

**KNOWLEDGE AND ATTITUDES ON CORAL REEFS:  
A CASE STUDY OF CORAL REEF EXCURSIONS  
IN THE EAST COAST OF THAILAND**



**A THESIS SUBMITTED IN PARTIAL FULFILLMENT  
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Thesis  
entitled

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IN THE EAST COAST OF THAILAND**



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Kosol Sriputtinibondh

**KNOWLEDGE AND ATTITUDES ON CORAL REEFS: A CASE STUDY OF CORAL REEF EXCURSIONS IN THE EAST COAST OF THAILAND**

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This study aimed to investigate tour guide agencies' and tourists' knowledge, understanding, and attitudes on coral reefs and eco-tourism, to study the tourism activities towards on coral reefs in the East region of Thailand, and to determine strengths, weaknesses, opportunities, and threats of the tourism activities in the East coast of Thailand. The questionnaires were used for data collection of nineteen tour guide agencies and two hundred and eighty-two tourists.

The results showed that most of the tour guide agencies had a mean score of knowledge, understanding, and attitudes at a good level. The tourists were categorized as having a moderate level of knowledge, while attitudes were at a good level. The statistical analysis indicated a non-significant difference in tour guide agencies' knowledge, understanding, and attitudes among education and participation in coral reef conservation. On the other hand, the results showed significant difference in tourists' knowledge and understanding among age, education levels, types of activity, and participation in coral reef conservation ( $p < 0.05$ ). The results indicated significant differences in tourists' attitude participation in coral reef conservation and information receiving ( $p < 0.05$ ).

The study showed there are not many documents and printed materials about coral reefs for tourists. Moreover, the publication to promote awareness and attitudes are not provided in all attraction places. For the community participation issue, it declines in the urban community such as Pattaya, Chonburi. The results also revealed that there have been unsuitable activities e.g. using anchor in the coral reef protected areas.

This study indicated the importance of the development and concern of activities and policies for enhancing knowledge, understanding, and promoting awareness of tourists for the conservation and protection of marine resources.

**KEY WORDS: KNOWLEDGE/ ATTITUDES/ CORAL REEFS/ DIVING**

106 pages

การศึกษาความรู้ความเข้าใจ และทัศนคติเรื่องการท่องเที่ยวชมปะการัง กรณีศึกษา แหล่งท่องเที่ยวแนวปะการัง บริเวณชายฝั่งทะเลภาคตะวันออก

KNOWLEDGE AND ATTITUDES ON CORAL REEFS: A CASE STUDY OF CORAL REEF EXCURSIONS IN THE EAST COAST OF THAILAND

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#### บทคัดย่อ

การศึกษาวัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความรู้ ความเข้าใจ และทัศนคติของผู้ประกอบการนำเที่ยวชมแนวปะการังและนักท่องเที่ยวในเกี่ยวกับการท่องเที่ยวเชิงอนุรักษ์ในแนวปะการัง และรูปแบบกิจกรรมการท่องเที่ยวเชิงอนุรักษ์ในแนวปะการังภาคตะวันออก การศึกษานี้มีวัตถุประสงค์ในการวิเคราะห์จุดเด่น จุดด้อย โอกาส และอุปสรรคของกิจกรรมท่องเที่ยวในแนวปะการัง ภาคตะวันออก โดยกลุ่มประชากรที่ใช้ในการศึกษาได้แก่ ผู้ประกอบการจำนวน 19 คน และนักท่องเที่ยวจำนวน 282 คน โดยใช้แบบสอบถามในการเก็บข้อมูล

ผลการวิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและการเปรียบเทียบค่าเฉลี่ยพบว่า กลุ่มผู้ประกอบการส่วนใหญ่มีความรู้ความเข้าใจและทัศนคติอยู่ในระดับสูง ส่วนกลุ่มนักท่องเที่ยวมีความรู้ความเข้าใจอยู่ในระดับปานกลาง และทัศนคติอยู่ในระดับสูง จากการศึกษาปัจจัยทางด้าน ภูมิสำเนา ระดับการศึกษา การได้รับข่าวสารเกี่ยวกับแนวปะการัง และการเข้าร่วมกิจกรรมเกี่ยวกับการอนุรักษ์ทางทะเลของผู้ประกอบการ พบว่าความรู้ความเข้าใจ และทัศนคติของผู้ประกอบการมีความแตกต่างกันอย่างไม่มีนัยสำคัญทางสถิติที่ระดับความเชื่อมั่น 0.05 ผลการเปรียบเทียบค่าเฉลี่ยความรู้ความเข้าใจของนักท่องเที่ยว โดยเปรียบเทียบปัจจัยทางด้านอายุ ระดับการศึกษา ลักษณะของการทำกิจกรรม การมีประสบการณ์ในกิจกรรม และการเข้าร่วมกิจกรรมทางด้านการอนุรักษ์ทางทะเล พบว่าความรู้ความเข้าใจมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับความเชื่อมั่น 0.05 ผลการเปรียบเทียบค่าเฉลี่ยทางด้านทัศนคติของนักท่องเที่ยว โดยเปรียบเทียบปัจจัยทางด้านลักษณะของการทำกิจกรรม การมีประสบการณ์ในกิจกรรม และการได้รับคำอธิบายจากผู้ประกอบการก่อนทำกิจกรรม มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับความเชื่อมั่น 0.05

ผลจากการประเมินปัจจัยด้านต่างๆที่มีผลต่อการท่องเที่ยวในแนวปะการัง พบว่าในด้านเอกสาร ข้อมูล และสื่อสิ่งพิมพ์ที่ให้ความรู้และคำแนะนำเกี่ยวกับแนวปะการังกับนักท่องเที่ยวยังมีอยู่ไม่มากนัก รวมถึงการประชาสัมพันธ์ให้มีความตระหนักถึงคุณค่าและความสำคัญของปะการังนั้นพบได้เพียงบางจุดซึ่งไม่ทั่วถึง และด้านการมีส่วนร่วมของชุมชน ซึ่งเป็นปัจจัยหนึ่งที่เกี่ยวข้องกับการท่องเที่ยวเชิงอนุรักษ์ พบว่าแหล่งท่องเที่ยวได้กลายเป็นสังคมใหญ่ยกตัวอย่าง เมืองพัทยา จังหวัดชลบุรี ส่งผลต่อการมีส่วนร่วมของชุมชนท้องถิ่นลดน้อยลง สุดท้ายในด้านการปฏิบัติตนในแนวปะการังนั้น ยังคงมีการใช้สมอในแนวปะการัง เพื่อส่งนักท่องเที่ยว

ซึ่งจากปัจจัยต่างๆ ที่เกิดขึ้นจากการท่องเที่ยวที่วนั้น ส่งผลให้แนวปะการังมีความเสื่อมโทรมลง จึงควรมีการปรับปรุง และพัฒนากิจกรรมการท่องเที่ยวในแนวปะการัง รวมถึงการให้ข้อมูลข่าวสาร การประชาสัมพันธ์ให้ประชาชนตระหนักถึงความสำคัญของการอนุรักษ์ เพื่อช่วยในการอนุรักษ์ทรัพยากรธรรมชาติทางทะเลไว้ต่อไป

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## CHAPTER I

### INTRODUCTION

#### 1.1 Overview

The first parts of this chapter provide the background and rationale for the problem of this study. The purposes of this study as well as the research question that help to delimit the breadth and the depth of the study are described.

#### 1.2 Background and Significance of Problems

The Thai eco-tourism had become increasingly popular during the end of the 7<sup>th</sup> Economic Development Plan; a tourist sustainability plan, the plan had been vastly accepted for solving environmental and commercial tourism issues. Tourism microscopes to the preservation and caring of natural resources focus mainly on the ecosystem. The burst of the 1997 economic bubble led tourism in becoming the mainstream to help boost the economy during 1997-1998, with the well-known “Amazing Thailand” campaign. From this point on tourism became the main interest (Department of Environment, 2008). The objects of eco-tourism are systematically handled, enabling the success measurement and suitable linkage for necessary adaptation to balance the need in all aspects at any level. This system will help assist the natural resources ability to maintain its status, roles, duty and natural re-habitation. Nevertheless the conscience mind of tourist, local people and tour guide agencies’ will be the heart in preserving natural resources for a better living standard.

The oceans have become more popular in aspects of tourism, amusement, and vacation. These aspects in turn will disturb the complex and fragile environment of the sea coast and the ocean’s ecosystems. Corals reefs, which are natural resources, are living species lying in the sea bed, comparable to forest on land, proving shelter, hideouts and sources of food for various creatures including humans. Furthermore,

coral reefs stand as nature's barrier easing the strong winds and currents from directly scouring the coast.

The conditions of the coral reefs in the East coast of the gulf of Thailand stretching from the Chonburi province to Trat are mostly in a near perfect state (Department of Resources by Sea and Shore, 2008). Coral's combination of the exotic beautiful shapes and colors has drawn in a rapid increase in the tourist industry; activities such as scuba diving provide a close-up look towards nature while leading to a deterioration of the coral reef, either intentionally or unintentionally. Knowledge must be asserted to all activities concerning the coral reef in order to help preserve its beauty; eco-tourism may be taken seriously.

Diving activity is considered to be of special interest for sporting entertainment. This activity involves getting acquainted with natural resources for enjoyable purposes, gaining knowledge and high moral responsibilities, whether it's shallow or deep-sea scuba diving. Organizers must be responsible for tourists in leading them towards responsibility of the coral reefs' ecosystem and the environment, as scuba diving had been categorized as eco tourist where delicate actions must be taken for all involved. Researchers need to understand the importance of eco-tourism from the coral reefs tour organizers, including the perspective of tourist towards natural resources in terms of eco-tourism. Modifications can be made when understanding the ideas of tourist and anyone involved in eco-tourism.

### **1.3 Objectives**

1.3.1 To study tour guide agencies' and tourists' knowledge and attitudes on coral reefs eco-tourism.

1.3.2 To study the tourism activities towards on coral reefs in the East coast of Thailand.

1.3.3 To determine strategies, weaknesses, opportunities, and threatens of the tourism activities in East coast of Thailand.

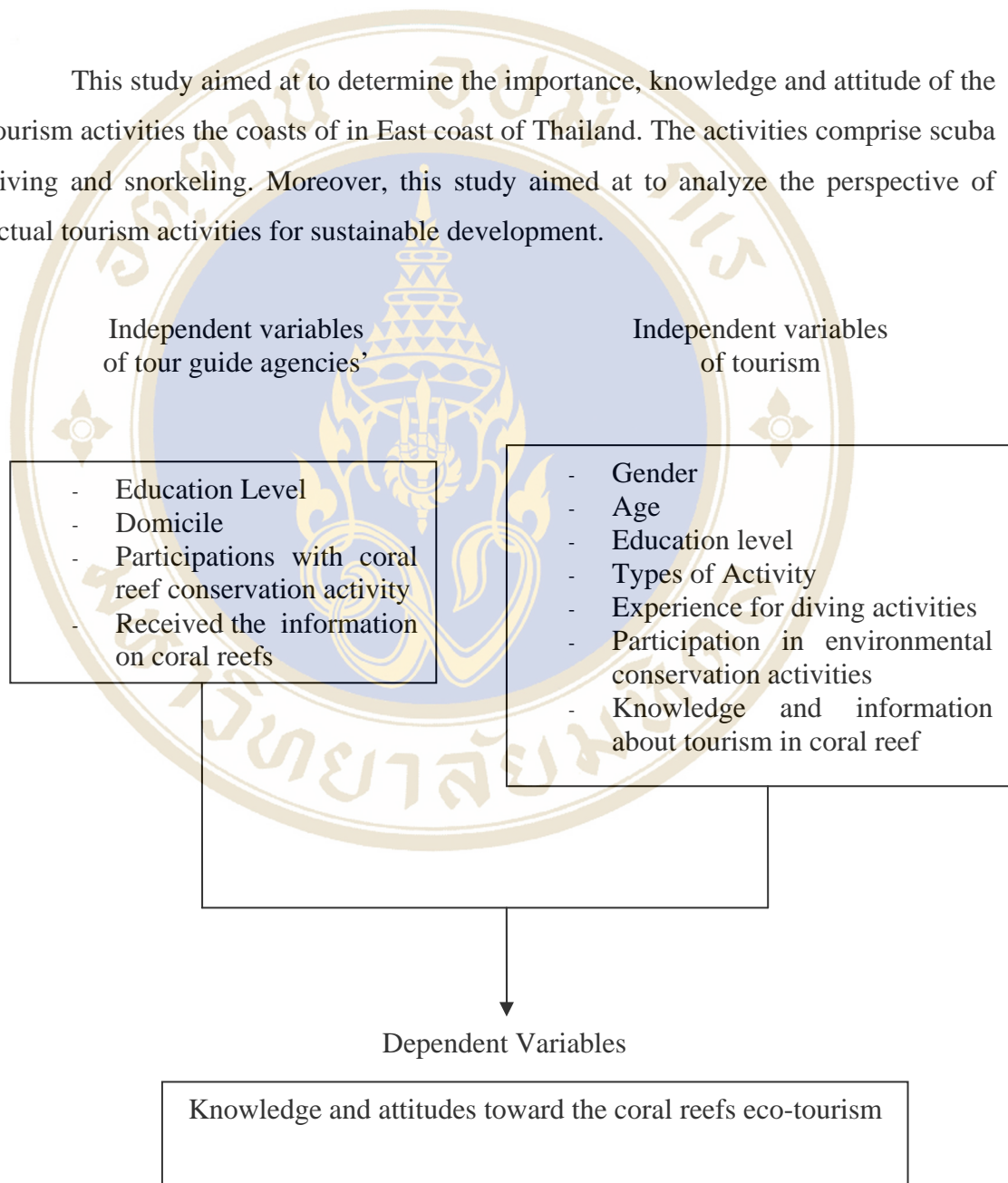
### **1.4 Scope of the Study**

To study insights of the respondents who involved in tourism in East coast of

Thailand, located at Gulf of Thailand. The areas of study covered three provinces, Chonburi, Rayong, and Trat. Data collection conducted during October 2008 to January 2009.

### 1.5 Conceptual Framework

This study aimed at to determine the importance, knowledge and attitude of the tourism activities the coasts of in East coast of Thailand. The activities comprise scuba diving and snorkeling. Moreover, this study aimed at to analyze the perspective of actual tourism activities for sustainable development.



**Figure 1-1** Conceptual Framework of the Research



## 1.6 Expected Outcomes

Expected outcomes of this study are

1.6.1 To evaluate tour guide agencies' and tourists' knowledge, and attitude on coral reefs and eco-tourism.

1.6.2 To determine the tourism activities of the coral reefs tourism for take care and conserve coral reefs.

1.6.3 To assess strategies, weakness, opportunities, and threatens of the tourism activities.

## 1.7 Research Hypothesis

This research will study the hypothesis of the tour guide agencies' and tourist

### **Tour guide agencies'**

1. Different of tour guide agencies' residence relationship towards knowledge and attitude of ecotourism.
2. Different of tour guide agencies' education level relationship towards knowledge and attitude of ecotourism.
3. Different of coral reefs knowledge of the tour guide's relationship towards knowledge and attitude of eco-tourism.

### **Tourist**

1. Different of age and the relationship towards knowledge and attitude of ecotourism.
2. Different of activities and the relationship towards knowledge and attitude of ecotourism.
3. Different of diving experience and the relationship towards knowledge and attitude of ecotourism.
4. Different of coral reefs advice and guidance for tourist before diving's relationship towards knowledge and attitude of ecotourism.

## 1.8 Research Definitions

**Eco-tourism:** tours giving importance to natural resources and environment in specific areas, by providing knowledge to anyone involved under the guidance of local people, building morality to preserve natural resources alongside tourism.

**Attitude:** ideas, emotions, trends and mind of people shown towards one thing or another.

**Attitude of eco-tourism:** ideas, emotions, trends or mind of people towards Eco-tourism.

**Coral reef tour guide agencies':** tour guides including diving institute and diving shops that are involved with natural resources and the well-being of coral reefs.

**Tourist:** Thais and foreigners who benefits from natural resources through shallow and deep-water scuba diving for the purpose of vacation, entertainment and sport.

## CHAPTER II

### LITERATURES REVIEW

#### 2.1 Overview

The purpose of this chapter is to provide a literature review concerning eco-tourism related to the scope of the study. The first part is the concept of eco-tourism. The second part describes the basis knowledge of the coral reefs ecosystem. Finally, the last part reveals research on eco-tourism on coral reef.

#### 2.2 Concept of Eco-tourism

##### 2.2.1 Definition, meaning and elements

Eco-tourism has been given many meanings and scopes, whereas each person gives similar meanings. Ceballos Lascurain (1991) was the first person to give meaning to eco-tourism: traveling that involves natural resources without disturbing or harming nature, for the purpose of appreciating, studying and enjoying the scenery of plants and animals, along with the culture that exists in each location.

Thailand had known eco-tourism through the scope of Sari Wachbudsakorn (1996): tours that gives responsibility to natural resources and environments involving the culture in each local village and ruins. Yuwadee Niratakul (1996): improvement of tourism with careful use of capital for sustainability, whereas in the end giving back to local villagers to better understand and act upon the decisions and systems in balancing out nature and society to sustain the economy.

Tourism Authority of Thailand (1997) stated importance of eco-tourism:

1. Tourist location that will support and develop eco-tourism should be a place with preserved natural resources and environment in addition to historical ruins and culture within the area.

2. Eco-tourism is everybody's responsibility. The tourist should enjoy the natural resources and ecology without harming natural resources.

3. Eco-tourism emphasized on the tourist having grasped a sense of Personal experience with the ecosystem, providing the tourist an understanding of the natural resources and greater satisfaction; this will also bring forth positive morality towards the environment.

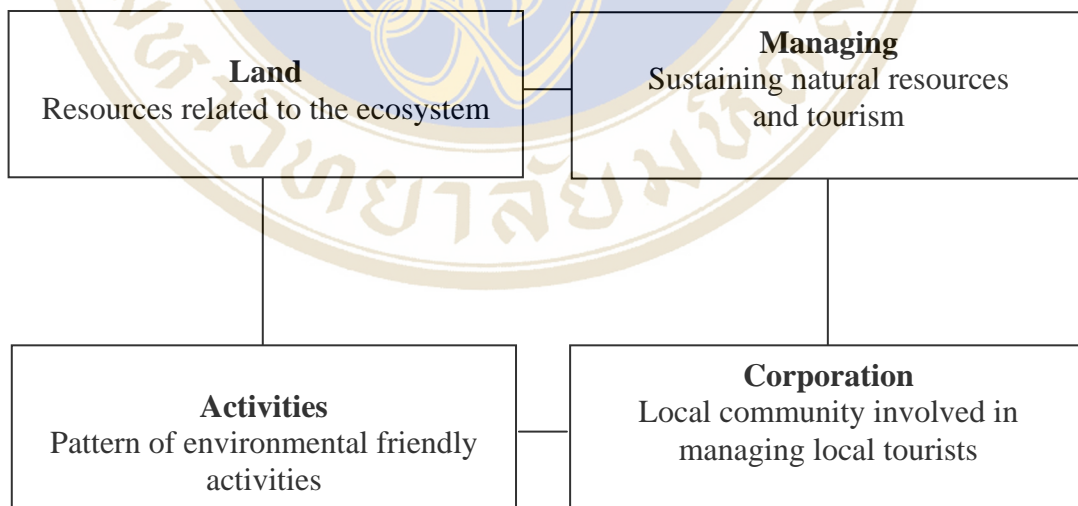
4. Eco-tourism must benefit both giving back and preserving nature, which in turn will favor the local people indirectly and directly.

5. Eco-tourism pinpoints the value of nature or the outstanding perspectives which is a symbol that attracts tourist, not artificial decorations for proving support.

In conclusion to ecotourism: tourist will see the importance of natural resources and the environment’s uniqueness within each area, providing a system to help understand the local people, for conscience implantation to help preserve natural resources alongside traveling.

### 2.2.2 Main factors of eco-tourism

Important four elements of ecotourism according to the Division of preserved Tourism Authority of Thailand (2002):



**Figure 2-1** Main elements of eco-tourism (Division of Preserved Tourism Authority of Thailand (2002))

**1. Location factor:** tourism that involves nature has a unique location base upon the natural habitat (Nature – base tourism) including the cultural and historical features related to the ecosystem within the area.

**2. Managing factor:** tourism have the responsibility not to disturb nature and society. Good management towards natural resources and protection of pollution, in addition, control the amount of tourists not to exceed the ability of the area to handle, so that tours will not affect the natural resources and can be sustained.

**3. Activity factor:** tourism which has the learning procedure, the education on environment surrounding and ecosystem of the attraction, will improve knowledge, and expression for tourist and tour guide agencies. These will also encourage the awareness.

**4. Involvement factor:** community participation on tourism, including thinking, planning, operating, and maintenance the attraction will benefit to spreading income and improving quality of the local life.

#### **Community involvement in eco-tourism**

Promotion and giving precedence to the local people on having role in tourism management by community involvement, an element of eco-system, according to the Office of the National Economic and Social Development Board (2006) had defined in the 10<sup>th</sup> economy development plan (2008 – 2011) to promote the potential of community on living together with natural resource and environment.

1) Build awareness to the community on the importance of natural resources affecting our lives, also expand the control of local people to assist in preserving and rehabilitating natural resources.

2) Support the local network in the protection of natural resources and biological importance for the sustainable food and herb.

3) Improve the ability and knowledge of the community to handle the natural resources and environment, where each community must have a linkage in preserving nature resources and have an equal share in profit.

#### **The importance in community support**

The community support is the cooperation between the government and the people, where the community will be able to gain self support and play a role in giving opinions to improve the standard of living (Taweethong Hongwiwat, 1984)

1) The community must be able to gain self-support, consider the benefits and believe in their own ability.

2) The community is able to understand their own problems starting with analysis and setting problems priority.

3) The community is able to know their needs and is compatible with reality.

4) The community must have a sense of ownership for them to protect as if it were their own property.

### **Attitude towards eco-tourism**

Attitude is the feeling one has towards something, a persuasion to adapt, for one to have an attitude one must study the society and environment.

Sunee Teradakorn (1982: 153) stated that attitude is a state of mind that a person has experienced no matter at what state which can be expressed as satisfied, agreed or unsatisfied and disagreed.

Same as Sumanus Meeprea (2002: 44) stated that attitude is a feeling of a person who has on a living creature which will produce a reaction.

### **Factors causing opinions**

Opinions depend on personal characteristics which have four types: imitating, learning, experience and social influence. In obtaining opinions, they can be false or different from the fact, however, and can be changed due to the information received (Praditnun Uparamai, 1976). To have a good opinion of tours from the tourist receiving correct information on the activities, which is one of the factors to preserved the natural resources and help tourist understand more about nature.

The most popular way to measure opinions is through the Likert Scale (Suchart Prasitratsin, 1966), a well-known method due to its simple measurement: starting with data collection of the opinions, each statement will have five answers: strongly agree, agree, not certain, disagree and strongly disagree. The scores will result in either a positive or negative.

### **2.2.3 Handling eco-tourism**

Handling eco-tourism can be considered in two factors:

1) Factors on land and resources to support eco-tourism, whereas the condition of the land and the value of nature play an important part in eco-tourism. Natural tourist places that have developed or changed dramatically will not be considered as eco-tourism.

2) Factors involving eco-tourism that should be promoted apart from offering pleasure and allowing tourists to get close to nature is a chance for tourists to study about natural resources along with the local living life style, through the means of natural resources.

Eco-tourism is a tour that comes in the form of preserving environment and natural resources and also knowledge with pleasure. Touring in a natural – based tourism and cultural – based tourism with the clever use of natural resources will be a symbol of preserving nature and culture for as long as possible.

#### 2.2.4 Activities conforming to eco-tourism

There are only several activities when touring with nature, whereas some activities pinpoint that it's an eco-tourism activity when some are only vivid, considering the elements and aim of the activity. For instance, taking a breath, gaining knowledge, adventure, sports amusement, exchanging experience, etc.

Setting activities in eco-tourism depends on the environmental surroundings, the Institute of Science and Technology of Thailand (1998) separated the eco-tourism into three parts:

- Appreciative recreational activities
- Adventurous recreational activities
- Ecotourism activities

1) **Appreciative recreational activities:** appreciating the scenery in a relaxing atmosphere, terrain/mountain bikes, tent camping, white-water rafting, picnicking, and waterfall visits/exploring, etc.

2) **Adventurous recreational activities:** hang glider, rock/mountain climbing, cave exploring/visiting, snorkel or skin diving, scuba diving, wind surfing and canoeing/kayak/row boating/sail boating, etc.

3) **Ecotourism activities:** hiking/trekking, nature education, nature photography videotaping and sound of nature audio taping, animal/bird watching, sky interpretation and boat sightseeing, etc.

Scuba diving activity is closely related to natural resources. Scuba diving can be categorized into three kinds per the Institute of Science and Technology of Thailand (1998):

1) **Snorkeling or skin diving:** an activity that gives a close-pleasure encounter with underwater natural resources. Tourists will have a chance to study the corals and animals underwater. Equipment involving in this activity are masks, snorkels, and fins, including life vest helps with floating. The area for this activity should be at a shallow end, the source of many corals and animals, combining with clear water and no current.

2) **Scuba diving:** an activity that gives close-pleasure encounter with underwater natural resources, this activity calls for a respirator. The areas for this activity should not exceed 30 meters under water. A source of many beautiful and rich corals and creatures, low current and clear water. The most important thing to remember is although it's the same as shallow diving, extra caution should be taken.

3) **Sea walking:** sea walking or surface air supply uses an oxygen inhaling machine from the surface pass down through the tube to be able to breathe under water; at the end of the tube will be a helmet cover the diver's head. Sea water diving limits to not exceeding 5 meters under water, deeper would cause the water pressure problem.

### 2.3 General Knowledge of the Coral Reefs Ecosystem

Corals have no backbone. Categorized as a Phylum Cnidaria, corals can be categorized into two categories:

- 1) Corals that slowly or never build limestone are categorized as “hermatypic coral”
- 2) Corals that build limestone on the outside employing calcium from the sea are categorized as “hermatypic coral”. These corals take different shapes, which can be further categorized into seven categories:
  - 1) **Massive coral:** shaped like a rock; for instance, brain coral.
  - 2) **Submassive coral:** shaped like sticks gathered in a group independent from each other.
  - 3) **Encrusting coral:** the growth spreads around the surface.
  - 4) **Branching coral:** grows like a twig and branches out.
  - 5) **Foliaceous coral:** shaped like petals overlapping one another looks like



turnip.

6) **Tabulate coral:** grows horizontally like a table, which can overlap one another.

7) **Mushroom coral:** grows like a mushroom, able to move slowly some areas are found in a group.

An important characteristic of a coral reef ecosystem is having a complex element and a richness of living creatures inside either with or without backbone. The structure of a coral reef is a place for many living creatures like sponges, sea worms, crabs, and many kinds of shells, etc. Furthermore, corals can become hideouts, a place to lay eggs, hatching grounds etc. Corals are considered to be an ecosystem that has richness and is also self dependent, from Zooxanthellae and bacteria producing primary products, making corals and important habitat for fishes and other animals, which is a cycle that occurs in the coral ecosystem (Thron Tumrongnanasawat, 1996).

### 2.3.1 Importance of coral reefs

The importance of natural coral reefs benefits both directly and indirectly (Suwaluck Satumanuspun, 2001), are according to the following:

**Direct benefits:** benefits gain from corals and others in the ecosystem.

- Shelter, place to lay eggs, hatching ground and good for fish and other animals.
- Produces sand for the beach with the erosion of limestone.
- Source of medicine production from some living creatures from the coral reefs; for instance, kalapungha, able to produce chemical to produce into medicine, anti-cancer medicine, anti-microbe, and chemical protecting crystals, etc.

**Indirect benefits:** beneficial value from the coral reefs.

- Beautiful scenery from the coral reefs and the structure of the coral and living creatures living in the coral's ecosystem.



Massive Coral



Submassive Coral



Encrusting Coral



Branching Coral



Foliaceous Coral



Tabulate Coral



Mushroom Coral

**Figure 2-2** Categorized of coral reef

- Coral reefs help protect the beaches from erosion from the waves, wind and storm; furthermore, coral reefs are a great natural protection from the wind.

- Educational purposes and preservation for studying and experimentation.

### **2.3.2 Reason for deterioration and the effects from coral reefs tour**

Able to separate into two types (Suwaluk Satumanuspun, 2001):

#### **1. Deterioration due to nature**

- Strong waves cause corals to break.
- Sea animals feeding from the coral.
- Too much fresh water from land running into the sea causing change in the sea water.
- Climate change causing phenomenon's like seawater becoming acidic, temperature change, etc.

#### **2. Deterioration cause by hands of human**

- Collecting corals for souvenirs.
- Dropping and hoisting the anchor into the coral reefs.
- Waste from factories, hotels and community living by the sea.
- Building structures near the beach causing the soil dregs running into the sea making it muddy. Same with mining; these dregs will pile up on the coral reefs causing death.
- Illegal fishing like using explosives and toxic chemicals etc.
- Littering the sea with bottles, cans, plastic bags, food scraps.
- Damage caused by touching, stepping, standing and hitting including diving equipment that are not properly stored can hook the coral during diving.

### **2.3.3 Coral preservation**

Coral preservation needs the cooperation from people, government, private sectors and other communities for preserving nature which can be done according to the following:

1. Announce a preservation area protecting the corals that have yet to be destroyed.
2. Promote education, understanding to know the beneficial importance coral reefs by arranging seminars in the education system.
3. Increase regulations and punishments to those who destroy the coral reefs.
4. Installing a buoy to the boat so there will be no dropping of anchor.

5. Decrease the use of coral reefs by limiting the number of tourists.
6. Build awareness and morals to see the importance of coral reefs and minimize waste to be thrown into the water.
7. Stimulate the cooperation of all to maintain and protect the beauty of coral reefs.

#### **2.3.4 Practice for tour around the coral reefs**

To decrease the effects on coral reefs and the ecosystem from the diving activities (Institute of Science and Technology Rajamangala University of Technology Krungthep, 2008).

- 1) Obey and act upon the request of the person in charge.
- 2) No dropping of anchor in the coral reefs area; instead use buoy.
- 3) Study about the coral reefs before going to see the corals.
- 4) Practice using diving equipment before going coral diving.
- 5) Wear a buoyancy vest every time when going to see the corals.
- 6) Jumping from and getting on the boat should be done away from the coral reefs.
- 7) No standing, stepping or touching the corals.
- 8) No chasing after fish or other creatures and avoid feeding the fish as it may disturb the ecosystem.
- 9) No collecting of any souvenirs from the sea.
- 10) Help keep the place clean and tidy.

#### **2.3.5 The study on patterns of coral conservation and rehabilitation in Eastern Thailand**

##### **2.3.5.1 Patterns of coral conservation**

Coral conservation requires understanding of how to utilize it, and how to prevent it from being destroyed, in order to maintain balance and sustainability of nature. Participation and cooperation of communities and governmental organizations are important and essential for conservation of coral reefs in the local areas. Solutions used these days for conserving coral reefs and relating natural resources are:

- Mapping the area surrounding coral reefs. The area is demarcated into 4 zones for managing utilization and conservation of coral reefs and other marine resources. The 4 zones are namely: area taken care by local communities' zone, area

for tourist and recreational activities zone, area for maintaining balance of nature zone, and area for studies or researches zone. Policies were made for administering coral management in each area, so that activities of utilization are ensured to comply with the defined coral conservation strategies.

- Setting up buoys in the area for tourism and recreational zone so that tourist ships can use for mooring without having to anchor.

- Prohibiting fish catching in some areas with coral reefs so that they can give shelters for fish and other marine animals.

- Using glass bottomed boats for tourist and recreational activities in the coral reef conservation areas.

- Promoting and publicizing the value and importance of coral in maintaining the balance of natural marine resources. Endorsing more researches and studies on coral.

- Publicizing coral reef conservation and area's cleanness protection to local communities, private sectors, associations, or groups of tourists. Activities may be arranged for this purpose.

- Supporting and encouraging participation of local communities, private organizations, associations, and tourist groups in activities for cleaning and taking care of the coral reefs areas.

#### **Promotion plans for enhancing efficiencies in tourism**

In 2005, the Mu Ko Chang National Park created a project to set up additional buoys for moorings of ships along the coasts of 6 islands within the park namely Rung Island, Tien Island, Tong Lang Island, Kra Island, Yak (Giant) Island, and Nok (Bird) Island.

The project's objectives were:

1. For sustainable utilization of marine resources in coral reefs areas.
2. For big and small ships can use for mooring without having to anchor, which cause damages to coral reefs.
3. For conserving and maintaining sustainability of coral reefs and other marine resources.

This project set up additional buoys to replace the old ones that were damaged or lost by the pulling force from big ships and harsh waves and winds after some long time of being in service.

### 2.3.5.2 Coral rehabilitation

Recently, there are several solutions to rehabilitate and protect the coral reefs that had been damaged or destroyed as follows.

#### 1. Using artificial coral reefs

Artificial coral reefs originated from local knowledge of fishermen who noticed that marine animals tended to live near rocks or something that can be used to hide themselves. So the fishermen developed the first model of artificial coral reefs using bamboos and coconut branches. It was called “sung”. Later, researchers had applied technical knowledge to develop new models of artificial coral reefs using blocks of steel-reinforced concrete in several shapes and sizes. The most popular model nowadays is a cubic concrete block measuring 1.5x1.5x1.5 cubic meters. The experiment by the Eastern Thai Gulf Fishery Research and Development Center found that using groups of 300 to 700, depending on locations, of these concrete blocks spreading on the sea floor is optimum for marine resources rehabilitation.

Artificial coral reefs are not made for replacing natural coral reef, but rather for protecting and sheltering marine animals. Main objectives of using artificial coral reefs are:

1. To develop the coastal areas for efficient fisheries.
2. To promote and support the occupation of fishery.
3. To support the government’s strategies regarding marine resources conservation and management near coastal areas.
4. To reduce conflicts between local fishermen and commercial fisheries.
5. To alleviate the problem with unemployment of local fishermen.

Artificial coral reefs are popularly used these days not only to enhance fishery resources for local fishermen but also to prevent commercial fisheries that use ring nets. Recently, besides cubic concrete blocks, many other materials can be used as artificial corals, such as: old containers of trains and out-of-service garbage trucks that were used in coastal areas of Pattani Province; an expired fighting aircraft of the Royal Thai Air Force that was used in Phuket’s coastal area; and a royal warship of the Royal Thai Navy that was dropped into the ocean near Sak Island, Pattaya, Chonburi

Province. These materials function well as artificial coral reefs that can shelter marine animals and also support tourist activities by being visiting sites for scuba diving.

- **Artificial coral reefs in Rayong province**

Rayong province started using artificial corals for their marine resources conservation in 1991. They dropped 540 cubic concrete blocks at a size of 1.5x1.5x1.5 cubic meters into the coastal area of Pla Village, Moo 5, Tambol Pla, Ban Chang District, covering approximately 0.5 square kilometers. Additional artificial coral has been used regularly. Up to now, Rayong Province has created artificial coral reefs for 21 areas. Each area has different numbers of concrete blocks and their arrangements, due to recommendations and requests from the local fishermen. During 1991 to 1996 the artificial coral reefs created were relatively small in size. Artificial coral reefs at a large size began to be used in 1997.

**Table 2-1** Locations of artificial coral reefs in Rayong province

No.	Year	Location
1.	1997	Tha Rua Village
2.	1998	Pak Klong Pe
3.	1998	Ma-khampom Bay Village
4.	2000	Chon Village
5.	2002	Ka-prao Road Village
6.	2002	Payoon Village
7.	2004	Km-16 Village
8.	2005	Chon Village
9.	2006	Bonban Village
10.	2006	Pay Village
11.	2006	Ma-khampom Bay

- **Artificial coral reefs in Chanthaburi province**

Chanthaburi is a province with coastal areas that has many fishery communities. As having many fishermen, there are also many kinds of fishery tools. Conflict arose between groups of fishermen that used different tools, mainly between small ships and big commercial ships, which can harvest and reduce a great number of

marine animals in a short time. In 1996 the Department of Fisheries began a marine resources recovery plan by setting up 4 small-sized artificial coral reefs. For sustainable fishery management and study purposes, more artificial coral reefs of larger sizes have been added since 1997 until now in order to benefit local fishery communities at the most.

**Table 2-2** Locations of artificial coral reefs in Chanthaburi Province

No.	Year	Location
1.	1999	Maew Island Village
2.	1999	Jik Island Village
3.	2001	Dongklang Village
4.	2002	Tha-klaeng Village
5.	2003	Khao Dun Village
6.	2005	Rua-taek Village
7.	2006	Krajae Village

#### **Artificial coral reefs in Trat province**

Trat is a province in Eastern Thailand bordering the neighbor country, Cambodia. There are many fishery communities along the province's coasts and islands. As having many islands, fish and other marine animals were abundant in the province's sea. Many commercial fishery ships from outside came into the area for taking advantage of the richness in marine animals. The ships used various types of big nets and rakes to catch fish and shellfish, which also damage natural coral reefs simultaneously. The fish were excessively caught and became less and less in amount. Moreover, because many islands were suitable for tourism, the government assigned them to serve tourism rather than fishery. Local fishermen faced difficulties due to reduced amount of marine animals caused both by commercial ships and tourist activities. Therefore, the Department of Fisheries, together with Trat Province and the Eastern Thai Gulf Fishery Research and Development Center of Rayong Province, have set up artificial coral reefs since 1999 until now, started with the budget of the Department of Fisheries. The list below also includes some artificial coral reefs that



were funded by the Province's Development Budget under the Chief Executive Office, which was set up in 1997.

**Table 2-3** Locations of artificial Coral Reefs in Trat province

No.	Year	Location
1.	1999	Huang Som Village
2.	1999	Huang Bon Village
3.	2000	Klong Jak Village
4.	2000	Suan Maprao Village
5.	2000	Mai Rood Village
6.	2003	Talkoo Bay Village
7.	2006	Klong Yai Village

## 2. Coral planting

There are two approaches to plant corals, either by letting them grow on a pad and move them to another place or by moving them directly. However, these approaches are still in a researching stage. Coral planting still can't be implemented practically. It would require a very high budget to grow real coral in nature. Researchers are trying to find solutions to grow coral with practical and economical approaches. At this time, coral planting is still limited to a very small size, such as planting for decoration in front of a resort, planting for trainings to grow coral conservation mind to youth, etc.

Mu Ko Chang National Park has solutions to rehabilitate coral reefs as follows.

1. Arrange 2 areas for coral culturing, one at the beach in front of Ko Wai Pakarang Resort and the other one at the beach in front of the national park's headquarter locating on the east side of Rung Island. The grown coral will be moved to plant in deteriorated areas. The culturing method was performed by collecting broken coral polyps around Wai Island and planting them on 100 plots made by PVC pipes and on 30 blocks of concrete. Around 1,400 coral polyps were planted in total.
2. Rehabilitate the deteriorated areas of coral reefs around Tien Island and Kra Island by using 100 concrete blocks as holding materials for newborn corals.
3. Monitor and assess the result every 3 months.

4. Create Snorkeling line routes for tourist divers to observe coral reefs without causing damages to them.

### **2.3.5.3 Setting up buoys for ship mooring**

In order to reduce damages to coral reefs caused by anchoring of tourist ships, many buoys were set up as moorings for ships along tourist spots such as around Mu Ko Chang National Park, Samed Island, etc. However, there are still many problems regarding the usage of buoys. In some areas, buoys are not enough, thus some tourist ships still anchor on coral reefs. Some areas were lack of good management, having too many buoys in a small area, inducing too many scuba divers, and causing damage to coral reefs. Some areas were lack of utilization planning, having too small buoys, which were broken when big tourist ships tried to moor with, or the buoys' bases might be pulled to the coral reefs area.

Buoys set up by the Department of Fisheries are mainly in areas with problems from anchors of tourist ships damaging lush coral reefs attractive to divers. Most of these areas are outside responsible areas of other organizations such as areas of Marine National Parks, or areas of Chulaporn Project taken care by Royal Thai Navy, in order to reduce conflicts and redundancies of budgeting and operations. The areas that the Department of Fisheries has set up buoys are:

- Trat province: along coral reefs of Chang Island, Kood Island, Mak Island, Wai Island, Mai See Lek Island, Mai See Yai Island, Klum Island, and Rung Island.
- Rayong Province: along coral reefs of Samet Island, Mun Island, Kangkao Island, Kuthi Island, Pla-teen (Mudskipper) Island, Gum Island, Sunchalarm Island, Saikaew Beach, and Pakarong Bay.
- Chonburi Province: along coral reefs of Lan Island, Si-chang Island, Nam Dog Mai Island, and Kham Island.

In case of Mu Ko Chang National Park, buoys were set up for other purposes rather than for ship mooring. The park used buoys of fishery nets or hard plastic buoys at a size of 8 inches. The buoys were tied together with ropes, with 1-meter intervals. The total length and number of buoys used depends on the size of the area of coral reefs. Installation was made by tying the set of buoys to stationed anchors or coral

reef's bases with another set of ropes at regular intervals. These buoys can be called multi-purpose buoys. The purposes of these buoys were: to delineate areas of coral reefs for recreational activities that ships are not allowed to get in or anchor, to help tourists notice the coral reef area, to be a resting place for tourist by holding the buoys when they get tired from diving or swimming, and to be moored by small boats.



**Figure 2-3** Tour guide agencies' used anchor in coral reef at Koh Samed, Rayong province



**Figure 2-4** Tour guide agencies' used anchor in coral reef at Koh Samed, Rayong province

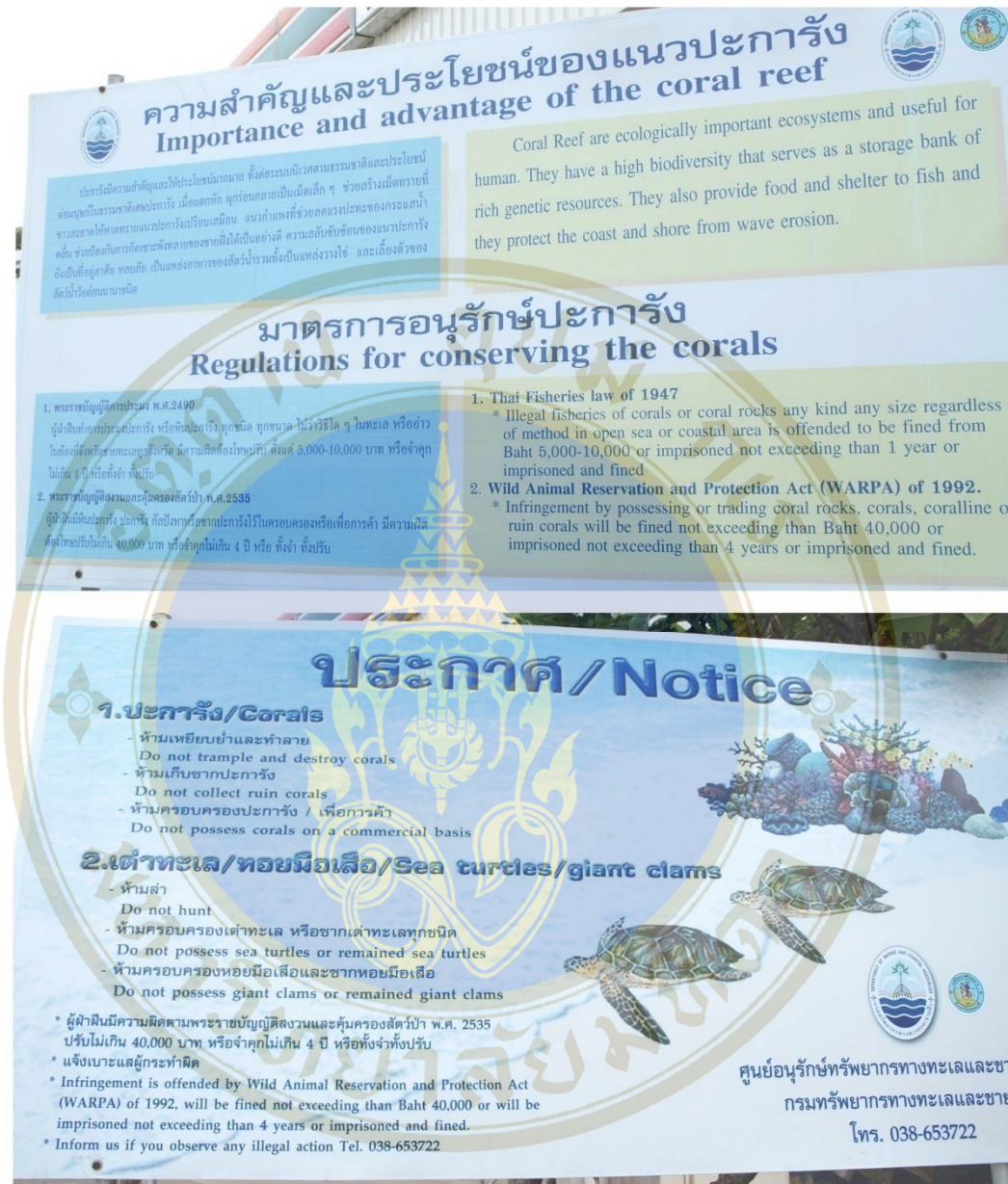


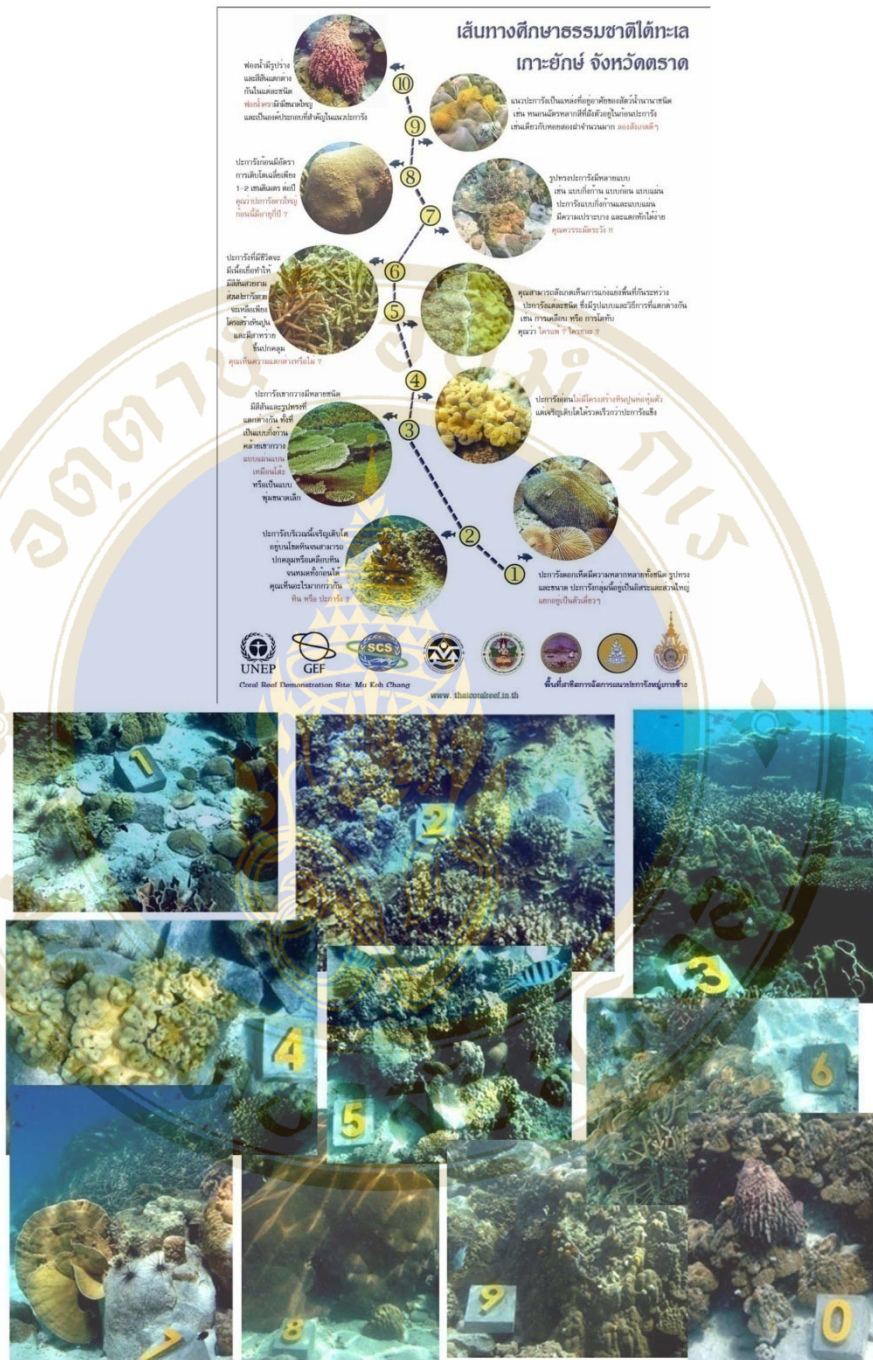
Figure 2-5 Poster by Department of Marine and Coastal Resources show in Na-Ban pier at Koh Lan, Pattaya, Chonburi province



Figure 2-6 Poster’s corals and coral reef fishes in Mu Koh Chang, Trat province show at dive shop



Figure 2-7 Brochures of corals and coral reef fishes in Mu Koh Chang at dive shop



**Figure 2-8** Brochure guidelines for snorkeling diving in Koh Yak, Koh Chang, Trat province





Figure 2-9 Brochure of guideline for sustainable coral reef tourism



**Figure 2-10** Poster of others research in coral reefs in Koh Chang showed at Krong Pru station, Department of National Parks, Wildlife and Plant Conservation in Koh Chang, Trat province



**Figure 2-11** Coral Planting in Koh Chang area

### **2.3.6 Causes of coral reef deterioration from tourist activities**

#### **Tourists**

- Tourists may collect seashells without knowing that the shells may accommodate hermit crabs inside. Collecting the shells will kill the hermit crabs. The shells that are sold as souvenirs used to be alive. They might be killed for their beautiful shells. The reduced amount of them will affect the balance of marine ecology.
- Tourists are in general appreciate to buy souvenirs made from carcasses of marine organisms such as seashells, sea urchins, and so on, resulted in activities harming marine nature.
- Tourists may disturb marine animals such as sea stars, sea urchins, nudibranchs (sea slugs), etc., by trying to catch them or playing with them.
- While the sea water level is low, tourists may step on small or newborn corals.
- Tourists may always throw garbage to the sea. Garbage that is left on the boat without securing inside garbage bags may be blown into the sea.

#### **Tourist ships**

- Some tourist ships may drop anchors on coral reefs in the area without buoys or the buoys are too far from the spots they serve customers.
- Some ships may drop garbage somewhere in the wide ocean, and the garbage was brought to coral reefs by waves later.
- Some tourist ships don't have sewage containers. Thus sewage of tourists is dropped directly to the sea. Even though the amount is small, it can cause effects to some sensitive and virgin coral reefs.

#### **Snorkeling diving**

- Divers may stand on corals for taking a rest.
- Divers may be inexperience in using the fins that make them kick corals accidently or cause sand to cover nearby corals.
- Some divers may try to catch marine animals, causing them get frightened, and may affect their behaviors permanently.
- Feeding the animals near coral reefs can also change their natural behaviors in finding food.
- Diving during the time of low sea level can cause more damage to coral reefs.

### Scuba Diving

- Some divers try to catch marine animals, such as lobster, rays (batoids), etc., for food, by using harpoon guns.
- Inexperienced divers may cause damage to organisms in coral reefs, such as soft corals, corallines, antler corals, etc.
- Diving during inappropriate time is more likely to cause damage to coral reefs. In a strong ocean current, for example, the divers may be pushed to hit coral reefs or some animals.
- Trying to catch animals or standing on coral reefs for taking photographs are also damaging.
- Some divers may try to catch big animals like whale sharks, frog sharks, sea turtles, etc.
- As some divers trying to dive into small caves or areas with limited space, bubbles they made may get stuck to animals resulting to deaths. Their air tanks can also accidentally hit some animals like sponges, corals, soft corals, etc.

### 2.4 Strategic Use: SWOTS

A SWOT analysis must first start with defining a desired end state or objective. A SWOT analysis may be incorporated into the strategic planning model. An example of a strategic planning technique that incorporates an objective-driven SWOT analysis is Strategic Creative Analysis (SCAN). Strategic Planning, including SWOT and SCAN analysis, has been the subject of much research.

- **Strengths:** attributes of the person or company that is helpful to achieving the objective.
- **Weaknesses:** attributes of the person or company that is harmful to achieving the objective.
- **Opportunities:** *external* conditions that is helpful to achieving the objective.
- **Threats:** *external* conditions which could do damage to the business's performance.

Identification of SWOTs is essential because subsequent steps in the process of planning for achievement of the selected objective may be derived from the SWOTs.

First, the decision makers have to determine whether the objective is attainable, given the SWOTs. If the objective is not attainable a different objective must be selected and the process repeated.

### **Internal and external factors**

The aim of any SWOT analysis is to identify the key internal and external factors that are important to achieving the objective. These come from within the company's unique value chain. SWOT analysis groups key pieces of information into two main categories:

- Internal factors – The strengths and weaknesses internal to the organization.
- External factors – The opportunities and threats presented by the external environment to the organization. The internal factors may be viewed as strengths or weaknesses depending upon their impact on the organization's objectives. What may represent strengths with respect to one objective may be weaknesses for another objective.

## **2.5 Relevant Research**

Sumanus Meeprean (2002) studied the role of preserving coral resources by local fishermen, at Samui Island Suradtanee province. The researcher collected information through questionnaires and evaluated through knowledge, opinion and role in preserving natural resources, and used to analyze factors that have an effect towards preserving natural coral. Statistics is used to analyze the variables and manifold. The independent variable were age, education level, fisherman experience, acknowledge the information on coral reefs and opinion on preserving coral reefs, while and the role of preserving coral reefs were an accordance variable. It is found that local fishermen have minimal knowledge and opinions on coral preservations; age, education level and fishing experience, acknowledge of corals and knowledge on corals has no effect towards preserving coral reefs. Opinion on coral preservation is the only significant, statistically viable variable that has an effect on the role of preserving corals.

Tunyaporn Wongakanit (2000) studies the tour guide's conscious on conservative guiding around coral reef. The southern of Thailand, including 6 provinces, Chumporn, Suratt hani, Ranong, Phuket, Phang-Nga, and Krabi were asked by the questionnaires. Studying the relationship between population, occupation and training factors toward conservative guiding around coral reef using the created questionnaires were analyzed by using statistical percentage, arithmetic means, t-test, simple correlation, and one-way ANOVA in analyzing the data. The studies found that variables of activities, tour place usage, and age had no effects in the difference of consciousness score towards leading the eco-tourism in the coral reefs ecosystem with the significance at 0.05, but found that male had more consciousness mind than female. The difference in education level of the guide also had a difference in consciousness of leading eco-tourism in the coral reefs ecosystem. Working duration had relationship with the consciousness of leading the eco-tourism in the coral reefs ecosystem. In addition, guides that passed trainings had higher conscious mind significantly, at a level of 0.05, than those who had not passed training sessions.

Ratcha Koachasangsun, (2001) studied the ways to develop eco-tourism in islands: A case study in Lipe Island, Satun province. The study used 2 groups of samples; (1) local people (2) tourists, both Thais and foreigners, using questionnaire as a tool and using statistics to analyze the data. Li-pe Island is at a medium level for eco-tourism. Furthermore, in comparison between the readiness for eco-tourism and suggestions to improve the eco-tourism, it was found that there were no difference between the local people and the Thai and foreign tourists, with a significance level less than 0.05. The study also found that there were strong agreements towards approaches to improve the eco-tourism in the area of (1) activities in the eco-tourism (2) better facilities supporting the eco-tourism (3) local people should take part to help eco-tourism and (4) Better arrangements of environmental conditions in tourist places.

Somsak Jamuritrat (2000) studied the eco-tourism's opportunity and limitations to development: A case study in Tao – Nangyoun Island, Suratthani province. Questionnaires were used for interviews. Percentage, mean and standard deviation were used to analyze the data. It was found that Tao – Nangyoun Island has a high potential in development for eco-tourism due to its richness of natural resources, especially the sea resources, whereas tourists were at a medium level of

satisfaction, including Tao – Nangyoun Island which had many communities causing a factor supporting the development in eco-tourism. However, the knowledge of environment was at a low level, using the income from tourist to preserve the environment was yet to be substantial. Tao – Nangyoun Island is still lacking the community's cooperation and clear planning to help preserve the natural resources.

Tiwat Rattanakate (1991), studied the potential of the land and the readiness of the community to support and develop eco-tourist water reservoir: A case study in Klong Ra Oak water reservoir, Rayong province. The study used GIS in analyzing the land data, and questionnaires for interviewing population around the water reservoir using statistical analysis: Minimum, Maximum, Percentage, Standard deviation, Chi-square multiple regression analysis, and ANOVA to analyze the data. The research found that the perfect location for support and develop eco-tourism was the center of the research land, for its high level of being natural and traditional, making the land suitable for eco-tourism. For community side, it was found that knowledge of eco-tourism was at medium level, 55.3% had moderate opinion upon eco-tourism, 38% were involved in preserving natural resources, and 38.7% had a low level of supporting and developing eco-tourism. From the one-sided variation, the knowledge had an effect towards the opinion of eco-tourism statistically significantly at level of 0.05.

Chalermkiat Suriyawong (2006), studied the present condition of shallow water scuba diving and the limitations of receiving tourists for scuba diving around the Mu Ko Chang Marine National Park, by using Lint Intercept Transect in exploration of the physical and eco science of the coral reefs. Questionnaires were used to study the physiology of the tourist. The research shown that physically the number of tourists the Park was able to receive per day was 125 people, and for the psychological side, the maximum was 300 per day. The ability of eco-science and environment was unable to calculate into numbers, it had been concluded from the effects that had occurred on the coral reefs, the damage caused by touching starts at 1-3 meters under water, which is a standing height for tourist. The ability of handling and providing support found that boats of tour guide agencies could receive around 3,000 people per day. When comparing the ability to received tourists and the amount coming, the



amount exceeds the ability, therefore some measures must be taken towards shallow water scuba diving in the Mu Ko Chang Marine National Park.

Boonlear Koachasanee (1990), studied the knowledge and awareness of the local people towards preserving nature around tourist beaches: A case study in Samet Island, Rayong province. Using the questionnaires and a readymade program, analytical statistics ANOVA and multiple classification analysis, it was found that the local population had a high knowledge on how to preserve the beaches' natural environment, especially the people involved in tourism had more knowledge than people who did not involve in tourism with a statistical significance of 0.01 and the local people had a very high awareness on preserving natural beach environment. Highly-educated people had more awareness than lower educated people with a statistic significant of 0.05; furthermore, people who had lived in the area longer had more awareness than the recent people living in the area with a statistical significance of 0.05.

Somsakul Alfred (1998), studied the behavior of local people preserving tourist natural resources in Koh Lan, Pattaya. The study used the knowledge test measuring the attitude and the behavior on preserving the tourist natural resources, the readymade program analyzing the one way analysis of variance, and testing the difference with Fisher's Least Significant Different (LSD). The study found that the knowledge gained on preserving the natural environment is through radio. The knowledge of preserving natural environment and the attitude of preserving natural environment run in different directions. This causes a different behavior in preserving the natural resources. However, people who received the knowledge consistently have a more positive attitude towards preserving natural resources than others.

Narumol Kornkhanitnan (1999), studied the effect of shallow and deep sea scuba diving and sea walking towards the coral reefs around Koh Lan, Chonburi province, and Koh Tao, Suratthani province. The study showed that, within an hour, the activities of tourist found were: for shallow water scuba diving, the coral had been touched 19 times; for deep sea scuba diving the coral reefs had been touched 11 times; and for sea walking the coral has been touched 12 times. The study showed that shallow water scuba diving had most effect toward coral reefs. From studying the opportunity and limitation towards the development of eco-tourism at Koh Tao,

Suratthani province, it was found that the improvement depended on the richness of the natural environment, environmental knowledge, cooperation of people, and plans for preserving the environment.



## CHAPTER III

### METHODOLOGY

#### 3.1 Overview

This chapter begins with research characteristics. The next section describes the data collection. The descriptions of the how the data were analyzed and interpreted are presented. Research design for this study is described as follows.

#### 3.2 Data Collection

Data collection for this research was divided into two parts:

Collection of secondary data: The researcher acquired secondary data from relevant researches, publication in libraries, the internet, journals, including statistical data from governmental offices being in charge of managing the study areas.

Collection of primary data: In order to obtain primary data from coral reefs excursion in the area of west coast of Thailand, the researcher, accompanied with 2 research assistants, had conducted field studies which were divided into two steps;

Step 1. To observe the study areas and examine people's characteristics of area utilization in order to compose an appropriate questionnaire. Photos were also taken during this step.

Step 2. To collect data using questionnaires. From October 2008 to January 2009, tourist on coral reefs excursion in the area of west coast of Thailand, were chosen as samples for the study with Purposive Sampling method.

Population used to obtain qualitative and quantitative methods are:

- 1) Coral reefs tour guide agencies in the East Coast Gulf of Thailand.
- 2) Shallow and deep sea scuba diving tourists including around the East Coast Gulf of Thailand area.

### 3.3 Tools for Research

The researchers used a questionnaire in this research to understanding and attitude information from the targeted group. The boundaries are as follow:

#### 3.3.1 Concept of questionnaire

The research has been done within the frame document and researches involved, as a guideline for the questionnaire.

Section 1: Characteristics of targeted population.

Section 2: Knowledge of coral reefs.

Section 3: Opinions upon the e co-tourism coral reefs.

Section 4: Additional opinions and suggestions towards coral reefs .preservations.

Inquires to local departments involved within the area in developing tours pinpointing upon the ideas and opinions in the following issues 1) Situation 2) Problems/Obstacles 3) Roles in managing and solving problems.

#### 3.3.2 Testing the tools for research

In this research the researcher has form a questionnaire to be used as a tool for research.

1) Present the finished questionnaire to the dissertation's advisor of expert in social science and expert in coral reefs, for the purpose of any modification needed.

2) Use the modified questionnaire from the advisors as a pre-test on the coral reefs tour guide agencies and tourists, whom are not the targeted population, but have common activities. The purpose is to test the questionnaire appropriateness. The test has been used at Tao Island in the South of Thailand. And obtain the information gathered to find the appropriateness and reliance, in the aspects of coral reefs knowledge the difficulty level translated using 25% technique (Wichean Katesing, 1988) ranges between 0.20 – 0.80. The Coefficient alpha of Cronbach (Puangrat Tawerat, 1994) equals to 0.74 and the opinion towards coral reefs eco-tourism equals to 0.82. Further modification had been done afterwards.

3) Used the recent modified questionnaires on the targeted populations.

### 3.4 Data Sampling

Specifying the sample size of the control group, in the case where the researcher is not able to know the amount the Cochran (1953) formula is put to use:

$$n = \frac{p(1-p)z^2}{d^2}$$

Determined

n	represents	the amount of populations the researcher wants
p	represents	proportion of populations the researcher choose at random
Z	represents	statistical standard significant score 0.5 (coefficient alpha 95% equals to 1.96)
d	represents	proportion of error allowed (coefficient alpha 95% proportion of error equals 0.05)

The random technique of Cochran allows the error of 0.05, the population of 323 has been used for this research.

The researcher used the questionnaires that had been modified to obtain information by the method of direct contact, where the targeted group filled the questionnaire personally. There had been both proportion and accidental sampling. The quota is 20 copies per boat will be distributed the tourist traveling for scuba diving activities and collected for further statistical analysis.

### 3.5 Data Analysis

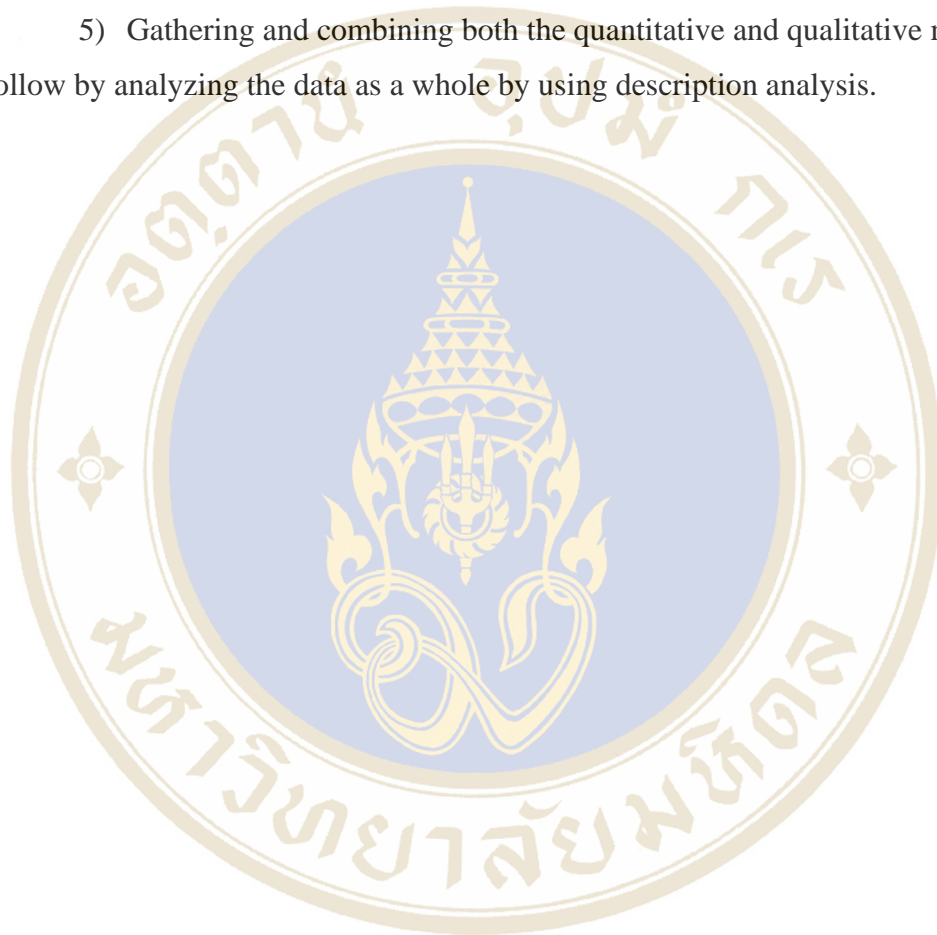
Completion of questionnaires was checked before being used for analysis as follows:

- 1) Percentage and arithmetic means for analyzing usual information from the sample group.
- 2) Percentage, arithmetic means, mode and standard deviation for analyzing knowledge, opinion and action.

3) t-test for testing the relationship between the answers of opinion and action, whether there the statistical level is 0.05 or not and One Way Analysis of Variance and pair wise comparisons analysis between group and within group by Fisheries' Least Significant Different (LSD).

4) Description analysis from the viewpoint obtained.

5) Gathering and combining both the quantitative and qualitative method follow by analyzing the data as a whole by using description analysis.



## CHAPTER IV

### RESULTS

#### 4.1 Overview

This chapter presents the study on coral reef survey located in the East coast area, the results, using questionnaires and tourist activities as data collectives. The first is explanation on general data of tourism tour guide agencies' and tourist activities on diving. The second is explanation on knowledge, attitude and opinion of tourism tour guide agencies' and tourist towards eco-tourism through percentage, means and standard deviations. The third is explanations on the set variable relations including the hypothesis of tourists relating to the attitudes and opinion of eco-tourism to coral reefs. Finally, results of perspective are shown at the end of this chapter.

#### 4.2 Respondents' Characteristics

##### 4.2.1 Classification of Tour Guide Agencies' Involving Coral Reefs Tourism

After collecting the questionnaires, it has been categorized (tour guide agencies' involving coral reefs tourism) according to sex, domicile, education, participating in the activities involving preservation.

**Education level:** most tour guide agencies' are graduate bachelor degree or equivalent with a 52.63 percentage, next up are high school or below 36.84 percentage.

**Domicile:** 68.42 percentage are non-residents and 31.58 percentage are residents. The foreign business owners have Thai wives, some who are residents and some who are non-residents.

**Participating in sea-preservation activities:** 52.63 percentage are the tour guide agencies' that have never joined any activities. 47.37 percentage have already joined some activities. Most activities were organized by the government. Each tour

guide agencies' would be requested to send a representative to join. For instance, annual garbage collection from the sea bed at Koh Lan and Aow Kung-Krabain, seminars on beneficial usage for sustainable coral reefs at Koh Chang, Trat province and planting corals at Samet, Rayong province.

**Recent news about the reef resource:** 57.89 percentage are rarely recent news about the coral reef resource and 31.58 percentage are 1-2 times per month for the recent news about the coral reef resource

As shown in table 4-1; our participants were divided according to the following:

**Table 4-1** Classification of tour guide agencies' involving coral reef tourism.

Classification of tour guide agencies'	No.	Percent
Total Populations	19	100
Education level		
- High school or below	7	36.84
- Bachelor degree or equivalent	10	52.63
- Master degree or higher	2	10.53
Domicile		
- Local people	6	31.58
- Stranger people	13	68.42
Participated in environmental conservation activities		
- No	10	52.63
- Yes	9	47.37
Recent news about the coral reef resource		
- Never	2	10.53
- Rarely	11	57.89
- 1-2 times / month	6	31.58

#### 4.2.2 Classification of Tourists Involving Coral Reef Tourism

For tourist participants, we had categorized them according to sex, age, education level, pattern of activities, those who given advice and tips for coral regulations and those who participate in coral reefs preserving activities are shown in table 4-2.

**Sample group:** 282 is the total amount of participants in this study, 36.53 percentage or 103 males and 63.48 percentage or 179 females.



**Age:** the range of age can be divided into 4 groups which are 25-36 years 46.09 percentage or 130 people, 37-48 years 22.34 percentage or 63 people, less than 24 years 17.02 percentage or 48 people and 49 years and above 14.54 percentage or 41 people.

**Educational level:** at an undergraduate or equivalent level 64.54 percentage or 182 people, graduate level or equivalent 23.75 percentage or 66 people, high school level or lower 12.05 percentage or 34 people.

**Type of diving activities:** snorkeling 76.24 percentage or 215 people and scuba diving 23.75 percentage or 67 people.

**Experience in scuba diving:** no experience is about 37.23 percentage or 105 people, with experience 62.77 percentage or 177 people.

**Participating in preservation activities:** 69.86 percentage or 197 of the participants have never joined the activities before and for those who joined, some 30.14 percentage or 85 people. Activities that the tourists have engaged were: collecting garbage on the beach, growing mangrove forest, scuba diving for diminishing the fishing net under sea, etc.

**Explanations and advices on coral reefs regulations for tourists:** tourists who did not receive advice amount to 39.7 percentage or 112 people and tourists who received advice amount to 60.3 percentage or 170 people. Snorkeling tour guide agencies' received advice mostly about equipment usage and animals that are dangerous and 4poisonous, etc. Deep sea divers received advice about the depth of the water, interesting features under the water, appropriate timing to stay under water and dangerous or poisonous animals, etc.

As shown in table 4-2; our participants were divided according to the following:

**Table 4-2** Classification of tourists involving coral reef tourism

Classification of tourists	No.	Percentage
Total Populations	282	100
Gender - Male	103	36.53
- Female	179	63.48
Age - less than 24 years	48	17.02
- 25 - 36 years	130	46.09
- 37 - 48 years	63	22.34
- 49 years and above	41	14.54
Education level		
- High school or below	34	12.05
- Bachelor degree or equivalent	182	64.54
- Master degree or higher	66	23.40
Activities that you have participated		
- Snorkeling	215	76.24
- Scuba Diving	67	23.75
Participated in diving or snorkeling activated before		
- No	105	37.23
- Yes	177	62.77
Participated in environmental conservation activities		
- No	197	69.86
- Yes	85	30.14
Give knowledge and information about tourism in coral reef from tour guide agencies'		
- No	112	39.72
- Yes	170	60.28

### 4.3 Statistic Analysis on Knowledge and Attitudes of Respondents

#### 4.3.1 Knowledge of tour guide agencies on coral reef eco-tourism

The questions had been asked to prove that how tourism tour guide agencies' knowledge in coral reefs eco-tourism. The result was founded that the tours guide agencies' have the knowledge and attitudes about coral reefs eco-tourism. The results shows tour guide agencies' acquire a comprehensive mark on average of  $8.05 \pm 1.22$  points from a possible of 10.

Item 2 “Eco-tourism affected by modified traditional culture just for tourist attraction purpose”. According to the questionnaires, the participants who answered with correct of eco-tourism to 57.89 percentage. They ignored the native beautiful tradition. On the other hand, they assumed that providing facilities for leisure and recreation would be the tourist attraction. The real proper path is to implement love and respect to preserve the traditional culture to attract the tourists.

Item 6 “Suitable souvenirs for purchasing should be rare, exotic and founded only in each local area.” The participants who did give their answers to support the right idea on the questionnaire part of knowledge to 63.81 percentage. They misunderstood that the way to impress tourists is to only seek for a rare souvenir. This idea must be changed by building awareness to care and respect their home town instead. And also to preserve natural beautiful things founded in their community.

Item 9 “White corals are dead corals”. The participants who answered correctly on the questionnaire part of knowledge to 31.58 percentage. Due to the lack of understanding of corals, actually, white corals are corals with limestone or non-living corals. Knowledge on corals should be given to tour guide agencies’ and spread it to tourists for better understanding. Details are shown in table 4-3.

**Table 4-3** Knowledge of tour guide agencies’ towards coral reef eco-tourism by using the ten true-false questions (n=10)

Item	Correct Answer (percentage)
1. Ecotourism is the travel for nature, human created-arts and cultures based on responsibility in environmental conservation and local community (+)	100.00
2. For the development and contribution to ecotourism, there should be a change to the local community’s traditions, culture, and way of living in order to get more tourists. (-)	57.89
3. Ecotourism only focuses on the understanding of nature. (-)	78.98
4. It is necessary to limit the number of tourists who do snorkeling or diving activities, to minimize the negative impact from tourism activities. (+)	84.21
5. Ecotourism gives an opportunity to the local community to present their local wisdom to tourists (+)	100.00

**Table 4-3** Knowledge of tour guide agencies' towards coral reef eco-tourism by using the ten true-false questions (n=10) (cont.)

Item	Correct Answer (percentage)
6. Souvenirs should be products that are rare to find and are from the local community. (-)	63.18
7. Sea tourism sites and activities must not harm rare aquatics and nursery area. (+)	94.74
8. Sea tourism sites and activities must not harm rare aquatics and nursery area. (+)	94.74
9. White coral mean dead coral. (+)	31.58
10. There is symbiotic relationship between all the sea lives on a coral reef. (+)	100.00

#### 4.3.2 Attitudes of tour guide agencies on coral reef eco-tourism

The questionnaires, were given to tour guide agencies, were aimed to survey on their attitude towards the coral reefs eco-tourism. It was found that most of the subjects are inclined. The average of the scores was  $4.32 \pm 0.41$  points from a maximum of 5.

The result can be indicated that the tour guide agencies mostly had the good level attitude on boat stopping nearby coral reef ( $\bar{x} = 4.84 \pm 0.50$ ), using a buoy instead of anchor to stop a boat. The details are shown in table 4-4.

**Table 4-4** Percentage, average, and standard deviation from survey of coral reef diver tourist's level of tour guide agencies' towards the coral reef eco-tourism (n=19)

Attitudes towards the coral reef eco-tourism	Score (Percentage)					$\bar{X} \pm S.D.$
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
1. Wearing gloves and booties during diving or snorkeling gives a better chance to touch corals than not wearing them.	7 (36.84)	6 (31.57)	6 (31.57)	-	-	4.05±0.85
2. You should be trained how to use the diving equipment before go diving in the coral reef.	15 (78.95)	4 (21.05)	-	-	-	4.79±0.42

**Table 4-4** Percentage, average, and standard deviation from survey of coral reef diver tourist's level of tour guide agencies' towards the coral reef eco-tourism (n=19) (cont.)

Attitudes towards the coral reef eco-tourism	Score (Percentage)					$\bar{X} \pm S.D.$
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
3. For snorkeling, wearing a life jacket will help to conserve the coral.	13 (68.42)	4 (21.05)	2 (10.52)	-	-	4.58±0.69
10. Spread the word - tell your dive friends or friends these simple, but important conservation practices of coral reefs.	11 (57.89)	2 (10.52)	6 (31.57)	-	-	4.26±0.93
11. You will participate in marine environment conservation activities.	13 (68.42)	4 (21.05)	2 (10.52)	-	-	4.58±0.69
12. Factors affecting tourism growth in this area are nature and non-spoiled environment.	17 (89.47)	1 (5.26)	1 (5.26)	-	-	4.84±0.50
13. Publication about coral reef knowledge provided in boats gives a better understanding about coral reefs.	15 (78.94)	2 (10.53)	2 (10.53)	-	-	4.68±0.67
14. In your opinion, suggestion tourist not to discard any trash or food scraps into the sea can help coral reef conservation.	15 (78.94)	2 (10.52)	2 (10.52)	-	-	4.68±0.67
15. In your opinion, wasting lubricant oil from ballast is not harmful to coral reef, since sea water large volume that able to be quickly diluted.	13 (68.42)	3 (15.78)	1 (5.26)	-	2 (10.52)	4.32±1.29
16. In your opinion, knowledge's about folkways and local wisdom depending on nature should be intervened to tourist.	13 (68.42)	3 (15.78)	3 (15.78)	-	-	4.53±0.77

**Table 4-4** Percentage, average, and standard deviation from survey of coral reef diver tourist's level of tour guide agencies' towards the coral reef eco-tourism (n=19) (cont.)

Attitudes towards the coral reef eco-tourism	Score (Percentage)					$\bar{X} \pm S.D.$
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
17. In your opinion, an inexperienced diver should be paid attention closely around coral reef.	13 (68.42)	4 (21.05)	2 (10.52)	-	-	4.58±0.69
18. You do not feel satisfied that visitors to a coral collected souvenir	7 (36.84)	11 (57.89)	1 (5.26)	-	-	4.32±0.58
19. Are you acting as a role model for non violent diving reef?	10 (52.63)	7 (36.84)	2 (10.52)	-	-	4.42±0.69
20. Do you understand that the eco-tourism must be conservation-oriented interpolation of knowledge to visitors before, during, and after that lead?	6 (31.57)	9 (47.37)	4 (21.05)	-	-	4.11±0.74
21. You see that tourism helps preserve the local revenue and job increases.	13 (68.42)	3 (15.79)	3 (15.79)	-	-	4.53±0.77
22. Do you think the reef decay because of tourism?	2 (10.52)	7 (36.84)	10 (52.63)	-	-	3.58±0.69
23. Satisfaction is in the eco-tourism. Is the enjoyment and learning about nature in nature.	8 (42.11)	10 (52.63)	1 (5.26)	-	-	4.37±0.60
24. Do you think that reef ecosystems would probably like any other ecosystem? What would be destroyed when the impact on others?	9 (47.36)	7 (36.84)	3 (15.78)	-	-	4.32±0.75

**Table 4-4** Percentage, average, and standard deviation from survey of coral reef diver tourist's level of tour guide agencies' towards the coral reef eco-tourism (n=19) (cont.)

Attitudes towards the coral reef eco-tourism	Score (Percentage)					$\bar{X} \pm S.D.$
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
25. Do you think that the current tourism development plan focuses on conservation of natural resources?	2 (10.52)	9 (47.36)	8 (42.10)	-	-	3.68±0.67
Total						4.32±0.41

The summarized are shown that the majority of tour guide agencies' possess high- level of knowledge of eco-tourism for 78.95 percentage and those with good attitude of eco-tourism 89.47 percentage. The average level of information about eco-tourism is due to the lack of core understanding on such topics as well as the coral reefs natural resources. It is statistically shown that the most misunderstood topic was on the coral reef itself and second to that is the level of possible involvement by the community on eco-tourism. The tour guide agencies' positive attitude was stemmed from the coral reef being their source of income. Details are shown in table 4-5.

**Table 4-5** Percentage of tour guide agencies', categorized by level of knowledge and also attitudes towards the coral reefs eco-tourism

Score level	No.	Percentage
Knowledge of eco-tourism		
Low-level (score 0 - 3)	-	-
Mid-level (score 5 - 7)	4	21.05
High-level (score 8 - 10)	15	78.95
Attitudes of eco-tourism		
Poor attitudes (score 0-2.33)	-	-
Moderate attitudes (score 2.34 - 3.66)	2	10.53
Good attitudes (score 3.67 - 5.00)	17	89.47

### 4.3.3 Knowledge of tourists on coral reef eco-tourism

The results were shown that tourists acquire comprehensive. The result was founded that the tourist has the knowledge about coral reefs eco-tourism. The results shows tourist acquires a comprehensive mark on average of  $7.90 \pm 1.16$  points from a possible of 10.

Item 2, with the statement of “Eco-tourism should be fostered by adapting the local culture and norms to attract more tourists” we found that 37.58 percentage of total tourists agreed. They perceived that adapting the local culture and norms to facilitate the tourists in the area will attract many more tourists in the future.

Item 6 “Good souvenirs should be rare and only be found on that visiting spot” was agreeable by 59.92 percentage of total tourists with the rational that such gifts should be unique and valuable. These feedbacks indicate the misunderstanding and the lack of information, which any organization that is authorized to this should concern, and take action to educate the local people to realize the importance of preserving valuable natural resources.

Item 9 “The remains of the coral reefs are white-colored” reveals the correct belief up to 52.48 percentage due to lack of knowledge on coral reefs. White coral reefs are merely the remains of limestone without any living organs. Tourists should be informed about the coral reefs before conducting activities in those areas to ensure sustainability of natural resources. Detail are shown in table 4-6.

**Table 4-6** Knowledge of tourist in coral reefs eco-tourism by using the ten true-false questions (n=282)

Item	Correct Answer (percentage)
1. Ecotourism is the travel for nature, human created-arts and cultures based on responsibility in environmental conservation and local community (+)	94.68
2. For the development and contribution to ecotourism, there should be a change to the local community’s traditions, culture, and way of living in order to get more tourists. (-)	37.58
3. Ecotourism only focuses on the understanding of nature. (-)	83.33



**Table 4-6** Knowledge of tourist in coral reefs eco-tourism by using the ten true-false questions (n=282) (cont.)

Item	Correct Answer (percentage)
4. It is necessary to limit the number of tourists who do snorkeling or diving activities, to minimize the negative impact from tourism activities. (+)	82.26
5. Ecotourism gives an opportunity to the local community to present their local wisdom to tourists (+)	99.29
6. Souvenirs should be products that are rare to find and are from the local community. (-)	59.92
7. Sea tourism sites and activities must not harm rare aquatics and nursery area. (+)	96.09
8. Sea tourism sites and activities must not harm rare aquatics and nursery area. (+)	88.29
9. White coral mean dead coral. (+)	52.48
10. There is symbiotic relationship between all the sea lives on a coral reef. (+)	96.09

#### 4.3.4 Attitudes of tourists on coral reef eco-tourism

This study aims to survey on tourist's attitudes towards the coral reefs eco-tourism and found that most of the subjects are inclined, as shown an average of  $4.25 \pm 0.32$  points from a possible of 5 on a good level.

Given a query is found that any question of awareness of tourism in coral reef conservation. The tour guide agencies' in the good level. Dive operator should have knowledge about the ecosystem and coral reef conservation averages are  $4.57 \pm 0.57$  as shown Table 4-7.

**Table 4-7** Percentage, mean, and standard deviation from coral reefs tourist's level of attitudes towards the coral reef eco-tourism (n=282)

Attitudes towards the coral reef eco-tourism	Attitudes Score (Percentage)					$\bar{X}$ $\pm$ S.D.
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
1. Wearing gloves and booties during diving or snorkeling gives a better chance to touch corals than not wearing them.	30 (10.63)	64 (22.69)	102 (36.17)	67 (23.76)	19 (6.74)	3.07 $\pm$ 1.08
2. Ensure you are confident in using your equipment before diving.	124 (44.97)	111 (39.36)	12 (4.26)	17 (6.03)	18 (6.38)	4.09 $\pm$ 1.14
3. Choose dive operator that are environmentally friendly, such as displaying the Green Fins certificate.	151 (53.54)	123 (43.61)	8 (2.83)	-	-	4.51 $\pm$ 0.56
4. For snorkeling, wearing a life jacket will help to conserve the coral.	113 (40.07)	122 (43.26)	38 (13.48)	6 (2.12)	3 (1.10)	4.19 $\pm$ 0.83
5. In coral reefs, instead of using and anchor, one should use available mooring.	158 (56.02)	89 (31.56)	22 (7.80)	7 (2.48)	6 (2.13)	4.37 $\pm$ 0.89
6. Feeding on coral reefs can have an adverse effect to ecosystem the marine.	76 (26.95)	92 (32.62)	89 (31.56)	17 (6.03)	8 (2.84)	3.75 $\pm$ 1.01
7. Carefully get on and get off from the boat in non-coral reefs to avoid destroying corals.	112 (39.72)	103 (36.52)	65 (23.05)	2 (0.71)	-	4.15 $\pm$ 0.79
8. If wearing fins, be aware of where your fins are, which can stir up sediments or damage corals.	77 (27.30)	118 (41.84)	84 (29.79)	3 (1.06)	-	3.95 $\pm$ 0.78
9. Collecting corals and marine organisms for souvenir helps to clean the coral reef.	123 (43.61)	75 (26.59)	58 (20.56)	10 (3.54)	10 (5.67)	3.99 $\pm$ 1.14
10. Learning about coral reefs and other animals that live in the reefs can help to support the conservation of coral reefs.	161 (57.09)	107 (37.94)	11 (3.90)	3 (1.06)	-	4.51 $\pm$ 0.63

**Table 4-7** Percentage, mean, and standard deviation from coral reefs tourist's level of attitudes towards the coral reef eco-tourism (n=282) (cont.)

Attitudes towards the coral reef eco-tourism	Attitudes Score (Percentage)					$\bar{X}$ ±S.D.
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
11. Spread the word - tell your dive friends or friends these simple, but important conservation practices of coral reefs.	133 (47.16)	134 (47.52)	6 (2.13)	6 (2.13)	3 (1.06)	4.38 ±0.73
12. When you are tried from snorkeling or diving, you should stand or rest on corals.	195 (69.15)	59 (20.92)	13 (4.61)	12 (4.25)	3 (1.06)	4.53 ±0.85
13. You are interested in the local community's wisdom and way of living; how they live together with nature and gain advantages from reefs.	132 (46.81)	122 (43.26)	12 (4.26)	14 (4.96)	2 (0.71)	4.30 ±0.83
14. You will participate in marine environment conservation activities.	97 (34.40)	151 (53.54)	27 (9.57)	7 (2.48)	-	4.20 ±0.71
15. Factors affecting tourism growth in this area are nature and non-spoiled environment.	163 (57.80)	105 (37.23)	8 (2.83)	-	6 (2.13)	4.49 ±0.75
16. Publication about coral reef knowledge provided in boats gives a better understanding about coral reefs.	174 (61.70)	93 (33.97)	1 (0.35)	10 (3.55)	4 (1.42)	4.41 ±0.74
17. Dive operators explain local guideline for practice, environmental rules and regulations in corals reefs	141 (50.00)	130 (46.09)	3 (1.06)	3 (1.06)	5 (1.77)	4.41 ±0.74
18. Ecotourism in local communities will minimize the negative impact toward nature and environment.	147 (52.13)	121 (42.91)	11 (3.90)	3 (1.06)	-	4.46 ±0.67
19. Dive operator should have knowledge about the ecosystem and coral reef conservation.	171 (60.64)	100 (35.46)	11 (3.90)	-	-	4.57 ±0.57

**Table 4-7** Percentage, mean, and standard deviation from coral reefs tourist’s level of attitudes towards the coral reef eco-tourism (n=282) (cont.)

Attitudes towards the coral reef eco-tourism	Attitudes Score (Percentage)					$\bar{X} \pm S.D.$
	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly disagree	
20. The explanation of the guideline environment rules and regulations in corals reefs before diving or snorkeling will help to conserve corals.	176 (62.41)	92 (32.62)	14 (4.96)	-	-	4.57 $\pm 0.587$
Total						4.25 $\pm 0.32$

The majority of tourists have high-level of knowledge on eco-tourism for 67.38 percentage and those with neutral attitudes to 95.39 percentage on the concept. It can be implied, from these statistics, which tourists lack of the essential knowledge on the coral reefs eco-tourism. The numbers reveal that the most misunderstood topic involved knowledge of coral reefs followed by the realization of possible involvement from the locals with Eco- tourism. As for the tourist’s attitudes, which reflected only mid-level of understanding, was a result of inadequate knowledge and should be greatly improved if they are effectively informed. Detail are shown in table 4-8.

**Table 4-8** Percentage of total tourist population, categorized by level of knowledge and attitude of tourists towards the coral reefs eco-tourism

Score level	No.	Percentage
Knowledge of eco-tourism		
Low-level (score 0 - 3)	-	-
Mid-level (score 4 - 7)	92	32.62
High-level (score 8 - 10)	190	67.38
Attitudes of eco-tourism		
Poor attitudes (score 0 – 2.33)	-	-
Natural attitudes (score 2.34 – 3.66)	13	4.61
Good attitudes (score 3.67 – 5.00)	269	95.39

#### 4.3.5 Explanations on knowledge and attitude of tour guide agencies' towards eco-tourism with mean difference analysis

The result of mean difference analysis regarding the domicile group of tour guide agencies was shown that the agencies mostly had the good knowledge level.

It is concluded that the insights to tourism in coral reef conservation of tourist between the local people and stranger is non-significantly difference. Details are shown in table 4-9.

**Table 4-9** Mean difference analysis of each tour guide agencies' group domicile, categorized by the score mark range of knowledge toward the coral reefs eco- tourism

Domicile	No.	Knowledge		F	t
		$\bar{x}$	S.D.		
Local people	6	8.00	0.12	0.38 <sup>ns</sup>	0.64 <sup>ns</sup>
Stranger	13	8.07	0.48		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the domicile group of tour guide agencies was shown that the agencies mostly had the good attitude level.

It is concluded that the insights to tourism in coral reef conservation of tourist between the local people and stranger is non-significantly difference. Details are shown in table 4-10.

**Table 4-10** Mean difference analysis of each tour guide agencies' group domicile, categorized by the score mark range of attitude toward the coral reefs eco- tourism

Domicile	No.	Attitude		F	t
		$\bar{x}$	S.D.		
Local people	6	4.41	0.12	2.18 <sup>ns</sup>	-0.12 <sup>ns</sup>
Stranger	13	4.28	0.48		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the high school or below and bachelor degree or equivalent, and master degree or higher difference education groups of tour guide agencies was shown that the agencies mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge as high school or below ( $\bar{x}=7.71\pm 1.25$ ), bachelor degree or equivalent ( $\bar{x}=8.30\pm 1.25$ ), and master degree or higher difference ( $\bar{x}=8.00\pm 1.41$ ) respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of knowledge regarding education were non-significant different at the confident level of 0.05 (P-value=0.45). Details are shown in table 4-11 and 4-12.

**Table 4-11** Mean difference analysis of different education group of tour guide agencies', categorized by level of knowledge towards the coral reefs eco- tourism

Education Level	No.	Knowledge	
		$\bar{x}$	S.D.
High school or below	7	7.71	1.25
Bachelor degree or equivalent	10	8.30	1.25
Master degree or higher	2	8.00	1.41

**Table 4-12** One-way ANOVA analyses of variance of mean levels of attitudes about tourism in coral

Variable	df	SS	MS	F
Between Groups	2	1.42	0.71	0.45 <sup>ns</sup>
Within Groups	16	25.53	1.59	
Total	18	26.95		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the high school or below and bachelor degree or equivalent, and master degree or higher difference education groups of tour guide agencies was shown that the agencies mostly had the good attitude level.

It can be descending ordered by their scores of knowledge as high school or below ( $\bar{x}=4.25\pm 0.39$ ), bachelor degree or equivalent ( $\bar{x}=4.32\pm 0.45$ ), and master degree or higher difference ( $\bar{x}=4.52\pm 0.28$ ) respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of

attitude regarding education were non-significant different at the confident level of 0.05 (P-value=0.34). Details are shown in table 4-13 and 4-14.

**Table 4-13** Mean difference analysis of different education group of tour guide agencies', categorized by level of knowledge towards the coral reefs eco- tourism

Education Level	No.	Attitude	
		$\bar{x}$	S.D.
High school or below	7	4.25	0.39
Bachelor degree or equivalent	10	4.32	0.45
Master degree or higher	2	4.52	0.28

**Table 4-14** One-way ANOVA analyses of variance of mean levels of attitudes about tourism in coral

Variable	df	SS	MS	F
Between Groups	2	0.12	0.06	0.34 <sup>ns</sup>
Within Groups	16	2.84	0.18	
Total	18	2.96		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the rarely, never, and 1-2 time per month difference tour guide agencies groups that received information on coral reefs of tour guide agencies was shown that the agencies mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge as rarely ( $\bar{x} = 7.90 \pm 0.83$ ), never ( $\bar{x} = 8.50 \pm 2.12$ ), and 1-2 time per month ( $\bar{x} = 8.17 \pm 17.5$ ) respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of knowledge regarding education were non-significant different at the confident level of 0.05 (P-value=0.22). Details are shown in table 4-15 and 4-16.

**Table 4-15** Mean difference analysis of tour guide agencies' groups that received information on coral reefs, categorized by level of knowledge towards the coral reefs eco- tourism

Received Information	No.	Knowledge	
		$\bar{x}$	S.D.
never	2	8.50	2.12
rarely	11	7.90	0.83
1-2 times / month	6	8.17	1.72

**Table 4-16** One-way ANOVA analyses of variance of mean levels of attitudes about tourism in coral

Variable	df	SS	MS	F
Between Groups	2	0.71	0.35	0.22 <sup>ns</sup>
Within Groups	16	26.24	1.64	
Total	18	26.947		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the never, rarely, and 1-2 time per month difference tour guide agencies groups that received information on coral reefs of tour guide agencies was shown that the agencies mostly had the good attitude level.

It can be descending ordered by their scores of attitude as rarely ( $\bar{x}$  =4.99±0.09), never ( $\bar{x}$  =4.31±0.43), and 1-2 time per month ( $\bar{x}$  =4.21±0.41) respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of attitude regarding education were non-significant different at the confident level of 0.05 (P-value=0.90). Details are shown in table 4-17 and 4-18.

**Table 4-17** Mean difference analysis of tour guide agencies' groups that received information on coral reefs, categorized by level of attitude towards the coral reefs eco-tourism

Received Information	No.	Attitude	
		$\bar{x}$	S.D.
never	2	4.66	0.09
rarely	11	4.31	0.43
1-2 times / month	6	4.21	0.41



**Table 4-18** One-way ANOVA analyses of variance of mean levels of attitudes about tourism in coral.

Variable	df	SS	MS	F
Between Groups	2	0.30	0.15	0.90 <sup>ns</sup>
Within Groups	16	2.67	0.17	
Total	18	2.96		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the tour guide agencies participation in coral reef conservation of tour guide agencies was shown that the agencies mostly had the good knowledge level.

It is concluded that the insights to tourism in coral reef conservation of tourist between the local never and ever is non-significantly difference. Details are shown in table 4-19.

**Table 4-19** Mean difference analysis of each tour guide agencies' participation in coral reef conservation, categorized by the score mark range of knowledge and understanding toward the coral reefs eco- tourism

Participate	No.	Knowledge		F	t
		$\bar{x}$	S.D.		
Never	10	8.20	0.92	0.99 <sup>ns</sup>	0.54 <sup>ns</sup>
Ever	9	7.89	1.54		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the participation in coral reef conservation of tour guide agencies was shown that the agencies mostly had the good attitude level.

It is concluded that the insights to tourism in coral reef conservation of tourist between the never and ever is non-significantly difference. Details are shown in table 4-20.

**Table 4-20** Mean difference analysis of each tour guide agencies participation in coral reef conservation, categorized by the score mark range of attitude toward the coral reefs eco-tourism

Participate	No.	Attitude		F	t
		$\bar{x}$	S.D.		
Never	10	4.31	0.34	0.38 <sup>ns</sup>	-0.06 <sup>ns</sup>
Ever	9	4.32	0.48		

<sup>ns</sup> P > 0.05

**4.3.6 Explanations on knowledge and attitude of tourist towards eco-tourism with mean difference analysis**

The result of mean difference analysis regarding the less than 24 years old ( $\bar{x}$  =7.23±1.25), 25-36 years old ( $\bar{x}$  =8.03±1.04), 37-48 years old ( $\bar{x}$  =8.09±1.07), and 49 years old and above ( $\bar{x}$  =8.00±1.26) difference tourist groups that age was shown that the tourist mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge less than 24 years old, 25-36 years old, 37-48 years old, and 49 years old and above respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of knowledge regarding education were significant different at the confident level of 0.05 (P-value=7.06). Details are shown in table 4-21 and 4-22.

**Table 4-21** Mean difference analysis of each tourist by age group, categorized by level of knowledge and attitudes towards the coral reefs eco- tourism

Age	No.	Knowledge	
		$\bar{x}$	S.D.
less than 24 years	48	7.23	1.25
25 - 36 years	130	8.03	1.04
37 - 48 years	63	8.09	1.07
49 years and above	41	8.00	1.26

**Table 4-22** One-way ANOVA analyses of variance of mean levels of knowledge about tourism in coral

Variable	df	SS	MS	F
Between Groups	3	26.63	8.78	7.06*
Within Groups	278	349.79	1.26	
Total	281	376.42		

\* P < 0.05

The result of mean difference analysis regarding the less than 24 years old ( $\bar{X} = 4.25 \pm 0.28$ ), 25-36 years old ( $\bar{X} = 4.26 \pm 0.32$ ), 37-48 years old ( $\bar{X} = 4.19 \pm 0.33$ ), and 49 years old and above ( $\bar{X} = 4.24 \pm 0.32$ ) difference tourist groups that age was shown that the tourist mostly had the good attitude level.

It can be descending ordered by their scores of attitude less than 24 years old, 25-36 years old, 37-48 years old, and 49 years old and above respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of attitude regarding education were significant different at the confident level of 0.05 (P-value=0.73). Details are shown in table 4-23 and 4-24.

**Table 4-23** Mean difference analysis of each tourist by age group, categorized by level of knowledge and attitudes towards the coral reefs eco- tourism

Age	No.	Attitude	
		$\bar{X}$	S.D.
less than 24 years	48	4.25	0.28
25 - 36 years	130	4.26	0.32
37 - 48 years	63	4.19	0.33
49 years and above	41	4.24	0.32

**Table 4-24** One-way ANOVA analyses of variance of mean levels of attitudes about tourism in coral

Variable	df	SS	MS	F
Between Groups	3	0.28	0.07	0.73 <sup>ns</sup>
Within Groups	278	28.81	0.10	
Total	281	29.04		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the high school or below and bachelor degree or equivalent, and master degree or higher difference education groups of tourist was shown that the agencies mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge as high school or below ( $\bar{X} = 7.18 \pm 1.38$ ), master degree or higher difference ( $\bar{X} = 7.82 \pm 0.97$ ), bachelor degree or equivalent ( $\bar{X} = 8.07 \pm 1.12$ ) respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of

knowledge regarding education were significant different at the confident level of 0.05 (P-value=9.33). Details are shown in table 4-25 and 4-26.

**Table 4-25** Mean difference analysis of the education level tourists, categorized by level of knowledge towards coral reefs eco- tourism

Education Level	No.	Knowledge	
		$\bar{x}$	S.D.
High school or below	34	7.18	1.38
Bachelor degree or equivalent	182	8.07	1.12
Master degree or higher	66	7.82	0.97

**Table 4-26** One-way ANOVA analyses of variance of mean levels of knowledge about tourism in coral

Variable	df	SS	MS	F
Between Groups	2	23.58	11.79	9.33*
Within Groups	279	352.83	1.27	
Total	281	376.42		

\* P < 0.05

The result of mean difference analysis regarding the high school or below and bachelor degree or equivalent, and master degree or higher difference education groups of tourist was shown that the agencies mostly had the good attitude level.

It can be descending ordered by their scores of attitude as high school or below ( $\bar{x}=4.21\pm0.29$ ), bachelor degree or equivalent ( $\bar{x}=4.24\pm0.34$ ), and master degree or higher difference ( $\bar{x}=4.28\pm0.28$ ) respectively. Using standard deviation for analysis with One-way ANOVA method, it was found that the average score of attitude regarding education were non-significant different at the confident level of 0.05 (P-value=0.71). Details are shown in table 4-27 and 4-28.

**Table 4-27** Mean difference analysis of the education level tourists, categorized by level of attitude towards coral reefs eco- tourism

Education Level	No.	Attitude	
		$\bar{x}$	S.D.
High school or below	34	4.21	0.29
Bachelor degree or equivalent	182	4.24	0.34
Master degree or higher	66	4.28	0.28

**Table 4-28** One-way ANOVA analyses of variance of mean levels of attitudes about tourism in coral

Variable	df	SS	MS	F
Between Groups	2	0.15	0.07	0.71 <sup>ns</sup>
Within Groups	279	28.89	0.10	
Total	281	29.04		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding the snorkel and scuba diving difference pattern activity of tourist's was shown that the tourist's mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge as snorkel ( $\bar{x} = 7.81 \pm 1.12$ ) and scuba diving ( $\bar{x} = 8.19 \pm 1.01$ ) respectively. It was found that the average score of knowledge regarding pattern of activity were significant different at the confident level of 0.05 (P-value = -2.37). Details are shown in table 4-29.

**Table 4-29** Mean difference analysis of tourist's activity groups, categorized by the level of knowledge towards the coral reefs eco- tourism

Pattern of activity	No.	Knowledge		F	t
		$\bar{x}$	S.D.		
Snorkeling	215	7.81	1.12	2.15 <sup>ns</sup>	-2.37*
Scuba diving	67	8.19	1.01		

\* P < 0.05

The result of mean difference analysis regarding the snorkel and scuba diving difference pattern activity of tourist's was shown that the tourist's mostly had the moderate and good attitude level by order.

It can be descending ordered by their scores of attitude as snorkel ( $\bar{x} = 4.23 \pm 0.03$ ) and scuba diving ( $\bar{x} = 4.32 \pm 0.29$ ) respectively. It was found that the average score of attitude regarding pattern of activity were significant different at the confident level of 0.05 (P-value = -1.95). Details are shown in table 4-30.

**Table 4-30** Mean difference analysis of tourist’s activity groups, categorized by the level of attitudes towards the coral reefs eco- tourism

Type of activity	No.	Attitude		F	t
		$\bar{x}$	S.D.		
Snorkeling	215	4.23	0.33	1.67 <sup>ns</sup>	-1.95*
Scuba diving	67	4.32	0.29		

\* P < 0.05

The result of mean difference analysis regarding the never and ever of experience of activity of tourist’s was shown that the tourist’s mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge as never ( $\bar{x}$  =7.55±1.18) and ever ( $\bar{x}$  =8.18±1.05) respectively. It was found that the average score of knowledge regarding experience of activity were significant different at the confident level of 0.05 (P-value=-5.30). Details are shown in table 4-31.

**Table 4-31** Mean difference analysis of groups of experienced tourist divers, categorized by level of knowledge towards the coral reefs eco- tourism

Experience of activity	No.	Knowledge		F	t
		$\bar{x}$	S.D.		
Never	105	7.44	1.18	5.03*	-5.30*
Ever	177	8.18	1.05		

\* P < 0.05

The result of mean difference analysis regarding the snorkel and scuba diving difference pattern activity of tourist’s was shown that the tourist’s mostly had the moderate and good attitude level by order.

It can be descending ordered by their scores of attitude as snorkel ( $\bar{x}$  =4.19±0.28) and scuba diving ( $\bar{x}$  =4.28±0.39) respectively. It was found that the average score of attitude regarding pattern of activity were significant different at the confident level of 0.05 (P-value=-1.95). Details are shown in table 4-32.

**Table 4-32** Mean difference analysis of groups of experienced tourist divers, categorized by level of attitude towards the coral reefs eco- tourism

Experience of activity	No.	Attitude		F	t
		$\bar{x}$	S.D.		
No	105	4.19	0.28	2.46 <sup>ns</sup>	-2.07*
Yes	177	4.28	0.39		

\* P < 0.05

The result of mean difference analysis regarding the took pre-visit training on recommendations of visiting procedures to the coral reef of tourist's was shown that the tourist's mostly had the moderate knowledge level by order.

It is concluded that the insights to tourism in coral reef conservation of tourist between the no and yes is non-significantly difference. Details are shown in table 4-33.

**Table 4-33** Mean difference analysis of groups who took pre-visit training on recommendations of visiting procedures to the coral reef sites, categorized by level of knowledge towards the coral reefs eco- tourism

Knowledge	No.	Knowledge		F	t
		x-bar	S.D.		
No	112	7.96	1.13	1.85 <sup>ns</sup>	0.60 <sup>ns</sup>
Yes	170	7.87	1.17		

<sup>ns</sup> P > 0.05

The result of mean difference analysis regarding took pre-visit training on recommendations of visiting procedures to the coral reef of tourist's was shown that the tourist's mostly had the good attitude level.

It can be descending ordered by their scores of attitude as no ( $\bar{x}=4.14\pm0.34$ ) and yes ( $\bar{x}=4.32\pm0.29$ ) respectively. It was found that the average score of attitude regarding pattern of activity were significant different at the confident level of 0.05 (P-value=-4.99). Details are shown in table 4-34.

**Table 4-34** Mean difference analysis of groups who took pre-visit training on recommendations of visiting procedures to the coral reef sites, categorized by level of attitude towards the coral reefs eco- tourism

Knowledge	No.	Attitude		F	t
		$\bar{x}$	S.D.		
No	112	4.14	0.34	2.79 <sup>ns</sup>	-4.99*
Yes	170	4.32	0.29		

<sup>ns</sup> P > 0.05, \* P < 0.05

The result of mean difference analysis regarding no and yes with difference involved in marine conservation activities of tourist’s was shown that the tourist’s mostly had the moderate and good knowledge level by order.

It can be descending ordered by their scores of knowledge as no ( $\bar{x}$  =7.78±1.21) and yes ( $\bar{x}$  =8.21±0.98) respectively. It was found that the average score of knowledge regarding being involved in marine conservation activities were significant different at the confident level of 0.05 (P-value=-2.97). Details are shown in table 4-35.

**Table 4-35** Mean difference analysis of being involved in marine conservation activities, categorized by level of knowledge towards the coral reefs eco- tourism

Participate	No.	Knowledge		F	t
		$\bar{x}$	S.D.		
No	197	7.78	1.21	2.38 <sup>ns</sup>	-2.97*
Yes	85	8.21	0.98		

\* P < 0.05

The result of mean difference analysis regarding the being involved in marine conservation activities of tourist’s was shown that the tourist’s mostly had the good attitude level.

It is concluded that the insights to tourism in coral reef conservation of tourist between the no and yes is non-significantly difference. Details are shown in table 4-36.



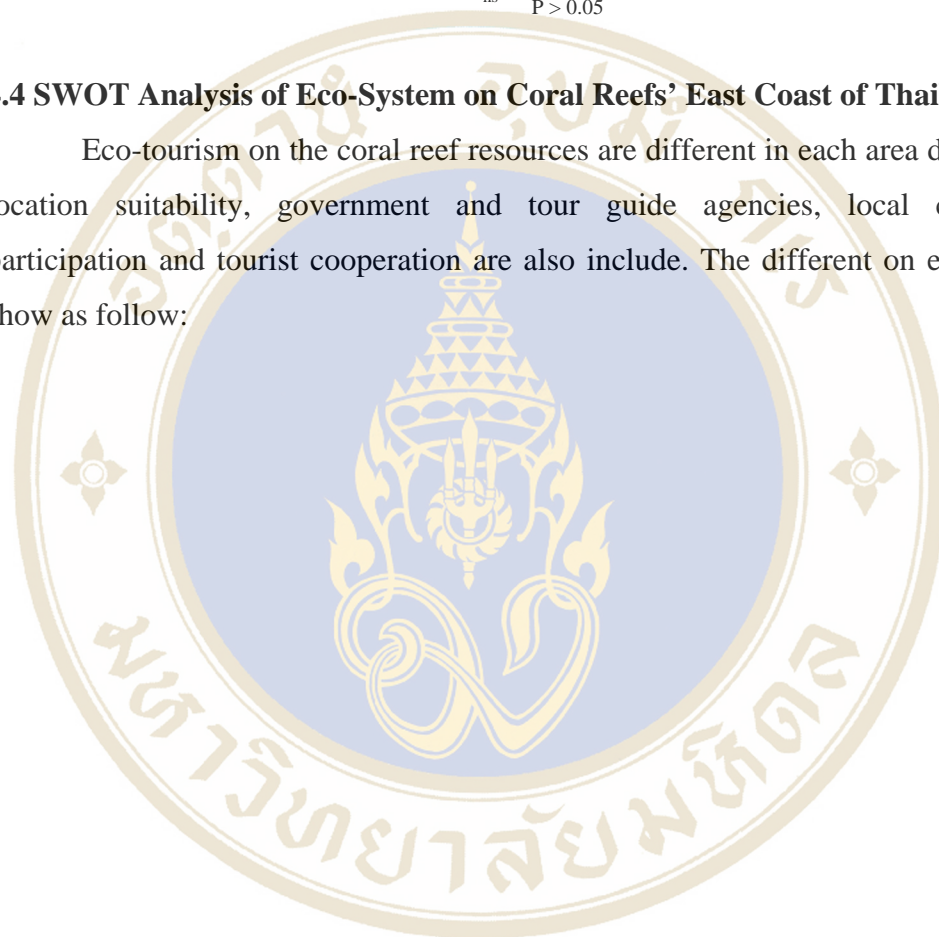
**Table 4-36** Mean difference analysis of being involved in marine conservation activities, categorized by level of attitude towards the coral reefs eco- tourism

Participate	No.	Attitude		F	t
		$\bar{x}$	S.D.		
No	197	4.24	0.32	0.74 <sup>ns</sup>	-0.57 <sup>ns</sup>
Yes	85	4.27	0.34		

<sup>ns</sup> P > 0.05

#### 4.4 SWOT Analysis of Eco-System on Coral Reefs' East Coast of Thailand

Eco-tourism on the coral reef resources are different in each area depending on location suitability, government and tour guide agencies, local communities participation and tourist cooperation are also include. The different on each area are show as follow:



**Table 4.37** SWOT Analysis of conservative-tourist capacity of Pattaya, Chonburi Province

<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Treats</b>
<p>1. Having the undersea historic park created by the Royal Navy to serve scuba-diving tourists.</p> <p>2. Having buoys for mooring tourist ships in diving areas.</p> <p>3. Having information boards containing information about coral conservation and importance of coral, in Thai and English.</p> <p>4. Being near BangKohk, with transportation time of only 2 hours. Therefore Pattaya area can serve weekend or one-day travelers.</p> <p>5. Having glass bottomed boats for tourists that do not want to get wet.</p>	<p>1. Having insufficient buoys, so some ships anchor instead of mooring.</p> <p>2. The area is dirty from food waste, garbage, wastewater, and oil spills from tourist ships.</p> <p>3. Having no documents or publications to give knowledge on coral for tourists in the ships.</p> <p>4. There is no evident cooperation from local communities due to being a large tourist area.</p> <p>5. The information boards look not interesting to tourists</p> <p>6. Some business has moved several kinds of corals from many areas of their natural places for being observed by tourist in one place.</p>	<p>1. For being a large tourist area, Pattaya can be developed to serve more conservative-tourist activities.</p> <p>2. As being popular for scuba-diving tourists, there are cooperative activities between divers and government officers to conserve giant clams, collect garbage, and remove nets in coral reefs.</p>	<p>1. Being difficult to manage due to a great number of international visitors.</p> <p>2. Having frequent accidents caused by an overlap in area utilization for diving and jet skiing.</p> <p>3. Being difficult to promote cooperation on development of the area because the growing economic become factors determining activities.</p> <p>4. Profits are gained by people coming from outside. Therefore, the area has little conservation for next local generations.</p> <p>5. There are some illegal acts with absence of officers.</p>

**Table 4.38** SWOT Analysis of conservative-tourist capacity of Mu Koh Chang National Park, Trad Province

<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Treats</b>
<p>1. Having information and education center for tourist in the national park's headquarter near Klong Plu Waterfall</p> <p>2. Having cooperation between fishermen community and fishery entrepreneurs for marine resources conservation.</p> <p>3. Having buoys set up around coral reefs popular for visitors in order to prevent tourist ships from coming too close to coral reef areas.</p> <p>4. Having capability to make leaflets for promoting coral conservation to tourists.</p> <p>5. There are variety of activities for tourist visiting Koh Chang.</p> <p>6. There are participation of community by setting up home stay services and promote marine resources conservation.</p>	<p>1. No cooperation between organizations in taking care of the set up buoys along coral reefs.</p> <p>2. Having insufficient budget for making leaflets enough for a great number of visitors.</p> <p>3. Having problem in communication and educating the entrepreneurs regarding natural resources conservation.</p> <p>4. Leaflets of coral conservation were provided only within the headquarter area, not covering the entire tourists.</p> <p>5. There is no promotion of information about value and importance of coral to visitors.</p>	<p>1. There are many research projects with budgets coming to the national park area.</p> <p>2. There are institutions coming regularly to conduct researches regarding solutions for coral reef conservation.</p> <p>3. There are many publications of studied information about coral reefs and relevant organisms. These publications should be placed in the areas with many tourists.</p> <p>4. The study on capacity of coral reef area in servicing tourist has been completed.</p> <p>5. There is an organization who takes responsibility in tourist activities specially which is the Sustainable Tourist Administration and Development of Special Areas Organization.</p>	<p>1. The buoys were destroyed in monsoon seasons. There was no maintenance from the organization that set up the buoys.</p> <p>2. Some tourist ships do not use buoys for mooring. They broke inside the area with buoys in order to drop their tourist at the coral reef spot. Such this action causes damage to both the buoys and the coral reefs, especially when the ocean water is low.</p> <p>3. There are some illegal acts with absence of officers.</p> <p>4. Not capable to implement the result from the research about area's servicing capacity to limit number of visitors during long holidays or high seasons.</p>

**Table 4.38** SWOT Analysis of conservative-tourist capacity of Mu Koh Chang National Park, Trad Province (continued)

Strengths	Weaknesses	Opportunities	Treats
	6. The information and education center in the office at Klong Plu waterfall is far from the place where there are tourist activities of coral reefs observation. 7. There are too many tourists during the time of long holidays. 8. Having no serious enforcement of laws to illegal people. 9. There is dirtiness from food waste, garbage, sewage, wastewater, and oil spills from visitors and tourist ships.		

**Table 4.39** SWOT Analysis of conservative-tourist capacity of Khao Laem Ya – Mu Koh Samet National Park, Rayong Province

Strengths	Weaknesses	Opportunities	Treats
1. Having buoys for mooring tourist ships in coral reef areas. 2. Having the national park to monitor tourist areas closely because some parts of tourist areas are within responsible area of the national park.	1. Tourist ships still used anchors instead of buoys for mooring while dropping tourists in coral areas. 2. There are oil spills and garbage from tourist activities. 3. There are souvenirs made from carcasses of marine animals such as shells, sea urchin, etc, for sale	1. There is some coral planting in Koh Samet area by cooperation of governmental and private sectors. 2. There is some coral planting by the local communities. However, supports from governmental sector are needed in order to achieve substantial outcome.	1. Many areas in Koh Samet belongs to businessmen from outside making resort business. Area management affecting resorts become difficult. 2. Private sectors aim for short-term benefits rather than long-term benefit from conservation, causing problems to governmental sector.

**Table 4.39** SWOT Analysis of conservative-tourist capacity of Khao Laem Ya – Mu Koh Samet National Park, Rayong Province (continue)

Strengths	Weaknesses	Opportunities	Treats
	<p>4. There is no evident cooperation or participation of local communities because the area is a large tourist area with many tourist activities.</p> <p>5. There is no promotion on information regarding importance of coral reefs.</p> <p>6. There were insufficient buoys for ship mooring. Thus some tourist ships still use anchors that damage coral reefs.</p>		

#### 4.5 Summary of the Results

The study of coral reef areas along the east coast of Thailand were divided into three zones, namely Koh Sak and Koh Lan area (Pattaya) in Chonburi Province, Koh Samet area in Rayong Province, and Koh Chang area in Trad province. There were 19 samples of Tour guide agencies and 282 samples of tourists: 5 Tour guide agencies and 67 scuba diving tourists belong to Koh Sak and Koh Lan area; 5 Tour guide agencies and 102 tourists belong to Koh Samet area; and 19 Tour guide agencies and 113 tourists belong to Koh Chang area.

**Table 4-40** Numbers of samples that received the research questionnaires

Location collecting questionnaires	Tour guide agencies (Percentage)	Tourists (Percentage)
Pattaya, Chonburi Province	4 (21.05)	67 (23.75)
Koh Samet, Rayong Province	5 (26.31)	102 (36.17)
Koh Chang, Trad Province	10 (52.63)	113 (40.07)
<b>Total</b>	<b>19 (100)</b>	<b>282 (100)</b>

The researcher has collected data from complete questionnaires and input into computer for analysis with a sociologic research application. Statistics used for analysis were percentage and means of population according to their general characteristics. Differences between general characteristics and acknowledgement on conservative tourist activities and between general characteristics and attitude toward conservation tourist activities in coral reef areas were analyzed by using t-test for testing the relationship between the answers of opinion and action, whether there the statistical level is 0.05 or not and One Way Analysis of Variance and pair wise comparisons analysis between group and within group by Fisheries' Least Significant Different (LSD).

#### **4.5.1 Knowledge and attitude toward conservative tourism in coral reef areas of tour guide agencies and tourists**

##### **4.5.1.1 Knowledge and attitude about conservative tourism in coral reef areas of tour guide agencies'**

The study results revealed that most of the tour guide agencies or 78.95 percents of them had a High level of understanding about conservative tourism in coral reef areas, with a Mean score equaled  $8.05 \pm 1.22$  from 10 maximum scores. Regarding the attitude toward conservative tourism in coral reef areas, most of them, 89.74 percents, had a Good level of attitude, with a Mean score equaled  $4.32 \pm 0.41$  from 5 maximum scores.

From the study to find relationships of personal characteristics of the tour guide agencies', domicile, education, recent the coral reef information, and

participation in marine conservation activities, and their understanding together with their attitude toward conservative tourism in coral reef areas, it was found that the factors were non-significant at a confidence level of 0.05. Details can be explained below.

- **Domicile**

Difference in domicile of the tour guide agencies' did not make their understanding and attitude about conservative tourism in coral reef areas differ significantly. That is explainable that, as working with marine resources, the tour guide agencies' perceive the value and importance of marine resources conservation. They know that if the coral reef can maintain their beauty tourist will keep coming to the area, and that means more income for them and local communities. Thus domicile has no effects toward understanding and attitude about conservative tourism of tourist tour guide agencies'. This is in agreement with the study result of Ratchada Kochsangsan (2000) who studied "Development approaches for ecotourism of Koh Lipe, Satun Province". The study found that readiness for ecotourism in Koh Lipe Island between Thai people and foreigners had non-significant difference, at significance level of 0.05.

- **Education**

Differences regarding education levels of the tour guide agencies' did not make their understanding and attitude about conservative tourism in coral reef areas differ significantly either. Recently, education is not limited only within educational institutions. Knowledge and information can be obtained from newspaper, medias, colleagues, etc. The tour guide agencies' that had low educational background can learn about conservative tourism from work and friends, for example. Therefore, education does non-significantly affect understanding and attitude of tour guide agencies' about conservative tourism in coral reef areas.

- **Recent the news and information about coral reefs**

Differences regarding news and information acquisition of the tour guide agencies' were found not making their understanding and attitude about conservative tourism in coral reef areas differ significantly. The reasons behind may be the uncertainty of their information acquisition, the insufficiency of cooperation between the governmental and private sector, and the low frequency of their information acquisition.

For example, a tour guide agencies' meeting is held monthly by a governmental organization, but it seems the tour guide agencies' do not cooperate well enough. They may occasionally attend the meetings, or may send a representative to the meetings, but the representative did not convey the information from the meeting to other tour guide agencies'. That could explain why information acquisition did non-significantly affect understanding and attitude of the tour guide agencies' about conservative tourism.

- **Participation in marine resources conservation activities**

The analysis resulted that differences regarding participation in marine resources conservation activities of the tour guide agencies' did not make their understanding and attitude toward conservative tourism in coral reef areas differ significantly. That was because the marine resources conservation activities were supported by the tour guide agencies themselves. The activities had objectives to provide information about marine resources conservation to participants, but not including the information or knowledge about the ecology of coral reefs.

**4.5.1.2 Knowledge and attitude about conservative tourism in coral reef areas of tourists**

In case of tourists, the study results shown that most of the tourist or 67.38 percents of them had a Moderate level of understanding about conservative tourism in coral reef areas, with a Mean score equaled  $7.90 \pm 1.16$  from 10 maximum scores. Regarding the attitude toward conservative tourism in coral reef areas, most of them, 89.74 percents, had a Good level of attitude, with a Mean score equaled  $4.25 \pm 0.32$  from 5 maximum scores.

The study has collected data and analyzed them to find relationships of personal characteristics of the tourists, namely age, education, patterns of their tourist activities, diving experience, acquisition of advice and knowledge about coral prior to diving, and participation in marine conservation activities, and their understanding together with their attitude toward conservative tourism in coral reef areas. It was found that the factors about age, education, diving experience, and participation in marine conservation activities affected differences in understanding about conservative tourism in coral reef areas of the tourists significantly at confidence level of 0.05. Regarding their attitude toward conservative tourism in coral reef areas,



diving experience and acquisition of advice and knowledge about coral prior to diving were found to have significant effects on their attitude at confidence level of 0.05. The study results can be discussed as follows.

- **Age**

The sampled tourists of different ages were found to have significant difference, at a significance level of 0.05, on their understanding about conservative tourism in coral reef areas, but have non-significant difference on their attitude toward conservative tourism in coral reef areas. That is because people at different ages had different amount of experiences and different knowledge; the older the more experienced. Therefore, difference of ages resulted in different understanding about conservative tourism in coral reef areas. However, age had not much effect toward the tourists' attitude because attitude might be affected more from other factors such as their social, environment of their communities, etc.

- **Education level**

The education level was found to have significant effect toward understanding of tourists about conservative tourism in coral reef areas at a confidence level of 0.05. However, it had non-significant effect toward attitude of the tourists toward conservative tourism in coral reef areas. This is explainable that the amount of knowledge receiving from their education has positive effect on their understanding. Thus it was found that tourists with education above undergraduate level had more understanding about conservative tourism in coral reef areas than those who had education lower than secondary school. However, their attitude may be affected by other factors rather than education.

- **Patterns of the tourist activities**

Regarding patterns of tourist activities, which were categorized into two patterns: snorkeling diving; and scuba diving, it was found that difference of patterns affected understanding and attitude of tourists about conservative tourism in coral reef areas significantly at a significance level of 0.05. The scuba divers were found to have higher scores of both understanding and attitude than snorkeling divers.

The results can be explained that, due to the more training in both lecture and practice for scuba divers in order to prepare them to dive and get close to coral reef safely and correctly, the scuba divers have more knowledge and attitude toward

conservative tourism in coral reef areas than snorkeling divers, who only stay near the sea surface and required little training and experience about diving. Moreover, the snorkeling divers may only want to observe coral reefs for pleasure or having new experience, but the scuba divers spend more time and money for their activities because of their passion toward coral reefs and surrounding organism. That explains why patterns of tourist activities had significant effect on understanding and attitude about conservative tourism in coral reef areas.

- **Experience of diving activities**

Diving experience was found to have statistically significant effects on understanding and attitude of tourists toward conservative tourism in coral reef areas, at a significance level of 0.05. Tourists who had more diving experience were found to have more understanding and better attitude than those who never had diving experience. That was because divers that had more experience can obtain more knowledge of value of coral reefs from officers' instructions, observation, their friends, etc. They also come to dive again because they have good attitude on coral reefs. That explains why diving experience affect differences in understanding and attitude of tourists toward conservative tourism in coral reef areas.

- **Receive of advice and knowledge about coral prior to diving**

The group of sampled tourists that had resented of advice and knowledge about coral before diving was found to have significant difference on understanding about conservative tourism in coral reef areas from the group of tourists that did not acquire advice and about coral before diving, at a significance level of 0.05. However, the attitude of both groups was found to have non-significant difference, at a confidence level of 0.05. This is because advice from persons who bring the tourists to dive is important and informative for emphasizing the importance of coral reef areas to tourists. Good advice by giving information on how to use diving equipment correctly, information about ecology of coral reefs, and information on good practices for sustainable tourism in coral reef areas (Science and Technology Faculty, Rajamangala University of Technology Krungthep, 2007) can help tourists know how to protect and prevent coral reefs from being deteriorated by incorrect tourist behaviors.

- **Participation in marine resources conservation activities**

It was found that participation in marine resources conservation activities had significant effect toward understanding about conservative tourism in coral reef areas, but had no significant effect toward attitude of tourist about conservative tourism in coral reef areas, at a significance level of 0.05. This is because activities that are arranged for marine resources conservation purpose have much knowledge and information about coral reefs for participants. Tourist who have participated in marine resources conservation activities can have much more knowledge about conservative tourism in coral reef areas than tourists that have never had experiences in marine resources conservation activities. It is advisable that marine resources activities should be arranged regularly for tour guide agencies', local communities, local students, and tourists so that they learn to cherish and know how to protect the marine resource that they gain benefits from. However, regarding attitude, the tourists may have unclear attitude toward conservative tourism from having participated in marine resources conservation activities. Therefore, participation in conservation activities had no significant effect on attitude of tourists about conservative tourism in coral reef areas.

From results of the study on several factors affecting understanding and attitude of tourists, it is recommended that, in order to enhance understanding of tourist about conservative tourism in coral reef areas, marine resources conservation activities should be arranged regularly as participation in such these activities were found to have significant effect on understanding of the tourists. Governmental sector and private sector (the tourist tour guide agencies') should cooperate and create more marine resources conservation activities in order to give knowledge to tourist and make them able to do their tourist activities correctly without causing damage to coral reefs and other marine organism. In addition, in order to promote good attitude toward conservative tourism in coral reef areas for tourists, advice before taking tourist activities is very important since it was found that advice and information given before diving had significant effect toward attitude of tourists about conservative tourism in coral reef areas. The government sector should emphasize on tour guide agencies' to always give advice and trainings to tourists about coral and living organisms in the ocean and about how to act correctly during having activities in coral reef areas. If the tour guide agencies' have clear understanding on importance of giving advice they can

provide useful and informative advice to tourists and make them have better attitude toward conservative tourism in coral reef areas. From having good attitude toward conservative tourism and knowing how to do the activities correctly to help conserve the coral reefs and other organisms, all marine resources will remain being in good condition for sustainable marine tourism.

**Table 4.41** Results from mean difference analysis and One-way ANOVA analysis of tour guide agencies satisfaction level regarding knowledge and attitude on coral reef eco-tourism

Item	Mean of Knowledge	P-value	Mean of Attitude	P -value
<b>Tour guide agencies</b>				
- Domicile				
Local people	8.00±1.41	0.90 <sup>ns</sup>	4.41±0.12	0.53 <sup>ns</sup>
Stranger	8.07±1.18		4.28±0.48	
- Education				
High school or below	7.71±1.25	0.65 <sup>ns</sup>	4.25±0.39	0.72 <sup>ns</sup>
Bachelor degree or equivalent	8.30±1.25		4.32±0.45	
Master degree or higher	8.00±1.41		4.52±0.28	
- Received Information				
never	8.50±2.12	0.81 <sup>ns</sup>	4.66±0.09	0.43 <sup>ns</sup>
rarely	7.90±0.83		4.31±0.43	
1-2 times / month	8.17±1.72		4.21±0.41	
- Participation in coral reef conservation				
No	8.20±0.92	0.60 <sup>ns</sup>	4.31±0.34	0.95 <sup>ns</sup>
Yes	7.89±1.54		4.32±0.48	

<sup>ns</sup> : non-significant at a confidence level of 0.05

\* : significant at a confidence level of 0.05

**Table 4-42** Results from mean difference analysis and One-way ANOVA analysis of tourist satisfaction level regarding knowledge and attitude on coral reef eco-tourism

Item	Mean of Knowledge	P-value	Mean of Attitude	P -value
<b>Tourist</b>				
- Age				
less than 24 years	7.23±1.25		4.25±0.28	
25 - 36 years	8.03±1.04	0.00*	4.26±0.32	0.54 <sup>ns</sup>
37 - 48 years	8.09±1.07		4.19±0.33	
49 years and above	8.00±1.26		4.24±0.32	
- Education				
High school or below	7.18±1.38		4.21±0.29	
Bachelor degree or equivalent	8.07±1.12	0.00*	4.24±0.34	0.46 <sup>ns</sup>
Master degree or higher	7.82±0.97		4.28±0.28	
- Type of activities				
Snorkeling	7.81±1.12	0.02*	4.23±0.33	0.05*
Scuba diving	8.19±1.01		4.32±0.29	
- Experience of activities				
No	7.44±1.18	0.00*	4.19±0.28	0.04*
Yes	8.18±1.05		4.28±0.39	
- Pre-visit training				
No	7.96±1.13	0.55 <sup>ns</sup>	4.14±0.34	0.00*
Yes	7.87±1.17		4.32±0.29	
- Participation in coral reef conservation				
No	7.78±1.21	0.03*	4.24±0.32	0.57 <sup>ns</sup>
Yes	8.21±0.98		4.27±0.34	

<sup>ns</sup> : non-significant at a confidence level of 0.05

\* : significant at a confidence level of 0.05

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusions and Recommendations

1. The study results showed that age and education of tourists had significant effect toward their understanding about conservative tourism in coral reef areas. The group of tourists who were below 24 years old were found to have lowest score on the understanding, with a mean score of  $7.23 \pm 1.24$  at a significance level of 0.05, comparing to other age classes. Regarding education, the group of tourists that had education lower than secondary school education had the lowest score on understanding about conservative tourism, comparing to groups of tourists with different educations, with a mean score of  $7.18 \pm 1.38$ . It can be summarized that young age and low education had negative effect on understanding about conservative tourism in coral reef areas. Therefore, it is recommended that there should be more knowledge or information about coral reef conservation added into learning materials of students. Posters and publications about good practices of good tourists in coral reef areas should be made available widely in tourist areas. Learning centers for giving information on conservative tourism should be set up. There should also be more public relations for tourists as an efficient tool to enhance their understanding about conservative tourism in coral reef areas.

2. Patterns of tourist activities and diving experiences were found to be two factors that had significant effects on both understanding and attitude of tourists about conservative tourism in coral reef areas. Snorkeling diving was found to represent understanding and attitude of snorkeling diver tourists with mean scores of  $7.81 \pm 1.12$  and  $4.21 \pm 0.28$  respectively, while the mean scores of scuba diver tourists' repressive their understanding and attitude were  $8.19 \pm 1.01$  and  $4.32 \pm 0.29$  respectively. Therefore, it is recommended that there should be more posters and publications about good practices while diving in coral reef areas, together with the information about organisms nearby coral reefs and their ecology. The publications should be provided

to snorkeling divers specially, but not only. Entrepreneurs should have more trainings for snorkeling divers to give them advice and information on how to dive correctly with considerations on coral reef ecology. These practical approaches should be greatly beneficial for conservative tourism.

3. The study found that tourists that had acquired advice and instructions before diving had different attitude toward conservative tourism in coral reef areas from those who had not acquired advice and instructions significantly, at a significance level of 0.05. The mean score of attitude toward conservative tourism in coral reef areas of tourists who had acquired advice prior to diving was  $4.32 \pm 0.29$ , which is higher than the mean score of those who had not acquired advice ( $4.14 \pm 0.34$ ). Thus it is recommended that the entrepreneurs should play an important role in giving advice and instructions on how to dive correctly without damaging coral reefs to tourists before they begin their diving. This will help enhance attitude of tourists toward conservative tourism and help conserve marine organism in coral reef areas.

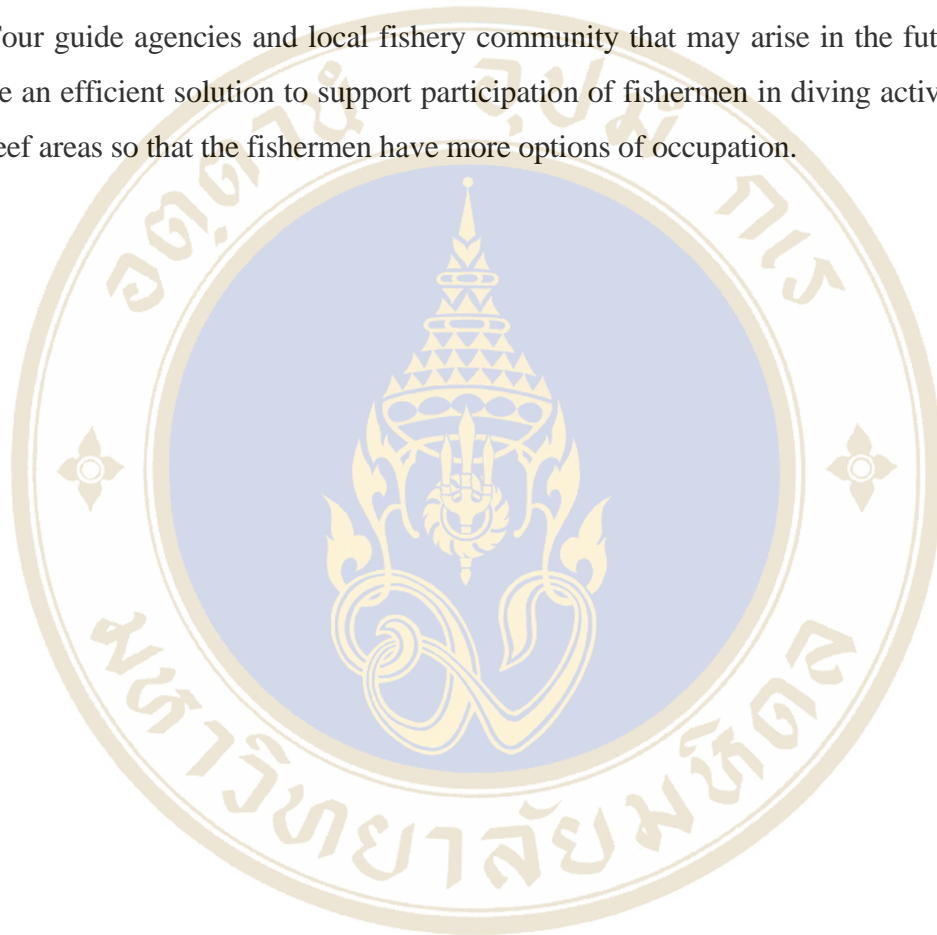
4. The factor of participation in marine resources conservation activities was found to have significant effect on tourists' attitude toward conservative tourism in coral reef areas, at a confidence level of 0.05. The mean score of tourists who had never had participated in any marine resources conservation activities were found to be  $7.78 \pm 1.12$ , which is lower than the mean score of those who used to have participated in some marine resources conservation activities ( $8.21 \pm 0.98$ ). Therefore, the study would like to recommend having more activities about marine resources conservation in order to enhance knowledge on marine ecology to tourists and promote their understanding and attitude toward conservative tourism in coral reef areas.

## **5.2 Suggestions for Further Study**

1. There should be a study on attitude toward other kinds of conservative tourism, such as tourism in forest area, mangrove ecology, cultural or historic places, etc., in order to apply the study results to conservation and management plans of the area.
2. There should be a study on attitude toward conservative tourism of other

partners involving with tourist industry and having some benefits from marine travelling, such as food businesses, hotel or camping businesses, and the local communities, etc.

3. There should be a study about pros and cons of having fishery activities in areas zoned for tourist activities in order to prevent or reduce conflicts between tourist Tour guide agencies and local fishery community that may arise in the future. It might be an efficient solution to support participation of fishermen in diving activities in coral reef areas so that the fishermen have more options of occupation.





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**APPENDIX A**  
**QUESTIONNAIRE FOR THE RESEARCH FOR**  
**“TOURISTS”**

**Statement of declaration:**

The purpose of this questionnaire is for surveying attitude of tourism business owners and tourists toward the ecotourism’s activities in coral reefs in the area of west coast of Thailand. The questionnaire is divided into four parts as follows:

- Part 1      Personal data of respondents
- Part 2      Knowledge of ecotourism in coral reefs area
- Part 3      Attitude toward ecotourism in coral reefs area
- Part 4      Other suggestions and comments for coral reefs conservation

Please mark ✓ the responses that are most appropriate regarding your actual knowledge, and opinion.

“All information taken will only be used for the research purpose and will be kept confidential”

If you have any suggestions or comments in any topics, please give us your comments in the last part of this questionnaire. Your suggestion will highly contribute to the study of this research. Thank you for your time and cooperation.

Respondent .....

Date of response.....

Dive sites.....

**Part 1: Personal Data**

Note: Please mark  in the that are your responses.

1.1 Gender                      Male                      Female

1.2 Age ..... years

1.3 Education level

High school or below

Others, please specify \_\_\_\_\_

Bachelor degree or equivalent

Master degree or higher

1.4 Activities that you have participated

Snorkeling

Scuba Diving

Have you ever participated in diving or snorkeling activated before?

No                      Yes

If yes, what type of activities have you done before?

Snorkeling, Number of dives ..... times

Scuba diving, Number of dives ..... dives

Scuba diving level: .....

1.5 Did the service provider give knowledge and information about tourism in coral reef sites before snorkeling or diving?

No                      Yes

If yes, please specify .....

1.6 Have you ever participated in environmental conservation activities?

No                      Yes

If yes, please specify .....

**Part 2: Knowledge of ecotourism in coral reefs area**

Note: Please mark ✓ in front of the true statement and mark X in front of the false statement based on your understanding and knowledge

- \_\_\_\_\_ 1. Ecotourism is the travel for nature, human created-arts and cultures based on responsibility in environmental conservation and local community.
- \_\_\_\_\_ 2. For the development and contribution to ecotourism, there should be a change to the local community's traditions, culture, and way of living in order to get more tourists.
- \_\_\_\_\_ 3. Ecotourism only focuses on the understanding of nature.
- \_\_\_\_\_ 4. It is necessary to limit the number of tourists who do snorkeling or diving activities, to minimize the negative impact from tourism activities.
- \_\_\_\_\_ 5. Ecotourism gives an opportunity to the local community to present their local wisdom to tourists.
- \_\_\_\_\_ 6. Souvenirs should be products that are rare to find and are from the local community.
- \_\_\_\_\_ 7. Sea tourism sites and activities must not harm rare aquatics and nursery area.
- \_\_\_\_\_ 8. Ecotourism enhances people's knowledge and responsiveness to the coral's advantage.
- \_\_\_\_\_ 9. White coral mean dead coral.
- \_\_\_\_\_ 10. There is symbiotic relationship between all the sea lives on a coral reef.



**Part 3: Attitude toward ecotourism in coral reefs area**

Note: Please mark / the responses that the most appropriate to your idea.

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1. Wearing gloves and booties during diving or snorkeling gives a better chance to touch corals than not wearing them.					
2. Ensure you are confident in using your equipment before diving.					
3. Choose dive operator that are environmentally friendly, such as displaying the Green Fins certificate.					
4. For snorkeling, wearing a life jacket will help to conserve the coral.					
5. In coral reefs, instead of using and anchor, one should use available mooring.					
6. Feeding on coral reefs can have an adverse effect to ecosystem the marine.					
7. Carefully get on and get off from the boat in non-coral reefs to avoid destroying corals.					
8. If wearing fins, be aware of where your fins are, which can stir up sediments or damage corals.					

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
9. Collecting corals and marine organisms for souvenir helps to clean the coral reef.					
10. Learning about coral reefs and other animals that live in the reefs can help to support the conservation of coral reefs.					
11. Spread the word - tell your dive friends or friends these simple, but important conservation practices of coral reefs.					
12. When you are tried from snorkeling or diving, you should stand or rest on corals.					
13. You are interested in the local community's wisdom and way of living; how they live together with nature and gain advantages from coral reefs.					
14. You will participate in marine environment conservation activities.					
15. Factors affecting tourism growth in this area are nature and non-spoiled environment.					
16. Publication about coral reef knowledge provided in boats gives a better understanding about coral reefs.					

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
17. Dive operators explain local guideline for practice, environmental rules and regulations in corals reefs					
18. Ecotourism in local communities will minimize the negative impact toward nature and environment.					
19. Dive operator should have knowledge about the ecosystem and coral reef conservation.					
20. The explanation of the guideline environment rules and regulations in corals reefs before diving or snorkeling will help to conserve corals.					

#### Part 4: Other suggestions and comments for coral reefs conservation

Note: Please choose the items that you are agree the most based on your opinion.

4.1 What do you think that should be improved for snorkeling or diving? (More than one answer is allowed, and please prioritize the first 3 items in order)

- Knowledge and role model about snorkeling and diving
- Safety during activities
- Knowledge of marine lives along coral reefs
- Underwater trail
- Knowledge about marine life and coral reef conservation
- Being accompanied by a guide during snorkeling or diving activities
- Diving or snorkeling equipment

Other Suggestions.....

.....

4.2 What are causes and problems affecting coral destruction? (More than one answer is allowed, and please prioritize the first 3 items in order)

- Tread on corals.
- Illegally collecting marine life and coral
- Anchoring in coral reef by boats.
- Litter by tourists.
- Litter by fishery boats.
- Litter by touring boats.
- Illegally stealing colorful fishes
- Illegal fishing using as dynamite in coral reefs.
- Phenomenon such as storms and climate change
- Fishing with toxic chemicals
- Sediment and garbage from land
- Oil slick

Others.....

.....

4.3 Additional comments and suggestions are for development the ecotourism in coral reefs area.

.....

.....

**APPENDIX B**  
**QUESTIONNAIRE FOR THE RESEARCH FOR**  
**“TOUR GUIDE AGENCIES”**

**Statement of declaration:**

The purpose of this questionnaire is for surveying attitude of tourism business owners and tourists toward the ecotourism's activities in coral reefs in the area of west coast of Thailand. The questionnaire is divided into four parts as follows:

- Part 1      Personal data of respondents
- Part 2      Knowledge of ecotourism in coral reefs area
- Part 3      Attitude toward ecotourism in coral reefs area
- Part 4      Other suggestions and comments for coral reefs conservation

Please mark ✓ the responses that are most appropriate regarding your actual knowledge, and opinion.

“All information taken will only be used for the research purpose and will be kept confidential”

If you have any suggestions or comments in any topics, please give us your comments in the last part of this questionnaire. Your suggestion will highly contribute to the study of this research. Thank you for your time and cooperation.

Respondent .....

Date of response.....

Dive sites.....

**Part 1: Personal Data**

Note: Please mark ✓ in the that are your responses.

1.1 Gender Male Female

1.2 Age ..... years

1.3 Education level

High school or below

Others, please specify \_\_\_\_\_

Bachelor degree or equivalent

Master degree or higher

1.4 Position of respondents

Owner

Staff / Employee

Partner

Other.....

1.5 Owner status.

Local people

Stranger people

Foreigners from countries.....

1.6 You are activities related to conservation?

never

ever had such .....

1.7 Have you ever joined activities associated with conservation?

never

ever had such .....

1.8 Given knowledge about the ecosystem coral reef conservation and those who take tourists to the reef activities.

never

ever had such .....

1.9 The activities that take tourists to the reef to describe their practices for reef tourism areas, including security about other activities in the sea.

any time

sometimes

uncertain

never

1.10 Have you ever received information about the coral? (The answer has more than 1)

1. Environment of marine ecosystems.

2. Information of general reef condition.
  3. Reef recovery.
  4. Tourism in the reef.
  5. Demarcation utilized in the reef.
  6. Recommended and should not be in compliance between the reef.
  7. Tourist activities in the reef.
  8. Problem of reef destruction.
  9. Degenerative problems of the reef.
  10. Problem of fishing in coral reefs.
  11. Problems coral die from natural phenomenon such as storms.
  12. Problem bleached coral from the sea temperature increases.
  13. Other (specify).....
- 1.11 Frequency in recent news about the reef resource.
- 1. never received.
  - 2. rarely
  - 4. week 1-2 times
  - 3. month 1-2 times
  - 5. every day

**Part 2: Knowledge of ecotourism in coral reefs area**

Note: Please mark ✓ in front of the true statement and mark X in front of the false statement based on your understanding and knowledge

- \_\_\_\_\_ 1. Ecotourism is the travel for nature, human created-arts and cultures based on responsibility in environmental conservation and local community.
- \_\_\_\_\_ 2. For the development and contribution to ecotourism, there should be a change to the local community's traditions, culture, and way of living in order to get more tourists.
- \_\_\_\_\_ 3. Ecotourism only focuses on the understanding of nature.
- \_\_\_\_\_ 4. It is necessary to limit the number of tourists who do snorkeling or diving activities, to minimize the negative impact from tourism activities.
- \_\_\_\_\_ 5. Ecotourism gives an opportunity to the local community to present their local wisdom to tourists.
- \_\_\_\_\_ 6. Souvenirs should be products that are rare to find and are from the local community.
- \_\_\_\_\_ 7. Sea tourism sites and activities must not harm rare aquatics and nursery area.
- \_\_\_\_\_ 8. Ecotourism enhances people's knowledge and responsiveness to the coral's advantage.
- \_\_\_\_\_ 9. White coral mean dead coral.
- \_\_\_\_\_ 10. There is symbiotic relationship between all the sea lives on a coral reef.



**Part 3: Attitude toward ecotourism in coral reefs area**

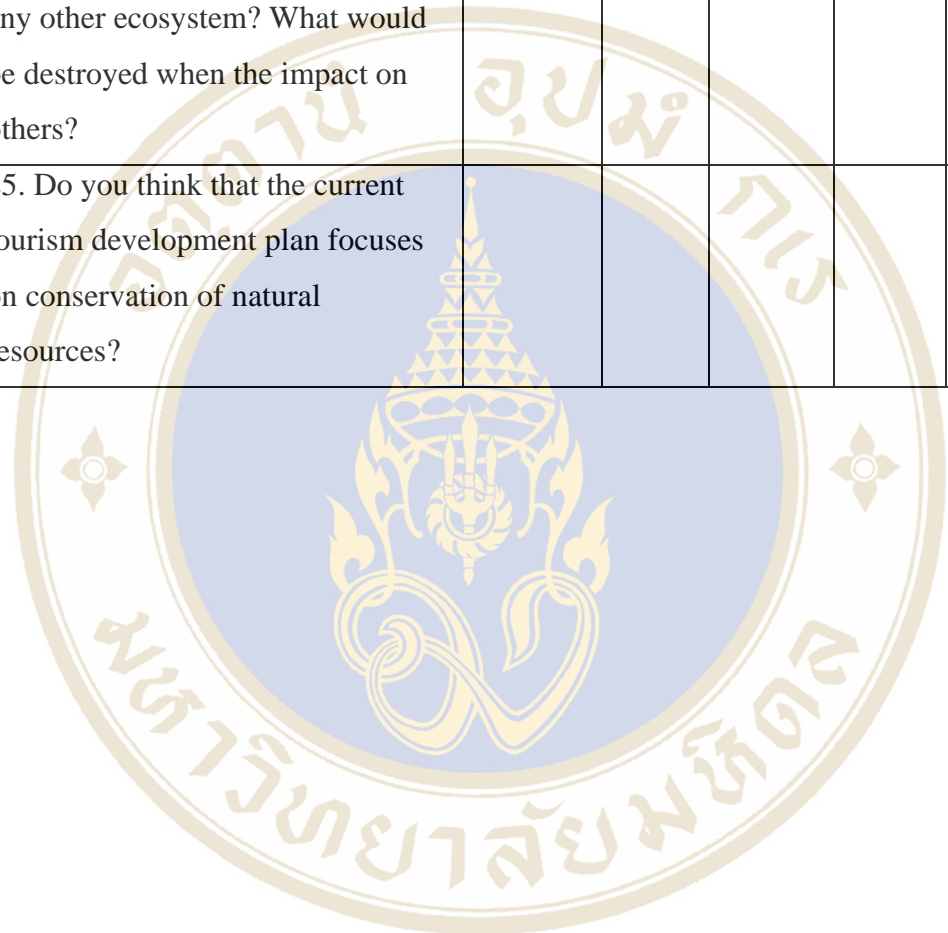
Note: Please mark / the responses that the most appropriate to your idea.

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1. Wearing gloves and booties during diving or snorkeling gives a better chance to touch corals than not wearing them.					
2. You think should be taught how to use the equipment prior to diving expertise to snorkel the coral.					
3. For snorkeling, wearing a life jacket will help to conserve the coral.					
4. In coral reefs, instead of using and anchor, one should use available mooring.					
5. Feeding on coral reefs can have an adverse effect to ecosystem the marine.					
6. Carefully get on and get off from the boat in non-coral reefs to avoid destroying corals.					
7. If wearing fins, be aware of where your fins are, which can stir up sediments or damage corals.					
8. Collecting corals and marine organisms for souvenir helps to clean the coral reef.					

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
9. Learning about coral reefs and other animals that live in the reefs can help to support the conservation of coral reefs.					
10. Spread the word - tell your dive friends or friends these simple, but important conservation practices of coral reefs.					
11. You will participate in marine environment conservation activities.					
12. Factors affecting tourism growth in this area are nature and non-spoiled environment.					
13. Publication about coral reef knowledge provided in boats gives a better understanding about coral reefs.					
14. In your opinion, suggestion tourist not to discard any trash or food scraps into the sea can help coral reef conservation.					
15. In your opinion, wasting lubricant oil from ballast is not harmful to coral reef, since sea water large volume that able to be quickly diluted.					

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
16. In your opinion, knowledge's about folkways and local wisdom depending on nature should be intervened to tourist.					
17. In your opinion, an inexperienced diver should be paid attention closely around coral reef.					
18. You do not feel satisfied that visitors to a coral collected souvenir					
19. Are you acting as a role model for non violent diving reef?					
20. Do you understand that the eco-tourism must be conservation-oriented interpolation of knowledge to visitors before, during, and after that lead?					
21. You see that tourism helps preserve the local revenue and job increases.					
22. Do you think the reef decay because of tourism?					
23. Satisfaction is in the eco-tourism. Is the enjoyment and learning about nature in nature?					

Description	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
24. Do you think that reef ecosystems would probably like any other ecosystem? What would be destroyed when the impact on others?					
25. Do you think that the current tourism development plan focuses on conservation of natural resources?					



#### **Part 4: Other suggestions and comments for coral reefs conservation**

Note: Please choose the items that you are agree the most based on your opinion.

4.1 What do you think that should be improved for snorkeling or diving? (More than one answer is allowed, and please prioritize the first 3 items in order)

- Knowledge and role model about snorkeling and diving
- Safety during activities
- Knowledge of marine lives along coral reefs
- Underwater trail
- Knowledge about marine life and coral reef conservation
- Being accompanied by a guide during snorkeling or diving activities
- Diving or snorkeling equipment
- Other .....

4.2 You think any organization should act and care management areas, most coral reefs. (More than 1 request and response sequence with the first key 3)

- Administration
- Department of marine and coastal resources.
- Private companies with business on the Reef.
- Marine National Park.
- Office of the Provincial Government.
- Club or group of people in the area.
- The district government offices.
- Other.....

4.3 What are causes and problems affecting coral destruction? (More than one answer is allowed, and please prioritize the first 3 items in order)

- Tread on corals.
- Illegally collecting marine life and coral
- Anchoring in coral reef by boats.
- Litter by tourists.
- Litter by fishery boats.
- Litter by touring boats.
- Illegally stealing colorful fishes

- Illegal fishing using as dynamite in coral reefs.
- Phenomenon such as storms and climate change
- Fishing with toxic chemicals
- Sediment and garbage from land
- Oil slick

Others.....

4.4 Additional comments and suggestions are for development the ecotourism in coral reefs area.

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## BIOGRAPHY



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