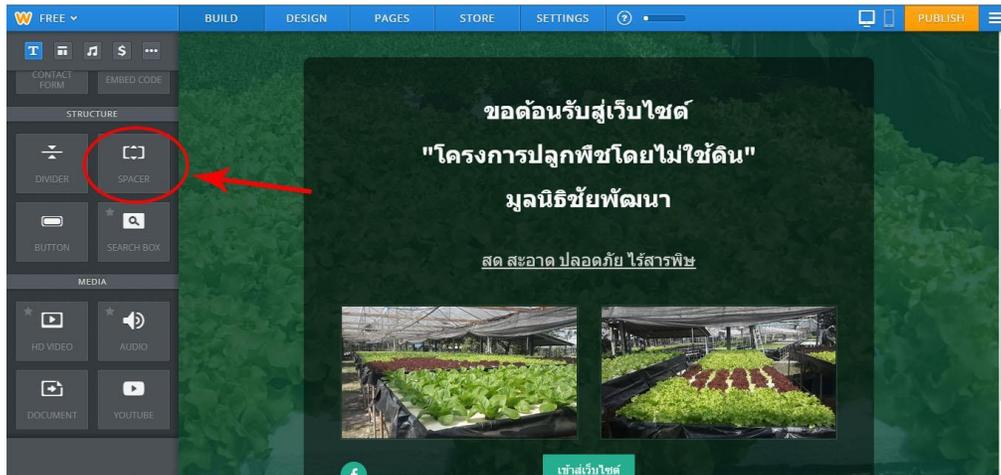


รูปภาพที่ 7

9. ตำแหน่งวัตถุนบนหน้าเว็บไซค์สามารถเปลี่ยนได้โดยการวางเมา์บนวัตถุให้ขึ้นกรอบตามรูปภาพที่ 8.1 หลังจากนั้นให้คลิกเมา์สี่ข้างที่กรอบและลากวัตถุไปในตำแหน่งที่ต้องการให้ ตามรูปภาพที่ 8.2 และปล่อยเมา์เพื่อเปลี่ยนตำแหน่งตามรูปภาพที่ 8.3



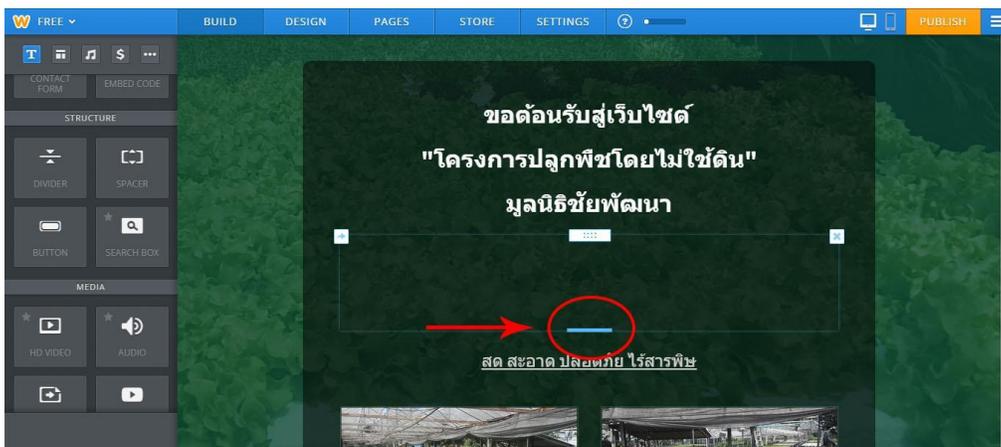
10. ฟังก์ชันวางระหว่างวัตถุในเว็บไซต์โดยการลากฟังก์ชัน spacer ตามรูปภาพที่ 9.1 จากนั้นเลือกตำแหน่งที่จะใส่ฟังก์ชัน spacer ตามรูปภาพที่ 9.2 และฟังก์ชัน space สามารถขยายได้ตามต้องการโดยการเอาเมาส์คลิกค้างที่กรอบสี่เหลี่ยมและลากเพื่อขยายหรือหด



รูปภาพที่ 9.1

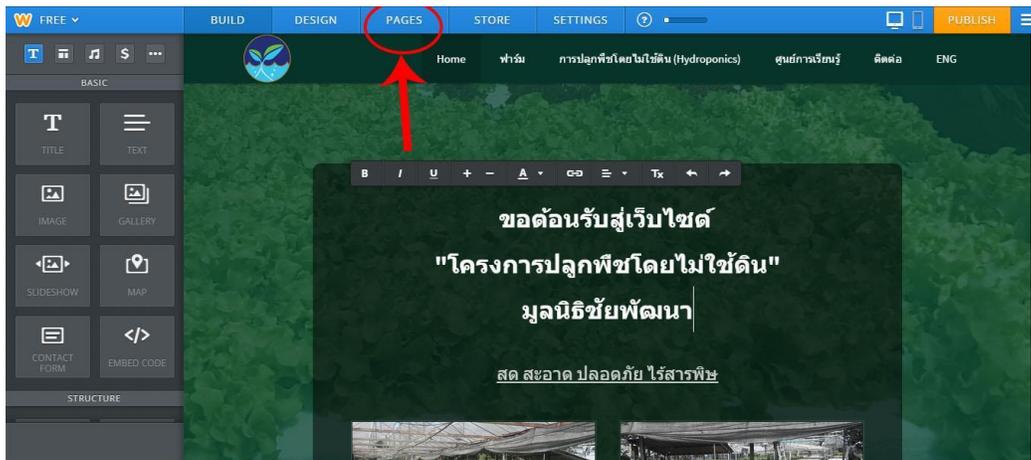


รูปภาพที่ 9.2

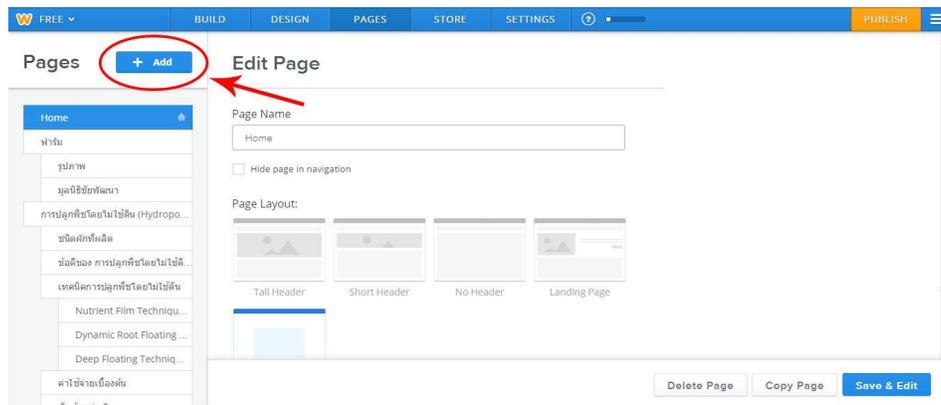


รูปภาพที่ 9.3

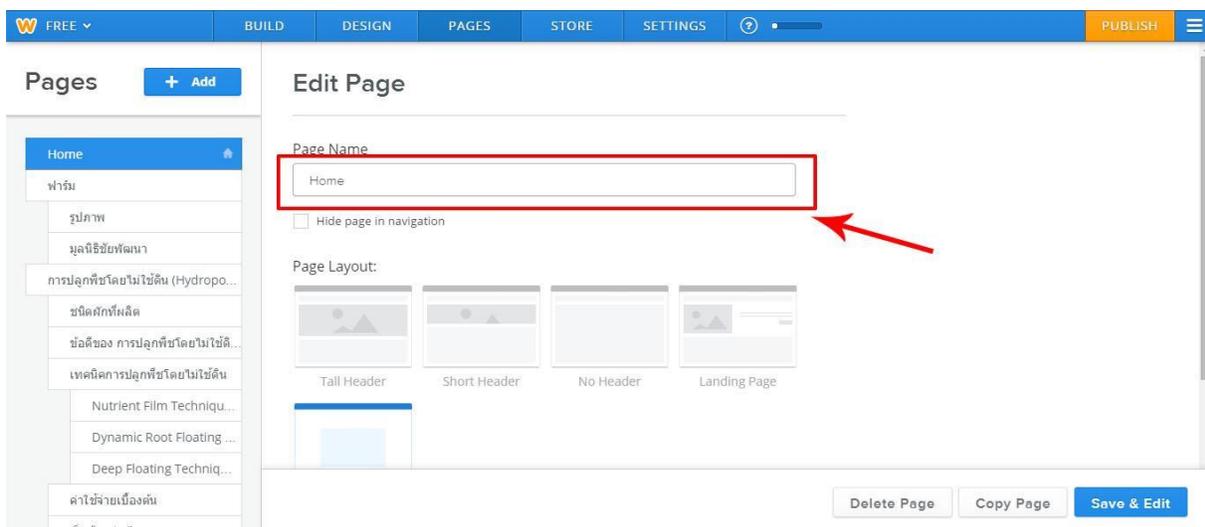
11. สามารถเพิ่มจำนวนหน้าในเว็บไซต์ได้โดยการคลิก Page ตามรูปภาพที่ 10.1 และคลิก + Add ฟังก์ชันตามรูปภาพที่ 10.2 ซึ่งสามารถเปลี่ยนชื่อหน้า  
ที่เพิ่มขึ้นมาได้โดยพิมพ์ในกรอบสี่เหลี่ยมตามรูปภาพที่ 10.3



รูปภาพที่ 10.1

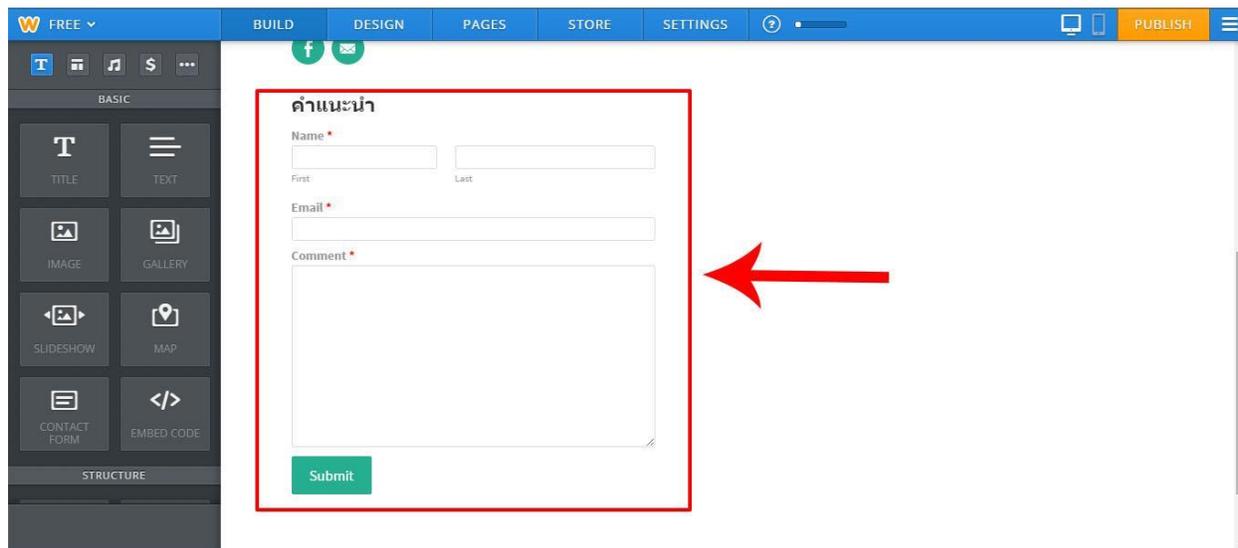


รูปภาพที่ 10.2



### รูปภาพที่ 10.3

12. ข้อคำแนะนำจะลิงค์เชื่อมไปยังอีเมลเพื่อที่จะรู้ผลตอบรับและข้อควรปรับปรุงของเว็บไซต์



รูปภาพที่ 11

### วิธีการวัดประสิทธิภาพของสื่อประชาสัมพันธ์

เพื่อที่จะวัดประสิทธิภาพของสื่อประชาสัมพันธ์ทางกลุ่มแนะนำว่าทางฟาร์มควรที่จะมีใบลงชื่อผู้เข้าชมฟาร์มเพื่อที่จะได้รู้ว่าผู้เข้าชมรู้จักฟาร์มได้อย่างไร และสื่อประชาสัมพันธ์ไหนที่ได้ประสิทธิภาพมากที่สุดในการโปรโมทฟาร์ม

## 7.17 Appendix Q: Facebook Page Measurement

### 7.17.1 English Version

#### 1. How to Access Facebook Insight

Click on the gear wheel on your Facebook Fan Page and select 'View Insights'. You'll see a graph like in Figure 1. This graph will show the number of likes, number of fans (the potential number of people this page can reach), how many people are talking about your page, and how many people that this page can reach in this week.



Figure 1

#### 2. Like

If you click 'Like' you'll be able to see the demographics as well as the locations of your fans. You'll also be able to see their age groups, where they come from and their language.

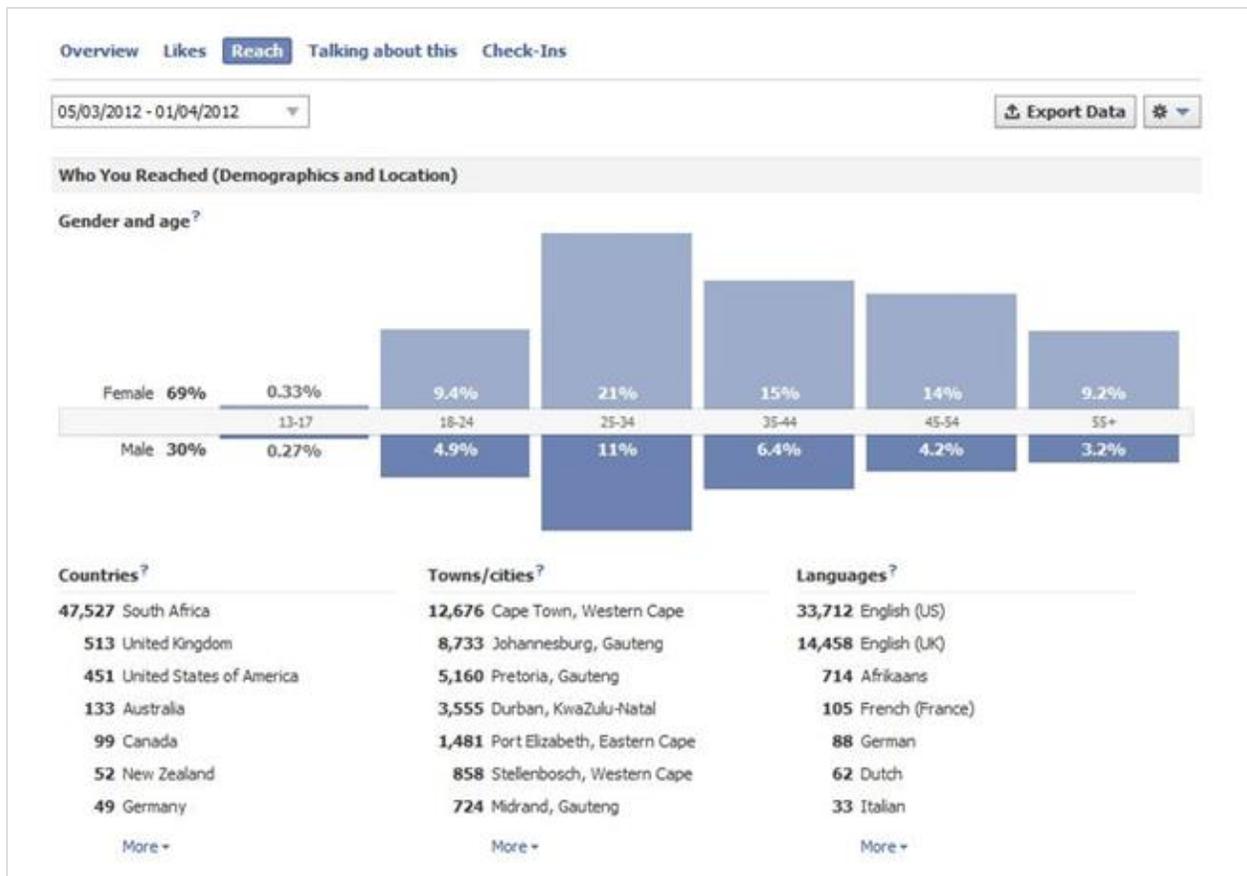


Figure 2

Below you'll see another graph like Figure 3:



Figure 3

In this section you can search by new likes and even by unlikes. For example, Figure 3 shows a graph of unlikes of the page. This is helpful to see what you posted on those days, which can be

helpful for your page to improve what went wrong on that day, such as too many posts or wrong information.

### 3. Reach

This section helps you see your page views and unique visitor views (those who searched for you as opposed to clicking on the Facebook ad). You'll also be able to see your reach in terms of organic searches, paid and viral searches. This section will answer the following questions: how much of your content is actually reaching your fans? Who is talking about your page? And are any of your fans referring your page to others or sharing your images with their friends?

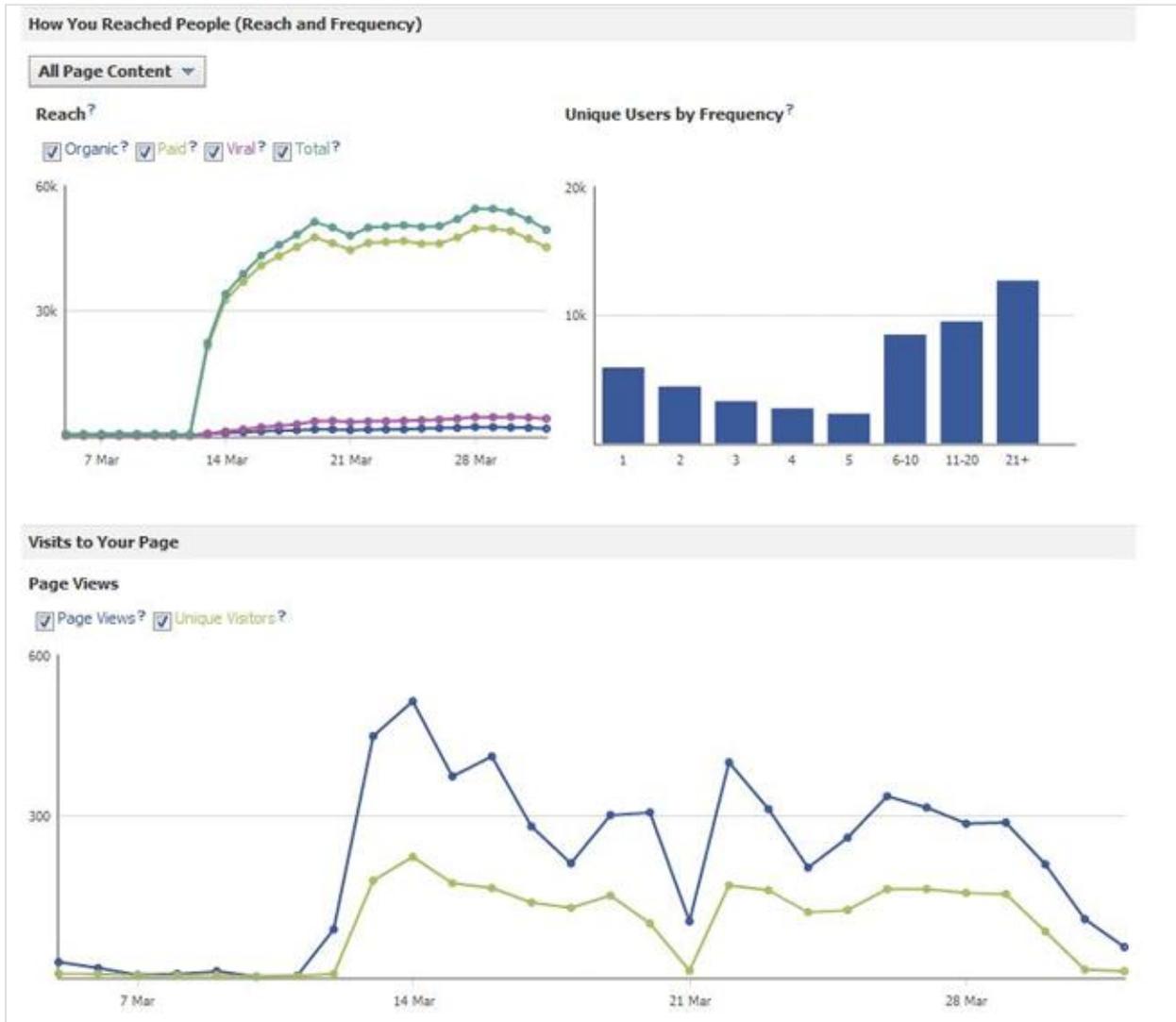


Figure 4

#### 7.17.2 Thai Translation

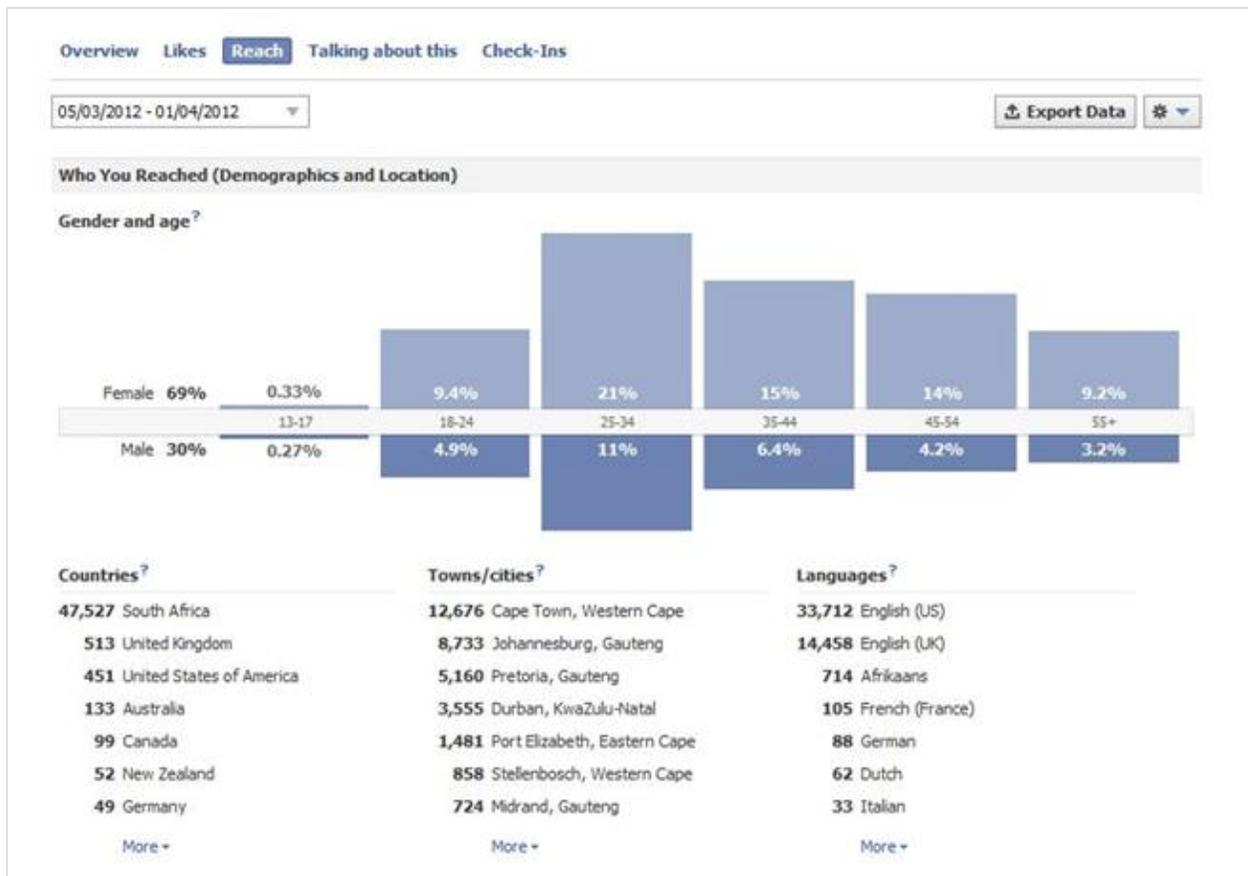
##### 1. วิธีการตรวจ Facebook Insight

คลิก รูปเกียร์ บนเฟสบุ๊คเพจ แล้วเลือก 'View Insights' จากกราฟ รูปที่12 แสดงให้เห็นจำนวนคนที่เข้ามาคลไลค์, จำนวนคนที่พูดถึงแฟนเพจ และจำนวนคนที่เข้ามาในเพจในอาทิตย์นี้



รูปภาพที่ 12

**2. Like** คัดตรง ' Like ' คุณจะสามารรถเห็นข้อมูลสถิติประชากรและสถานที่ของคนทีกดไลค์เพจ คุณยังสามารถรู้ช่วงอายุของคนทีเข้ามาในเพจ มาจากไหน และ ภาษาที่ใช้



รูปภาพที่ 13

ข้างใต้รูปภาพที่ 13 จะมีกราฟอีกกราฟหนึ่งตามรูปภาพที่ 14.:

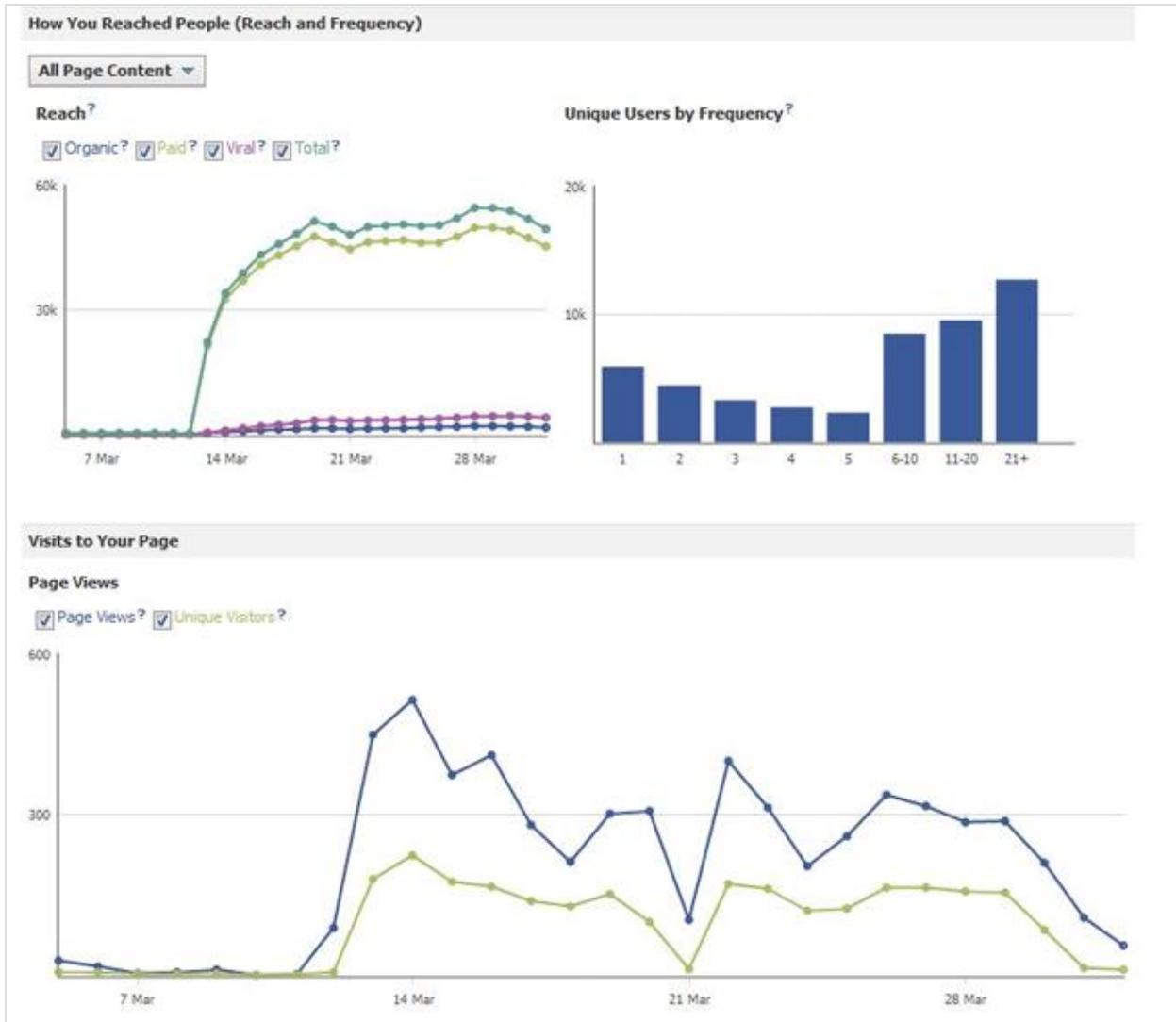


รูปภาพที่ 14

ในส่วนนี้คุณสามารถเห็นจำนวนไลค์ (like) และอันไลค์ (unlikes) ตัวอย่างในกราฟที่ 14 แสดงให้เห็นถึงจำนวนอันไลค์ของเพจซึ่งจะสามารถช่วยให้คุณได้สามารถพัฒนาและปรับปรุงเพจในอนาคต โดยดูจากสิ่งที่โพสต์ไปเมื่อวันก่อน คนกดไลค์อาจจะเป็นเพราะว่ามีโพสต์มากไป ข้อมูลมีความผิดพลาดไม่น่าสนใจ หรือน่าราคาญ

### 3. Reach

ในส่วนนี้สามารถช่วยให้คุณได้เห็นจำนวนคนเข้ามาเยี่ยมชมเพจ (มี 2 แบบ แบบ Organic Reach หมายถึงการมองเห็นโดยธรรมชาติทั่วไป ส่วนแบบ Paid Reach หมายถึงการมองเห็นที่มาจากคนที่เราจ่ายเงินซื้อ “ตำแหน่ง และการมองเห็น” โดยโพสต์จะอยู่บนสุด และจะมีคำว่า Sponsored อยู่ใต้โพสต์นั้นๆ) ในส่วนนี้จะสามารถบอกได้ว่าข้อมูลในเพจสามารถเข้าถึงผู้เข้าชมหรือแฟนเพจได้หรือไม่ ใครบ้างที่พูดถึงเพจ และมีคนที่แชร์ข้อมูลเพจแก่เพื่อนบ้างหรือไม่



รูปภาพที่ 15

## 7.18 Appendix R: Contact Information for Muang District Schools and Farmer Organizations

### 7.18.1 Schools

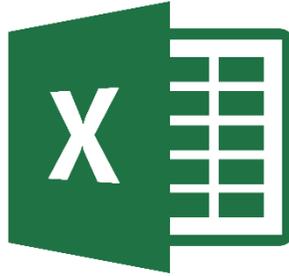
<b>School</b>	<b>Contact Name</b>	<b>Phone Number</b>
<b>Prachin-ratsadorn-amroongs II</b>	Tuangsat Vichianrot	080-0993156
<b>Prachin-ratsadorn-amroongs</b>	Sumrerng Chokroong	086-5814933
<b>Chakrabongse-pittayalai</b>	Lerdsilp Boon-chuay	088-5295174
<b>Prachin-kallayanee</b>	Bang-orn Chaiyom	03-7211071

### 7.18.2 Farmer Organizations

<b>Organization</b>	<b>Contact Name</b>	<b>Phone Number</b>
<b>Organic Community</b>	Boonsueb Dechsorn	086-1430995
<b>Dong-Kee-Lhek</b>	Kuson Sakulta	086-1081338
<b>Suan-Baan-Pra</b>	Boonvecht Srikasikit	086-1081338

## 7.19 Appendix S: PR Strategy Tracking Sheet

This appendix includes the PR Strategy Tracking Sheet as a Microsoft Excel spreadsheet in both English and Thai. The sponsor can print it out in landscape orientation and place it at the entrance to the farm. Click on the Microsoft Excel icon or hyperlink below to open the spreadsheet. If the link does not work, the file should be in the same folder as this report.



[PRStrategyTrackingSheet.xlsx](#)