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3. To stimulate and support education at the university level

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# Editorial Note

The Interdisciplinary Research Review (IRR) was established with academic cooperation by the Nakhon Pathom Rajabhat University, The Royal Society of Thailand Committee of Interdisciplinary Research and Development, Rajabhat University (Western Group), and Rajamangala University of Technology Rattanakosin. This Issue, Volume 15 Number 2 (March – April 2020). This issue contains of nine interesting articles in multidisciplinary fields: (1) Innovative leadership attributes of school administrators in the Philippines: Implications for educational management, (2) The development of green office standard: Thailand initiative, (3) The effectiveness of strengthening leg muscles physical exercise promotion program for preventing falls of the elderly in Thailand, (4) Morphometry of mountain crabs (Crustacea: Decapoda: Brachyura: Potamidae) from Phetchabun Mountains Thailand, (5) Factors affecting dividend policy: Evidence from manufacturing company in Indonesia, (6) Factors affecting earnings management: manufacturing companies in Indonesia, (7) Audit fees contribution as moderating auditor switching on audit quality: Evidence from Indonesia, (8) Development of participatory cultural tourism management strategies case study of Baan Huay Hin Dum community, and (9) Tourism demand in Nakhon Pathom for the development of revisit tourism destinations in Nakhon Pathom and the connected areas.

The Editorial Board of the IRR encourages anyone to submit articles for evaluation and review. The processes of submission, review and publication of articles are described on the journal's website, <https://www.tci-thaijo.org/index.php/jtir>. The Editorial Board and Committees of the IRR sincerely thank all peer reviewers who have sacrificed their time to help us produce a better journal, and also wish to thank all teachers, researchers and other academicians for submitting their valuable research to this journal. Finally, we thank readers of our journal who help to spread the knowledge and benefits gained to others. With your feedback and suggestions, we will strive to improve the quality and relevance of the IRR.

Yongyudh Vajaradul  
Editor  
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## **Innovative leadership attributes of school administrators in the Philippines: Implications for educational management**

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### **Abstract**

Innovative leadership is crucial in the 21st century. The success of any organization depends on the kind of leaders in managing at the helm of the institution. This study determined the attributes of school administrators in the four dimensions namely: visionary, team builder, relationship builder, and risk taker. The descriptive method was employed using quantitative data. This study was conducted at Bukidnon State University, Northern Mindanao, Philippines. A total of 102 respondents participated in this study. They represented the five colleges of the university such as the College of Arts and Sciences, College of Nursing, College of Education, College of Social Development, College of Business, and College of Social Development and Technology. The data were gathered using a researcher-structured questionnaire. The instrument was validated and the coefficient reliability of Cronbach Alpha is 0.951. Mean and Standard deviation were utilized to analyze the data. The findings revealed that the administrators were rated *agree* by their teachers considering the four indicators of innovative leadership attributes. This implies that the administrators are much highly innovative. The result of the study serves as a guide for educational planners to incorporate the results of the study in the regular strategic planning.

**Keywords:** Attributes, innovative leadership, leadership styles.

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### **1. Introduction**

Innovative leadership plays an important role in any educational institution. The best schools are managed by an effective leader. Leaders are multifaceted as they deal with teachers, support staff, students and parents. Innovation leadership is a combination of different leadership styles in organizations to influence employees to be more creative and innovative in the workplace. It is also about nurturing their skills and abilities to produce efficient results. Hence, innovation leadership is vital in attaining the mission and vision of the institution. According to Spahr [29] innovative leaders inspire others to think and create an environment where new ideas can be tested and evaluated. These leaders tend to be missionaries and motivate their subordinates through leading by example and fostering collaboration. Employees strive for creativity and innovation when their leaders are innovative Wipulanusat et. al [34].

Bukidnon State University envisions not only to produce expert teachers but also effective and innovative leaders. These leaders exhibit varied attributes

which can be the source of impression by the subordinates. The school leaders are expected to be innovative in managing the institution. They are expected to possess these attributes such as visionary, team builder, relationship builder, and risk taker.

These attributes will help encourage their subordinates to support them and work together for the attainment of the mission and vision of the institution. In addition, teachers are motivated to perform beyond expectations.

Numerous studies have confirmed the significance of innovative leadership. According to Hunter and Cushenberry [11] innovation leadership is highly significant in influencing creativity and innovation. Successful innovation becomes realistic and achievable with appropriate leadership. As such, Miller [21] mentioned that innovative leadership has evolved at the same pace as technology. Hence, innovation leadership is the skill of integrating an overview of innovation and leading its components of innovation in a strategic manner Ailin & Lindgren, [1]. However, current literature suggests that there is a research gap on the attributes required for innovative leadership specifically for school administrators that prompted a study to determine what those attributes are.

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The study is significant to the University in identifying the attributes of a good leader. The role of leaders is crucial for the success of the institution. Hence, this study aimed to determine the leadership attributes of school administrators at Bukidnon State University. This will also serve as a guide for the administrators on how to become an innovative leader in their respective positions.

## 2. Objectives of the Study

The objectives of the study are the following:

1. To determine the innovative attributes of school administrators considering the four indicators namely: visionary; team builder; relationship builder; and risk taker.
2. To analyze the implication of the findings to educational management.

## 3. Literature Review

Relevant studies were reviewed to provide a perspective on the innovative attributes of the school administrators. This also provided the theoretical foundation of the study.

### 3.1 On innovative leadership

According to Basu and Green [2] innovative leadership is a product of path-goal theory and leader-member exchange theory as path-goal theory is based on the fact that many leadership styles are needed within an organization. Likewise, innovation leadership appears to be a new branch of study dealing with new complexities in value realization and the role of innovation in dealing with these. Carmeli et. al [3] who examined the firm importance of innovation leadership in enhancing various economic, relationship and product performance outcomes, found that leadership innovation can enhance firm performance. However, there are few studies on the attributes of an innovative school leader. Stevenson [30] in order for the organization to be successful, leaders will support innovation strategy and encourage their subordinates to make the right choices.

### 3.2 Attributes of innovative leadership

Recognizing the existence of individual differences in every human gathering as well as the need for efficient and effective realization of organizational goals, we must understand the nature of interactions within and around the organization especially in relation to their influence on the achievement of set objectives Chike-Okoli, [4]. Kotter [13] claimed that a successful organization has visionary leaders responsible for its innovation. On the other hand, Govindarajan [9] added that innovation leaders are visionary and innovators. They are responsible for developing innovations in the institution. They are also responsible for

managing not only the present but build the future as well.

According to Perry [23] the human relations theory of management, introduced by Mayo 1920 believed that people aspire as to belong to a team that fosters development and growth. That is, giving particular attention and due recognition to employees will encourage them to be more productive since they feel that they are doing something significant.

Since leadership centered on people, leaders must understand that the function of leadership is to guide and lead people. An effective leader is one who builds relationships and fosters communities Shaefer [27]. Hence, a collaborative environment is necessary for any organization.

One of the attributes of a leader is to take a risk. According to Flynn & Staw [7] effective leaders are expected to influence risk behavior among employees. He specifically examined the conditions under which leadership influences risk behavior. In addition, Ling [16] confirmed that a prone risk leader can attain innovative results. Yuan & Woodman [35] stated that innovative employees in the organization possess a desirable behavior which is to perform trial and error in any endeavor.

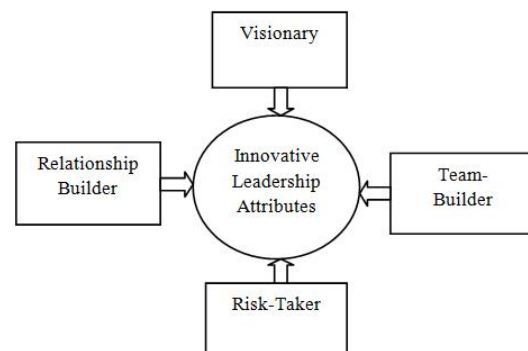


Figure 1: The conceptual framework of the study.

## 4. Conceptual Framework

This study is anchored on the concept of innovation leadership model developed by Gliddon [8]. This model emphasized that innovative leaders possess traits that create a work environment conducive to innovation and activities that lead to thinking and solving problem. This new paradigm shifts of innovation switches from information management to innovation management. To cope with this, innovation leaders should combine strategies and skills to implement change within an organization Lazarova [15]. According to Couros [6] the four characteristics of innovative leaders are visionary, open risk taker, team builder, and relationship builder.

Figure 1 presents the conceptual framework showing the parameter of the study.

One of the roles of leaders is to establish a clear vision, mission, and objectives. It must be disseminated to all units in the organization to achieve uniformity. On the other hand, to create innovation, strong leadership is needed to embrace a creative culture that would promote innovation. Thus, there should be the presence of an innovation model that outlines how organizations deal with the flexibility to counter challenges and opportunities Sammut-Bonnici & Paroutis [25].

## 5. Method

This study employed the descriptive method of research, where a researcher-structured questionnaire was used to gather primary data needed. According to Sanchez [26] descriptive research describes and interprets what is. It is concerned with conditions and relationships that existed; practices that prevailed beliefs, a process that is going on effects that are being left or trends that are developing.

According to Koh and Owen [12] descriptive research is a study of the status and is widely used in education and behavioral science. It is based on the premise that problems can be solved and practices improved through observation analysis and description. The most common descriptive research is the survey, which includes a questionnaire, formal interviews, and normative surveys.

### 5.1 Sample size, sampling procedure & ethical procedure

This study was conducted at Bukidnon State University, the Philippines for the school year 2018-2019. The administrators refer to the unit heads and deans of Bukidnon State University. They were the subjects of the study. One hundred two (102) or 35% out of 292 teachers were taken as participants of the study. These participants represented the five Colleges of Bukidnon State University namely: College of Arts and Sciences, College of Nursing, College of Education, College of Social Development College of Business and College of Social Development and Technology. They were chosen using simple random sampling.

Prior to the gathering of data for the study, protocol as well as research ethics were observed. The participants gave consent to the researcher to gather data about them and to be utilized for research purposes. The researcher observed confidentiality in the process. Mean and SD were used to analyzed the data on the attributes of school administrators.

### 5.2 Instrument

The study was utilized researcher-structured instrument. The instrument was validated using both face and content validity by three experts in Educational Administration teaching at the Graduate School of Bukidnon State University. They examined the appropriateness and relevance of the items to the four

**Table 1.** Values of Cronbach alpha.

Variables	Cronbach Alpha
Visionary	0.952
Team-Builder	0.951
Relationship Builder	0.951
Risk-Taker	0.950

dimensions. Some revisions were made based on different suggestions by the experts. It was also tried out to 35 teachers not included in the study. Cronbach alpha was utilized to determine the reliability of an instrument and the value was 0.951, which shows that the twenty-one items in the questionnaire are reliable.

The instrument has two parts. The first part deals with the profile of the participants and the second part pertains to the four dimensions with a total of twenty-one items. A five-point Likert scale was utilized with a qualitative description of strongly agree, agree, neutral, disagree and strongly disagree.

Table 1 presents the reliability test for each dimension in the study.

## 6. Findings and Discussion Visionary Attributes

Table 2 shows the visionary attributes of administrators as rated by the teachers. The overall mean ratings were 4.21 or *strongly agree* with a standard deviation of 0.711. Among five indicators in visionary attributes, the three indicators are rated *strongly agree* and two indicators rated as *agree*.

The data in Table 2 also indicates that teachers *strongly agree* that their administrators have visionary attributes which means that administrators are very much highly innovative. This implies that the school administrator must be a visionary leader. He sets a clear vision for the institution and supports the teachers in making it happen. A well-developed vision unites everyone toward a common goal. Zenger [36] alleged that one of the traits of innovative leaders is displaying excellent strategic vision.

Hence, a visionary leader is someone who envisioned the future. Careful planning is necessary for creating and implementing a vision. As mentioned by Chopra and Ahmad [5] visionary leaders share and express the organization mission and goals in an easy and simple way so that everybody can understand. Their vision statement is always in a tangible and easy understood way. Their vision and mission statement is to help management. Visionary leadership develops the clarity, flexibility and focus in the organization grew to motivate the employees.

### 6.1 Team builder attributes

Table 3 presents the attributes of administrators as a team builder. The overall mean was 4.29 or *strongly agree* with a standard deviation of 0.707.

**Table 2.** Attributes of administrators as visionary.

<b>A. Visionary</b>	<b>Mean</b>	<b>SD</b>	<b>Qualitative Description</b>
My administrators ...			
1. facilitate clear formulation of goals and objectives	4.28	0.708	SA
2. make sure that goals and objectives are parallel with the vision and mission of the institution	4.38	0.641	SA
3. conduct strategic planning regularly	4.17	0.755	A
4. motivate teachers to understand the strategic direction of the institution	4.04	0.838	A
5. create a work environment conducive to innovation	4.21	0.611	SA
Overall mean	4.21	0.711	SA

**Table 3.** Attributes of administrators as team builder.

<b>B. Team Builder</b>	<b>Mean</b>	<b>SD</b>	<b>Qualitative Description</b>
My administrators ...			
1. motivate teachers to find other ways of doing work	4.22	0.801	SA
2. involve teachers in decision-making process	4.22	0.754	SA
3. open to new ideas from teachers	4.24	0.937	SA
4. give positive feedback	4.37	0.761	SA
5. utilize different forms of communications (ie. Fb, Twitter, Gmail, etc.) to reach out and transmit information	4.35	0.866	SA
6. encourage teacher to attend professional growth and development activities	4.34	0.971	SA
Overall mean	4.29	0.707	SA

As shown in table 3, it shows the attributes of school administrators as a team builder. This means that generally, teachers *strongly agree* that their administrators are a team builder. Administrators must foster teamwork among the subordinates. They encourage teachers to work together to attain success. Teamwork can lead to an increase in productivity and efficiency.

Several studies have shown that teamwork boosts productivity. When people work together towards a common goal, they can combine their skills, solve complex problems more efficiently, and strengthen their commitment to a positive outcome (Walgrove) [31]. According to Lepine et. al. [17] teamwork is positively related to important team effectiveness variables, including team performance, group cohesion, collective efficacy, and member satisfaction. In addition, McEwan et. al. [20] stated that teamwork training is an effective way to foster teamwork and team performance.

### 6.2 Relationship builder attributes

Table 4 reveals the attributes of administrators as a relationship builder. The overall mean was 4.21 or *strongly agree* with a standard deviation of 0.795. Out of the five indicators, three indicators are rated *strongly agree* and two indicators are rated agree.

Table 4 also presents the attributes of school administrators in relationship builder. The teachers' perception in this dimension is *strongly agree* which means very much highly innovative. This finding implies that

administrators establish a warm and cordial relationship among the teachers. Building a good relationship between teachers and administrators is valuable in any workplace. According to Kouzes & Posner [14], the quality of relationships and level of the trust require a great deal of attention on the part of a leader for a strong influence, and trust to motivate people to go beyond mere compliance with authority. It motivates teachers and administrators to reach for the best in themselves, their team, and their organization. In addition, human relations is the process of training employees, addressing their needs, fostering a workplace culture and resolving conflicts between different employees or between employees and management. Understanding some of the ways that human relations can impact the costs, competitiveness and long-term economic sustainability of business help to underscore their importance.

### 6.3 Risk taker attributes

As shown in table 5, the teacher rated their administrators as *agree* in all indicators, the overall mean was 4.09 with a standard deviation of 0.783. The standard deviation also shows that there is the homogeneity of their answers to each item because it is almost the same with the standard deviation of each item.

It can be noted from the results that administrators were rated *agree* in all items under risk taker attribute which means that they are much highly innovative.



**Table 4.** Attributes of administrators as relationship builder.

<b>C. Relationship Builder</b>	<b>Mean</b>	<b>SD</b>	<b>Qualitative Description</b>
My administrators ...			
1. establish warm and collaborative working relationships with others	4.29	0.909	SA
2. work effectively with teachers from diverse backgrounds	4.27	0.802	SA
3. treat everyone with dignity and respect	4.33	0.903	SA
4. pay attention to individual needs	4.12	0.935	A
5. visit the teachers' workstations to converse with them face to face	4.05	0.980	A
Overall mean	4.21	0.795	SA

This indicates that school administrators are reluctant and avoid risk situations as much as possible.

Risk taking is something to do on how administrators make a right decision. According to the decision theory of Simon [28] decisions are made through rationale choice among different alternatives available. Hence, decision making is important in managing the organization. In addition, Zinn [37] mentioned that a person takes risk to develop a valued identity and to protect it.

According to March and Shapira [19] risk-taking is often regarded as an important organizational aspect of organizational success and many managers consider the evaluation of risk and management of uncertainty as essential components of their jobs.

One vital trait of innovative school administrators is to take risks and not be afraid to make a mistake. To make mistakes is the best way leaders learn. Tull [30] confirmed that risk-taking is an increasingly critical element of leadership and essential for a leader's effectiveness. A leader who wants to achieve success understands that taking risks is an essential part of achieving results. Furthermore, the willingness of leaders to take risks on novel initiatives and adopt fresh perspectives is the main factor in the success of innovation implementation Orazi et. al., [21]

Table 6 presents a summary of the attributes of school administrators in all areas. The overall qualitative description is agree. The responses in the table indicate a widely dispersed data. The responses of the teachers show heterogeneity which means that their responses vary. That probably means each teacher has different views on how innovative are their respective administrators.

Among the four attributes, the team builder got the highest mean. This implies that it is the responsibility of the administrators to establish teamwork among the teachers. As cited by Stott & Walker [31] teamwork provides teachers with a significant role in school decision-making, control over their work environment and opportunities to contribute to a range of professional roles.

Meanwhile, the attributes of administrators as risk-takers got the lowest mean. This signifies that school

administrators need to make risky decisions in order to achieve innovation. This would mean that administrators vary in their individual propensities to take risks. As mentioned by March [18] risk-taking is valued, treated as essential to innovation and success.

#### *6.4 Implications of findings to educational management*

The school administrators in this study were rated *agree* in the overall rating in the indicators of innovative attributes.

Among the four indicators, risk-taker got the lowest mean. The results show that there is a need for the administrators to take risk in managing the institution. Being innovative is a vital trait of an administrator. In this modern era, the success of any organization depends upon on the innovative leadership. With this, the university may conduct a training course on Risk Taking Management to enhance their knowledge in this aspect.

Another finding is the administrators must take time to visit the workstations of teachers to establish warm and cordial relations with them. This implies that teachers are happy when their administrators visit them in their respective assignment. It is also recommended that the institution must conduct training on human relations for the administrators.

In line with this, the university will conduct leadership training specifically on innovative management for the administrators to equip them with the new trends in management.

In addition, future research on the relationship of leadership attributes and organizational performance will be conducted.

## **7. Conclusion**

The findings revealed that administrators were rated *agree* which means highly innovative considering the four dimensions namely, visionary, team builder, relationship builder and risk taker. It is therefore concluded that there is still a need to improve on these

**Table 5.** Attributes of administrators as risk taker.

<b>D. Risk Taker</b>	<b>Mean</b>	<b>SD</b>	<b>Qualitative Description</b>
My administrators ...			
1. find new ways of doing things	4.10	0.795	A
2. apply new things to produce good results	4.09	0.849	A
3. devise ways that lead to creative thinking and problem solving	4.07	0.953	A
4. ready to make mistakes	4.0	0.930	A
5. recognize that success failure are connected and are necessary for growth	4.2	0.867	A
Overall mean	4.09	0.783	A

**Table 6.** Summary of innovative attributes of school administrators in four dimensions.

	<b>Mean</b>	<b>SD</b>	<b>Qualitative Description</b>
A. Visionary	4.21	0.711	SA
B. Team Builder	4.29	0.707	SA
C. Relationship Builder	4.21	0.795	SA
D. Risk Taker	4.09	0.783	A
Overall Mean	4.20	0.749	A

attributes. The findings of the study are crucial to educational planners. This serves as their basis for possible agenda to be incorporated in the regular strategic planning.

This paper limits its scopes on the innovative attributes of school administrators which is quantitative in nature. Hence, it is recommended that a similar study may be conducted considering the profile of the administrators, their educational qualification, administrative position, age and gender. It is further recommended that a future research will be conducted on innovative attributes of administrators using multi factor analysis.

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## The development of green office standard: Thailand initiative

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### Abstract

Green Office encourages companies to promote the wellbeing of their personnel, for example by promoting everyday exercise and a good working atmosphere. Undeniably, the operation of all activities has required and consumed either resources or energy and at the same time emitting a certain environmental impact into the earth. Think about the consequence, all offices produce huge greenhouse gases into the atmosphere, which the main cause of climate change and global warming that is becoming a significant environmental crisis widely affecting to the quality of life of most populate around the world. The Department of Environmental Quality Promotion has collaborated with the Faculty of Environment and Resource Studies, Mahidol University conducted a study on development of Green Office Standard. Objective: To develop standards and associated criteria for assessment of Green Offices and to examine the empirical research that grounds the development methods and application of green office standards for promoting environmentally friendly activities at both public and private sectors including local administration organizations. Design, Method and Setting: The research framework is outlined grounding on an integration of 3 standard protocols; ISO14001 environmental management system, Greenhouse Gas Management, and Waste Minimization Pollution Prevention which rather beneficial for modelling the best standard of environmental management in the office. Six academic environment and energy research databases (SCImago, EnvironmentAsia, ThaiJO, UNEP-GRID, NETROnline and BBC-Science and Nature) were interrogated, the websites of 24 agencies associated with the study topic were investigated. A multi-method strategy was employed over the period March 2016 to August 2018. A major research designs are particularly using EDFR (Ethnographic Delphi Futures Research) and survey method for collecting baseline information and setting the green office standard criteria. Subjects: 10 pilot organizations where exclusively adopted the green office initiatives and first conducted in June 2016. Since these pilots to receive the assessment of standardized green office from a Commission on Certification of Green Office Standard-accredited Green Office Assessor who had the following: a master or doctoral degree, at least 5 years of monitoring and supervising environmentally friendly activities, and familiarity/experience with green initiative instruction in various settings, so then the assessment is to equip the organization managers and their staff with the information, protocols, and guidance to serve as eco-friendly building tool at their institutions. Measurements: We used panellist's critiques and ratings to make sequential revisions in a series of 3 EFDR rounds of workshop. Standards were rated as to whether they were clear, necessary, and appropriate. We rated criteria for the associated standard as to whether they were useful, helpful, clear, specific, and consistent. Results: We developed a final set of 7 criteria, 19 activities, and 88 associated indicators to measure the Green Office standards. The accepted standards include the following: Organization Management, Operations of Green Office, Energy and Resource Utilization, Office Waste Management, Indoor & Outdoor Environment, Eco-friendly Procurement, and Continual Improvement. Conclusions: The 7 standards and associated indicators developed in this research project could be used not only for the government organizations or local administrations but also to business processes, strategies and decisions in environmental management. The success of the Environmental Management System depends on the commitment of personnel at all levels and all functions in the organization led by top executives in the organization. Further research should include validating these standards/criteria among responsible citizenship within our society representing different types of environmental protection and awareness settings.

**Keywords:** Green office standard, friendly-environment, environment quality control.

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### 1. Introduction

Nature conservation at the workplace is becoming an alarming point of view of the environment, it is

significant how premises are developed and how work communities act. Green Office is a fun way of conserving the nature at the workplace. Anyone's can reduce your carbon footprint by e.g. saving energy and improving energy efficiency, making sustainable purchases, paying attention to travel and food choices

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and sorting and recycling. We are currently using 50% more natural resources than the Earth can sustain. The Green Offices initiative constantly reduce their impact on the environment as well as encouraging offices to build environmental awareness and to promote ecological and economical sustainability. [1] An effective environmental management system will show the way for your organization's climate work and guide towards wise use of natural resources. Earth's environmental issues require acting quickly. Climate change is one of our biggest global crises. Degradation of the natural environment does not threaten the nature alone; it also compromises people's health, food production, economy and well-being. Fortunately, it is still possible to change the direction. The efforts of businesses and organizations play a key role so that we can limit global warming to the 1.5 degrees agreed in the Paris Agreement and secure biodiversity. [2] As a member of the Green Office network, you will be involved in contributing to these objectives.

Implementation of all kind activities is requiring both resources and energy, at the same time, causing environmental deterioration by garbage and waste water which is considered crucial environmental impact. Obviously, offices are the major sources in producing greenhouse gas emissions and mainly causing eventually climate change and global warming at the present time. There are widespread impacts both in the country and around the world that could bring about a global environmental crisis as well as widely affecting to the quality of life of most populate around the world. Accordingly, the Department of Environmental Quality has collaborated with the Faculty of Environment and Resource Studies, Mahidol University to establish a standardized environmental management system especially for fully operating at the workplace or office settings. A collaborative initiation is started from 2 major steps include such development of alternative criterions and then testing all these. Other enquiry steps include a trial application of green office standard at the target offices, certification of Green Office, building the capacity of various offices for effective management of environment, energy and resources, and implementing a green purchasing and procurement process. Green Office allows the officers to find out the environmental impacts of their workplaces in a blink. They will get the means for building an effective environmental management system and lots of support for engaging the work community. The certificate also tells others that your environmental issues are in order. While the Green Office programme is directly related to most of the SDGs. [3, 4] The practical measures with pay particular attention to the goals relating to the environment and wellbeing, such as fighting climate change, conserving biodiversity, and developing sustainable forms of livelihood. At Green Offices, the entire work is guided to act in an environmentally responsible way. The envi-

ronmental management system pays attention to matters such as travel, energy consumption, recycling and sorting of waste, sustainable procurement and food choices. A sustainable mind-set is incorporated into day-to-day life. [5] In addition to earning a livelihood, many people want relevance from their work and want to work in an office with values aligned to their own. At a Green Office, employees can make a difference and act ecologically also at the workplace. This way, Green Office also influences the employee experience and employer image. Accordingly, the ultimate goal of development of Green Office Standard is to promote environmentally friendly activities emphasizing on reduction of energy consumption, reducing, reusing, and recycling of wastes and eliminating of dangerous chemicals, and supporting to existence of green procurement system. [6, 7] Since, Standards are the foundations of social wellbeing in an age of globalization and convergence across traditional technology and market boundaries. Standardization provides the foundation on which technology innovation is based. It enables more complex solutions to be developed at a better cost structure. Standards drive technological innovation, fuel growth of global markets, expand consumer choice, support interoperability and help protect the health and public safety of workers and the general public. The Green Office standard development process is rooted in consensus, due process, openness, right to appeal and balance. It adheres to and supports the principles and requirements of the UNEP and Paris Agreement on Principles for strengthening the Global Response to the threat of Climate Change by keeping a global temperature rise this century well below 2 degrees. [8] In particular, the Green Office operates in active agreement with the WTO principle that standards should not create unnecessary obstacles to trade, and whenever appropriate, should specify requirements in terms of performance rather than design or descriptive characteristics. [9]

This study was realized in the key grounding of environmentally-friendly setting which is to change the personnel's behaviours for reducing especially energy consumption and to initiate eco-healthy activities such as reducing waste by reducing use, reuse, or recycling. The development of Green Office Standard will certainly help Thailand to reduce the amount of greenhouse gas emissions and environmental deterioration in the country, and more or less may be beneficial to our country preparedness to attain the international standard for environmental protection in the near future. Similar countries are using five main areas of green office management: energy management, water management, waste management, logistic management, and the procurement management. It can be summarized the various activities in the implementation of the green office management of each country as shown in Table 1.

The study of Green Office Standard Development

**Table 1.** Various green office activities in each country.

Activity \ Country	Energy	Water Resource	Chemical Substances	Waste & Garbage management	Transportation & Logistics	Procurement	Building Design	Land allocation	Air Quality	Utilization of Materials in the office	Paper
India	X			X	X	X	X				
USA	X	X		X	X	X					
Canada	X	X		X					X		
Spain	X		X	X							
France	X	X	X	X	X			X			
England	X	X		X	X	X					X
Australia and New Zealand	X			X		X					
Hong Kong	X			X							
Singapore	X	X		X		X					
Vietnam	X	X		X	X	X					
Thailand	X	X			X	X	X			X	

here in Thailand is initially guided through the ten themes; management, communications and engagement, energy conservation, water conservation, waste reduction, recycling, sorting and cleaning, paper reduction, green procurement, integrated environmental management, and education and awareness. [10] Together, we assessed which measures will have the biggest impact at the workplaces and effectively reduce ecological footprint. [11]

## 2. Research Objectives

This research had overall aim to create and develop the Green Office Standard including its criteria and indicators. The special objective of this study was to promote the establishment of green office as well as to enhance integral environmental-friendly organizations nationwide. The study's destination purpose was to examine the empirical research that grounds the development methods and application of green office standards for promoting environmentally friendly activities emphasizing on reduction of energy consumption, reducing, reusing, and recycling of wastes and eliminating of dangerous chemicals, and supporting to existence of green procurement system.

## 3. Research Methods

### 3.1 Research design

This research is a qualitative study with the application of a multi-method strategy over the period March 2016 to August 2018. A major research design is particularly using EDFR (Ethnographic Delphi Futures Research) technique, a modified approach derived from a combination of EFR (Ethnographic Futures Research) and Delphi. The EDFR is quite similar to Delphi technique, but it was modified to be more flexible and applicable. [12] We used the

**Table 2.** Initial standards reviewed in Workshop 1.

Chapter	Criteria
1	Management
2	Communications and engagement
3	Energy Conservation
4	Water Conservation
5	Waste Reduction
6	Recycling, sorting and cleaning
7	Paperless/Paper Reduction
8	Green Procurement
9	Integrated Environmental Management
10	Education and Awareness

EDFR technique for systematic consensus building among a group of environmental conservation experts. This technique encourages open professional opinions without the negative effects of group dynamics such as peer-group pressure to conform to opinion. [13] [14] Responses from the panel members were anonymous to the other panel members. Using the consultative Delphi technique to determine the components of professional effectiveness improves the validity of the study from 2 aspects. [15] First, the standards identified by the experts have a high face validity because they appear to be the most relevant standards to those who are experts in environment education. Second, when the panel reached consensus, it can be argued as evidence of concurrent validity in that the experts themselves have both identified and agreed on the requisite standards. The standards development lifecycle involved 3 major stages; 1) Mobilizing the Working Group, 2) Literature reviewed and Drafting the Standard, and 3) Resolution of the Standard.

Seventeen panelists were purposively selected from the qualified pool of government and state enterprise environment-related organizations such as Fac-

**Table 3.** Final approved green office standard, criteria, indicators, and its' weight.

Chapter	Criteria/Activities	Determinants/Indicators	Weight (%)
1	<b>Organization Management</b>		15
	1.1 Environmental Quality Control Policy	1. Existence of Environmental Quality Control Policy 2. The details in the policy indicate the consistency as specified in the manual. 3. Setting the frequency for environmental policy reviews	
	1.2 Operational Planning	1. Setting up plans, strategies and responsible persons to cope with environmental problems and utilization of resources and energy. 2. The analysis of environmental issues and utilization of resources and energy are extremely required to be made covering normal and emergency events. 3. All significant environmental issues and poor resources and energy consumption must be properly and well managed. 4. The list of the legislative matters and its sources relating to the means for environmental problems control must be written and documented. 5. Determining the persons responsible for searching and finding of any relevant law items. 6. Fire drills training and its regular schedules are setting up emphasizing at basic fire drill and fire escape training. 7. Emergency plan in the office is existed. 8. Regular checking of fire management devices such as fire extinguishers, fire alarms, and staff understanding of using fire extinguishers. 9. Announcement on the appointment of Chairman, Committee or Environmental Team and include their responsibilities. 10. The appropriateness of appointing the Board or Committee or environmental team. 11. Chairman of the board or environmental team are well understood in the significances of environmentally friendly management.	
	1.3 Reviewing Process and Action by management team	1. The Chairman of the Environmental Management Committee or the concerned person knows the problems, obstacles, strengths and weaknesses of the organization and having proactive visions. 2. Attendances in the management team meeting by each executive committee. 3. Recommendations and responses from the management team meeting.	

**Table 3.** Final approved green office standard, criteria, indicators, and its' weight. (Cont.)

Chapter	Criteria/Activities	Determinants/Indicators	Weight (%)
2	<b>Operations of Green Office</b>		20
	2.1 Communication and Environmental Training	<ol style="list-style-type: none"> <li>1. Determining the environmental communication methods using in the office and exploring the channels of communication.</li> <li>2. Determining the person responsible for communication.</li> <li>3. Communication on Environmental Policy for Staff.</li> <li>4. Communication on environment-related problems including resource and energy uses to all concerned staff for their understanding.</li> <li>5. Communication on law and environmental requirements to all concerned staff for their understanding.</li> <li>6. Communication on notifications from the Executive Board or Environmental Team.</li> <li>7. Making on public relations or campaign to stimulate all staffs initiating and building the cleanliness and orderliness in their offices.</li> <li>8. Communication on greenhouse gas emissions issue to all staff.</li> <li>9. Communication or clarification on the significances of energy control measures to all staff.</li> <li>10. Communication or clarification on the significances of water use control measures to all staff.</li> <li>11. Communication or clarification on the significances of resource utilization measures to all staff.</li> <li>12. Communication on the target and detailed project related to environmentally friendly initiatives programs to all staff.</li> <li>13. Hearing suggestions and complaints from employees including people who come in contact.</li> <li>14. The appropriateness of determining the person responsible for the training.</li> <li>15. Determination of necessity, work plan, assessment of knowledge and understanding of staff along with the recording of their personal histories.</li> </ol>	
	2.2 Organizing conferences and exhibition	<ol style="list-style-type: none"> <li>1. Preparation of meetings and exhibitions i.e. sending invitations to the meeting, preparation of documents and folders for the meeting.</li> <li>2. Arrangement of the meeting room and the exhibition venues.</li> <li>3. Preparation of food and beverage.</li> <li>4. Selection of hotel or conferences venues.</li> </ol>	



**Table 3.** Final approved green office standard, criteria, indicators, and its' weight. (Cont.)

Chapter	Criteria/Activities	Determinants/Indicators	Weight (%)
	2.3 Cleanliness and orderliness in the office.	<ol style="list-style-type: none"> <li>1. Assigning a definite timing for making cleanliness and maintaining all of-office items in a good order.</li> <li>2. The office spaces must be clean and orderly following to the standard criteria.</li> <li>3. Cleanliness of the bathroom.</li> </ol>	
	2.4 Greenhouse gas management	<ol style="list-style-type: none"> <li>1. Collecting the data relating greenhouse gas emissions from office activities. (compared to the numbers of staff)</li> <li>2. The amount of greenhouse gas emissions from office activities has decreased comparing to the past records and statistics.</li> <li>3. The assigned staff must know the information concerning the amount of greenhouse gas emissions and methods for calculation of its amount.</li> </ol>	
	2.5 Transportation and travel	<ol style="list-style-type: none"> <li>1. Existing communication through electronic media.</li> <li>2. Planning for traveling before using vehicles.</li> <li>3. Having such a campaign of walking or cycling to the office or using public transport. (For staff who are residing near the workplace)</li> </ol>	
3	<b>Energy and Resource Utilization</b>		15
	3.1 Energy use	<ol style="list-style-type: none"> <li>1. Setting-up a measure for energy saving. (Electricity and other fuels) appropriately.</li> <li>2. The amount of energy consumption (electricity and other fuels) is compared to the number of employees.</li> <li>3. Economically use of electricity in the workplace. (observe)</li> </ol>	
	3.2 Water use	<ol style="list-style-type: none"> <li>1. Setting-up a measure for water saving appropriately.</li> <li>2. The amount of water usage is compared to the number of employees.</li> <li>3. Economically use of water in the workplace. (observe)</li> </ol>	
	3.3 Other resources	<ol style="list-style-type: none"> <li>1. Setting-up a measure for paper saving.</li> <li>2. Setting-up a measure for printing-ink saving.</li> <li>3. Setting a measure for saving the usage of stationery and office equipment.</li> <li>4. Setting -up the target for office resources using.</li> <li>5. Use office equipment economically at the workplace. (observe)</li> </ol>	

**Table 3.** Final approved green office standard, criteria, indicators, and its' weight. (Cont.)

Chapter	Criteria/Activities	Determinants/Indicators	Weight (%)
4	<b>Office Waste Management</b>		10
	4.1 Disposal /Garbage management in the workplace	1. Garbage management of the organization. 2. Disposing of garbage by office staffs. 3. Location of garbage collection point before dispatch. 4. Garbage and waste disposal of the organization. 5. Means and techniques applying for garbage/waste minimization and utilization such as reuse, recycle, and reduce the amount of waste from the origin.	
	4.2 Waste water management in the workplace	1. Management of waste water from related activities. 2. Maintenance of equipment for waste water treatment. 3. Debris, food scraps, grease and dirt are well and appropriately managed. 4. The use of environmentally friendly products for cleaning in the office.	
5	<b>Indoor &amp; Outdoor Environment</b>		15
	5.1 Air	1. Maintenances of air condition, copier machine, printer, air filter, office area, floor, carpet including other equipment. 2. Assigning a smoking point and how staff using this area. 3. Air pollution from office renovation activities such as wall penetration, painting etc. 4. Management of air pollution from outside the office that affected.	
	5.2 Light	1. Light intensity. 2. The selection of high performance and environmentally friendly lighting equipment.	
	5.3 Sound	1. Establish measures to control noise pollution. 2. Management of noise from outside the office that affected.	
	5.4 Liveliness	1. Determine the responsibilities of the staff and a definite time to maintain the office cleanliness and orderliness. 2. Clearly specify the usable areas where as divided into areas for working, storage of materials, resting, eating and others as necessary with a sign indicating the titles of areas. 3. Caring and maintenance of all areas such as recreation area. 4. Control of animal carriers.	

**Table 3.** Final approved green office standard, criteria, indicators, and its' weight. (Cont.)

Chapter	Criteria/Activities	Determinants/Indicators	Weight (%)
6	<b>Eco-friendly Procurement</b>		15
	6.1 Purchasing materials and office supplies	<ol style="list-style-type: none"> <li>1. Purchasing of environmentally friendly office supplies.</li> <li>2. Clearly specify the persons responsible for purchasing environmentally friendly office supplies with his/her contact details.</li> <li>3. Documentation of amount and type of environmentally friendly office supplies using at the organization.</li> <li>4. Existence of the list of eco-friendly products.</li> <li>5. The evidence to indicate a selection process for obtaining the agencies or individuals who are environmentally-friendly employers. (if applicable)</li> <li>6. Checking the performance of agency or person who responsible for environmental care and protection work. (if any)</li> </ol>	
7	<b>Continual Improvement</b>		10
	7.1 Project and activity	<ol style="list-style-type: none"> <li>1. Establishing environmental care and protection objectives and targets.</li> <li>2. The assigned targets can be measured and consistent with objectives.</li> <li>3. Define environmental activities that meet objectives and goals.</li> <li>4. There is existed the setting of proper timeline for the operation of green office activities as well as are in accordance with the goals and objectives?</li> <li>5. Monitor and attentive to the success and achievement of green office goals and project implementations.</li> </ol>	
Total			100

ulty of Environment and Resource Studies of Mahidol University, Department of Environmental Quality Promotion, Pollution Control Department, Greenhouse Gas Management Organization (Public Organization), Center for Nature and Agricultural Ecology, The Electricity Generating Authority of Thailand, The Bangchak Petroleum Public Company Limited, etc. In addition, we informed panelists of the overall process and rationale for using the EDFR technique as well as their responsibilities in the study. Panelists were also advised of the time-intensive nature and commitment level required for this study.

### 3.2 Procedures and instrumentation

This study presented the potential standards and criteria in the form of a checklist. Each checklist dissemination and response were occurred through "Workshops." [16, 17] Panelists received, via electronic mail,

instructions for completing before meeting in a particular workshop. Both before and after the workshops conducted we regularly used electronic mail and telephone correspondence to help keep the panelists on task and to answer their questions as they arose. Each workshop lasted approximately 1-2 days, with 4 weeks interval for the data to be processed and to create the next modified checklists.

### 3.3 Workshop 1

The first round largely involved guided exploration and was designed to engage panelists in brainstorming. [18] To initiate the brainstorming process, we provided the panelists with 10 initial potential standards criteria (Table 1) that generated from a review of the eco-healthy workplace and friendly environment literature. They were also persuaded to propose any additional standards and criteria they criticized and judged

essential for initiating the green office standards in Thailand.

These initial potential standards and associated criteria were adapted from the expert panellist group consists of scholars from government, state enterprise and non-government organizations. These experts have been appointed by the Department of Environmental Quality Promotion. Using an open-ended format, we instructed panelists to carefully consider the clarity, necessity, and appropriateness of each of the 10 potential standards and associated criteria as well as the consistency of the criteria with the associated standard. This initial set of potential standards and criteria was opened to discussion and interpretation, thus facilitating comments and revisions from the panelists are highly accounted and focused in this workshop.

### 3.4 Workshop 2

The second workshop consisted of a second checklists created through the synthesis of panelists' comments from the first workshop. This input regarding the initially reviewed and additional standards and criteria proposed by the panelists was compiled, summarized, and used to reformulate the standards/ criteria.

### 3.5 Workshop 3

The third workshop consisted of a third checklists based on the analysis and critical comments from workshop 2. Additional consensus to retain those standards and criteria was not reached during round 2 were also revised based on panelists' comments and reappraised in this round. A summary of the standards and criteria for which consensus included 7 categories as follows:

- Chapter 1: Organization Management
- Chapter 2: Operations of Green Office
- Chapter 3: Energy and Resource Utilization
- Chapter 4: Office Waste Management,
- Chapter 5: Indoor and Outdoor Environment
- Chapter 6: Eco-friendly Procurement
- Chapter 7: Continual Improvement.

## 4. Results

The standards developed in this study were considered by a panel of environmental management education experts to be necessary, clear, and appropriate for the development of the Green Office Standards and assessment of the 10 pilot green offices. All these standards are consistent with the intents of ISO14001 environmental management system, Greenhouse Gas Management, and Waste Minimization Pollution Prevention protocols. What follows is a discussion of each of the environment-related scholar and instructor standards developed in this research. Our results and the literature fully support the qualities, characteristics, and skills associated with these standards and

their necessity and appropriateness in environmental management education.

From 3 workshops, the EDFR panel reached consensus on the potential standards and criteria necessary to illustrate and assess the green office management. A total of 7 standard chapters, each with 1 to 5 criteria and 5 to 28 indicators, was ultimately developed (Table 2). Each of the 3 workshops yielded numerous valuable comments from the panelists regarding the visibility, necessity, and reasonableness of each of the potential standards and associated indicators as well as the consistency of the criteria with the corporate standard. For example, there was one essential comment arose during workshop 2 to add a criterion to further clarify the Environment Quality Indoor and Outdoor standard: "It should be added a more applicable assessment of both indoor and outdoor environment quality to following the suitable appraisal standards as outlined by WWF Green Office Program." Panelists also provided general comments in support of the development of manuals for Green Office Standard implementation. For example, 1 panelist indicated "I am realized a good job with the standards. We utilize many of these criteria already in the carbon footprint assessment process, where many organizations evaluate the eco-friendly atmosphere at their offices."

Absolutely, the green office standards development lifecycle involved 3 major stages; 1) mobilizing the working group, 2) literature reviewed and drafting the standard, and 3) resolution of the standard. The study found the criteria and indicators suitable for the Green Office management in seven categories, each of the weight percentages are different as shown in Table 2.

By each of these determinants/indicators, rating will be considered relying on attribution of the area, environmental care and practices, office staff's knowledge and understanding, the amount of greenhouse gases discovered and the reduction of greenhouse gas emissions in the office. The assessment criteria in each sub-item is provided for the committee make a rating at 5 levels from 1 – 5.

## 5. Conclusions and Discussions

The Green Office initiative will help offices carry their environmental responsibility and motivates staff to sustainable solutions in every day office work. The Green Offices comprise a fantastic network of organizations with ambitious ecological objectives and realistic ways of achieving the criteria. The purpose of the Green Office scheme is to reduce the consumption of natural resources by improving offices' environmental efficiency, promoting sustainable practices by increasing environmental awareness of employees, and promoting climate change mitigation by requiring energy-saving and use of renewable energy sources. [19] The Green Office scheme supports offices in sys-

tematic improvement of their environmental performance. Since, an increasing need has been identified within the profession of eco-friendly concern to provide standard guidelines and development for building our world grow green. Consequently, under the direction of the Department of Environmental Quality Promotion and Faculty of Environment and Resource Studies, Green Office Standard was developed including a guideline that certified organization complete and achieve environmentally friendly establishment and first introduced to 10 pilot organizations from all regions of Thailand. The main asset of Green Office Standard is its concreteness. There are 7 criteria categories, 19 activities, and 88 indicators as follows;

(1) Organization Management 3 Activity 17 Indicators

(2) Operations of Green Office 5 activities 28 indicators

(3) Energy and Resource Utilization 3 Activities 11 Indicators

(4) Office Waste Management 2 activities 9 indicators

(5) Indoor & Outdoor Environmental 4 Activities 12 Indicators

(6) Eco-friendly Procurement 1 Activity 6 Indicators

(7) Continual Improvement 1 Activity 5 Indicators

These anticipated criteria require a more standardized approach to environment-friendly management contents and increased accountability in the nature conservation proficiencies. Although the developed green office standard is part of the evolutionary process of mitigating climate change and reducing ecological footprint, it has placed more environmentally friendly learning and evaluation responsibilities on certified green offices where may have required for promoting sustainable lifestyle and improving environmental awareness in their resource's preparation and management. The success of the Environmental Management System depends on the commitment of personnel at all levels and all functions in the organization. Led by top executives in the organization. Coincidentally, since the environmental commitment varies with standards, expectations of producers and buying power of the consumers, then the environmental issues are integrated into the corporate culture in order to tackle cost and profit aspects in business. Firms have started finding end solutions caused by the trade effluents to the environment by converting such waste itself to be the input for further production. [20] It depends on the level of responsibility of each department to eliminate and reduce the environmental impact and conserving the world's biological diversity, especially the application of strategies.

Subsequently, assessment of the 10 pilot organizations were exclusively adopted and first conducted in June 2016. An overriding goal of the assessment is to equip the organization managers and their staff with

the information, protocols, and guidance to serve as eco-friendly building tool at their institutions. Environmental management academic and expertise existed among the assessor team contributed to effectively learn and apply the environmentally friendly proficiencies. In order to bring reliance and validity to the environmental initiatives of organizations' members, it is mandatory that expectations for eco-friendly practices be established and investigated by the upright professionals rather than just borrowing and adapting practices from other allied professions.

Identically, the presentation of success in environmentally-friendly management depends on the suitability of the person and the organization concerned. The application of this model standard at any settings may not guarantee that an organization can properly control and manage their environment, such as two organizations with similar activities, but may have different legal compliance capabilities. Commitment to compliance and utilization of existing technologies that will make the efficiency of environmental management and meet the specified requirements of the organization.

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## The effectiveness of strengthening leg muscles physical exercise promotion program for preventing falls of the elderlies in Thailand

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### Abstract

This quasi-experimental research aimed to study the effectiveness of a physical exercise promotion program for strengthening leg muscles to prevent falls of the elderlies. Protection motivation theory was employed as a theoretical framework in this study. The experimental group comprised 30 elderly people aged 60 years and older who received medical care at Pathum Thani Hospital in Pathum Thani Province, Thailand. Simple random sampling was used to select participants to the experimental group ( $n = 30$ ). The participants took part in the physical exercise promotion program consisting of 2 activities. The first activity, *Know Risks - Know Dangers - Prevent Falls*, comprised watching a video regarding falls in the elderly, group discussions, media lectures, and demonstrations and practices of a 10-step physical exercise to strengthen leg muscles. The second activity involved the use of intelligent postcard innovation to prevent falls as well as releasing emotions and feelings. The comparison group received activities determined by the hospital with a monthly follow-up for 3 months. A questionnaire and a leg muscle strength test were used as instruments in this study. Data were collected both before and after participating in the program and subsequently analyzed using descriptive statistics, paired t-test and independent t-test. The results showed that after participating in the program, the experimental group had higher mean scores for physical exercise to prevent falls and strengthening leg muscles than before participating in the program and those in the control group at  $\alpha .05$  significance level. This study concluded that the program developed from the protection motivation theory proposes that people protect themselves based on four factors. The researchers can effectively promote physical exercise to strengthen leg muscles in preventing falls of the elderlies.

**Keywords:** Elderly, leg muscle strength, physical exercise to prevent falls.

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### 1. Introduction

At present, the proportion of elderly people in the population is gradually increased continually, from 13% in 2015 to 32.1% in 2016, while labor force population ratio tends to decrease [1]. Such rapid change in Thailand's population structure causes Thai society to be elderly society since 2005 with 10% elderly population ratio increase [2] based on surveyed data, 11.6% of elderly people have suffered from accidental falls, 6 months prior to interview [3]. In 2010, national mortality rate by falls is 5.89% of 100,000 population and has tendency to be increased to 10.03% in 2014. Such injuries lead to disability or death of elderly people [4].

The major causes of fall-related self-efficacy in older persons were such as vision blur, body balance, lag of physical exercises, their congenital disease, and

medicine treatment [5] along with environment condition factor, such as wet floor & stairs, different floor level or uneven floor, insufficient light, no handrail in house (stairs and restroom). Currently, guidelines for preventing falls focus on elderly people and environmental conditions. The most effective prevention from falls is to strengthen physical conditions of elderlies [6]. The study has proposed 10 physical exercise postures, with a focus for strengthening leg muscle [7, 8]. Aims of physical exercise are to increase body movement efficiency i.e. leg muscle and joints. Therefore, elderly people should practice 5-15 minutes every day [9].

From literature review, it is found that factors affecting elderly falls prevention is bio-social factors such as gender, age, status, occupation, fall records [10] and incentive factors i.e. perceived severity of falls, perceived vulnerability to falls, expectation of response efficacy, expectation of self-efficacy, and physical intention [8]. These factors are classified under Pro-

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tection Motivation Theory. It can be explained that any protection motivation of people were based on 4 factors; perceived vulnerability of disease, perceived severity of disease, expectation of response efficacy, expectation of self-efficacy. Such perception will reflex to changing of attitude and behavior of people [11].

According to the study in Thailand, it is found that relationship between such perceptions (perceived vulnerability of disease, perceived severity of disease, expectation of response efficacy, expectation of self-efficacy) and elderly people's behavior on preventing falls in community and several preventing falls program for elderly people are provided. But elderly people fall can be found from concept of protection and motivation, that has influenced on preventing behavior. Therefore, the elderly to be fear of threat and lead to falls protection behavior [12]. From above literature review, researchers are interested in development of physical exercise promotion program for enhancement of leg muscle strength that can prevent elderly people's falls.

## 2. Objectives

### 2.1 Main objective

To study on effectiveness of physical exercise promotion program for enhancement of leg muscle strength that can prevent elderly people's falls

### 2.2 Specific objectives

2.2.1 To compare average scores of experiment group on perceived vulnerability to fall down, perceived severity(damage) from accidental falls, expectation of response efficacy, expectation of self-efficacy, physical exercise intention for falling prevention, and leg muscle strength between pre and post experiment.

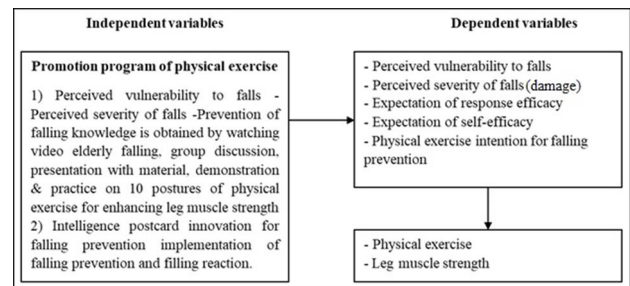
2.2.2 To compare average score of experiment group and control group on perceived vulnerability to falls, perceived severity to falls, expectation of response efficacy, expectation of self-efficacy, physical exercise intention for falling prevention, and leg muscle strength between pre and post experiment.

## 3. Hypothesis

3.1 Post-experiment, experiment group average scores on perceived vulnerability to falls, perceived severity to falls, expectation of response efficacy, expectation of self-efficacy, physical exercise intention for falling prevention, and leg muscle strength is higher than pre-experiment.

3.2 Post-experiment, experiment group average score on perceived vulnerability to falls, perceived severity to falls, expectation of response efficacy, expectation of self-efficacy, physical exercise intention for falling prevention, and leg muscle strength is higher than control group's average score.

## 4. Conceptual Framework



## 5. Research Methodology

A quasi-experimental research method was applied for this research with two groups: pre & post - test design. An appropriate sample size for this method should be 30 participants according to principle of Polit and Hunger [12]. Participants' age was 60 years or more. A simple random sampling was applied for selection of 60 participants and then they were divided into two groups: experimental group and control group with 30 participants each.

### 5.1 Selection criteria

In general, participants' age was 60 years or more. Moreover, they were patients of Pathum Thani Hospital, Pathum Thani Province and could participate in the whole program. In addition, all participants were able to communicate and understand Thai language.

Disqualified criteria were elderly patients who participated in specific falls prevention program besides normal program of hospital or had severe underlying disease e.g. cancer, heart disease, and stroke.

### 5.2 Promotion program on physical exercise in preventing falls for elderly people

Two activities of promotion program on physical exercise in preventing falls for elderly people; 1) perception on vulnerability and severity of falling by watching video of elderly people falls, group discussion, presentation with material, demonstration and operation on ten (10) postures of physical exercise for enhancing leg muscle strength; 2) dissemination on utilization of Intelligence postcard innovation for falling prevention implementation and feedback from elderly, are provided to experiment group.

The first activity started from providing consultation to elderly people by research team about steps of participation in promotion program on physical exercise in preventing falls for elderly people. After that elderly people practiced on perceived vulnerability, severity, and preventing of falling. This activity was implemented by video presentation on



**Table 1.** Comparing average scores of experimental group and control group both pre-experiment and post-experiment.

Variables	Pre-experiment		Post-experiment		t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
<b>Perceived vulnerability to falls</b>						
Experimental group	3.31	0.43	4.14	0.50	-14.966	.000*
Control group	3.32	0.50	3.35	0.51	-.682	.501
<b>Perceived severity of falls</b>						
Experimental group	3.40	0.49	4.25	0.52	-15.378	.000*
Control group	3.45	0.40	3.59	0.55	-1.570	.127
<b>Expectation of response efficacy</b>						
Experimental group	3.35	0.45	4.22	0.58	-17.170	.000*
Control group	3.48	0.56	3.44	0.53	-.694	.493
<b>Expectation of self-efficacy</b>						
Experimental group	3.32	0.37	3.99	0.48	-11.514	.000*
Control group	3.17	0.58	3.20	0.55	-.551	.586
<b>Physical exercise intention for falls prevention</b>						
Experimental group	3.39	0.41	4.19	0.59	-13.511	.000*
Control group	3.33	0.53	3.40	0.54	-1.201	.240
<b>Physical exercise in preventing falls</b>						
Experimental group	3.29	0.50	3.70	0.72	-6.498	.000*
Control group	3.08	0.64	3.16	0.66	-1.624	.115
<b>Leg muscle strength</b>						
Experimental group	17.63	5.74	20.03	5.75	-7.180	.000*
Control group	16.53	5.22	16.93	5.32	-1.618	.117

\*P&lt;.05

falling of elderly people following by group discussion on “Causes of elderly people falls and its impact”. After that presentation together with material on physical exercise for enhancing leg muscle strength for preventing elderly people falls was administered. Demonstration on ten (10) postures was provided by research team and the elderly people practices under supervision of research team.

The second activity, intelligence postcard innovation for falling prevention was implemented including feedback from participants. Such innovation consists of HP REVEL application that was used to scan picture in poster to obtain video presentation on ten (10) posture of physical exercise. This application was developed by Maj. Dr. Nattakritta Siri-Sophon. After that elderly people or participants had to make completely practices. Each posture, a signature and phone number of witness had to be put in monitoring form in postcard. Then added line group application in smart phone according to line ID or QR code in postcard for monitoring and information provision. For feedback from participants, elderly people explained feeling of self-efficacy to complete the exercise and expected results by practicing this activity.

### 5.3 Tools of data collection

The tool used for data collection in the present study was questionnaire, consisting of 8 parts as: 1) Personnel record of elderly people; 2) Perceived vulnerability to accidental falls; 3) Perceived severity (dam-

age) from accidental falls; 4) Expectation of response efficacy; 5) Expectation of self-efficacy; 6) Physical exercise intention to prevent falls; 7) Physical exercise in preventing falls; 8) Measurement of leg muscle strength. This research tool was verified by three experts on content validity and index of item objective congruence (IOC) as shown in figure 0.60-1.00. In addition, Cronbach Alpha Coefficient was calculated for reliability as: 0.84, 0.90, 0.82, 0.84, 0.80, and 0.86 respectively. Regarding leg muscle strength, it was measured by using 30 second chair - stand test method along with supervision by physical therapist. The data were interpreted by applying criteria on ability test of leg muscle strength of male & female elderly people of Thai Health Promotion Foundation and Mahidol University [9].

### 5.4 Data analysis

5.4.1 General data were analyzed by using descriptive statistic, frequency distribution presented in term of percentage, mean, and standard deviation.

5.4.2 Comparing a difference of average score between pre and post experiment of experiment group by applying of paired t-test technique.

5.4.3 Comparing a difference of average score between experiment group and control group in stage of pre and post experiment was conducted by applying independent t-test technique on parameter of perceived vulnerability to falls, perceived severity of falls, perceived response efficacy, perceived self-efficacy,

**Table 2.** Comparing average score of experimental group and control group both pre-experiment and post-experiment.

Variables	Experiment group		Control group		t	p-value
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
<b>Perceived vulnerability to falls</b>						
Pre-experiment	3.31	0.43	3.32	0.50	.068	.946
Post-experiment	4.14	0.50	3.35	0.51	-6.022	.000*
<b>Perceived severity of falls</b>						
Pre-experiment	3.40	0.49	3.45	0.40	.428	.670
Post-experiment	4.25	0.52	3.59	0.55	-4.787	.000*
<b>Expectation of response efficacy</b>						
Pre-experiment	3.35	0.45	3.48	0.56	.938	.352
Post-experiment	4.22	0.58	3.44	0.53	-5.408	.000*
<b>Expectation of self-efficacy</b>						
Pre-experiment	3.32	0.37	3.17	0.58	-1.181	.242
Post-experiment	3.99	0.48	3.20	0.55	-5.910	.000*
<b>Physical exercise intention for falls prevention</b>						
Pre-experiment	3.39	0.41	3.33	0.53	-.470	.640
Post-experiment	4.19	0.59	3.40	0.54	-5.298	.000*
<b>Physical exercise in preventing falls</b>						
Pre-experiment	3.29	0.50	3.08	0.64	-1.399	.167
Post-experiment	3.70	0.72	3.16	0.66	-2.975	.004*
<b>Leg muscle strength</b>						
Pre-experiment	17.63	5.74	16.53	5.22	-.776	.441
Post-experiment	20.03	5.75	16.93	5.32	-2.166	.034*

\*P&lt;.05

physical exercise intention, physical exercise in preventing falls, leg muscle strength.

score is not different between pre and post experiment (Table 2)

## 6. Results

Data on bio-society characteristic of experiment group and control group, most of them were female aged between 60-65 years, marital status, unemployment, and never fall within 6 months prior participation.

Results of comparing average score of pre and post experiment between experiment group and control group showed that the experimental group has average score of perceived vulnerability to falls, perceived severity of falls, perceived response efficacy, perceived self-efficacy, physical exercise intention, physical exercise in preventing falls, leg muscle strength are higher than prior experiment at significant level of 0.05. But control group's average score is not different between pre and post experiment (Table 1).

Results of comparing average scores of pre and post experiment between experimental group and control group showed that the post implementation the experiment group has average score of perceived vulnerability to falls, perceived severity of falls, perceived response efficacy, perceived self-efficacy, physical exercise intention, physical exercise in preventing falls, leg muscle strength are higher than control group at significant level of 0.05. But control group's average

## 7. Conclusions and Discussions

The results of research on effectiveness of physical exercise promotion program for enhancement of leg muscle strength to prevent elderly people's falls found that physical exercise promotion program is important for enhancing leg muscle strength. This will help to prevent elderly people from accidental falls. The result indicated increasing average score of perceived vulnerability to accidental falls, perceived severity (damage) of falls, perceived response efficacy, perceived self-efficacy, physical exercise intention, and physical exercise in preventing falls, leg muscle strength after comparing with pre-experiment and control group at significant level of 0.05. That complies with study of Sirisophon [7] and Chanjirawadee et al. [14]. Because experimental group provided promotion program for physical exercise which has provided development mechanism on perceived vulnerability to accidental falls, perceived severity (damage) of falls, perceived response efficacy, perceived self-efficacy, physical exercise intention, physical exercise in preventing falls and to strengthen leg muscle. The participants were required to watch video of falling of elderly people and group discussion on "Cause of elderly people falls and its impact". Following by presentation together with material on physi-

cal exercise for enhancing leg muscle strength for preventing elderly people from accidental falls. Demonstration on ten (10) postures was conducted. Moreover, intelligence postcard innovation for falling prevention implementation and feeling from elderly was added and they can exchange knowledge and experience among their group. These activities made them aware of the severe effects. It resulted that their need for practices. These activities support physical exercise behavior for preventing fall according to the theory of incentive on disease prevention. It can be explained that perception of elderly people increases fear and insecurity. These factors lead to behavior changer for preventing falls [12]. If elderly people do physical exercise frequently, their leg muscle will be strengthened to assist elderly people from falls. While control group obtained normal program of hospital such as knowledge on preventing falls and leaflet, it was insufficient for incentive to practice or perform physical exercise.

In conclusion, the program which was developed by researcher can encourage physical exercise behavior of elderly people for enhancing leg muscle strength to prevent falls. The results of promotion program on physical exercise has an influence on elderly people's intention to exercise their legs for preventing fall in the future.

## 8. Recommendations

8.1 The physical exercise promotion program results change behavior of elderly people to exercise for preventing falls and enhances their leg muscle strength. So, this promotion program should be applied for other elderly groups.

8.2 Study and development of pattern for behavior promotion should be conducted systematically by applying theory of incentive for disease prevention and theory of social support for changing elderly people's

behavior to prevent falls because the individual's social relationships have a high influence on expectations and reactions to support [14].

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## Morphometry of mountain crabs (Crustacea: Decapoda: Brachyura: Potamidae) from Phetchabun Mountains Thailand

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### Abstract

Mountain crabs are freshwater crabs which live in high mountain streams. They are an important food source for local villagers, but some species are threatened with extinction. The aims of this study was to collect and identify mountain crabs of family Potamidae using external morphology, and morphometric analysis. A total of 138 crabs (103 males and 35 females) were collected from 15 locations of the Phetchabun Mountains (310 to 845 meters above sea level). The morphological crab was classified based on gonopod and other characters. This study identified six species: *Indochinamon bhumibol*, *Indochinamon ahkense*, *Indochinamon mieni*, *Iomon nan*, *Vietopotamon phuluangense* and *Larnaudia chaiyaphumi*. All species showed relationship between the carapace width and weight, indicating that they maintain the same shape throughout life, making identification more difficult. The variety of morphological characteristics presents a challenge in the identification. *I. bhumibol*'s the first gonopod is extreme like other species and has high variation coloration. Therefore, taxonomists need to search for other characters and techniques for classification. It is suggested that species of crabs facing extinction be selectively propagated incapacity for release back into the wild.

**Keywords:** Morphometry, Potamidae, Phetchabun Mountains, mountain crabs.

**Article history:** Received 16 January 2020 Accepted 24 April 2020

### 1. Introduction

The study of freshwater crabs in Thailand started about 1920. Most of the previous mountain crabs studies of mountain crabs placed them in the genus *Potamon* but they were separated into many genera later [1]. Now, there are 93 species in 25 genera of the family Potamidae in Thailand distributed in mountainous regions [2]. The decapod crustacean family Potamidae consist primarily of crabs of fast streams and waterfalls in, waterfall crab and mountain areas. These crabs are important in mountain ecosystems, and are indicators of non-polluted water [3, 4]. Some mountain crabs species are considered by the International Union for Conservation of Nature (IUCN) to be "Endangered (EN)". The mountain crabs have provided an important source of food and income for local villagers. Increasing exploitation has reduced the number of mountain crabs. Furthermore, village still lack basic information about their life cycle, abundance, kind of crabs and their distribution. On the other hand, mountain crabs are facing threats such as over-consumption, reduced forest area, tourism activities and water pollution. Freshwater crabs distributed in

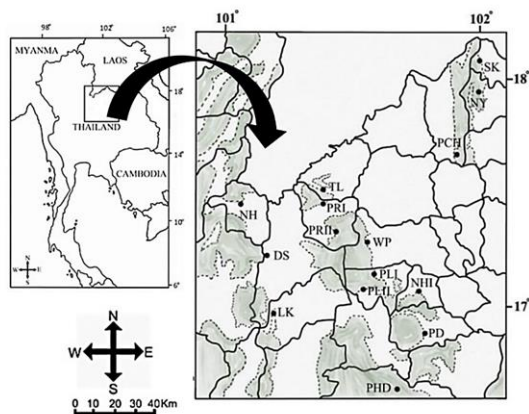
aquatic and terrestrials of tropical and subtropical region [5]. The Phetchabun Mountains are located in the Northeast of Thailand, it connected to the south of Luang- Prabang Range Laos, and is headwater streams with a high diversity of endemic organisms [6, 7].

Currently, mountain crabs are facing several threats, and they are not protected under the Wildlife Preservation and Protection Law of Thailand, it is urgent to study and identify mountain crabs of family Potamidae using external morphology, morphometric and distribution areas. It can apply knowledge for the selection of crab species for the conservation of mountain crabs.

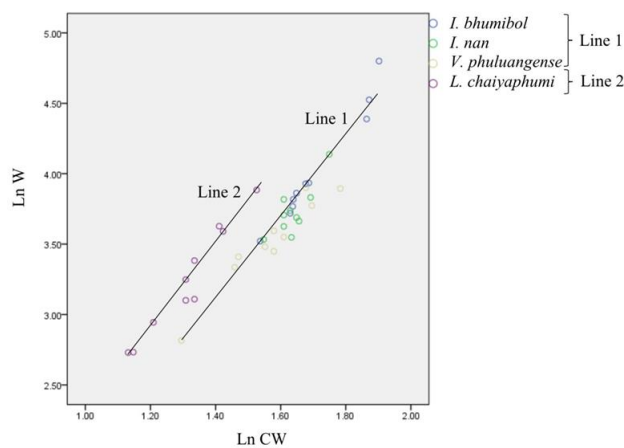
### 2. Materials and Method

Field surveyed and the collection was carried out with the help of local peoples. The specimens were collected by traps from mountain streams in the Phetchabun Mountains for 3 months (May 2019 to September 2019). The sampling locations from located in five Provinces (Loei, Phetchabun, Nongkhai, Udonthani, and Chaiyaphum). Collective locations have 15 areas: Phuruea (PRI, PRII), Dansai (DS), Thali (TL), Phuluang (PLI), Lomkao (LK), Pakchom (PCH), Sangkhom (SK), Nayoong (NY), Nahaew

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**Figure 1:** Sampling location of mountain crabs in Phetchabun mountains Thailand.



**Figure 2:** The relationship between weight and carapace width of six mountain crabs.

(NH), Nonghin (NHI), Phuluang (PLII), Wangsapung (WP), Phukradueng (PD) and Phakdichumphon (PHD) (Figure 1). Specimens were cleaned and kept at  $-20^{\circ}\text{C}$  at the faculty of Science Mahasarakham University until being processed. The external morphological characters including carapaces, chelipeds, walking legs, abdomen, chelae, third maxilla, mandibular palls, first gonopods (G1) and second gonopod (G2) were studied using existing published methods of Chuensri (1973) [8], Yeo & Ng (2008) [9], Ng & Naiyanetr (1993, 1995, 2003) [11, 12], T. Pramual (1990) [13], Brandis (2000) [14], Supajantra (2002) [10], Ng & Guinot (2008) [15] and Naruse et al (2018)[16]. We measured carapace width and carapace length of all crabs using a Vernier caliper. The specimens were weighed (wet weight: W) using an analytical pocket balance to the nearest 0.01 g. We use these data to study the relationship between carapace width (CW) and weight (W), using the equation  $W = a(CW)^b$ , where: (a) is the intercept on the y-axis and, (b) is a shape variable relat-

ing C and W. The above equation can be transformed to a linear regression by taking natural logarithms:  $\ln W = \ln(a) + b \ln(CW)$ . Linear regression analysis can be used to estimate the fitted values of a and b [17 – 19].

### 3. Results

#### 3.1 Collecting sample and study locations

Sampling locations were scattered in five princes in Phetchabun Mountains of Thailand. It is located between latitudes 101 to 102 and longitude from 16.5 to 18.30. The crabs have collected 138 crabs (103 males and 35 females) from high mountain streams. It was found that *I. bhumibol* has the highest distribution as 369 to 845 meters above sea level. The most mountain crabs live under rocky stream but there are some species (*V. phuluangense*) prefer to dig a hole beside the soil stream. Their habitats have various kinds of rock including siltstone, sandstone, limestone and round pebbles (Table 1).

#### 3.2 Morphometrics variation

The biggest size of crab is *I. bhumibol*, its mean W, CW and CL were 54.81 (98.15-31.55) g, 52.75 (42.54-65.43) mm, 41.00 (32.35-50.05) mm respectively. *V. phuluangense* is the least size. *L. chaiyaphumi* is the least of difference and ratio between CW and CL as 0.78 and 1.26 respectively (Table 2). The figure 2 shows growth pattern of specific body part. From the study, it was found that, almost mountain specimens shows relationship of the carapace width (CW) and wet weight (W). It could be explained by the linear graph regression that has normal distribution and linear equation as  $W = -2.776C^{-0.661}$  and  $Y = -0.661 + 2.776X$  ( $R^2 = 0.944$ ). *I. bhumibol*, *V. phuluangense* and *I. nan* have a high relationship (Line 1). *L. chaiyaphumi* has the least relationship with other species (Line 2) (Figure 2).

#### 3.3 Morphological and color body variation

The 138 crabs were classified into four species. Some characteristics showed variation and unclear morphology, and various species had very similar characteristics. *I. nan*: dorsal view carapace and the color body were dark-brown-olive, carapace surface was crease and clear groove. The ventral body was white. The most of crabs had bigger right chelae than left, the chelae and walking legs tip had oranges. G1, the subterminal joint was wide base and narrow upper, the terminal joint was broken-curve and hook tip. G2, upright terminal segment was the nib (Figure 3); *V. phuluangense*: dorsal view carapace, and the color body were dark-brown or brown-yellow. The carapace surface was a smooth and unclear cervical groove. The ventral body was yellow-white. The most of crabs had bigger right chelae than left, the chelae and walking legs tip were brown-orange. G1, the subterminal joint

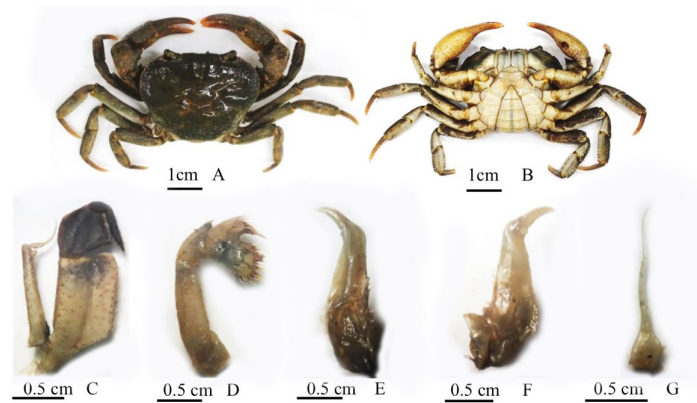
**Table 1.** List of specimens of six Potamidae species and each sample collecting locality, GPS coordinates and altitude.

Species/Locality	Geographic position	Elevation (m)	Total number (N) M = male, F = female	Habitat/ Rock*
<i>Indochinamon bhumibol</i> (Naiyanetr, 2001)			N = 84, M = 59, F = 25	
Phuruea District, Loei Province (PRI)	17 23'09.4"N 101 29'20.1"E	733	N = 8, M = 4, F = 4	rocky stream/siltstone
Phuruea District, Loei Province (PRII)	17 28'55.88"N 101 23'04.45"E	789	N = 10, M = 3, F = 7	rocky stream/siltstone
Dansai District, Loei Province (DS)	17 15'01.70"N 101 08'24.99"E	414	N = 10, M = 8, F = 2	rocky stream/siltstone
Thali District, Loei Province (TL)	17'32'09"N 101'19'41"E	829	N = 9, M = 6, F = 3	rocky stream/siltstone
Phuluang District, Loei Province (PLI)	17 06'04"N 101 33'28"E	845	N = 9, M = 7, F = 2	rocky stream/siltstone
Lomkao District, Phetchabun Province (LK)	17 06'25.94"N 101 19'06.62"E	602	N = 10, M = 7, F = 3	rocky stream/siltstone
Pakchom District, Loei Province( PCH)	17 02'50"N 101 50'56"E	720	N = 10, M = 9, F = 1	rocky stream/siltstone
Sang-Khom District, Nongkhai Province (SK)	18 12'05.01"N 102 06'39.51"E	369	N = 8, M = 7, F = 1	rocky stream/siltstone
Nayoong District, Udonthani Province (NY)	18 28'5 N 102 87'7 E	473	N = 10, M = 8, F = 2	rocky stream/round pebbles, sandstone
<i>Iomon nan</i> (Ng & Naiyanetr, 1993)			N = 10, M = 10, F = 0	
Nahaew District, Loei Province (NH)	17 18'16.90"N 101 05'49.93"E	795	N = 10, M = 10, F = 0	rocky stream/ sandstone
<i>Vietopotamon phuluangense</i> (Bott, 1970)			N = 41, M = 24, F = 17	
Nonghin District, Loei Province (NHI)	17 02'50"N 101 45'40"E	594	N = 10, M = 4, F = 6	rocky stream/red brown sandstone
Phuluang District, Loei Province (PLII)	17 05'29.37"N 101 34'11.31"E	461	N = 7, M = 5, F = 2	rocky stream/ sandstone
Wangsaphung District, Loei Province (WP)	17 16'16"N 101 34'42"E	411	N = 6, M = 2, F = 4	rocky stream/limestone
Phukradueng District, Loei Province (PD)	16 50'15.59"N 101 49'42.49	310	N = 11, M = 8, F = 3	rocky stream/brown sandstone
<i>Larnaudia chaiyaphumi</i> (Naiyanetr, 1982)			N = 10, M = 10, F = 0	
Phakdichumphon District, Chaiyaphum Province (PHD)	16 08'42.42"N 101 27'49.23"E	462	N = 10, M = 10, F = 0	rocky stream/sandstones, siltstones
			N = 138, M = 103, F = 35	
				sandstone

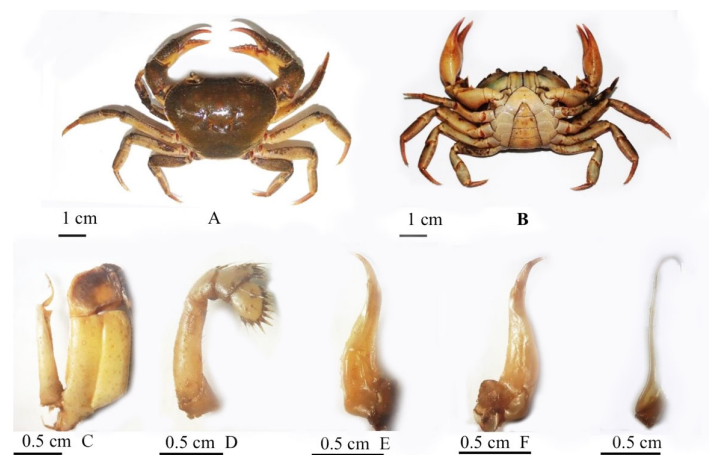
\*Type of rock was identified from the data of Department of Mineral Resources  
(<http://www.dmr.go.th/download/digest/Leai2.pdf>)

was wide base and the smooth narrow upper, terminal joint was alike semilunar curve. G2, upright terminal segment had a curve sclerotized tube (Figure 4); *L. chaiyaphumi*: dorsal view carapace and the color body was bark-brown-orange. The carapace surface was a quite smooth, clear semi-circular and unclear crevicular groove. The ventral body was white-brown. Most of the chelae crabs had right bigger than left. The walking legs surface was Black spot pattern. G1, the subterminal joint was wide base and narrow upper, the terminal joint was an upright conical shape. G2, upright terminal segment was the nib (Figure 5);

*I. bhumibol*: dorsal view carapace and the color body were dark-purple (morpho I), onyx-dark-blue (morpho II), brown-yellow (morpho II) or dark-brown (morpho IV). The carapace surface had a small granum, clear cervical groove and semicircular groove. The ventral body was brown-white or purple-white. Most of the crabs had bigger right chelae than left (Figure 6). *In. ahkense*: dorsal view carapace and the color body were brown-orange. The carapace have granule on lateral and frontal surface, clear cervical groove, and clear semi-circular groove. The ventral body was brown-white. G1's the subterminal was wide base and



**Figure 3:** *Iomon nan* male. A, dorsal view; B, ventral view; C, left third maxilliped; D, right mandibular palp; E, right first gonopod anterior view; F, right first gonopod posterior view; G, second gonopod.



**Figure 4:** *Vietnopotamon phuluangense*, male. A, dorsal view; B, ventral view; C, left third maxilliped; D, right mandibular palp; E, right first gonopod anterior view; F, right first gonopod posterior view; G, second gonopod.

narrow upper (a little hair), G1's flexible zone was unclear. The terminal joint was 45-degree angle and straight tip. G2, upright terminal segment had a curve sclerotized tube (Figure 7); *In. mieni*: dorsal view carapace and the color body were onyx-dark-blue. The carapace has granule on the lateral and frontal surface, clear cervical groove, and clear semi-circular groove. The ventral body was purple-white. The chelae and walking legs tip were white-oranges. G1's subterminal joint was narrow base and concave in the narrow upper (a little hair), G1's flexible zone was concave V-shape. The terminal joint was the 45-degree angle and slightly angled bent tip. G2's upright terminal segment had a curve sclerotized tube. The walking leg surface of *In. mieni* had a black spot pattern (Figure 8). All three species of genus *Indochinamon*, have small granum on the lateral and frontal surface, clear cervical groove, and semicircular groove. Their G1 character was very similar, but there were a little different each species. Most of the crabs had bigger right chelae than left.

## 4. Discussion

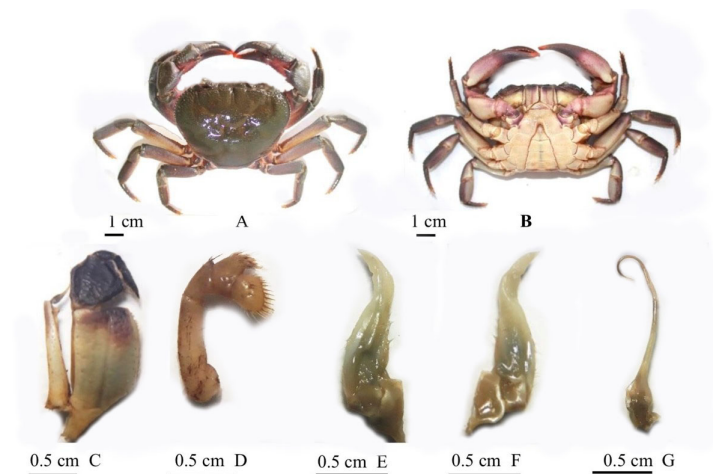
### 4.1 The distribution and collection samples

Tropical Southeast Asia is the species richness location, comprises many important of the world's biodiversity, Phetchabun mountains have abundant natural resources and various kind of animals and plants [7, 21]. This study found four species in four genera: *I. bhumibol*, *I. nan*, *V. phuluangense* and *L. chaiyaphumi*. All of them live in abundant location, clean water, and moderate flowing streams. They were important food for the locals especially *I. bhumibol*, because of its big body size (The biggest freshwater crab in Thailand). It is also the endemic species of Loei Province [22]. There were important endemic species every continent such as *Candidiopotamon rathbunae* in Taiwan [23] and *Sesarma* species Western Jamaica [24]. Almost of them are risking of extinction. From study of Shih & Ng (20011) found freshwater crabs in Eastern Asian distributed to china and upper ASEAN countries [25]. *I. nan* used to classify into genus *Potamon* (Its old name is *Potamon man*, it was first discovered in Nan Province





**Figure 5:** *Larnaudia chaiyaphumi*, male. A, dorsal view; B, ventral view; C, left third maxilliped; D, right mandibular palp; E, right first gonopod anterior view; F, right first gonopod posterior view; G = second gonopod.



**Figure 6:** *Indochinamon bhumibol*, male. A, dorsal view; B, ventral view; C, left third maxilliped; D, right mandibular palp; E, right first gonopod anterior view; F, right first gonopod posterior view; G, second gonopod.

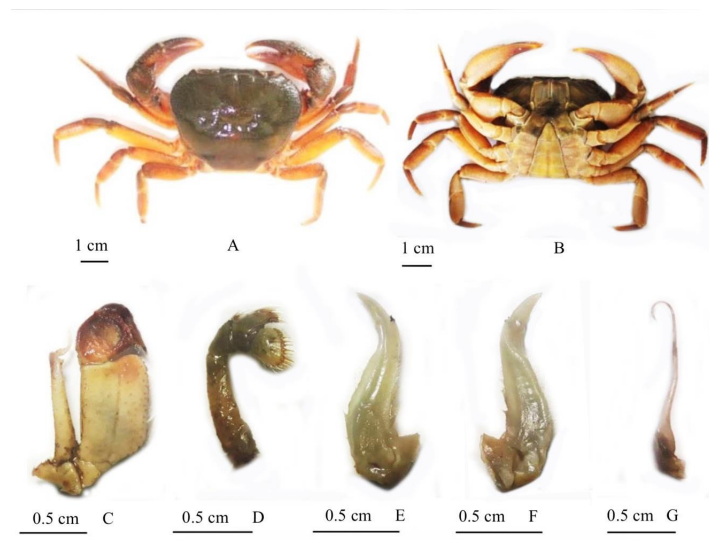
[1, 11]. This study collected from Nahaew District, Loei Province (NH). This species was considered as EN, because its distributive area is really restricted (less than 500 km<sup>2</sup>) [26]; *V. phuluangense* was found distributional area between border of Vietnam, Laos and Thailand. Its characteristics is very similar to *Ranguna luangprabangensis* (Rathbun, 1904) [11]; *L. chaiyaphumi* was considered as Least concern [25]. It was found Phakdichumphon District, Chaiyaphum Province (Figure 1). From 1973 to 2019, Thailand's forest has been decreased from 43% to 31% [26]. The increasing of the anthropogenic activities results to discharging of chemical materials and pollutions to the environment such as: urbanizations, industries, agricultural development, tourism activities, mining and overexploitation. From these causes affected to decreasing of crabs habitat [27 – 32]. The dramatic effect was threat for crab's biodiversity. From this study two species were discovered and considered as EN such as *I. nan* and *I. bhumibol*. According with IUCN assess-

ment, 27% of crustaceans were threatened with extinction [29].

#### 4.2 Morphological and Morphometric analysis

Over decades ago, taxonomy depend on differentiation of external morphology. Some species was mistakenly classified, was had confused. For example *Iomon luangprabanges* used to incorrectly identified as *Iomon nan* and *Indochinamon cua* [13, 9]. *I. nan* had old name that *Potamon nan* [13]. It had previously been referred to *Ranguna luangprabangensis* (Rathbun, 1904). Its terminal joint of G1 was broken curve and hook tip like to *Doimon maehongsonensis* (Naiyanetr, 1992), but *D. maehongsonensis* was curvature and thickening on the mid-terminal joint of the G1. *I. bhumibol*: Its old name was *Potamon bhumibol* (Naiyanetr, 2001). It was moved to genus *Indochinamon*. Its G1, G2 and carapace characteristics were similar to those of the *Potamon tannanti* species





**Figure 7:** *Indochinamon ahkense*, male. A, dorsal view; B, ventral view; C, left third maxilliped; D, right mandibular palp; E, right first gonopod anterior view; F, right first gonopod posterior view; G, second gonopod

**Table 2.** Morphometric characters for four species Potamidae.

species	weight			carapace						WC-L average	CW/CL average
	max	min	average	wide: WC (cm)			long: CL (cm)				
				max	min	average	max	min	average		
<i>I. bhumibol</i>	98.15	31.55	<b>54.81</b>	6.54	4.24	<b>5.27</b>	5.00	3.23	<b>4.10</b>	1.18	1.29
<i>In. ahkense</i>	68.16	33.31	51.47	59.20	49.5	54.10	46.20	38.00	41.70	12.40	13.00
<i>In. mieni</i>	72.23	12.10	39.51	63.00	31.0	47.00	48.30	24.00	36.80	10.20	12.80
<i>I. nan</i>	62.65	34.23	42.25	5.75	4.70	5.15	4.45	3.60	3.98	1.17	1.29
<i>V. phuluangense</i>	37.5	9.445	22.49	4.82	2.91	3.89	3.68	2.27	2.99	0.9	1.29
<i>L. chaiyaphumi</i>	48.63	15.33	27.20	4.60	3.10	3.75	3.60	2.45	2.97	0.78	1.26

group. The *P. tannanti* group consisted of *Indochinamon jinpingense* (Dai, 1995) [Northern Vietnam, Southern China], *Indochinamon orleansi* (Rathbun, 1904), *Indochinamon mieni* (Dang, 1967), *Indochinamon guttus* (Yeo & Ng, 1998), *Indochinamon lipkei* (Ng & Naiyanetr, 1993) [Northern Thailand] [20, 15] and *Indochinamon ahkense* (Naruse, 2018) [Yunnan Province China] [16]. *V. phuluangense*: It had previously been identified as a subspecies as *P. luangprabangensis* (Ng & Naiyanetr, 1993). However, the G1 had characteristics like those of *Iomon luangprabangensis* (Rathbun, 1904), but the tip of terminal joint of *I. luangprabangensis* was more bent. In this the study found that various of G1 character within each species especially *I. bhumibol* and *V. phuluangense* [34] found that the frog crab (*Ranina ranina*) showed variations in the carapace color, white spots patterns, antenna shape, feeding apparatus and maxilliped each individual crabs. In some Potamonautidae used mandibular palps and third maxilliped for identifying [35], but it cannot use in Potamidae. However, G1 characteristics have a clear difference in inter-genus, but overlap within the genus. G2 characteristics were divided into two groups: the first group was upright sclerotized tubes (*I. nan* and *L. chaiyaphumi*); the second

group was curved sclerotized tubes (*In. bhumibol*, *In. ahkense*, *In. mieni* and *V. phuluangense*). Mountain crabs showed high color variation, it may be a result of carapace formation that has to gotten minerals (Calcium carbonate) from food and environment after molting [32]. The animal color variation was the topic that linked to the history of the evolution. There was discovery on various animals which had color pattern changed, based on the environment. For example, land animal group were studied in primates, birds, butterflies [33], insects [34], centipede [35] and grass frog [36]. In this study, coloration variation of all four group species was discovered. The truth that the animal color is determined by genes in the body, but environment may influence to color variation. Morphometry of four species of Potamidae showed relationship between CW and W, in accordance with the study of Fadlaoui et al (2019) which found the allometric growth patterns of *P. algeriense* [19], Buatip et al. (2017) studied the relationship of CW and W in five freshwater crabs in southern Thailand [3]. *I. bhumibol* was the biggest crabs in this group, was similar to the biggest crab in the same genus in Chinese (CW = 59.4 mm) [16]. The relationship of the wide carapace and wet weight showed the growth pattern of moun-



**Figure 8:** *Indochinamon mieni*, male. A, dorsal view; B, ventral view; C, left third maxilliped; D, right mandibular palp; E, right first gonopod anterior view; F, right first gonopod posterior view; G, second

tain crabs. However, environments, foods, age and organism's chemical reaction may cause variation in morphological characteristics. Habitats influence the growth and shape of animals, according to the phenotypic plasticity theory [37].

## 5. Conclusions

The morphology of the mountain crabs showed external morphological variation that was influenced by the environment. The characteristics were varied in each habitat. These phenomena were explained by the phenotypic plastic theory. These mountain crabs were classified using gonopod characteristics as four species which were *I. bhumibol*, *I. nan*, *V. phulungense*, *L. chaiyaphumi*. For the extremely close species was quite hard to classify. There were many possible factors that promoted morphological differentiation include: foods, water, mineral, and genetic structure. Therefore, taxonomists need to combine the study both of morphological characters and genetic molecular techniques in order to select breeders for commercial rearing.

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## Factors affecting dividend policy: Evidence from manufacturing company in Indonesia

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### Abstract

The goal of the current research was to prove the effect of profitability, liquidity, leverage, company growth and company size to the dividend policy. Object of the research was manufacturing companies listed in Indonesia Stock Exchange, period 2016 – 2018. Sampling method used purposive sampling. Method of data analysis used Structural Equation Modeling (SEM) with Warp PLS 4.0. Based on the analysis, profitability, company growth and company size significantly affected to dividend policy, while liquidity and leverage did not significantly affect to dividend policy. For future research, it should make synthesis research with other factors influencing dividend policy. For go public companies, knowing that dividend policy is one of the most considerations by investors in investing, they should make the best dividend policy to attract investors to invest.

**Keywords:** Profitability, liquidity, leverage, company growth, company size and dividend policy.

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### 1. Introduction

Manufacturing industry is raw material treatment to be end product or on work-product. The industry has an important role in supporting the progress of Indonesia economy. In the period of the research, manufacturing industry is undergoing the decline. It is caused by the business war between US and China, the strength of AS dollars curs and the poor performance of export because of slowing global economy growth. Therefore, the investor role is needed to stabilize the Indonesia economy condition. Economy indicator often used by investors to see business condition in manufacturing sector is Purchasing Managers Index Manufacturing (PMI-Manufacture). Eventhough weak, up to Desember 2018, index of PMI manufacture is still in expansive level, namely 51,2 (Kontan.co.id). The government has tried to attract investor interest, whether it is through foreign capital investment or domestic capital investment. Dividend policy is interesting to be analysed, especially in manufacturing companies listed in Indonesia Stock Exchange. Dividend policy is management policy to determine profit proportion for investors and profit proportion to fund company operation. One of factors considered by capital investor before investing their stock is dividend return rate. The main purpose of investors to invest is getting welfare through income in the form of dividend

or capital gain. Investors tend liking the stable level of dividend return.

Brigham and Houston [1] stated that dividend sharing proportion does not determine company value. A company value is measured based on the capability in booking the profit. For investors, dividend gain is saver than capital gain. The management must be accurate in making decision concerning dividend policy. The investors's interest and company internal funding must be balanced. Dividend policy in manufacturing sector in declining phase can be affected by many factors. One of the factors influencing the dividend policy is profitability. Return on asset (ROA) as proxy of profitability is used to measure profitability ration ROA giving description about to what extent profit gained by a company uses its owned activa. The increase of ROA value reflects the capability of the company in booking the profit, that will be retained earning or will be paid to investors in the form of dividend. Hanif & Bustaman [2] and Wicaksono & Nasir [3] found that profitability significantly affects to dividend policy. The different result is stated by Sari & Sudjarni [4], Laim [5], and Swastyastu [6] finding that profitability does not affectto the dividend policy. The other factor influencing the dividend policy is liquidity. Liquidity counted by using Current Ratio (CR) in the current research, describes to what extent a company is capable in meeting its current liabilities using current asset by the company. The dividend shar-

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ing will increase if CR values is high. Nevertheless, if debt level owned by a company is higher, the dividend sharing by the company will decline [7]. However, the measure does not describe the level of liquidity wholly of each current asset component [8]. Sari & Priyadi [7] and Wicaksono & Nasir [3] stated that liquidity does not affect to dividend policy. The other result is found in the research of Sari & Sudjarni [4] and Mawarni & Ratnadi [9] finding that there is a significant effect between liquidity and dividend policy.

The other factor affecting dividend policy is leverage. Leverage is one of important components because it covers funding and company performance. Company performance can decline because of higher leverage. In such situation, a company will be difficult to meet its obligation. In the research, leverage ratio is described by Debt to Equity Ratio (DER). DER is the comparison between the amount of company liabilities to own capital. A company with higher leverage will retain the profit and use to fund the liabilities and share the dividend in small portion. The research of Hanif & Bustaman [2] and also Wicaksono & Nasir [3] found that leverage does not significantly affect to dividend policy. Conversely, Sari & Sudjarni [4] found that leverage significantly affect to dividend policy. The other factor influencing the dividend policy is company growth. Indicator of company growth can be seen from selling level. The selling growth that increase will give opportunity for the company to grow and develop. Most of profit of company operation result will be used to fund the growth. A company with higher growth will tend minimizing the dividend sharing to the investors. Sari & Priyadi [7], Sari & Sudjarni [4], and Wicaksono & Nasir [3] in their research found that company growth significantly affects to dividend policy. On the other hand, Laim [5], Ahmad [10], and Swastyastu [6] found that company growth does not affect to dividend policy. The last factor affecting dividend policy is company size (CS). CS can be counted with total active the company has. The big company has a bigger opportunity to enter capital market if compared with the smaller one [3]. A company getting funding from external resource should share part of the profit gained to the investors. Hanif & Bustaman [2] and Wicaksono & Nasir [3] found that CS does not affect to dividend policy. The different result was found by Devi & Erawati [11] and Ahmad [10] finding that CS affects to dividend policy significantly. Based on the phenomena and research gap, it can be proposed questions whether ROA, CR, DER, Growth and CS have significant effect to dividend policy.

## 2. Literature Review and Hypothesis Development

Agency theory and signalling theory is grand theory in the current research. ROA is capability of company ratio to gain profit using its owned asset. Meanwhile dividend is part of net profit after tax accepted

by shareholders. In other side, management want the profit be retained to reinvest to fund the company operation. Therefore, ROA can be one of factors being able to influence dividend policy of a company. It is in line with the research of [2, 3], and [10] finding that profitability significantly affect to dividend policy.  $H_1$ : ROA affects to dividend policy.

CR is company capability in paying current liabilities using liquid asset. Paying dividend is out cashflow and constitutes one of obligations of principal to the shareholders. Based on signalling theory, CR value is a signal of company capability in paying its current liabilities and one of them is paying dividend. The higher percentage of CR does not guarantee the higher dividend paying of principal. Referring to agency theory, between management and shareholders, there is different interest. Management has interest to use liquid asset as funding of company operation and not always act in line with investors's interest. Thus, it can be concluded that CR significantly affect to dividend policy. It is in line with the research of [4] and [9] finding that liquidity has significant effect to dividend policy.  $H_2$ : CR affects to dividend policy.

DER is a ratio to measure the capability of company in fulfilling all liabilities using its own capital. The ratio will affect management in making a policy. If viewed from agency side, higher liability ratio will cause a company more focused on paying the liabilities than sharing the dividend. Thus, the investor's interest to gain dividend as return is not fulfilled yet as long as the level of liabilities is still high. If related with signalling theory, DER value of a company can be negative signal for a company. The number indicated by the ratio can decrease the investor's interest to invest his fund. Investors in law usually considers the ratio number to forecast the return for his investment in the future. Thus, it can be concluded that DER affects to dividend policy. It is in line with the research of [4] and [10] finding that DER significantly affects to dividend policy.  $H_3$ : DER significantly affects to dividend policy.

A company growing will tend using the profit gained to fund the growth. Agency theory postulates that in determining the dividend policy, it often occurs conflict of interest between management and investors. Investors want profit of company shared as dividend, while management tend retaining it to reinvest or use the profit to fund the growth of the company. The company growth indicates that there is a better prospect to gain higher profit in the future. Based on signalling theory, it gives positive signal for company and can attract investors to invest. It is assumed that growth will affect to dividend policy. It is in line with the research of [7, 4], and [3] finding that growth significantly affects to dividend policy.  $H_4$ : Growth significantly affects to dividend policy.

CS can be measured based on number of asset owned by company. Big company will be easier to ob-

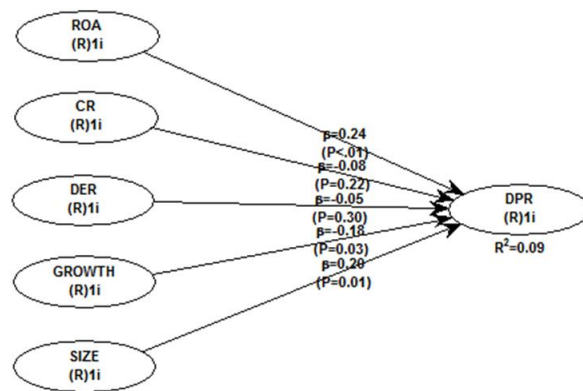


Figure 1: Research result.

tain fund from external because they have better stock market access. It indicates that flexibility and capability of company to get bigger fund is better. If it is related with signalling theory, CS measured by total asset is able to send positive signal for financial report users, especially investors. Thus, the bigger company has an obligation to pay the return to the investors higher than the smaller one. If seen from agency side, investors want dividend return of fund invested in a company listed in stock exchange. In other side, management has interest to reinvest the fund to get higher return. Written contract between investors with the principal is one of the ways to minimize the conflict of agency. Thus, it is concluded that CS has significant effect to dividend policy. It is in line with the work of [11] and [10] finding that there is significant effect between CS and dividend policy. H<sub>5</sub>: CS significantly affects to dividend policy

### 3. Research Method

Population of the research was all manufacturing companies listed in Indonesia Stock Exchange. Purposive sampling is a technique used to choose sample of research. The measurement of ROA is EAT/Total Asset, CR is Current asset/current liabilities, DER is Total liabilities/Equity, Growth is Selling, CS is natural log of total assets, DP is DPS/EPS. Partial Least Squares-Structural Equation Modeling (SEM) was used to run path analysis with latent variable. PLS can be used for analysing secondary data [12 – 15]. Statistic analysis was chosen because of having many benefits [16].

### 4. Result and Discussion

Manufacturing companies listed in Indonesia Stock Exchange in the period of 2016-2018 was the object of the research. The number of population was 155 companies. Based on the criteria, 35 companies were the

samples. Thus, the sample data in the research were 105 data, namely: 35 companies for 3 years. The average block VIF (AVIF) value of 1,261 showed that the AVIF value was ideal and it is accepted. The average full collinearity VIF (AFVIF) value of 1,210 also revealed the ideal one and accepted AFVIF value. Moreover, the GoFtenenhaus value (GoF) of 0,308 which indicated that the value was middle.

#### 4.1 The effect of ROA on DP

Based on data analysis, it is known that ROA significantly affects to dividend policy. The higher the dividend value is shared, the higher the company can book the profit. It is in line with the signalling theory stating that a company shares the dividend as signal of company's success in booking the profit. Different with the agency theory, such condition often causes agency conflict. Management (agent) has different interest with shareholders (principal). Nevertheless, by sharing the dividend, it can increase the welfare of shareholders so that the trust toward the company will increase. Though often occurring conflict because of profit booked, based on the research, agent really pays attention to the principal's interest to share dividend as part of return. It proves that the level of ROA will affect to management in determining dividend policy. The research finding is in line with [2, 3], and [10] stating that profitability measured by ROA significantly affect to dividend policy. However, it is not in line with the research findings of [4, 5], and [6] finding that profitability does not affect to dividend policy.

#### 4.2 The effect of CR to dividend policy

Based on partial test result, CR does not affect to dividend policy. Based on signalling theory, CR value can be a signal of capability of a company in fulfilling the short term liabilities using his own current assets, included sharing dividend. However, liquidity of each component of current assets is not always measured with CR. There are still many other rations, such as liquidity ratio (quick ratio, cash ratio, and cash turnover ratio). If CR does not affect to dividend policy, it can be the other ratio of liquidity affecting the dividend policy. Viewed from agency side, agent will tend using liquid asset owned to fund company operation. Moreover, period of the research is in the phase of declining. The US curs strengthening causes company need more fund to run the business. Of the elaboration, it can be concluded that in determining the proportion of dividend sharing, management does not consider CR value. CR is prioritized to know the internal fund sufficiency to fund the company operation and fulfill its current liabilities. The finding supports the research result of [7] and [3] stating that liquidity measured with CR does not affect to dividend policy. However it is in line with the finding of research of [4] and [9] finding that liquidity has significant effect to dividend policy.



**Table 1.** Hypothesis testing results.

Path	Direct Effect		Remark
	Coefficient	p-value	
ROA → DPR	0,243	0,005	H <sub>1</sub> is accepted
CR → DPR	-0,075	0,217	H <sub>2</sub> is rejected
DER → DPR	-0,051	0,300	H <sub>3</sub> is rejected
Growth → DPR	-0,182	0,027	H <sub>4</sub> is accepted
Size → DPR	0,205	0,014	H <sub>5</sub> is accepted
<b>Indikator Model Fit</b>			
Average Path Coefficient (APC)	0,151	0,028	
Average R-square (ARS)	0,095	0,080	
Average Adjusted R Squared (AARS)	0,049	0,153	

#### 4.3 The effect of DER to dividend policy

Based on partial test result, DER is a liability ratio owned by company. The ratio describes the capability of the company to fulfill all liabilities using its own capital. If seen from agency theory, a company with high level of liability will tend paying its liabilities than paying the dividend. However the finding of the research indicated that DER does not affect to dividend policy. Liability is one of funding resources. A company having many funding resources will tend developing his business. Thus, liability level is not always as negative signal for company. The level of resources of funding does not affect to management in making financial policy, and one of them is dividend policy. The finding is in line with the result of research of Hanif & Bustaman (2017) and Wicaksono & Nasir (2014) stating that leverage does not affect to dividend policy. However, the finding of the research does not support the research finding of Sari & Sudjarni (2015) and Ahmad (2014) stating that DER significantly affect to dividend policy.

#### 4.4 The effect of Growth to dividend policy

Based on partial test result, DER is a liability ratio owned by company. The ratio describes the capability of the company to fulfill all liabilities using its own capital. If seen from agency theory, a company with high level of liability will tend paying its liabilities than paying the dividend. However the finding of the research indicated that DER does not affect to dividend policy. Liability is one of funding resources. A company having many funding resources will tend developing his business. Thus, liability level is not always as negative signal for company. The level of resources of funding does not affect to management in making financial policy, and one of them is dividend policy. The finding is in line with the result of research of [2] and [3] stating that leverage does not affect to dividend policy. However, the finding of the research does not support the research finding of [4] and [10] stating that DER significantly affect to dividend policy.

#### 4.5 The effect of CS to dividend policy

Based on partial test result, CS in the research is measured based on total asset ratio. Total asset ratio had by a company is a signal offunding used to operationalize company. Big companies tend easier to enter capital market and get external fund. External fund is derived from share publishing oblige to company to pay shareholders dividend. Seen from agency side, of capital invested, principals want to get returns. Capital managed well will increase business operation so that CS will also increase. The increase of CS indicates the capability of company in paying dividend. Therefore, the change of CS will influence agent in making dividend policy. The research is in line with the result of research of [11] and [10] finding that CS significantly affect to dividend policy. However, it is not in line with finding of research of [2], and [3] stating that CS does no affect to dividend policy.

### 5. Conclusion

The conclusion of the research is that profitability, company growth and CS significantly affect to dividend policy, while liquidity and leverage do not affect to dividend policy. The limitation of the research is that the value of adjusted R square is just 4,9%, 95,1% dividend policy variable is affected by other variables out of model. Therefore, for future researchers, they should make synthesis research by taking into account other factors that influence dividend policy. Thus, the variables used are more varied and obtain better research models. While for go public companies, knowing that dividend policy is one of the important things considered by investors in investing, they should make the best dividend policy to attract investors to invest.

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## Factors affecting earnings management: manufacturing companies in Indonesia

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### Abstract

Proving whether profitability, managerial ownership and firm size influence earnings management were the objectives of this study. All manufacturing companies listed on the Indonesia Stock Exchange in the 2014-2018 period were made the population in this study. The sample selection technique used was purposive sampling, the sample used amounted to 34 companies for 5 years. So, the observation data amounted to 170 data. Data analysis using Structural equation modeling (SEM) with Warp PLS 4.0. From the test results prove that the profitability variable affects earnings management, while managerial ownership and company size do not affect earnings management. Therefore, the recommendations for future research is to add another variable because there may be other variables not included in this study, which may affect earnings management such as good corporate governance, auditor reputation, company age, leverage, and so on.

**Keywords:** Profitability, managerial ownership, company size, earnings management.

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### 1. Introduction

Cases of offense in the capital market which are handled by the Financial Services Authority (OJK) are the main issues in this study. The Openness of issuers and public companies, securities trading, and investment management are examples of cases of alleged capital market offense handled by OJK. The presentation of financial statements is one example of a case related to the openness of issuers and public companies. Providing information to users of financial statements in decision making is the purpose of preparing a financial statement. Besides that, the financial statements also refer to responsibilities related to management planning as the manager of the company to the stakeholders in one period. Profit is one of the main indicators to measure the performance and accountability of management (Statement of Financial Accounting Concepts No. 1), there by making poor financial management better.

So that performance looks good, then this triggers management to take creative accounting actions, example namely by changing accounting methods, shifting the recognition period of income or costs, and taking advantage of opportunities to make accounting estimates. But in reality, it is often misused. The act

of creative accounting is known as earnings management. Earnings management according to Fischer and Rosenzweig [1], as a manager's action by presenting a report that raises (decreases) the profit for the current period of the business unit for which he is responsible, without causing an increase (decrease) in the economic profitability of the unit in the long run. Managers make the motivation bonus an encouragement to get bonuses. The profit achieved by the company is used as the basis for bonus calculations. So that managers will choose the right accounting methods to be able to increase reported income in the current period [2]. Motivation of the contract arises because the agreement between the manager and the owner of the company is based on managerial agreement and debt agreement. Higher the debt/equity ratio of the company, then the challenges of the company will tighter and the agreement more difficult, more managers likely to use accounting methods that increase revenue. To spend all the regulations issued by the government, then encourage the emergence of politics [2].

Cohen, et. al. [3] in his study entitled earnings management trends and earnings informativeness in the period before and after the announcement of Sarbanes Oxley, found evidence that earnings management continued to improve from 1997 to 2002. Several factors influence earnings management actions, includ-

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ing profitability, ownership managerial, and company size. Profitability is a measure of the level of success or failure of a company in getting profits during a certain period. The value of company profitability is an indicator of measuring company performance. If the ability and performance of the company while generating profits increases, the value of profitability of the company is higher, and vice versa if the profit generated by the company decreases, the value of the company's profitability will also decrease. This is in line with the first earnings management motivation hypothesis, the bonus plan hypothesis. Thus, if the company gets profitability that tends to be small, the company will try to maximize profitability by taking creative accounting actions in the financial statements.

According to Wibisana and Ratnaningsih [4] prove that the level of profitability affects earnings management actions. Meanwhile, according to Yusrilandari, et. al. [5] and Bestivano [6] found evidence that profitability does not affect earnings management because investors do not care about information ratios so that management ignores profitability. Besides profitability, another factor that influences earnings management is managerial ownership. Managerial ownership is the participation of management in the ownership of company shares. The greater managerial ownership in the company, it is hoped that managers will be more motivated to improve their performance because management has the responsibility to meet the wishes of shareholders who are none other than themselves as shareholders so that it is expected to reduce earnings management. Research Liu [7], Fayoumi et. al. [8], Cornett et. al. [9] and Yermack [10] find evidence that there is a positive relationship between share ownership and earnings management. However, research by Gabrielsen et. al. [11] and Warfield, et. al. [12] find empirical evidence that managerial ownership is negatively related to earnings management. However, research from [5] conducted the same research but showed different results, namely earnings management is not influenced by managerial ownership.

Company size is also one of the factors that influence earnings management. Companies that have a large size tend to report their financial condition carefully because they will get more attention from stakeholders. Whereas small-sized companies will report higher profits to show the quality of company performance, Makaombohe, et. al., [13]. With this, it is concluded that managers who lead small companies have a strong incentive to do income smoothing compared to large companies. With such allegations, the size of the company affect the company's earnings management, if the size of the company is large, the higher the efficiency of earnings management. Research findings from Rahmani & Mir [14] and Rice [15] find evidence that earnings management is influenced by firm size. While [5], Gunawan, et. al. [16], and Lee

and Choi [17] show that company size does not influence earnings management. Therefore, the questions in this study are 1) Does profitability influences earnings management ?, 2) Does managerial ownership influence earnings management ?, 3) Does company size affect earnings management?

## 2. Literature Review and Hypothesis Development

Agency theory assumes that management can behave opportunistically to maximize its interests by carrying out earnings management. This will affect the quality of reported earnings because earnings do not reflect actual economic performance. This managerial action can be misleading and can cause outsiders to make the wrong economic decisions, Xie et. al. [18]. Making a profit is one of the goals of the company. If the level of profitability obtained by the company is high, then the principal considers that the company's performance is going well and supervision is going well. Meanwhile, if profitability is low, then the manager's performance looks bad in the eyes of the principal in performing his duties. Therefore, earnings management actions are usually carried out by management to obtain personal goals if management can improve the welfare of shareholders. Equality of goals between the two parties that makes management act in the interests of the owner, according to agency theory can minimize the occurrence of conflict of interest. According to [14] if both groups try to maximize their utility, then that reason becomes a strong foundation for believing that the principal's interests will always be fulfilled by the agent. So that management seeks to smooth income to maximize the utility between the two parties, these conditions can minimize agency problems that will occur. The high agency cost to be incurred by the principal depends on the magnitude of the agency problem. Research findings of [4] declares that the level of profitability affected earnings management actions.  $H_1$ : profitability affects earnings management

Managerial ownership is the number of shares owned by company managers. In decision making and corporate strategy, the role of the manager also participates in determining the existence of managerial ownership. If there is a manager's involvement as a shareholder, the agent will no longer work to represent the interests and welfare of shareholders but will work to optimize his well-being. This ownership causes no majority shareholder to be able to intervene in the authority of the manager so that all shareholders have relatively equal voting rights from one another. As a result, principals find it difficult to supervise and control management, which raises agency problems between agents and principals. These conditions can minimize agency problems by reducing agency costs by giving management authority to have managerial ownership in the company. The research results of Pu-

tri and Yuyyeta [19] stated that earnings management is influenced by managerial ownership. The second hypothesis is:  $H_2$ : Managerial ownership affects earnings management

One element that influences earnings management is company size. If the size of a large company, then the performance and supervision of the company look good in the eyes of investors. So that managers will try to increase the size of the company by doing income smoothing that is used to attract stakeholders. A conflict of interest will occur if the principal gives the manager the power to hold shares and make decisions that will lead to conflicts of interest. This is by following agency theory which states that if the size of the company with a small scale certainly management will be greater to smooth income so that deviant management activities can be limited by principals by using monitoring mechanisms of management behavior to align interests. Research findings from [14] and [15] find evidence that company size influences earnings management. The third hypothesis is:  $H_3$ : Firm size influences earnings management

### 3. Research Method

While the sample was all manufacturing companies that always publish financial statements in the period 2014-2018. To determine the sample members in this study a purposive sampling method was used. The modified Jones model was used as measurement of earnings management variables. The modified Jones model used as measurement of earnings management variables are as the following stages:

1. Calculate the difference between earnings and cash flows from operating activities, using the following calculation:  $TA_{xy} = NI_{xy} - CFO_{xy}$

2. Calculate the accrual value with a simple linear regression equation with the equation:  $TA_{xy}/A_{xy} - 1 = \alpha_1(1/A_{xy} - 1) + \alpha_2(\Delta Rev_{xy}/A_{xy} - 1) + \alpha_3(PPE_{xy}/A_{xy} - 1) + E_{xy}$

3. From the above equation, non-discretionary accruals (NDA) can be calculated by re-entering the formula:  $NDA_{xy} = \alpha_1(1/A_{xy} - 1) + \alpha_2(\Delta Rev_{xy}/A_{xy} - 1) - \Delta Rec_{xy}/A_{xy} - 1 + \alpha_3(PPE_{xy}/A_{xy} - 1)$

4. Determine the value of discretionary accruals which is an indicator of accrual earnings management by calculating total accruals with non-conditioner accruals, with the formulation:  $DA_{xy} = TA_{xy}/A_{xy} - 1 - NDA_{xy}$

Information:

$TA_{xy}$  = Total accrual x in period y.

$NI_{xy}$  = Net income x in period y.

$CFO_{xy}$  = Operating cash flow x in period y.

$A_{xy} - 1$  = Total asset x in period y.

$\Delta Rev_{xy}$  = Changes net sales x in period y.

$PPE_{xy}$  = Property, plant, and equipment x in period y.

$\alpha_1, \alpha_2, \alpha_3$  = Parameters obtained from the regression equation.

$E_{xy}$  = Error term x in period y.

$NDA_{xy}$  = Discretionary accruals in period y.

$\Delta Rec_{xy}$  = Changes account receivables x in the y period.

$DA_{xy}$  = Discretionary accrual x in period y.

Partial Least Squares-Structural Equation Modeling (SEM) analysis is used to analyze the path (path analytic) with latent variables. PLS can be used with data collected through secondary data (Ittner et al. [20]; Papadopoulos & Amemiya [21]; Lee et al. [22]). This statistical analysis was chosen because it has several advantages, Hair, et al., [23] First, the SEM component-based technique (PLS / Partial Least Square) works well with small sample sizes and does not require data normality. Second, SEM analysis can test multiple dependence simultaneously as a model in this study. Third, this technique applies different procedures for analyzing data that contain measurement models, structural models, and overall models, Wold [24].

### 4. Result and Discussion

While the determination of sample members in the study was to use the purposive sampling method, to obtain 170 observational data. The average block VIF (AVIF) value of 1,028 indicated that the ideal and acceptable AVIF value. The average full collinearity VIF (AFVIF) value of 1,090 also revealed the ideal and acceptable AFVIF value. Moreover, the GoF tenenhaus value (GoF) of 0,295 which indicated that the value was moderate.

The results of the test show the significance of the profitability variable which is proxied by return on equity of  $0,001 < \text{smaller than the significance level of } 0,05$  with a positive difference value of 0,275 which means that the profitability variable has a positive effect on earnings management. The higher the profitability produced by a company, the more it will affect the earnings management actions. The higher return on equity shows that the equity owned by the company is used as much as possible so that it can make a profit. When profits generated by the company in a period are very high, these conditions affect the desire of management to manage earnings, because management has fulfilled the cues the amount specified to get a bonus.

The results of this study are as follows; the bonus plan hypothesis if the company can obtain profits that exceed the specified signals, the manager seeks to regulate accounting numbers in the financial statements so that the manager gets a bonus every year. According to [14] if both groups try to maximize their utility, then that reason becomes a strong foundation for believing that the principal's interests will always be fulfilled by the agent. So that management seeks to

**Table 1.** Hypothesis testing results.

Path	Direct Effect		Remark
	Coefficient	p-value	
Return on Equity → Earnings Management	0,275	<0,001	H <sub>1</sub> is accepted
Managerial Ownership → Earnings Management	0,045	0,277	H <sub>2</sub> is rejected
Company Size → Earnings Management	0,054	0,240	H <sub>3</sub> is rejected
<b>Indikator Model Fit Average Path Coefficient (APC)</b>	0,125	0,024	
Average R-square (ARS)	0,087	0,062	
Average Adjusted R Squared (AARS)	0,071	0,088	

manage earnings to maximize the utility between the two parties.

The results of this study agree with the opinions of [4] who in their research found evidence that profitability affects earnings management. However, the results of this study disagree with the research of [6] stating that earnings management is not influenced by the level of profitability. The second hypothesis testing shows that managerial ownership does not influence earnings management. The significant value of the managerial ownership variable is 0,277 > greater than the significance level of 0,05 with a different value of 0,045, which means that the managerial ownership variable does not affect earnings management. Access to information that has involvement with managers in the company is one of the initiatives to manipulate information if it can harm both. These results do not support the theory agency because of the alignment of interests between management and the principal, these conditions can minimize the existence of problems in the agency. So that the amount of proportion owned by management in the company does not affect the existence of earnings management actions in decision making in a company. The results of this study support the results of research from [5] which state that earnings management is not influenced by managerial ownership. However, the results of this study disagree with the research of [19] who in their research found that managerial ownership influences earnings management. The third hypothesis in the test shows that firm size does not affect earnings management. These results indicate that the size of the company does not affect the actions of earnings management agents in managing the company. The results of this study are in line with research by [16] in their research found evidence that company size does not affect earnings management. However, it does not support research results from [14] and [15] showing that company size affects earnings management.

## 5. Conclusion

The summary of this research can be concluded that only profitability variables that affect earnings management. While managerial ownership variables and firm size do not affect earnings management. This research still has many shortcomings, so the limitation

in this study is the adjusted R squared value is only 7.1% so that 92.9% of earnings management variables are influenced by other variables besides profitability, managerial ownership, and company size. Therefore, the recommendations for future research is to add another variable because there may be other variables not included in this study, which may affect earnings management such as good corporate governance, auditor reputation, company age, leverage, and so on.

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## Audit fees contribution as moderating auditor switching on audit quality: Evidence from Indonesia

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### Abstract

The case of an audit failure conducted by one of the KAP that occurred in Indonesia resulted in obtaining a penalty from the Public Company Accounting Oversight Board (PCAOB) as the main issue in this study. Testing the effect of auditor switching on audit quality with audit fees as a moderating variable was the main objective of the study. The logistic regression method was used as an analytical tool to process data. The data used were secondary data in the form of quantitative. To get a representative sample, a purposive sampling method was used. During seven years (2012 – 2018) of observation, 321 company data were obtained which included in the sample criteria. The data were used to be processed as research findings. The results showed that auditor switching affects audit quality and audit fees moderate the effect of auditor switching on audit quality. The contribution of this research is public accountants to be able to maintain public trust through the quality of the published audit and support the previous theory related to auditor switching, audit fees and audit quality.

**Keywords:** Auditor switching, audit fees, audit quality.

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### 1. Introduction

Case of audit failure conducted by KAP Purwanto, Suherman and Surja along with Roy Iman Wirahardja, EY Indonesia partner, so that received a penalty from the Public Company Accounting Oversight Board (PCAOB). KAP Purwanto, Suherman and Surja received the sentence for failing to reveal evidence supporting the calculation of the lease of 4,000 cellular towers in the annual report of PT. Indosat, Tbk fiscal year 2011 and instead provided a unqualified opinion (WTP) opinion on the annual report and the calculation and analysis has not been completed. This causes PT. Indosat, Tbk conducted auditor switching in 2012 and evaluated accounting policies and internal controls to ensure compliance with applicable standards [1].

This case is the example that there are still public accountants with low audit quality on the annual report, even though it is very important to maintain the integrity of the annual report with audit quality. The Increasing user's credibility of financial statements is obtained from the results of credible annual reports because audit quality is high [2]. Annual reports that can be used for making the decision are annual reports with good audit quality results, which are produced

by auditors with the assumption of high fees as well [3]. Audit fees or fees for audit services are fees that received after carry out auditing services to an entity. Audit fees can be determined by many factors, such as the size of the entity, the location of the firm and the size of the firm. However, the determination of audit fees in Indonesia has not been made clear as in several developed countries in Europe, America and Australia. [4] considers that high quality auditors can detect the condition of entities that are not good and inform it to the public, so that if the entity's condition is not good, entity managers who had naturally think will not choose KAP with high quality so they also pay the high fees.

The assumption replaces the entity by auditor switching to reduce the risks that might appear. [5] declare that non-conformities expected by the company from the auditor cause the auditor switching or KAP. Auditor switching also can occur if the KAP or public accountant takes too long to do audit the entity, so that it can put independence so escalation commitment problem appears and makes bad decisions from an auditor [6]. The regulations about auditor switching are contained in the Minister of Finance Regulation (PMK) No.17/PMK.01/2008 concerning "Public Accountant Services" which said the deadline for KAP to do their job on an entity for a maximum of six years the accounting period while the accountant public did

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their job are three-year accounting period.

Many researchers about audit quality have examined, but the results of each research illustrate different results from each researcher. [7] proves that auditor switching does not influence on audit quality. [8] revealed that the regions where have weak legal institutions must be doing the rotates of audit partners can improve audit quality more effectively when compared to regions that have strong legal institutions. [2] revealed that auditor switching has a positive effect on audit quality but audit tenure has a negative effect on audit quality. [9] declare that there were no significant differences in audit quality at the time after or before auditor switching, while [10] shows the influence of audit fee on auditor switching.

[11] revealed that between audit fees and audit quality from an independent auditor there was a significant influence. However, [12] revealed that more often an entity rotates the audit it will reduce audit quality. While [13] declare that if the audit fee is bigger, the audit quality results will be better. The result of [14] research by using audit fee as a moderating variable revealed that audit fee tends to cause a weak relationship between auditor switching and audit quality. The results of research that are still varied become the reason why this needs to be reviewed. Based on the description it can be taken several problems there are, that auditor switching has an effect on audit quality and that audit fees can moderate the influence of auditor switching on audit quality. So it can be clear that the purpose of this study is to examine the effect of auditor switching on audit quality by using audit fees as a moderating variable.

Agency theory is applied in various studies to illustrate the relationship between the principal and agent. Agency theory according to [15] is the connection between the contract (nexus of contract) as the holder of economic resources and the manager (agent) who uses and controls these economic resources. [16] said that the relationship between the principal and the agent causes several problems, there are: asymmetric information and conflicts of interest. The entity uses an independent auditor to increase the credibility of the financial statements. And minimize the risk of differences in information in the annual report. However, if the auditor or KAP takes too long to do audit services, it will cause a personal attachment and lead to a decrease in independence so that the issue of commitment escalation has the potential to appear and create bad decisions from an auditor [6]. The statement is supported by the research of [2] which declares that audit rotation has a positive influence on audit quality. [8] revealed that in regions with weak legal institutions should partner rotation can improve audit quality more effectively when compared to regions that have strong legal institutions. Based on the arguments from supporting research, the first hypothesis in this study is: H<sub>1</sub>: auditor switching has an effect on audit quality.

The existence of an independent auditor as an intermediary between the two parties (agent and principal) can serve to reduce agency costs arising from selfish behavior by the agent. The agent is acting requires information in the annual report to be considered in making decisions. Annual reports that can be used for decision making are annual reports with good audit quality results [3]. An audit with good and quality results is an audit carried out by someone who has competence and independence [17]. [18] declares that quality belongs to large KAP. Large KAP are assumed to use high fees standards as well. The high fees standard results in the entity performing auditor switching to reduce the risk that might arise if the entity is experiencing poor financial conditions. [19] declares that many multinational entities and many banks in Lebanon choose to find auditors in KAP who can make audit reports that can increase the credibility of annual reports to be able to compete worldwide even for these entities should pay high audit fees. However, auditors with high quality are considered can detect the condition of the entity that is not good and convey it to the public, so that if the condition of the entity is not good, rational entity managers will not choose auditors with high service rewards despite producing high quality [4].

Research results of [10] shows the influence of audit fees on auditor switching. Audit fees charged by the entity for the benefit of auditor services cause a greater influence of audit fees on audit quality than an independent auditor [11]. [13] stated that when the audit fees are high, then the audit quality results being more higher. The second hypothesis in this study based on the statement is: H<sub>2</sub>: audit fees moderate the effect of auditor switching on audit quality.

## 2. Research Method

Companies in the infrastructure, utilities and transportation sectors, as well as companies in the property and real estate sectors listed on the IDX from 2012 to 2018, were made the population in this study. The purposive sampling method was used to obtain a representative sample, the following are the sample criteria used in the study. Measurement of auditor switching used dummy variables that have values of one and zero. If an entity changes the KAP, then the value is one. Conversely, if the entity does not change the KAP, the value is zero. Audit fees were measured using a proxy for the total assets of the entity [20]. The audit quality variable used the auditor scale proxy and its measurement with a dummy variable. If the entity uses the Big Four, the value is one. If an entity uses non-Big Four, the value is zero. Hypothesis testing was done using logistic regression analysis tools (logistic regression). Interaction Test (Moderated Regression Analysis/MRA) is a special application wherein the regression equation there is an element of interaction.

**Table 1.** Logistic regression test.

		<b>B</b>	<b>Sig.</b>
Step 1	X <sub>1</sub>	47,611	0,002
	X <sub>2</sub>	3,922	0
	X <sub>1</sub> .X <sub>2</sub>	-2,811	0,002
	Constant	-67,079	0

Source: The data is processed by logistic regression, 2018

Logistic regression models were used to test the hypotheses are:

$$\text{Ln} \frac{p(\text{Quality})}{1-p(\text{Quality})} = \alpha + \beta_1 \text{Switch} + \beta_2 \text{LnFee} + \beta_3 \text{Switch} * \text{LnFee} + \varepsilon \quad (1)$$

Where  $p(\text{Quality})$  is audit quality;  $\alpha$  is a constant;  $\beta$  is the regression coefficient; switch is a switching auditor; LnFee is a natural logarithm of audit fees; Switch \* LnFee is the interaction of auditor switching with audit fees; and  $\varepsilon$  is the residual error.

### 3. Result and Discussion

The number of entities in the infrastructure, utilities and transportation sectors was 35 entities and entities in the property and real estate sector, listed on the IDX are 63 entities so that the total entity used was 98. Observations have been made over seven years, so a total of 686 (98\*7) data. However, not all data can be processed into samples, because as many as 45 entities did not meet predetermined sample criteria. So that the data used as a sample of this study were 53 entities, with seven years of observations a total of 371 observations were obtained. From 371 data, 50 data were indicated as outliers (\* residual casewise diagnostics, outliers outside "1.5 standard deviations") because the data deviates too far from other data (extreme data). Variables that have extreme values can distort the estimated regression coefficients. Therefore, the outlier data (extreme value) needed to be excluded from the research data by using casewise diagnostics so that the final sample became 321 data.

The data analysis technique used for this study was logistic regression. The logistic regression model obtained, they are :

$$\text{Ln} \frac{Y}{1-Y} = -67,079 + 47,611X + 3,922\text{LN\_M} - 2,811X.M + \varepsilon \quad (2)$$

Where  $Y$  is audit quality;  $X_1$  is auditor switching;  $X_2$  is the audit fee;  $X_1.X$  is the interaction of auditor switching and audit fees; and  $\varepsilon$  is the residual error.

The test results using logistic regression showed a coefficient value of 47.611 with a significance value of 0.002 which is smaller than  $\alpha = 5$  percent (0.002 < 0.05). These results indicated that  $H_1$  is accepted, namely auditor switching effect on audit quality. When an entity performed auditor switching, the

results of audit quality increase because the independence of the KAP is maintained. These results are in line with the self-interest assumptions of the agency theory, where principals who are interested in return on investment for their investments look at the results of the annual report, so the agent will try to maintain its reputation in the eyes of the principal by replacing his auditor to continue to get annual report with audit quality the good one.

The good audit quality is obtained because in working KAP will perform its services professionally, by following the professional standards of public accountants (SPAP), which states that KAP must work independently. So in carrying out auditor switching, the entity will ignore whether the KAP is Big Four or Non Big Four. The research results of [2] revealed that audit rotation has a positive effect on audit quality. In line with this, [21] declare that termination of the relationship with the auditor because may be of poor relations between the auditor and client, accounting disagreements and too frequent rotation of audit staff. Auditor switching is also possible due to dissatisfaction with the performance of the old KAP, fewer appropriate costs, to get better audit quality, financial difficulties experienced by the entity and the auditor's reputation. [8] revealed that in regions with weak legal institutions mandatory partner rotation can improve audit quality more effectively when compared to regions that have strong legal institutions. However, this study is not by following the results of [7] study which states that auditor switching does not influence on audit quality and [9] which revealed that there were no significant differences in audit quality at the time after or before auditor switching. The more frequently an entity rotates an audit, it will reduce the quality of the audit [12].

The logistic regression test results showed a coefficient of 2.811 with a significance value of 0.002 which was smaller than  $\alpha = 5$  percent (0.002 < 0.05). The results of this test indicated that  $H_2$  is accepted, that is, audit fees moderate the effect of switching auditors on audit quality. When an entity uses KAP services and pays for audit fees, the resulting audit quality is good and has competitiveness in the world, so increasing auditor turnover will increase because the entity has obtained good audit quality results and wants to keep maintaining the quality of the audit results. The majority of entities in this study used the services of Non-Big Four to carry out audits of their annual reports. Non Big Four with lower audit fees rates still produces good audit quality and can be responsible by shareholders because Non Big Four regulates its services independently and competently. The work of the Non-Big Four replaces the manager who will make changes to the auditor because he wants to maintain good audit quality and shareholder credibility.

The main purpose of agency theory was to explain how parties who have a nexus of contract can design



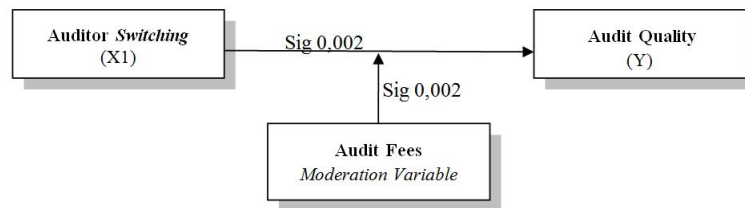


Figure 1: Research results.

their contracts so that costs appearing from asymmetric information and uncertain conditions because differences in objectives and target principals and agents can be reduced. These costs can also be called agency fees in economic terms. Therefore, this agency theory is to provide answers to agency problems that arise due to parties who have different goals in establishing the nexus of contract [7]. The results of this study contradict the research results of [14] which revealed that audit fees moderate the influence of auditors' switching on audit quality. [19] approving audit reports that can increase the credibility of annual reports to be able to compete around the world more needed by many entities, for entities that have to pay large audit fees, as well as [4] rational entity managers will not choose auditors with high service reward resulting in high audit quality. [13] announced the high audit fees, the higher the audit quality results.

#### 4. Conclusion

This concluded that auditor switching has an effect on audit quality and audit fees moderate the effect of auditor switching on audit quality. The suggestions for further researchers, they are the addition of other variables outside of research that might affect audit quality can be taken into consideration for subsequent researchers, such as management changes, audit tenure, audit risk to increase knowledge about audit quality.

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## Development of participatory cultural tourism management strategies case study of Baan Huay Hin Dum community. Amphoe Dan Chang, Changwat Suphanburi

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### Abstract

This paper proposes to study the possibilities and/or strategy to effectively develop tourism in the field of art and culture in the community of Baan Huay Hin Dam, Amphoe Danchang in Suphanburi Province, and to advertise in accordance with the way of life thereof, by which the research was conducted in a quality way. The community's potential in tourism development and proper advertisements, by the tactics of managements of tourism in the field of art and culture, runs as follows: 1. Natural resources: the community has its own outstanding natural resources, as the areas remain intact and abound with coverage of thick jungles, along with the Karen tribes name Po, which is supposed to be so far conserved. 2. Community participation: the community has its own outstanding natural resources, as the areas community coordination and participation correspond to each other through local tourism and income thereof, which maintain the old way of life, or to pave way of making through other options. 3. Management: regarding the persistence of the surroundings, social affairs, and culture of the community, their role as a host may provide co-learning among locals and visitors. 4. Learning activities: activities should be designed in accordance with the management of natural resources, surroundings, and culture, and conserve the characteristics of the community. The tourism in the community may create awareness and knowledge into conserving natural resources and culture for both locals and visitors.

**Keywords:** Development of participatory, cultural tourism management strategies, Baan Huay Hin Dum community.

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### 1. Introduction

From the past, Tourism has been evolving from the leisure to the main of world-class business, and it has grown significantly. Since the last 30 years. International tourism has grown threefold, and the World Tourism Organization (WTO) has forecast that it will grow twice by the year of 2020. Thailand has seen the importance of economic tourism, and has been promoting the tourism industry since the beginning of the National Economic and Social Development Plan No. 1 (1961 – 1966). From that time, Tourism is the one of the key industries to help Thailand recover from past crises: for example, there are outbreaks in Asia and around the world, and the unrest in the south in 2004, and at the end of the same year, Tsunamis have lost a lot of tourists. That is why “Thailand Happiness on Earth” has been established to create a peaceful image for Thailand. In 2013, political unrest has taken

place in the country, so “The Fall in Love for Thailand” has been used to promote tourism in Thailand to become popular again. (Marketing Research Division, Tourism Authority of Thailand, 2557) The Tourism Development Plan 2555 – 2559 has a vision: “Thailand has the tourism resources that have been qualified and capable for the global travel competition. They can generate and distribute incomes by taking into account the fairness, balance and sustainability.” (Ministry of Tourism and Sports, 2558) It is evident that the competitiveness of Thai tourism is to achieve the global goals in order to bring revenues from tourism into the country. One of the most important factors to achieve this goal is to have good and suitable public relations. Then, the goal of Thai tourism is to distribute income fairly. It means that tourism should not be only concentrated but also be in the big or major cities, such as Bangkok, Chiangmai or Phuket.

Thailand is a country with a wide range of tourist attractions, and has many beautiful tourism places in almost every region. Most tourism places in Thailand

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are traditional, primitive and local cultures. Tourism will contribute to preserve the identity of local traditions and culture in the form of tourism products in Thailand. Therefore, it will contribute to preserve the identity of local traditions and cultures in the form of products in the official site of Tourism Authority of Thailand. Baan Huay Hin Dum community is located at Amphoe Danchang, Suphanburi which there is an identity of the cultural resource. In addition, Suphanburi is not far from Bangkok, so it can be used to create values for the community as well as to preserve the culture and traditions for people in the community

## 2. Research Objectives

1. To find guidelines and strategies for cultural tourism development in Baan Huay Hin Dum Community at Amphoe Danchang, Suphanburi effectively.

2. To bring the results in order to guide the development of tourism and public relations appropriate to the community of Baan Huay Hin Dum. Amphoe Danchang, Suphanburi. This paper is qualitative research methodology for data collection by using in depth-interview and focus group discussion from related stakeholders both from government sector and private sector such as director of local tourism, community leader, local people and also related documents. Then data analysis to evaluate, conclusion and evaluate the solutions.

## 3. Reserch Results

1. Results for the contextual study of Baan Huay Hin Dum Community, Amphoe Danchang, Suphanburi

2. Results for the study of potential community for tourism of Baan Huay Hin Dum Community, Amphoe Danchang Suphanburi

3. Results of the study of development strategy in order to promote the participatory tourism.

### 3.1 Results for the contextual study of Baan Huay Din Daam Community, Amphoe Danchang, Suphanburi

The summaries of document analysis and interviews with Baan Huay Hin Dum community representatives, Wang Yao district, Amphoe Danchang, Suphanburi about the participatory cultural tourism can be divided into 4 parts as follows;

- Part 1: Natural Resources and Culture
- Part 2: The Organization of Community
- Part 3: Management
- Part 4: Learning

Part 1: Natural Resources and Culture

Baan Huay Hin community has the complete natural resource base due to mountainous conditions that are 700 meters above the sea level. Their beautiful and cool climate all year is suitable for agriculture. Most

of them are vegetables, fruits, and livestock, such as goats. It is also supported by the Agricultural Office of Dan Chang District to be opened as an agricultural tourism site. Therefore, there is a group of farmers in the community, which is established in the organic farming by the headman as the leader in order to carry out their own non-toxic vegetable cultivation. The usage of herbs is to prevent and eliminate pests. Organic vegetables are delicious and safe from toxic substances. It also has the beauty of the scenery and the completeness of nature, such as Putoey National Park, Suan Son Song Nai, and Tapuenkri waterfall as the nearby nature tourism.

Baan Huay Hin Dum Community also preserves the tradition, culture and environment to become last as long as possible because the community has the unique culture, tradition and way of life of Karen hill-tribe people as the local identity composed of the ritual beliefs of the Karen people.

- The sacrificed ceremony and exorcise was by using bamboo bracken the banyan tree. The banyan tree chosen by local people has been in the community with their ancestors. For bamboos used to brace it, each house would cut the bamboo rod equal to the number of members in the house, tie each of them together, decorate them with flowers, and take them to the ceremony with a community leader, who was an old man as a ritualist. The release of fish, turtles and wildlife was also another sacrificed ceremony and exorcise in order to buy life.

- With the faith and respect in the ghost and spirit, the Karen has had their own traditions and rituals related to the witchcraft. It is called Pong Ka Kaue, the witchcraft traditions on T-junction. About 6 months of every year, every house would bring the savory and sweet food to put together in a basket. Then put it to T-junction. It was the belief of the Karen people to feed food for the Abstain who have no relatives. This ceremony was considered as a kind of the charities of the Buddhist Karen people. It was made for the peace and calmness of the people in the village as well.

- The ceremony to tie the wrist has been made on the 15th day of the 5th waxing moon every year. It would be chanted by an abbot, who would use the yellow thread dyed for chanting with worshipping and praying. Participants would wrap the yellow thread that was chanted at his wrists all the time without removing until the new ceremony.

- Another was Sneaky tradition. The Karen people had a specific tradition, which was a Sneaking. This was an opportunity for young people in the village to have more private time to talk and learn to each other. However, because most of them worked in the daily time, they had to do at night instead by beginning with talking and feeling satisfied to each other. The man would find time to date a girl from the evening to late night He would go to the woman's house and climb up to the ladder. This was the first point that the parents

of the women who may not go to bed. If they knew that the young man who was looking for a daughter was a good man, they would go to sleep in order to let him enter the house. The next step was to invade the bedroom. The young man had to kindle the lamp to talk with the woman. If she trusted in him, the light lamp be extinguished. However in the opposite case, if parents disliked him, they might pretend to talk to each other or do any other businesses in order that he could not see her. Although this tradition was approaching in the bedroom, it did not mean that the girl was not going to get married for sure. If both parties were dissatisfied with each other later; for example, the man's habit became bad, there was no need to get married. This was not considered to become corrupted or wrong.

However, currently these traditions' roles have been reduced as with any other ways of life, especially to build the modern house. It has been modified from the wood house that has high basement to a cement house that has the room on the basement as the city house. Thus, Sneaky tradition has been faded away. The only remnants of old people who remember the past when they have had wives with this tradition.

– Eating new rice tradition was another. The Karen people would organize the eating new rice ritual after harvesting rice. The ceremony was similar to the new home tradition. Each home would cook both paddy and sticky rice. The food must be composed of taro and bitter melon. The Karen people believed that the bitter melon had a slow walking style and made the rice abundant throughout the year. Then they would celebrate with the neighbors in the same village by alternating hosts. This tradition was held around February to April every year. The common people who were not Karen are still able to attend this even

– The culture of weaving in Karen Suphan style had the unique pattern. It was designed by the wisdom of the Karen people at Baan Huay Hin Dum.

#### Part 2: The Organization of Community

Baan Huay Hin Dum Community has been supported by the tourism network within Wanglang District as the existing fund, so people here have been combined to become a group in order to carry out the prototype community. The first sage and community leader said on behalf of the thought community, using local herbs to be conserve the herbs of the Karen people as follows: 1) to know the herbs, 2) to explore the forest with the staff of Putuey National Park, 3) to use herbs in the forest in the home that means some of the herbs from the forest to be planted in their own home, 4) to work with the villagers in the community, and 5) to propagate such a way by entering the competition at both provincial and country levels.

#### Part 3: Management

The heart of the tourism management serviced by the community is the participation of community members truly, so Baan Huay Hin Dum Commu-

nity found an organization as the driving force for sustainable tourism in the community. The members of the community are involved in problem solving and tourism development under the supervision of the Agricultural Tourism Board, Wang Yao District. These make the rules of the community with the measurement to manage the environment, culture and tourism so that people in the community and visitors can follow, to increase the income of households, and to have the solidarity between Thais and Thai Karens. There is also a fair distribution of benefits to members participating in three professional enterprise groups, as discussed in Part 2.

In addition, the sage and community leaders said that the traditions of Karen people would show the respect and firm commitment to the resources around important traditions, such as the tradition of making bridges, the tradition of bamboo bracken the banyan tree hat is still practiced every 6th month, the tradition of new rice merit or worship of Mae Phosop in the 3rd month. There are also teachings and beliefs about the utilization of forest resources including farming and gardening. Therefore, efforts should be made in order to encourage young people to understand and adhere to traditions and original beliefs related to forests and nature by maintaining traditional activities in each season and having the religious ceremony according to traditions. However, adults and seniors must have a duty to explain the meaning and importance of cultures and rituals.

The management of tourism by the community, CBT, is from Community based Tourism, so it is not easy to manage for maximum benefit in order to become sustainable and balanced in many people. However, interviewing and talking with community leaders makes us keep in mind that community leaders here have a strong role to play, being admitted, having an idea, and having a vision of tourism. They are also supported in many ways by government agencies who give them advices how sustainable tourism should be done, how the incomes should be distributed and allocated in order to prepare the community for sustainable tourism management

These data can be integrated with the management of tourism in the community as follows:

#### 1. Governmental Sector

– Supporting budgets for the community development in tourism

– Supporting the personnel to supervise and provide information on various aspects of tourism in the community

– Supporting for public utilities and facilities for the hygiene and comfort of the community and visitors

– Supporting marketing and public relations activities, such as leaflets, brochures, tourism activities on the website.

#### 2. Private Sector

– Promoting tourism network activities.

- Promoting marketing and public relations activities of the community

### 3. Local Sector

- Conserving the tourism, culture and environment resources

- Maintaining security in tourist attractions within the community

- Facilitating and providing services to travelers such as community information centers, local guide or a tour guide in the homestay community

- Participation of community in tourism management, such as planning, problem solving, making decisions on tourism activities and joining the benefits.

### Part 4: Learning

Baan Huay Hin Dum Community not only has the potential of the area including the natural resources and cultural traditions of the local wisdom that can process the varieties of tourism industry, but also has the potential of local people to bring the readiness in many sectors. People in the community know their roots as well. They can inform data, be ready to learn, unite and work together.

The nature of tourism activities in the community is diverse. It can promote learning for visitors in the lifestyle, cultural tradition and the study of nature. It consists of:

- Visiting and studying the organic farming Visitors can learn how to grow non-toxic vegetables and can keep the vegetables back to cook at home.

- Visiting goats and tasting their milk  
Visitors can visit the goat-free farmers group certified farm from the Department of Livestock. Listen to briefings on how to raise the farmer with goat milk rich in nutrition.

- Activities for community forest  
Baan Huay Hin Dum is a Thai-Karen ethnic group with a settlement of over 200 years. Visitors can study the livelihood of the community with the forest. Exploitation of forests, and listen to the old man tell stories about Karen community, including cultural traditions, dance performances, wildlife walks.

- Activities for eco-wildlife tourism  
The community area has trees ages 500 years old and still has abundance of forest. There is also wildlife in order to see and study, such as tigers, tapirs, red bulls, gibbons, great hornbills, Asiatic black bear, buffalo, banking deer, deer, chamois, etc.

- Visiting processed agricultural products, such as Filipino Banana, fresh Tong Muan, fresh tamarind, including making dishwashing and shampoo from herbs

- Visiting a weaving group  
Visitors can learn how to weave in Karen style, and the souvenirs are sold as well.

- Visiting Karen Herb Group  
Visitors can study the local wisdom on the use of herbs for life and treatment.

These activities have established the concept of sustainable tourism, the learning process between local

communities and visitors. It is also a conscious effort to conserve natural resources and culture between the community people and visitors as well. It can be determined from four elements as follows:

1. The community has activities in the area of community capacity in terms of the natural resources, manners, traditions, cultures and lifestyle of the community sustainably.

2. The community is aware of tourism activities that affect the community in all aspects, such as the environment, manners, cultures and lifestyle of the community.

3. Considering the participation of all sectors in tourism activities that can affect ecology in the community, traditions, culture and way of life towards tourism.

4. Coordinating the economic demanding, the survival of society and the environmental conservation, manners, cultures and way of life of the community sustainably.

### 3.2 *Strategic management of cultural tourism in collaboration with the tourism community Baan Huay Hin Dum, Wang Yai District, Amphur Dan-chang, Suphanburi*

The potential for tourism in Baan Huay Din Daam area is as follows:

1. Tourism resources Baan Huay Hin Dum Community is unique and distinctive of natural resources because the area is still abundant with the plants and forest, including the uniqueness of the local Karen culture. That should be worth to preserve. The unique nature of tourism resources can be a point of sale or attraction to tourists, especially traveling to learn the culture and way of life of the local people. Thus, to make tourism become a tool for community development, there should be a guideline for managing cultural tourism.

- Encourage and support children and young people in the community to learn and inherit the local culture continuously, such as weaving the bamboo basket, traditional dance, and ancient weaving. It is also a cultural transfer from the inside to the outside as well.

- Encourage the community to be beautiful in order to show the unique identity and to attract tourists.

- Encourage maps and tourist guides in the community by using the information network as an aid in marketing and public relations for the cultural tourism of the community.

- Encourage the creation of signage at the points of attraction and cultural resources in the community in order to educate and prevent the loss of tourists.

2. Community of Organization and Participation. The community tourism contributes to support the economy of the community and the quality of life of local people. Tourism is an additional income, which can bring income to life because the community people

still continue their traditional way of life, or to create income options for some families. Therefore, the community should have the following guidelines:

- Professional enterprises should be allocated revenue from tourism fairly, and support the development of community and public interest in order to add convenience to tourists and local people themselves.
- The community should provide opportunities for all sectors to participate in planning or making tourism activities in the community, and have a mutual income among the people in community.
- The community should be involved in the planning of community tourism together with all sectors in order to exchange learning and to help to promote cultural tourism on the right way.

### 3. Management

Community tourism is a tourism, which regards into account the environmental, social and cultural sustainability of the community. It should be determined the direction, management and doing for the community. Community also has an active role in the management of learning for visitors. There are guidelines for doing so.

- To have an organization or mechanism and participation in the community development of the pipeline clearly
- To have the tourism management system of the community and the rule of law in order to manage the tourism of the community to be concrete, and linked to other developments
- To strengthen the community, which should be empowered by the people in the tourism community, such as the training of local guides or tour guide, foreign language training, etc., in order to further the preservation and revitalization of local culture
- To have a systematic and continuing promotion of marketing and public relations
- To have a good service and security in life and property to tourists in terms of hotels, vehicles, tourist guides, as well as good coordination between groups in the community for tourist services

### 4. Learning Activities

- There should be a design for tourism activities that take the management of natural resources, environment and culture into account.
- Tourism activities can create learning and understanding the way of life. They can build up the culture of the community sustainably and be still uniqueness in themselves.
- Travel activities in the community can create consciousness and knowledge in the conservation of natural resources and culture for the people in the community and visitors.

### 3.3 Results of the study of development strategy in order to promote the participatory tourism

Community tourism contributes to the economy of the community and the quality of life of local people.

Traveling is an additional income, which can bring that income to life whereas people in the community still continue their traditional way of life, or create income options for some families.

Baan Huay Hin Dum Community is unique and distinctive of natural resources because their area is still abundant from plants and forest. Their local culture is unique to Karen people, and it should be worth keeping to stay. The unique nature of tourism resources can be a point of sale or attraction to tourists, especially the visit to learn the culture and way of life of the local people.

From the above, many communities have developed themselves into tourism, but some of them have become poor quality tourist destinations because of lack of appropriate tourism management in terms of society, culture and environment. Some tourist attractions have been developed according to government policy, while the community personnel are much less contributed in the management of tourist attractions in the community. These make community members lack the knowledge and understanding of community based planning and management. Therefore, the Sustainable Cultural Tourism Management needs to integrate strategies from many fields, such as cultural tourism planning, designing tools for cultural tourism development and creating the network of cooperation organizations as follows.

#### 3.3.1 Strategy: 1 planning cultural development

Planning for tourism development aims to maximize the benefits of both economics and society. It is important that planning is carefully and clearly planned because the tourism industry is associated with natural, cultural, and lifestyle resources. These things are inevitable. Thus planning for tourism development is an important and necessary process to set the framework, direction, steps, and goals for development tourism in order to prevent the development of tourism as a crime and be ultimately detrimental to society.

Therefore, in preparing the cultural tourism development plan of the local community and stakeholders including various agencies need to have meeting or public hearing to be held for comment and acceptance so that they can have mutual understanding and agreement. They must be under the guidance and advice of experts, for the plan must be implemented correctly. Development plan must be easy to understand and may determine a few issues, which must be clear enough to enable stakeholders both inside and outside the community. They can follow in the same direction.

#### 3.3.2 Strategy 2: networking, community organization and participation

Networking is an important strategy for building synergies in management, collaboration, assistance and encouragement to each other in order to promote

the development of tourism by the community. Community tourism is a tourism, which regards into account the sustainability of the environment, society and culture. It must be directed, managed and done by the community that can be an active role in the management and care of learning for visitors. There are guidelines for performances as follows: 1. Create the network of cooperation between organizations, communities and groups related to tourism.

2. Establish the policy, planning and marketing both public and private sectors that are responsible in tourism, such as governmental officers, local politicians, local business owners, tourism associations, shop or souvenir shops owners, and community enterprises, etc.

3. Establish a cooperative network for community tourism management, especially rules to govern the cultural tourism of the community. It can be linked to other developments.

4. The community should have an organization or mechanism. They need to participate in the community development clearly in order to strengthen the community. Therefore, there should be a network of cooperation with all sectors to strengthen the potential of the community in tourism, such as the training of local guides or tour guide, foreign language training, etc. to further the preservation and revitalization of local culture.

5. The community should contribute to the planning of community tourism together with all sectors in order to exchange learning and help to promote cultural tourism on the right way. It should allow all sectors to participate in planning or tourism activities in the community to have a mutual income in both young (pupils / students) and old people,

Therefore, appropriate strategies for developing appropriate tourism and for people to participate in tourism management are as follows:

- Strategic management of natural resources environment and ecology
- Strategy for conservation and inheritance the arts and cultures, traditions and local wisdom
- Strategy for agricultural tourism and economic development in accordance with Sufficiency Economy Philosophy
- Strategy for developing the quality of life of people in the community

#### 4. Conclusion

In conclusion, the community of Baan Huay Hin Dum has the ability for tourism development and promotion for Suphanburi Province. Anyway, the cooperation among stakeholders is the need for the successful tourism management.

The discussion of this research are 2 strategies as follows.

1. Cultural Tourism Planning.
2. Community Network and Participation for Tourism.

The recommendations from the research are

1. The Committee of the community should study the communities which they have the same development concept or plan.
2. The committee of the community should have fair Benefit Sharing system.
3. The committee of the community should have Monitoring and Evaluation system for Tourism Development

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## Tourism demand in Nakhon Pathom for the development of revisit tourism destinations in Nakhon Pathom and the connected areas

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### Abstract

The purposes of this research were to: 1) study tourism demand of tourists in Nakhon Pathom Province; 2) study revisit demand in tourist attractions and 3) find out tourism the patterns for the development of revisit tourism destinations in Nakhon Pathom Province and its connected areas. It was a quantitative study of behavior and demand of tourists. The data then were analyzed by percentage, mean, and standard deviation. Regarding the result, it is found that: 1) the samples are more of female gender and are single of age between 35 – 44. They live in Bangkok. They are government employees with monthly income of 5,001 – 10,000 baht. Moreover, most tourists travel in the country approximately 5 times a year and often travel during the school-off. They traveled to Nakhon Pathom for the second or third time to pay respect to the Buddha images and they decided to travel based on opinions from their friends and their relatives. In addition, regarding the expectation of tourist attractions, they focused on the convenience of travel. They organized the trip by themselves, travelled by private car, and bought food souvenir. Furthermore, demand for revisit tourism in Nakhon Pathom has been rising due to tourism factors, tourists' opinions, and tourism demand in the province. The average expenditure is 2,001 – 3,000 baht. It is also found that tourism demand was at a very high level. Considering the various aspects, it is found that tourists had the highest demand in service quality, tourism activities, and restaurants and bars. Moreover, from the tourists' opinions, it is found that the most suitable tourism pattern for Nakhon Pathom was leisure tourism, followed by agro-tourism, and spiritual tourism. Most tourists traveled for spiritual purposes, e.g., to make merit, learn about the history, and learn about the local way of life. Finally, the research found 3 patterns for revisit tourism, including 1) leisure tourism in local community, 2) agro-tourism, and 3) spiritual tourism. The finding leads to the creation of tourism activities, for example, those concerning spiritual tourism, which can properly respond to tourists' demand in Nakhon Pathom Province.

**Keywords:** Tourism demand, tourist behavior and revisit tourism.

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### 1. Introduction

At present, tourism is relatively one of the major economic factors of many countries, especially Thailand. According to the United World Tourism Organization (UNWTO), it is estimated that, by 2020, the number of the international tourist will have grown to 1,600 million, with more than the cumulative amount of 100 trillion baht spent worldwide [1]. In Thailand, it is found that tourism contributes one third to the national income, amounting to more than 100 billion baht each year. Since 1982, tourism has been playing the major role in Thai economy. In 2015, for example, tourism earned the country as much as 3.54 trillion baht [2]. The importance of tourism seems to grow more and more eminent, considering that new various

purposes of traveling have emerged, for instance, traveling to learn more about the local; and many tourism attractions positively responded to them. The reason why Thailand is one of the most visited countries finds the answer in its tourism resources, which can be developed into many patterns of tourism, for example, nature tourism, historical tourism, and cultural tourism. In addition, it is undeniably known that Thai people are friendly and tourist-welcoming, and their exotic way of life can greatly interest international tourists. The idea of Thai uniqueness was also promoted by the Ministry of Tourism and Sports, running the campaign "Discover Thainess" [1]. A tourism strategy was devised accordingly, focusing on three objectives: 1) to create tourism management sustainability, 2) to add more value to the place of tourism, and 3) to raise awareness of the community identity and encourage local people's participation [3].

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Thereby, tourism management needs to take the three objectives into account, creating a co-learning space between the locals and the visitors, promoting sustainability, and developing a way to increase the tourism value, regarding economic, social, cultural, and ecological aspects. This will help create sustainable Thai-unique resources of tourism. However, a number of tourist attractions are facing problems at present, e.g., the lack of proper preservation and maintenance of tourism resources, the management with no regard to sustainability, as well as the external factors, for example, gloomy economic prospect, turbulent political climate, and natural disasters. All of these impose negative effects upon the country's tourism. It is agreed, then, that to put emphasis solely on the financial benefit of tourism can be detrimental to the community and any related agencies [4]. Thereby, many authorities and agencies decided to develop the mutual learning of the locals and the visitors and a way to increase the value of each tourist attraction, regarding economic, social, cultural, and ecological aspects, in order to advance towards sustainable tourism and promote repeat visitation.

Nakhon Pathom Province is notable for its natural, historical, and cultural tourism resources, from which many places of tourism and tourism activities emerged [5]. In 2015, the number of Thai tourists visiting the province was 3,011,331, generating the income per visitor as 3,837.42 baht. In 2016, the number was 3,564,887 and 4,804.55 baht, respectively [4]. Despite the income, the province suffered from the negative effects of tourism, for instance, the decadence of tourism resources, the raise of the living cost, the change in the local way of life, all of which are especially due to the lack of understanding and communication between the locals and the visitors. The National Tourism Development Plan 2012-2016 holds a study in tourism trend and situation which focuses on common tourism problems and resource sustainability. Five key points are emphasized: the development of infrastructure and facilities, the development and preservation of a tourist attraction, the development of tourism-supporting products and services, the development of the visitor's trust and confidence, and the collaboration between the government agencies, the private agencies, and the local authorities in tourism management. This aims to improve the standard of tourism, encourage repeat visitation, as well as establish the tourism routes, one of which connects Kanchanaburi Province of Thailand, and Myanmar, while the other route connects several adjacent central provinces such as Nakhon Pathom, Ratchaburi, Samut Songkram, and Kanchanaburi, with the help of the construction of a new motor way. These routes are bound to be affected by tourism. In order to respond to the change in the purpose of traveling, a study becomes necessary. It will help to analyze tourism-related factors, such as demand and supply, to help

develop the travel destinations in Nakhon Pathom and the nearby provinces into a place of repeat visitation. Tourism management will be improved, which helps to cater to each group of visitor's needs. The study findings will seek to boost cooperation between the locals and the visitors, add new values to tourism, simultaneously develop and preserve the place of tourism, and create the open space for the visitors and the locals to learn from each other, all of which will mutually result in sustainable tourism in the end.

## 2. Research Objectives

2.1 To study tourism demand of tourists in Nakhon Pathom.

2.2 To study revisit demand in tourist attractions in Nakhon Pathom.

2.3 To determine the tourism patterns for the development of revisit tourism destinations in Nakhon Pathom and the connected areas.

## 3. Literature Review

### 3.1 *The idea of tourism demand*

"Tourism demand" as the need of tourists in using services and purchasing products in tourist attractions [6]. The demand varies in degree depending on the season of the year, length of the stay, economic climate, personal experience, current trend, and modes of transportation available. Furthermore, it divided tourism demand into three groups [7], i.e., 1) actual demand: tourists who wish and can actually visit the place of tourism and have high payability; 2) potential demand: tourists who wish to visit the place of tourism but lack money, time, or viable transportation. This group can turn into Actual Demand with the aid of marketing promotions and the improved availability of transportation facilities; 3) deferred demand: people who are not yet interested in traveling due to the lack of information and other support factors (money, time, traveling management). It added that tourism demand is related to the willingness of a person of sufficient purchasing power to travel to another place, buy goods, and use traveling-related services. Thereby, the rise and fall in the quantities of the product and the tourism-related services will reflect the rise and fall in tourism demand [8]. To summarize, tourism demand refers to the degree of a person's willingness to purchase products and use tourism-related services, and that person must hold sufficient purchasing power and wish to buy products and use tourism-related services. The factors which make tourism demand vary include: 1) push factors: technological advancement, income, lifestyle, well-being, occupation, increase in leisure, transportation development, communication, and information exchange; and 2) pull factors: readiness of tourism supply, tourism resources, service charges, rules and regulations, safety, and the media.

### 3.2 Tourists' behavior and motivation

Tourists' motivation will help to create more effective tourism and revisit tourism plans. A study on motivation then becomes necessary for a study on satisfaction, decision, and marketing [9]. Maslow's Hierarchy of Needs to explain the travel motivation of humans as follows: 1) physical needs, 2) safety needs, 3) social needs, 4) esteem needs, and 5) self-actualization needs [10]. Apart from that, a study by Wansamon Jantadit [11] talked about the factors which affect tourists' behavior and motivation. The author categorized the factors into two groups, that is, 1) internal factors: health, income, attitude, and experience, and 2) external factors: political situation, economic climate, as well as obtained information [10]. The information sources could be divided onto three groups as follows: 1) personal sources; 2) commercial sources, including advertisement, exhibition, and a salesperson; and 3) public sources, including travel articles and tourist attraction reviews.

## 4. Research Methodology

4.1 Population: 3,564,887 Thai tourists.

4.2 Sample groups: 400 Thai tourists visiting Nakhon Pathom, selected by accidental sampling.

4.3 Research instruments: a questionnaire addressing tourism demand in Nakhon Pathom to help with the development of revisit tourism destinations in Nakhon Pathom and the connected areas.

4.5 Content analysis following the objectives of this research.

## 5. Results

### 5.1 Tourism demand: general information, travel behaviors, and demand of tourists

Regarding the sample groups, it is found that 62.50% of them are female, 62.50% of them are single, 27% of them are 35 – 44 years old, 37.50% of them live in Bangkok, 41% of them work for government agencies, 19.50% of them earn 5,001 – 10,000 baht per month, 51.25% of them travel within Thailand fewer than five times a year, 46.75% of them travel during summer vacation when schools are close, 50.75% of them came to visit Nakhon Pathom for the second or third time, 51.75% of them visited Nakhon Pathom for religious purposes, 21.75% of them chose Nakhon Pathom as their destination based on the information received from their relatives; as for tourists' expectations in Nakhon Pathom, 26% of them focused on tourist attractions, 22.50%, restaurants and bars, and 19% a place to stay; as for what motivated tourists to visit the province, 24.75% of them said it was about transportation convenience, 23%, financial convenience, and 22.50%, the locals' hospitality; 38.50% of them organized the trip themselves, 87.50% of them used private car to travel, 55.50% of those who stayed

overnight chose to stay at a hotel or a resort, 75.50% of them contacted the resort and arranged the reservation themselves, and 37.25% of the sample groups chose to buy food and beverage as souvenir.

### 5.2 Revisit demand of tourists

Regarding the sample groups, it is found that 77.25% of them chose not to revisit Nakhon Pathom. Still, 50% of them rated their trip very satisfactory. 27.25% of them spent 2,001 – 3,000 baht on average, and 25% of them spent 1,001 – 2,000 baht on average. The overall tourism demand of tourists is considered high. It is also found that tourists focused on service quality the most ( $\bar{X} = 4.18$ ), followed by tourism activities ( $\bar{X} = 4.14$ ) and food quality ( $\bar{X} = 4.05$ ). Regarding service quality, it is found that tourists focus on service provider's attendance the most ( $\bar{X} = 4.32$ ), followed by the adequacy of tourism staff ( $\bar{X} = 4.27$ ) and staff's hospitality ( $\bar{X} = 4.19$ ). Regarding tourism activities, it is found that tourists focused on activity duration and participation convenience the most ( $\bar{X} = 4.22$ ), followed by the interestingness of the activity ( $\bar{X} = 4.19$ ) and the allowance of visitor participation ( $\bar{X} = 4.14$ ). Regarding restaurants and bars, it is found that tourists focus on the adequacy of restaurants and bars the most ( $\bar{X} = 4.28$ ), followed by the suitable price of food and beverage ( $\bar{X} = 4.19$ ) and the service ( $\bar{X} = 4.16$ ). Regarding the tourists' opinion on the travel pattern most suitable for Nakhon Pathom, it is found that 22.50% of them thought that leisure travel was the most suitable one, followed by agro-tourism, 20%, and spiritual tourism, 15%. Regarding the choice of a place to stay, 40% of the sample groups chose the place that was near a tourist attraction, 20.75% chose the place by reputation, and 13.50%, by price. Regarding the modes of traveling, 84.75% used a private car, 5.25% used local transportation service providers such as two-rowed buses and auto rickshaws, and 1.25% use public transportation or a bus. Regarding the activity during the travel, 55.75% went to visit religious sites to pray and make merit, 22% visit historical sites to learn more about the province's history, and 9.25% sought to learn about the local way of life. The most used facility and service was phone/internet, 61%, followed by public toilets, 20.75%, and a guide, 8.50%.

### 5.3 Travel pattern for the development of revisit tourism destinations in Nakhon Pathom and the connected areas

Three patterns are determined, that is, 1) leisure tourism in a local community, 2) agro-tourism, and 3) spiritual tourism, all of which were adapted and provided with tourism activities as follows:

#### 5.3.1 Leisure tourism in a local community: Khlong Mahasawat and Khlong Lat Eetan Communities

There are nine activities:

- 1) Visit Miss Usa's lotus farm, where tourists can row a boat in a pool of lotus and gather them at will.
- 2) Visit a fruit orchard with the owner guiding and informing tourists of interesting information.
- 3) Learn how to plant orchids.
- 4) Learn how to make lotion, soap, and noodle sauce from baby jackfruits.
- 5) See the demonstration of traditional rice cracker making; tourists visiting Khlong Mahasawat Community will be given an opportunity to make the snack.
- 6) Ride a railcar viewing the local way of life; the locals along the railway are mostly farmers who plant riceberry, tend a fruit orchard, and grow rice.
- 7) Visit the renowned pomelo grove of Nakhon Chai Si District. The most grown pomelo varieties are khaow nampueng, khaow tongdee, and khaow pen. The grove was built in 1981.
- 8) Learn about the organic way to grow food.
- 9) Buy a low-price souvenir such as lime and pomelo.

#### 5.3.2 *Agro-tourism: Bang Lane District*

There are four activities:

- 1) Enjoy the fresh morning air at Red Lotus Floating Market. Row boat and a rower service are available.
- 2) View a variety of food and beverage nearby. Tourists are highly recommended to taste the savory lotus petal wraps at RED LOTUS Caf?.
- 3) Learn about the preservation method of more than 1,200 Thai herbs, including the rare species such as *Wrightia sirikitiae* and *Bauhinia sirindhorniae*.
- 4) Take a tour to study the work of Lam Bua Agriculture Group. This provides tourists with an opportunity to visit their farms and fields as well as to learn practical techniques in growing plants.

#### 5.3.3 *Spiritual tourism: Nakhon Pathom City*

There are five activities:

- 1) Visit the Phra Pathom Chedi Temple and pray to Phra Ruang Rojanarit, the tutelary holy being of the province, and Phra Phuttha Narachet, the sacred buddha image widely revered.
- 2) Pay respect to Phra Rahoo at the Sisa Thong Temple.
- 3) Visit the Bang Phra Temple, known for yantra tattooing.
- 4) Visit the Raikhing Temple to worship Luang Phor Wat Raikhing, the buddha image respected by the locals. One of the tourist attractions of this temple is the merit making method by feeding carps with milk.
- 5) Pay respect to the large walking buddha image which is held the most exquisite in Phutthamonthon District.

That there are 3 patterns and 18 activities meet needs of tourists who will revisit in Nakhon Pathom province.

## 6. Conclusion

From the study of tourism demand of tourists in Nakhon Pathom Province, it is found that the sample groups are mostly female, single, and 35-44 years old. They live in Bangkok and work as government employees, earning 5,001 – 10,000 baht a month. Most of the tourists travel in Thailand fewer than 5 times a year and like to travel during summer vacation when schools are close. Many visited Nakhon Pathom for the second or third time with religious purposes. They decided to come to the province based on the information received by their friends or their relatives. They focused on the tourist attraction the most. What motivated them to visit Nakhon Pathom was the convenience in traveling. They organized the trip themselves and traveled by cars. The most popular souvenir was food and beverage. Regarding demand on repeat visitation, opinions on tourism in Nakhon Pathom, and general tourism demand, it is found that many people rated their trip very satisfactory. The money spent on average is 2,001 – 3,000 baht per person. Also, there were tourism demand in many aspects. Tourists focused on the quality of tourism-related services the most, followed by tourism activities and restaurants and bars. Apart from that, tourists believed the most suitable pattern for travel in Nakhon Pathom was leisure tourism, followed by agro-tourism and spiritual tourism. Most of the tourists chose to stay overnight in the province, choosing the place by their location and tourist attractions nearby. The most popular activity was to visit a temple and make merit, followed by to learn about local history and to learn about the local way of life.

Furthermore, three suitable tourism patterns are determined: 1) leisure tourism in a community, 2) agro-tourism, and 3) spiritual tourism. The research team attempted to encourage repeat visitation in Nakhon Pathom by devising tourism activities in many places. This can help to distribute tourists to the connected areas. Also, it is found that tourists were more interested in activities concerning faith and spirituality.

## 7. Discussion

Overall, Thai tourists travel to Nakhon Pathom for leisure purposes. More and more people are finding desired information by themselves and have expectations for tourist attractions in the province. One of the factors which help them to choose this as their destination is the affordable price of traveling. Popular souvenir includes food and beverage. However, most tourists choose not to come back in the year after. The reason seems to be that, although most tourists visit many places of attractions in the province, they do not have many activities to do. It is essential, then, to add new values to a tourist attraction and develop a variety of activity to help with this problem. The institute for

small and medium enterprise development [12] suggested the same thing: in this era where people compete with creativity and idea, value creation is the core strategy to promote competitiveness in tourism industry. In addition, value creation differs from value added: it places importance on the consumer, raising the value of a product or service with creative force drawn from arts and culture, local wisdom, natural resources, innovation, and technology, which help people to recognize a product or service. Integrating local uniqueness into a product or service will prevent them from being easily imitated. The process to imbue a product or service with creative uniqueness is also in accordance with the creative development of tourism, which supports the variety of tourism activities and boosting the tourists' motivation for travel. The value addition to tourist attractions and the betterment in tourists' satisfaction can increase the rate of repeat visitation. Terdchai Choibamroong [13] mentioned that the value of tourism resources refers to the application of those resources goal to respond to human's demand. He divided the value into four categories: 1) local wisdom value, 2) historical value, 3) social and economic value, and 4) educational value. The same idea was expressed by Thanathon Thongkhom [14], in his study on the importance of the resources value to help with proper response to tourists' need, saying cultural value raised means financial value raised as well. It will help contribute to personal recognition, that is, the sense of connection between tourists and their place of tourism. They will not only enjoy each trip but can even find their second home in a certain place, which encourages repeat visitation.

Thai and foreign tourists find satisfaction in different places. Thai tourists focus on service quality, tourism activities, and restaurants and bars, while foreign tourists focus on the place of tourism, the place to stay, and tour package offered. The difference in external factors causes the different in the two groups' expectations. Wansamon Jantadit [11] said that the factors which affect tourists' behavior and travel motivation include 1) health: this factor directly supports the travel; for example, people like in the sample groups travel to Nakhon Pathom in order to seek relaxation; 2) income: it is another major factor which dictates the tourism pattern of each tourist and is used to roughly determine their payability [10] 3) tourists' attitude and personal predilection: tourists' emphasis on the factors which decide their place of destination naturally varies and alters from time to time, depending on their age, experience, and circumstance; and 4) experience: this factor can change a tourist's attitude, knowledge, and perception.

Regarding revisit tourism demand in Nakhon Pathom, it is found that tourists believed that the most suitable pattern of tourism for the province was leisure tourism. The popular activity of repeat visitation of Thai tourist was to visit the temple and make merit,

while that of foreign tourists was to visit a tourist attraction. Thereby, the variety of activity, the allowance of tourist participation, and the impression of local identity can encourage repeat tourism. Phuriwat De-taom [15] proposed a creative tourism development plan. The practical guideline is as follows: 1) find an identity and try to understand the value of a culture; 2) develop uniqueness; 3) analyze the marketing demand in depth; 4) add value to the tourism product; and 5) adapt and change the marketing plan when necessary. When applied, this guideline can highlight the concealed characteristics and uniqueness of tourism resources, which can be utilized in the creation of a variety of tourism activity as well as promote repeat tourism.

## 8. Suggestion

8.1 A further study on the promotion of special interest tourism activities in Nakhon Pathom should be conducted.

8.2 A further study on the community's potential and capability in supporting tourists should be conducted.

8.3 A further study to form the value-adding guideline for minor places of tourism in Nakhon Pathom should be conducted.

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