

Strategies for Developing the Innovative Prototype of an Environmental Friendly Market A Case Study of Ying Charoen Market

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Received: September 19, 2021; Revised: October 5, 2021;

Accepted: October 6, 2021; Published online: October 30, 2021

Abstract

This article aims to 1) Study the needs of customers and community about the environment of Ying Charoen Market using a questionnaire with users of Ying Charoen Market. 2) Create development strategies for an environmentally-friendly market prototype in a case study of Ying Charoen Market. It is mixed research using a questionnaire with 31,500 users of Ying Charoen Market along with the Taro Yamane method in calculating the sample groups at a confidence level of 95% and 400 samples are obtained. The results of the need analysis are applied to create a prototype of an environmentally friendly market development strategy. And the results of study indicate that 1) the demand of users of the market regarding the development strategy is at a high level while the overall demand regarding the environmental-friendly market is at a high level. As for management factors affecting the development of an environmentally-friendly market prototype in all aspects, namely wastewater, waste, and energy, data from the group discussion revealed that the stakeholders of the Ying Charoen market demand for the management and market structure that support the development of an environmentally friendly market in terms of wastewater, waste, and energy 2) Strategies for the development prototype of environmentally friendly market in a case study of Ying Charoen Market are aimed to make the growth and expansion of the market to be in an environmentally friendly manner and to be a model for fresh markets in nearby areas in adapting to be environmentally friendly markets, consisting of 3 strategies as follows: (1) Wastewater Strategy to restore beautiful canals with clear water, no pollution. (2) Waste strategy with the goal in separating waste at the source, the use of environmentally friendly packaging; and (3) Energy strategy to reduce unnecessary wastage of electrical energy.

Keywords: Strategy, Market Prototype, Environmentally Friendly Market, Ying Charoen Market

Background and the importance of research problems

Global and regional environmental situations and operations indicate that the global environmental situation is still focused on issues such as climate change and natural disasters, forests, water resources, biodiversity, world heritage sites, trans-boundary pollution, and problems of land use. In 2016, the population of urban areas increased while the number of slum communities in Bangkok decreased and the proportion of green areas per population increased. It is also found

that there was a problem of changes of landscape in the urban area which is inconsistent with the original landscape, resulting in obscuring, destroying, or degrading of the landscape, for example, installation of a large number of billboards and untidy installation of cable, etc. It is also found that there is a problem of solid waste and the amount of dust is still increasing. However, the government has prepared a 10-year strategic plan of the Department of Local Administration (2017-2026) to drive the local economic growth, planning, and making a provincial city plan for the safety and better quality of life of the people.

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The fresh market is an area with a lot of activity occurs and is considered as a source of a lot of waste and pollution such as garbage, sewage, bad smell, noise, cooking fumes, etc. A market without a system in monitoring and disposing of these wastes properly will cause environmental impact resulting in trouble and nuisance to the public. Moreover, most of the fresh markets are located in the community, thus causing a large number of people to be affected by the market. Therefore, there should be a proper marketing management strategy. The hygienic market is the type of market that makes people healthy which consists of 3 elements: clean, safe, orderliness.

Ying Charoen Market is a large private market. The environment of Ying Charoen Market is diverse which can be classified into environmental systems related to water, waste, and energy. Although Ying Charoen market executives have ongoing research projects on the market environment, the participation of entrepreneurs in the market, however, is one of the important strategies in managing the market to be more environmentally friendly market. Ying Charoen Market is intended to be an environmentally friendly market by applying microorganisms to manage the odor issues. Since the Lam Phak Chi canal runs through the market, the smell of the water becomes the issue including the sewage that comes with the water. Eliminating these problems requires cooperation with surrounding communities in preserving the canal without destroying the ecosystem. Another thing is that the market has a large amount of electricity consumption and this makes the market realize that consuming a large amount of electricity will affect the environment. Since consumption of electricity partially comes from trading partners, Ying Charoen Market, thus, needs to cooperate with these partners in reducing the amount of electricity consumption.

Due to the current situation and environmental problems, a market causing a source of waste and pollution, and the intention of the Ying Charoen market to becoming an environmentally friendly market, the researchers, therefore, conduct the study on strategies for developing an environmentally friendly market pro-

tototype in a case study of Ying Charoen Market, for the growth of the market with environmental friendliness, as a market model in applying the management with other markets.

Research Objectives

1. To study the needs of customers and community about the environment of Ying Charoen Market.
2. To create a strategy in developing an environmentally friendly market prototype in a case study of Ying Charoen market.

Research Methodology

It is a research and development using methodologies mixed between quantitative research and qualitative research, divided into three stages according to the objectives as follows:

Step 1: Study the context and environmental problems of the Ying Charoen Market by conducting an in-depth interview with executives and employees of the market who are environmental stakeholders of the Ying Charoen Market.

Step 2: Collect data from traders and consumers trading products in the Ying Charoen market using a questionnaire for statistical analysis. The basic information obtained from the questionnaire will be used to create interview forms for group discussion with stakeholders of Ying Charoen Market and organize group discussion with representatives of stakeholders for the environment of the Ying Charoen market for analyzing content and the needs of customers and community regarding the environment issue of Ying Charoen Market.

Step 3: Apply the results of correlation analysis obtained from the questionnaire and results from group discussion to create a prototype of an environmentally friendly market strategy in a case study of Ying Charoen market for experimenting with the strategy based on systemic management theory in the nearby area of Ying Charoen market to gain strategies for developing a market prototype of an environmentally friendly market in a case study of Ying Charoen Market.

Research Results

1. To study the needs of customers and community about the environment of Ying Charoen Market

1.1 In studying the needs of users of the Ying Charoen Market, the data from the questionnaire reveal that 1) there is a high level of demand for the market development strategy. The aspect having the highest opinion level is the infrastructure, followed by the administration 2) there is a high level of overall demand for the development prototype of an environmentally friendly market. The aspect having the highest level of opinion is the energy, followed by the waste and the wastewater respectively.

As shown in Table 1, for the multiple regression coefficients among management factors affecting the prototype development of an environmentally friendly market, the correlation coefficient is 0.689 and the management factors can be predicted to be 47.5% (Adj. $R^2=0.472$) with two predictor variables (X_1-X_2). The correlation prediction reveals that the infrastructure variables (X_1) and management variables (X_2) result in a positive direction. The variables with the best predictive correlation compared to constants are the infrastructure variables (X_1) and the management variables (X_2), respectively.

1.2 To study the needs of community on the environment of the Ying Charoen Market, the data from the group discussion reveal that 1) the stakeholders of the Ying Charoen Market require infrastructure management regarding the

installation of shop signs and product labels, development of road and drainage pipes within the market, road expansion, sewers dredging and landscaping within the market. In addition, there is a need for administration of the Ying Charoen market regarding the collection of solid waste, cleanliness maintenance, environment preservation, fabric bag giving away, and foam use reduction 2) The needs for the prototype development of an environmentally friendly market in terms of wastewater include the solving of wastewater by treating wastewater in the market, the campaign in using microorganisms to clean fresh food stalls rather than using detergents, and provisions of knowledge about the construction of wastewater treatment systems used in the Ying Charoen Market. Additionally, the needs regarding the waste include reducing the amount of waste, promotion, and educating on waste separation and creating awareness among energy traders in using No.5 labeled electrical appliances, using energy-efficient LED lamps, unplugging the electrical appliances whenever no one is present. Furthermore, a campaign in educating traders, installation of electricity meter in each stall, electric energy saving, all should be treated with equal priority 3) Stakeholders of the Ying Charoen Market require that the market be managed to be the development prototype of an environmentally friendly market which will enable to solve the problems of wastewater, waste, and energy issues of the Ying Charoen market.

Table 1 Stepwise multiple regression analysis during the prototype development of an environmentally friendly market in terms of development strategies that affect the prototype development of an environmentally friendly market

Predictor Variables	b	S.E.	Beta	t	Sig.
Infrastructure (X_1)	.266	.038	.374	6.918	.000*
Management (X_2)	.245	.036	.365	6.751	.000*
Constant (a)	1.858	.107	-	17.289	.000*

R=0.689 $R^2=0.475$ Adj. $R^2=0.472$ F= 177.939

* Statistically significant at 0.05

Table 2 Summary of the needs of customers and the community regarding the environment of Ying Charoen Market

Data Source	Management factors	Prototype development of an environmentally friendly market		
		Wastewater	Waste	Energy
Ying Charoen market users	1. Structure	✓	✓	✓
	2. Management	✓	✓	✓
Representative of Ying Charoen Market's environmental stake-holders	1. Structure	✓	✓	✓
	2. Management	✓	✓	✓

*(✓ Correlated, - Not Correlated)



Figure 1. The strategy of the prototype development for an environmental-friendly market in a case study of Ying Charoen

Table 2 represents the summary of the needs of customers and the community regarding the environment of Ying Charoen Market. Ying Charoen Market users and environmental stakeholders of the market require Ying Charoen Market to have management in the prototype development of an environmentally friendly market in the aspects of wastewater, waste, and energy

2. In creating a strategy for developing a prototype of an environmentally friendly market in a case study of Ying Charoen Market, the researchers apply the results in linking the needs of customer and community about the environment of Ying Charoen Market to create a prototype of an environmentally friendly market strategy in a case study of Ying Charoen Market, which can be divided into three strategies, as follows: 1) wastewater strategy 2) waste strategy and 3) energy strategy, as shown in Figure 1.

As shown in Figure 1, the strategy of the prototype development for an environmental-friendly market in a case study of Ying Charoen Market consists of 3 strategies, as follows: 1) wastewater strategy 2) waste strategy and 3) energy strategy. All three strategies are equally important and can be implemented simultaneously or can be first chosen to execute any strategy individually with the goal in making the growth and expansion of the market in an environmentally friendly manner and to be applied as the prototype for other fresh markets in other areas to become environmentally friendly markets.

Wastewater Strategy

Objectives to restore beautiful canals, clear water without pollution.

Strategy 1: Strengthen cooperation to participate in the development of clear canals among the Ying

Charoen Market and government agencies, private sectors, and communities around the Ying Charoen Market

Strategy 2: Restoring water quality in canals for the improvement and the integrated problem solutions of sewage in the Lam Phak Chi Canal

Strategy 3: Water treatment to restore wastewater within the Ying Charoen market for re-uses

Waste Strategy

Objectives to separate waste at the source, to use environmentally friendly packaging

Strategy 1: Prepare separate types of trash for initial waste segregation for easy management of different waste and to implement waste disposal consequently.

Strategy 2 Recycle waste to create value from waste to reduce the problems caused by the amount of waste, lowering the costs of waste disposal

Strategy 3: Create awareness in reducing plastic bags to create long-term behaviors in reducing the plastic bags, foam containers, or hard-to-decompose materials for stakeholders of the market.

Objectives to reduce unnecessary wastage of electrical energy

Energy Strategy

Strategy 1: Use labeled No.5 electrical appliances to reduce the wastage of electricity caused by Most Electricity-Drawing appliances

Strategy 2: Use LED light lamps instead of incandescent bulbs to obtain sufficient light for shopping and for saving electricity

Strategy 3: Build knowledge regarding energy saving for cooperation in being part in helping to save electricity. This is to create a long-term behavior in energy conservation of partners, employees, and executives

Summary and discussion

1. To study the needs of customers and community about the environment of Ying Charoen Market

1.1 In developing an environmentally friendly market prototype in terms of development strategies and market infrastructure, the installation of store signs indicating product type and various labels in each zone helps improve

the landscape within the market. And the market has improved and maintained the roads and sewers inside the market to be in good condition following the standard of type 1 market in having stable and a strong structure, cleanliness, and hygienic conditions. In the administration, the market encourages the awareness of cleanliness, preservation of the market environment with the campaign in reducing the use of foam and plastic bags. The garbage has been collected thoroughly which is in line with Suprawee Mee-ma Wachiratripop (2015), who found that, in the research study on the "Management of cooperation between the public and private sectors in regulating fresh market standards in the Bangkok area", fresh markets that passed the standards following the attractive market project are due to the commitment of the management that has followed market standards, having social acceptance, and communication between, government, private and public sectors in regulating market standards for mutual benefits. In addition, the waste management of the Ying Charoen Market is also consistent with Valerie Guillard et al., (2019) which found that, in the research study on the "Next Generation of Sustainable Food Packaging to Preserve Our Environment in a Circular Economy Context", for long-term management of waste, products used for food packaging must be biodegradable packaging. This indicates that the choice of packaging inevitably affects the environmentally friendly market.

1.2 The prototype development of an environmentally friendly market in terms of wastewater, waste, and energy are as follows: 1) In terms of wastewater: participation in wastewater management by stakeholders with the Ying Charoen Market, meeting to summarize the market performance. This is to implement rehabilitation plan management or market projects related to preventing or solving the problem of wastewater within the market to jointly prevent or solve the problem of wastewater within the

market and community. This is in line with Levi-dow Les, 2014, who found that, in the study on the “Eco-efficiency improvements in industrial water-service system: assessing options with stakeholders”, sharing knowledge with stakeholders is a significant guideline for improving water use. 2) In terms of waste, stakeholders of the Ying Charoen Market realize that reducing waste can be achieved through waste segregation. For effective waste separation, in-situ segregation must be carried out. This is in line with Yupin Vacharakavin (2015) in the study and research on the "Management of solid waste according to the Buddhist principles of residents in Thung Hua Chong Municipality, Thung Hua Chang District, Lamphun Province" and (Valeria Gillard et al., 2019) who found that, for the best waste management, household wastes must be sorted out using different black trash bags for proper disposal. And the plastic waste will be sorted and sold to earn the income into households and 3) In terms of energy, the Ying Charoen Market stakeholders are knowledgeable about energy-saving regarding the advantages of using labeled No.5 electrical appliances, LED or fluorescent lamps instead of incandescent lamps, proper adjustment of air conditioning temperature, unplugging the electrical appliances whenever no one is presented. These lead to a reduction in the electricity consumption of customers and stakeholders of the market which is in line with (Chioma Ifeyinwa M. adueke and Mmaduabuchukwu M kpado, 2020), who found that in the study on the “Prospects for and Constraints to Investment in Environmentally Friendly Infrastructure in Western Nigeria”, the use of energy-saving lamps in infrastructure helps to reduce energy consumption and is regarded as an environmentally friendly behavior.

In addition, it is found that educating the stakeholders of Ying Charoen Market about the environment, wastewater, waste, and energy will enable to create consciousness and environmentally-friendly behaviors in the long run

which is in line with Somsak Meenakorn (2012) who found that, in the study on the “Appropriate Energy Management Models in Amphawa District”, in reducing energy costs of people in the community, the principle of sufficiency economy must be integrated to change the energy consumption behavior. It is also consistent with Hilma Tamiami Fachrudin, Khaira Amalia Fachrudin, and Wahyu Utami, 2019, who found that, in the study on the “Education Activities to Realize Green Campus”, activities in educating the Green Environment help create awareness so as to make a green environmental area. It can be seen that raising awareness and consciousness can change the behavior of customers and stakeholders of the market into environmentally friendly behavior.

1.3 As for the needs of customers and stakeholders of Ying Charoen Market, each party requires the market to have the structure that enables the development of an environmentally friendly market in wastewater, waste, and energy aspects. Whereas, the customers and stakeholders of Ying Charoen Market work with the market to find ways to manage wastewater, waste, and energy in order to apply the guidelines obtained in planning the development of an environmentally friendly Ying Charoen Market. This is in line with Chatchai Inthasung and Paweena Atnawang (2012) who found that, in the study on the “Marketing Strategy Prototype for developing community enterprise products for sustainable international trade (A Case Study of Community Products with below 3 stars in Wang Nam Khiao District, Nakhon Ratchasima Province)”, the development of a sustainable management prototype consists of 3 main parts, namely government agencies, communities, and cooperation from all sectors. This is also in line with Boonlert Matanakun (2016) who found that, in the study on the “Model of the Development of an attractive market at Fao Rai Municipality, Fao Rai District, Nong Khai Province”, key success factors

contributing to the good development of performance consist of 1) The committee of fresh market club 2) participation of related parties, and 3) continuous monitoring and evaluation. It can be seen that cooperation from all parties is important for the development of various goals. Therefore, the Ying Charoen Market requires cooperation from customers and stakeholders of the market to achieve the objective for the prototype of an environmentally friendly market.

2. To create a strategy for developing a prototype of an environmentally friendly market in a case study of the Ying Charoen Market from the study of concepts and theories, context and environmental problems of the Ying Charoen Market and from the needs of customers and community regarding the environment of Ying Charoen market who require the market to have the management and structure that is environmentally friendly in terms of wastewater, waste, and energy which will result in a strategy to develop an environmentally friendly market in a case study of Ying Charoen Market, it consists of 3 strategies: 1) wastewater strategy 2) waste strategy and 3) energy strategy. All these three strategies are equally important and can be implemented simultaneously or any of these strategies can be chosen first to conduct in making the growth and expansion of the market in an environmentally friendly manner. Strategic experiments based on systems management theory will be conducted in the area around the Ying Charoen market to achieve the strategy to develop the prototype of an environmentally friendly market in a case study of the Ying Charoen Market.

2.1 Wastewater Strategy: the objective is to restore beautiful canals, clear water, and a pollution-free atmosphere, which is consistent with Phongthep Suwannawan et al. (2012) who found that, in the study on the "Waste and wastewater management with the community participation in Nakhon Ratchasima Municipality", residents in Nakhon Ratchasima municipality treat wastewater from bio-fermented water for use in the agriculture, to improve water quality in Lam Ta Khong and other purposes. Therefore,

wastewater strategy serves as guidelines in the rehabilitation of wastewater especially in the canals to be able to be reused.

2.2 Waste strategy: the objective is in-situ segregation, and the use of environmentally friendly packaging, which is in line with Naparat Waicharoen et al. (2018) who found that, in the study on the "Management of solid waste from the fresh market and green waste within Prince of Songkla University, Pattani Campus", there are three approaches in managing to benefit from solid waste in the fresh market including composting, keeping in an outdoor area, and feeding to animals.

It is also in line with Phakaporn Fangsin, Chirawit Rattanaphan, and Weerawat Unsaneha (2019) who found that, in the study on the "Guidelines to reduce food wastage and food waste in Thailand's wholesale sector in a case study of the Thai sea market at Samut Sakhon Province", the garbage from the Thai seafood fresh market can be used to produce organic fertilizers, biogas. Thus, the approach in waste strategy must start with waste separation, bringing the sorted waste to the waste disposal process, whether it is composted, sold or recycled. And solving the problem of waste from source is to reduce the use of plastic bags or packaging materials that are difficult to be decomposed.

2.3 Energy Strategy: The objective is to reduce unnecessary wastage of electrical energy, which is consistent with (Amin Shahamipour and Seyed Osat Hosseini, 2016) who found that, in the study on "Traditional Bazaars Energy Efficiency Retrofits, By EECM (Electrical Equipment Consumption Management) method. Case study: Tabriz Historical Bazaar", managing electrical appliances is simple electric power management. It is also in line with Suparinya Limwananon (2016) who found that, in the study on "Factors Affecting Behavior of Electricity Energy Saving in the Workplace of Employees of the Leopard Medical Brand Company", knowledge of electric

power and realization of electric power benefits will help save more electricity. Therefore, for the approach of energy strategy, the simplest way is to change devices related to the use of elec-

tricity to be energy-saving devices, always clean and check electrical appliances regularly including performing continuous saving electricity as a long-term behavior.

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