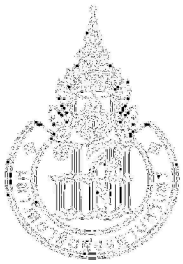

The Awareness and Responsiveness of the Hotel Industry in Phuket to Climate Change

Ruth Carrillo Campos

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration in Hospitality and Tourism Management (International Program) Prince of Songkla University 2009

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ชื่อวิทยานิพนธ์ ความตระหนักและการตอบสนองต่อการเปลี่ยนแปลงบรรยากาศของอุตสาหกรรมโรงแรมในภูเก็ต

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บทคัดย่อ

การเปลี่ยนแปลงบรรยากาศเป็นสิ่งท้าทายต่อสิ่งแวดล้อมที่สำคัญยิ่งในโลกปัจจุบัน และเป็นประเด็นร่วมสมัยที่มีการกล่าวถึงโดยภาครัฐและเอกชนมากที่สุดประเด็นหนึ่ง ผลกระทบของการเปลี่ยนแปลงบรรยากาศจะก่อให้เกิดผลกระทบทางลบหลายประการ อย่างไรก็ตามผลกระทบที่อาจจะมีต่ออุตสาหกรรมการท่องเที่ยว จะเป็นเรื่องของการเปลี่ยนแปลงอากาศอย่างกะทันหันและการสูญเสียความหลากหลายทางชีวะภาพ รวมทั้งความเสื่อมโทรมของแหล่งท่องเที่ยวทางมรดกซึ่งเป็นผลจากการเพิ่มของความเป็นกรดจากน้ำฝน สถานที่ท่องเที่ยวส่วนมากตั้งอยู่ในแหล่งธรรมชาติ เช่น ชายหาด ภูเขา สายน้ำและทะเลทราย สิ่งเหล่านี้ล้วนแล้วเป็นสิ่งจูงใจของการเดินทาง ประเทศที่มีอุตสาหกรรมท่องเที่ยวเป็นหลักจะเผชิญกับการเปลี่ยนแปลงบรรยากาศอย่างแน่นอน เกาะส่วนมากจะเผชิญกับปัญหาประชากรที่เติบโตมากขึ้นที่จะนำไปสู่ภัยพิบัติและความเสื่อมโทรมของทรัพยากรธรรมชาติ ความแห้งแล้งและน้ำท่วมเป็นบรรยากาศสุดขั้วที่มีผลกระทบต่อปริมาณและคุณภาพแหล่งน้ำในชุมชนเกาะและผลที่ตามมาคือปัญหาสุขภาพสืบเนื่องจากที่มีขนาดพื้นที่เล็กและความห่างไกล เกาะต่างๆ ส่วนมากจะเผชิญกับปัญหาความขาดแคลนน้ำที่เรื้อรัง ปัญหากับการจำกัดของเสีย ความสูญสิ้นของพืชและสัตว์บางประเภท และปะการังเปลี่ยนสี สิ่งเหล่านี้เป็นสิ่งที่เกิดขึ้นในเกาะภูเก็ต ภูเก็ตมีประสบการณ์ของการท่องเที่ยวที่เติบโตอย่างรวดเร็ว มีนักท่องเที่ยว 5,005,653 คนในปี พ.ศ. 2551 และจำนวนที่พัก 639 แห่ง ดังนั้น อุตสาหกรรมท่องเที่ยวจะมีผลต่อสิ่งแวดล้อมและการเปลี่ยนแปลงบรรยากาศ ในทางกลับกันอุตสาหกรรมท่องเที่ยวมีความสำคัญต่อเศรษฐกิจของภูเก็ต ภูเก็ตก็จะอยู่ในอันตรายจากการเปลี่ยนแปลงของบรรยากาศ

ด้วยเหตุผลที่ว่าได้มีการศึกษาวิจัยในเรื่องความตระหนักและการสนองตอบของอุตสาหกรรมโรงแรมในโลกต่อการเปลี่ยนแปลงบรรยากาศนี้น้อยในปัจจุบัน ดังนั้นการศึกษาเรื่องนี้จะสำรวจความรู้และการดำเนินการของโรงแรมในภูเก็ตเพื่อลดผลกระทบของการเปลี่ยนแปลงบรรยากาศให้น้อยที่สุด วัตถุประสงค์ของการศึกษาคือเพื่อพิจารณาความตระหนักของโรงแรมในภูเก็ตปัจจุบันต่อการเปลี่ยนแปลงบรรยากาศและการสนองตอบต่อการเปลี่ยนแปลงและเพื่อเสนอแนะต่อโรงแรมต่อการโต้ตอบและการป้องกันการเปลี่ยนแปลงของบรรยากาศ

การเก็บข้อมูลจะเก็บจากประชากรโรงแรมทั้งหมดจำนวน 639 แห่งจากฐานข้อมูลของการท่องเที่ยวแห่งประเทศไทยในปี พ.ศ. 2550 โดยการส่งแบบสอบถามไปยังผู้จัดการทั่วไปในเดือนธันวาคม พ.ศ. 2551 จุดเน้นเบื้องต้นของแบบสอบถามเพื่อบ่งชี้ถึงความตระหนักของโรงแรมในภูเก็ตถึงการเปลี่ยนแปลงบรรยากาศและพิจารณาถึงข้อจำกัดและการสนองตอบ ได้รับแบบสอบถามที่ใช้ได้คืนจำนวน 117 ชุด

ผู้ศึกษาวิจัยได้พัฒนาดัชนีชี้วัดเพื่อใช้ในการบ่งชี้และวิเคราะห์ความตระหนักและการสนองตอบของอุตสาหกรรมโรงแรมในภูเก็ต ดัชนีความตระหนักถึงสิ่งแวดล้อมใช้ปัจจัย 10 ปัจจัยในการพิจารณาโดยวัดความสนใจของผู้ตอบต่อการเปลี่ยนแปลงบรรยากาศที่กระทบต่อการดำเนินการโรงแรม ดัชนีการสนองตอบต่อสิ่งแวดล้อมประกอบด้วยวิธีการที่เกี่ยวกับสิ่งแวดล้อม 26 ประการที่โรงแรมสามารถนำออกใช้ปฏิบัติเพื่อลดการปล่อยแก๊สเรือนกระจก สภาวะการณ์การนำมาตรการออกมาใช้จะเป็นการกำหนดระดับขั้นของการสนองตอบของผู้ตอบแบบสอบถาม ผลการศึกษาเบื้องต้นชี้ให้เห็นว่าผู้ตอบแบบสอบถามไม่ได้ตระหนักมากนักเกี่ยวกับผลของการเปลี่ยนแปลงบรรยากาศ อย่างไรก็ตามการสนองตอบอยู่ในระดับสูง

การสัมภาษณ์กึ่งโครงสร้างได้จัดทำเพิ่มเติมจากแบบสอบถามกับผู้จัดการฝ่ายความรับผิดชอบต่อสังคมของโรงแรมที่ได้ลงมือปฏิบัติในเรื่องความเป็นมิตรต่อสิ่งแวดล้อมสามแห่งในภูเก็ต เป็นการเลือกตัวอย่างแบบเฉพาะเจาะจง ผลการสัมภาษณ์แสดงให้เห็นว่าบางบริษัทที่ลงมือปฏิบัติหรือมีกระบวนการเปลี่ยนแปลงที่อาจจะลดการปล่อยไอเสียจะมองว่าเป็นค่าใช้จ่าย ขณะที่ส่วนหนึ่งถือว่าเป็นการลงทุนระยะยาวที่จะสร้างความได้เปรียบในการแข่งขัน และเป็นกลยุทธ์ที่จะจูงใจส่วนการตลาดที่ตระหนักถึงสิ่งแวดล้อมและจะอ่อนไหวน้อยต่อการขึ้นลงของภาวะเศรษฐกิจ นอกจากนี้ยังแสดงให้เห็นว่ากิจกรรมสนับสนุนสิ่งแวดล้อมจะลดต้นทุนการดำเนินงานของโรงแรม การตลาดและกิจกรรมเหล่านี้จะเพิ่มความมีกำไรของโรงแรม

ปัจจัยสำคัญที่เป็นอุปสรรคการนำวิธีการความเป็นมิตรต่อสิ่งแวดล้อมในอุตสาหกรรมโรงแรมเป็นเรื่องการขาดสารสนเทศ การสนับสนุนจากรัฐ และการลงทุนขั้นแรกที่โรงแรมไม่เต็มใจจะลงทุนด้วยความเชื่อที่ว่าการเปลี่ยนแปลงบรรยากาศจะไม่มีผลกระทบต่ออัตราการเข้าพักของโรงแรมและละเลยต่อความได้เปรียบทางการตลาดที่ความเป็นมิตรต่อสิ่งแวดล้อมจะนำมาให้โรงแรม

คำสำคัญ การเปลี่ยนแปลงบรรยากาศ สิ่งแวดล้อม แก๊สเรือนกระจก อุตสาหกรรมโรงแรม ภูเก็ต

Thesis Title	The Awareness and Responsiveness of the Hotel Industry in Phuket to Climate Change
Author	Miss Ruth Carrillo Campos
Major Program	Hospitality and Tourism Management (International Program)
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ABSTRACT

Climate change is the greatest environmental challenge facing the world today, and it is one of the topics most spoken of by government and the private sector in the contemporary era. The effects of climate change would have several negative impacts, however, the disruptions in weather patterns and loss of diversity, as well as the degradation of heritage sites with the increase of acidity in the rain, most likely will affect the tourist industry. Many tourist destinations are based in natural settings such as beaches, mountains, rivers, and deserts; these represent an important tourist motivator to travel. Countries with strong tourism industries are particularly exposed to the effects of climate change. Many Islands are facing the stresses of rapid human population growth; this would very likely increase natural disasters and degradation of natural resources. Droughts and floods are among the climate extremes of most concern as they affect the amount and quality of water supplies in island communities and thus can have significant health consequences. Due to their small size and isolation, many islands face chronic water shortages, problems with waste disposal, species extinction, and coral bleaching. This can be said of Phuket Island. This tourism destination is experiencing fast growth, welcoming 5,005,653 tourists a year to 639 accommodation establishments. Thus on one hand, the tourism industry has effects on the environment and contributes to climate change; on the other hand, because the tourism industry is vital to Phuket's economy, the destination is particularly endangered by the effects of climate change.

In spite of this, relatively little research has been conducted so far about the awareness and responsiveness of

hotel industries around the world to climate change, therefore this study explores the knowledge and the actions taken by the hotel industry in Phuket to respond to minimize the impact to climate change. The objectives of this study were to examine the current awareness of hotels in Phuket to climate change, and their responsiveness to it, and to propose recommendations for hotels to respond to, and prevent climate change.

The data was collected using the census method. A total of 639 questionnaires were sent in December 2008 via mail to the General Managers of the total number of accommodation establishment identified by the Tourism Authority of Thailand in 2008. The primary focus was to identify the awareness of hotels in Phuket to climate change, and seek to determine its limitations and responsiveness. Altogether, 117 usable questionnaires were returned.

In order to find out and analyze the awareness and responsiveness of the hotel industry in Phuket, the researcher developed two indices. The Environment Concern Index takes into consideration 10 factors that measure the respondents concern on climate changes' affects on their hotels' operations. The Environment Responsiveness Index is composed of 26 environmental procedures that hotels can implement in order to reduce the emission of greenhouse gases, the implementation status of those procedures determine the degree of responsiveness of the respondents. The results showed that the majority of the respondents were not highly concerned about the effects of climate change; however, the responsiveness was high.

In addition to the questionnaires, semi-structured interviews were conducted with the Corporate Social Responsibility Managers of three hotels in Phuket recognized for their environmentally friendly practices. The purposive method was used to determine the interviewees. The results show that for some companies the implementation of activities or the change of processes that would reduce CO_2 emissions are viewed mostly as an expense, while for others are seen as a long term investment that brings a competitive advantage and is a

strategy to attract a specific environmentally conscious market. This market is more concerned with environmental conservation and less sensitive to economic fluctuations. It is also shown that the implementation of pro-environment activities reduces hotel operational costs, marketing and these activities increase hotel profitability.

The main factors impeding the implementation of environmental friendly procedures in the hotel industry are the lack of information, government support, and the initial investment that hotels are not willing to pay, the belief that climate change is a factor that will not affect their hotel occupancy, and ignorance of the marketing advantages that environmental friendly practices bring to the hotel.

Key words: Climate Change, environment, greenhouse gases, hotel industry, Phuket.

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There are so many people involved in the development of this thesis and I would like to express my gratitude to them. First of all, I would like to thank and dedicate this to my family and friends who have been constantly encouraging me throughout my life, without their support all this would have not been possible.

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Ruth Carrillo Campos

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LIST OF ABBREVIATIONS AND SYMBOLS

ADEQ	Association for the Development of Environmental Quality (Thailand)
CO_2	Carbon Dioxide
ECI	Environment Concern Index
ERI	Environment Responsiveness Index
EGAT	Electricity Generating Authority of Thailand
EMS	Environmental Management Systems
GHG	Greenhouse Gas
GLF	Green Leaf Foundation
GGAP 21	Green Globe Asia Pacific 21
IPCC	Intergovernmental Panel on Climate Change
ICSU	International Council of Scientific Unions
ITC	Investment Tax Credits
MWA	Metropolitan Water Works Authority (Thailand)
NGOs	Non Governmental Organization
PTC	Production Tax Credit
SEIA	Solar Energy Industries Association
TAT	Tourism Authority of Thailand
THA	Thai Hotels Association
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNWTO	World Tourism Organization
WMO	World Meteorological Organization
WTTC	World Travel and Tourism Council
WWF	World Wildlife Fun

CHAPTER 1
INTRODUCTION

1.1 Statement of the Problem

The environment represents one of the key aspects of the tourism industry, most tourist destinations are based on a natural settings such as beaches, mountains, rivers and deserts which represent the tourists motivation to travel. Besides all the advantages of tourism there are some areas of it that should be approached more wisely, like the use of natural resources. Conventional tourism not well managed is a harmful activity that can lead to natural habitat loss, soil erosion, waste discharges into the sea, increased pollution, the overuse of water resources by hotels, swimming pools, golf courses, greater use of local resources like energy, food and other raw materials (UNWTO, 2007).

Climate change is the greatest environmental challenge facing the world today and it is one of the topics most spoken of by government and private sector in the contemporary era. However, it is not a new phenomenon that the earth is facing; there is evidence that the first time climate change was addressed was in an international conference in 1979 during the first World Climate Conference organized by the World Meteorological Organization (WMO), the United Nations Environment Program (UNEP) and the International Council of Scientific Unions (ICSU). After this conference, in 1992, one of the most popular meetings because its impact on the development of more sustainable societies took place in Rio de Janeiro; Agenda 21: Conference on Environment and Development. In the Rio Declaration, 178 governments voted to adopt a program that involves; social, economic, conservation and resource management for development; strengthening the role of major groups and the means of implementation. This was a great step for environment conservation.

In December 1997, the Kyoto Conference on Climate Change organized by the United Nations Framework Convention on Climate Change took place. The countries participating agreed to implement some regulations and actions in order to reduce their emissions of greenhouse gases. The objective of the Kyoto protocol is to reduce by an average of 5.2% the 183 countries participants' emissions of greenhouse gases over their 1990's release levels during the 2008-2012 period.

Five years later at the World Summit on Sustainable Development held in Johannesburg, South Africa (2002 Johannesburg Summit) it was stated that the "progress in implementing sustainable development has been extremely disappointing since the 1992 Earth Summit, with poverty deepening and environmental degradation worsening" (Murphy, 2005:167). At this conference Climate Change was recognized as a serious problem that would have effects on human activities in all sectors of the world's economy, including tourism.

The first International Conference on Climate Change and tourism was organized by the World Tourism Organization (UNWTO) in Djerba, Tunisia in 2003 where delegates from 42 countries and six international organizations participated. One of the conclusions of this conference showed the necessity of raising awareness of the inter-relationship between climate change and tourism.

The World Travel and Tourism Council (WTTC, 2007) has estimated in 2006 that tourism generated approximately 234.3 million jobs which represented the 10.3% of global GDP, which makes tourism the second largest industry in the world. In 2007, its growth exceeded the World Tourism Organization (UNWTO) expectations with almost 900 million international arrivals worldwide, which represents a 6% growth rate in one year. In relation to that growth the UNWTO's Secretary-General, Francesco Frangialli said that, "'Economic

and tourism growth are driven by emerging markets and developing economies."

In October 2007, the Second International Conference on Climate Change and Tourism took place in Davos, Switzerland. Several International Organizations (UNWTO, UNEP, WMO, WEF) and the Swiss Government were - among other issues - discussing about the environmental impacts of tourism and they agreed that:

> "The tourism sector must rapidly respond to climate change, within the evolving UN framework and progressively reduce its Greenhouse Gas (GHG) contribution if it is to grow in a sustainable manner; this will require action to:
>
> - Mitigate its Greenhouse Gases emissions, derived especially from transport and accommodation activities;
> - Adapt tourism businesses and destinations to changing climate conditions;
> - Apply existing and new technology to improve energy efficiency;
> - Secure financial resources to help poor regions and countries".

UNWTO (2007) calls on all private and public stakeholders in tourism to factor climate change into their decision-making process. UNWTO advocates adaptation to and mitigation of climate change, while maintaining its commitment to reducing extreme poverty and fostering sustainable development, as laid out in the UN Millennium Development Goals.

The effects of climate change will very likely cause hot extremes, heat waves and heavy precipitation events which will continue to become more frequent. Tropical cyclones will become more intense, with larger peak wind speeds and more

heavy precipitation associated with ongoing increases of tropical sea surface temperatures (IPCC, 2007).

Many islands are facing the stresses of rapid human population growth; this would very likely increase natural disasters and degradation of natural resources. Droughts and floods are among the climate extremes of most concern as they affect the amount and quality of water supplies in island communities and thus can have significant health consequences. Due to their small size and isolation, many islands face chronic water shortages, problems with waste disposal, species extinction crisis and coral bleaching. This can be the case of Phuket Island. This tourism destination is experiencing fast growth, in 2007 Phuket welcomed 5,005,653 tourists in 639 accommodation establishments (TAT, 2008). Thus on one hand, the tourism industry has effects on the environment and contributes to climate change; on the other hand, because the tourism industry is vital to Phuket's economy, the destination is particularly exposed to the effects of Climate Change.

However, relatively little research has been conducted so far about the awareness and responsiveness of hotel industries around the world to climate change. Therefore this study aims to explore the knowledge and the actions taken by the hotel industry in Phuket to respond to minimize the impact to climate change.

1.2 Related Literature

1.2.1 Sustainable Development

Humanity is moving towards a more holistic conception and performance of their daily activities. This new trend is affecting the way the government, business and people are being managed. At the end of the 20th Century the term sustainable development as an environmental management concept (WCED, 1987) became popular.

It is imperative to define the meaning of Sustainable Development in order to have a better understanding of it when applied to Tourism Industry.

Weaver, in his book Sustainable Tourism (2006), states that according to Bramwell and Lane (1993) the idea of sustainable development was first expressed in 1973 and became known during the World Conservation Strategy in 1980. However, it was not until the World Commission on Environment and Development (WCED, 1987) held in Brundtland, that this term became popular.

During the WCED (1987:1) the original definition of sustainable development was given: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This definition somehow resulted in many ambiguous and different interpretations came out of it. In fact, several hundred different definitions of sustainable development now exist.

Hunter (2002) summarized the major issues in interpreting Sustainable Development:

- The role of economic growth in promoting human well-being
- The impact and importance of human population growth

- The effective existence of environmental limits to growth
- The substitutability of natural resources (capital) with human-made capital created through economic growth and technical innovation
- The differential interpretation of the criticality of various components of the natural resources base and, therefore, the potential for substitution
- The ability of technologies (including management methods such as environmental impact assessment and environmental auditing) to decouple economic growth and unwanted environmental side-effects
- The meaning of the value attributed to the natural work and the rights of non-human species, sentient or otherwise.
- The degree to which a systems (ecosystems) perspective should be adopted and the importance of maintaining the functional integrity of ecosystems.

The diversity of sustainability concepts is based on the approach to the three dimensions of sustainability (social, economic and environmental). Some definitions have a very weak sustainability position while others a very strong position. The characteristic of four sustainability positions are explained by Hunter (2002): very weak position is growth oriented and resources exploitative, weak position is resource conservationist, strong position is resources preservationist and very strong position is resources preservationist oriented to the point where utilization of natural resources is minimized. Table 1.1, shows these positions in more detail.

Table 1.1 The Sustainable Development Spectrum

Sustainability Position	**Defining Characteristics**
Very Weak	Anthropocentric and utilitarian: growth oriented and resource exploitative; natural resources utilized at economically optimal rates through unfettered free markets operating to satisfy individual consumer choice; infinite substitution possible between natural and human-made capital; continued well-being assured through economic growth and technical innovation.
Weak	Anthropocentric and utilitarian; resource conservationist; growth is managed and modified: concern for distribution of development costs and benefits through intra- and intergenerational equity rejection of infinite substitution between natural and human-made capital with recognition of some aspects of natural world as critical capital (e.g. ozone layer, some natural ecosystems); human-made plus natural capital constant or rising through time; decoupling of negative environmental impacts from economic growth.

Table 1.1 (Continued)

Sustainability Position	**Defining Characteristics**
Strong	(Eco) systems perspective, resources preservationist; recognizes primary value of maintaining the functional integrity of ecosystems over and above secondary value through resources utilization interests of the collective given more weight that those of the individual consumer; adherence to intra- and intergenerational equity; decoupling important but alongside a belief in a steady state economy as a consequence of following the constant natural assets rule; zero economic and human population growth.
Very strong	Bioethical and eco-centric; resources preservationist to the point where utilization of natural resources is minimized; nature's rights or intrinsic values in

	nature encompassing non-human living organisms and even abiotic elements under a literal interpretation of Gaianism; anti-economic growth and for reduced human population.

Source: Theobald, 2005

1.2.2 Sustainable Tourism

The tourism industry has been cataloged in general as the more environmentally friendly of the industries, but its fast growth and development, sometimes not well planned and managed, has created several negative environmental and social impacts.

When referring to a kind of tourism where the negative impacts to the environment and culture are minimized, the term Sustainable Tourism is used.

Some of the definitions that Butler (1999) collected, from many authors, in one of his articles.

- *Tourism which meets the needs of present tourist and host regions while protecting and enhancing opportunity for the future (UNWTO, 1993).*
- *Sustainable tourism is tourism and associated infrastructures that: both now and in the future operate within natural capacities for the regeneration and future productivity of natural resources; recognize the contribution that people and communities, customs and lifestyles, make to the tourism experience; accept that these people must have an equitable share in the economic benefits of local people and communities in the host areas (Eber, 1992).*
- *Tourism which can sustain local economies without damaging the environment on which it depends (Countryside Comission, 1995).*
- *It must be capable of adding to the array of economic opportunities open to people without*

adversely affecting the structure of economic activity.

- *Sustainable tourism ought not interfere with existing forms of social organization. Finally, sustainable tourism must respect the limits imposed by ecological communities (Payne, 1993).*
- *Sustainable tourism in parks (and other areas) must primarily be defined in terms of sustainable ecosystems (Woodley, 1993).*
- *Sustainable tourism is tourism which develops as quickly as possible, taking into account of [sic] current accommodation capacity, the local population and the environment, and: Tourism that respects the environment and as a consequence does not aid its own disappearance. This is especially important in saturated areas, and: Sustainable tourism is responsible tourism (Bramwell et al., 1996).*

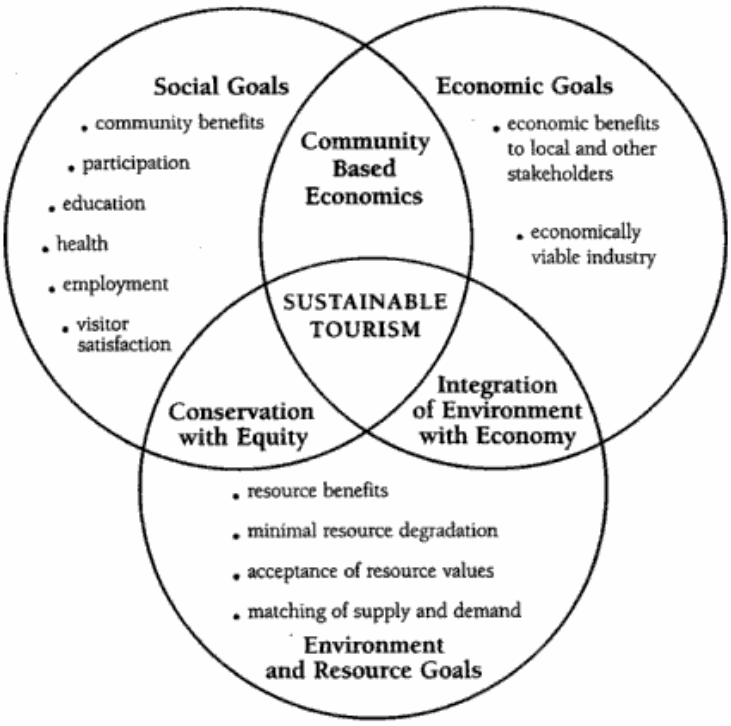
Sharpley (2000) mentions that there are two categories for sustainable development: *those 'tourism-centric' (Hunter, 1995), focusing on sustaining tourism as an economic activity, and those which consider tourism as an element of wider sustainable development policies (Cronin, 1990).*

For the purpose of this study, the definition given by Wight (1997) is more accepted:

Tourism, as it relates to sustainable development, is tourism which is developed so that the nature, scale, location, and manner of development is appropriate and sustainable over time, and where the environment's ability to support other activities and processes is not impaired, since tourism cannot be isolated from other resource activities. At the heart of sustainable tourism is a set of implicit values related to striving to integrate economic, social and cultural goals.

This definition can be understood more clearly in Figure 1.1 Model of Sustainable Tourism values and principles, proposed by Hall, Jenkins and Kearsley in 1997 (Murphy and Prince, 2005)

Figure 1.1 Model of Sustainable Tourism Values and Principles



Source: Hall, Jenkins and Kearsley, 1997

This model indicates that it should be a balance between environment, social and economic goals in order to develop sustainable tourism.

There are four points which are imperative in the development of sustainable tourism (Aronsoon, 2000):

- Tourism development may take place if it does not damage the environment and is ecologically sound.
- Sustainable tourism development largely consists of small-scale development and is based on the local community.

- Sustainable tourism development takes its point of departure in who benefits from tourism. The aim is not to exploit the local residents
- Sustainable tourism development places the emphasis on cultural sustainability, e.g. the destination is developed in such a way that the feel of the place is retained in its architecture and cultural heritage.

1.2.3 Tourism Impacts

Tourism is a social phenomenon that impacts directly and indirectly the economy, socio-culture and environment of the host community. These impacts can be positive and negative, unfortunately they cannot be prevented, however, it is possible to manage them in order to minimize the negative ones and maximize the positive.

1.2.3.1 Economic Impacts

The most important reason to develop tourism is its economic benefits. In 2003 the World Travel and Tourism Council suggested that 200 million jobs, around the world, were product of the Tourism Industry, which makes it the second largest industry in the world (Ennew, 2003).

The impacts of tourism are classified in three types: direct, indirect and induced effects, figure 1.2 shows clearly how these effects are caused (Ennew, 2003:3).

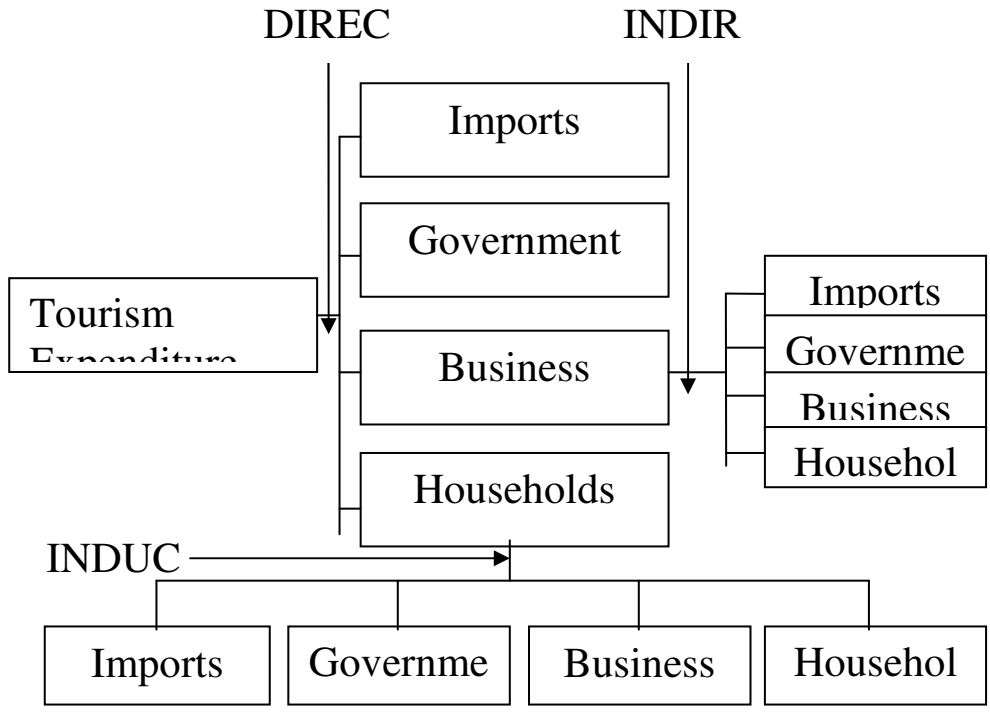
“Direct Effects are the ones which occur when a tourist expends money directly into a business.

Indirect Effects happens once that the money expended by the tourist is used to buy items to create the services and products that will be purchased by tourist.

Induced effects occurs when a tourist industry employee, government and business spends the money earned in the tourist activity in other activities that not concern with the tourist".

During the process that the tourist expenditure has in the host community macro economically this activity is having effect thru expenditure on imports, this is call leakages.

Figure 1.2 The Effects of Tourism Expenditure



Source: Ennew, 2003:3

The process of spending and re-spending the money initially earned by tourism is frequently known as multiplier effect and this is the true impact of tourism.

The multiplier effect is the amount by which a change in autonomous expenditure is multiplied to determine the change in equilibrium expenditure that it generates (Wesley, 1996). A decrease in a consumer spending will affect not only the sale of consumer goods directly but also the goods'

producers economy (workers and owners) reducing the output and income in other producers, affecting consequently other sectors (Bernake, 2004).

Other positive effects of tourism are (UNEP, 2006; Yunis, 2003)

- Foreign exchange earnings: Tourism often plays a major part in the economy of poor countries. In 2001, USD 142,306 million were received by developing countries. Is the principal export in a third of all developing countries and amongst the 49 Least Developed Countries (LDC's), it is the primary source of foreign exchange earnings. In addition to that the export and import of services and products generate income to the host community that can finance the growth in other economic sectors.
- Contribution to government revenues, which can be classified in two: direct, generated by taxes paid directly by the visitor and indirect, levied on products or services supplied to tourist.
- Employment generation: The attractiveness for tourism of many areas such as remote rural, big cities, etc. areas benefits their economy by generating jobs and at the same time supports traditional activities such as agriculture and handicrafts, what would contribute to their local economy.
- Stimulation of infrastructure investment: which can be induced by the Tourism and can benefit the residents' life.

1.2.3.2 Socio-Cultural Impacts

It is almost impossible to imagine a tourist activity without tourist and host community inhabitants' interaction, which means people from different economic and socio-cultural backgrounds being in contact. These relations cause influences that are difficult to measure. Nevertheless, over time changes have been observed in value systems and behavior and thereby threatens indigenous identity, which affects the community structure, family relationships, collective traditional life style, ceremonies and morality (UNEP, 2006).

The socio-cultural impacts of tourism can be divided in five types (UNEP, 2006):

- Change or loss of indigenous identity and values: This can be by several influences such as: co-modification, standardization, loss of authenticity and stage authenticity, adaptation to tourist demands.
- Contribution to socio cultural development in different ways such as; economic, through employment creation, income redistribution, poverty alleviation; social; strengthening communities rejuvenating their traditions, re-forcing the peace by bringing people together, bringing higher living standards to a destination, revaluation of culture and traditions, raising local pride in local and national heritage. All this happens if tourism is practiced and developed in a sustainable.
- Culture clashes which occurs when people from different background get in contact. These clashes can generate economic inequality, irritation due to tourist behavior and job level friction.
- Ethical issues such as crime generation, child labor and prostitution and sex tourism.

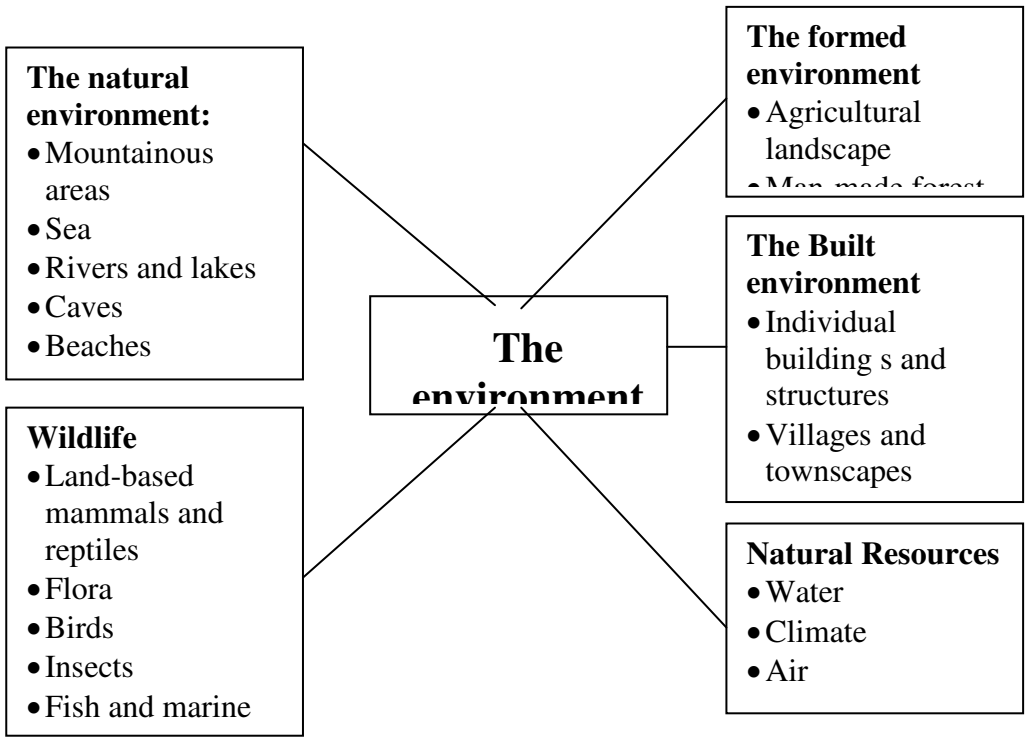
- Physical influences causing social stress caused by; the resource use conflict when there is a competition between tourism and local population for the use of prime resources, cultural deterioration and conflicts with traditional land uses.

1.2.3.3 Environmental Impacts

The environment has been defined as the complex of physical, chemical, and biotic factors (as climate, soil, and living things) that act upon an organism or an ecological community and ultimately determine its form and survival (Webster dictionary).

Swarbrooke (1999) classified the environment in five aspects which are; natural environment, wildlife, farmed environment, build environment and natural resources (See figure 1.3) all of them represent potential tourism developments.

Figure 1.3 The Scope of the Concept of Environment



Source: Mason, 2005:53

The requirements for the tourism activity to take place such as; the creation of general infrastructure like roads, airports, hotels, resorts, shops, spas, generate a negative impact in the environment. The quality of the environment is essential for the tourism and its implications can be divided in positive and negative impacts.

Mason (2006) classified the environmental impacts of tourism as follows:

Positive environmental impacts:

- Tourism may stimulate measures to protect the environment and/or landscape and/or wildlife;
- Tourism can help to promote the establishment of National Parks and/or Wildlife Reserves;
- Tourism can promote the preservation of buildings/monuments (this includes for example UNESCO's World Heritage Sites);

- Tourism may provide the money via, for example, entrance charges to maintain historic buildings, heritage sites and wildlife habitats.

Negative environmental impacts:

- Tourist are likely to drop litter
- Tourism can contribute to congestion in terms of overcrowding of people as well as traffic congestion
- Tourism can contribute to the pollution of water courses and beaches
- Tourism may result in footpath erosion
- Tourism can lead to the creation of unsightly human structures such as buildings (e.g. hotels) that do not fit in with vernacular architecture.
- Tourism may lead to damage and/or disturbance to wildlife habitats.
- Tourism contributes to the climate change and global warming by 5% of global CO_2 emissions (Davos Conference, 2007)

These negative impacts occur when the level of visitor use is higher than the environment's ability to handle this use within the acceptable limits of change, what is called carrying capacity.

The United Nations Environmental Programme (UNEP, 2006) has identified the environmental impacts of tourism in four areas:

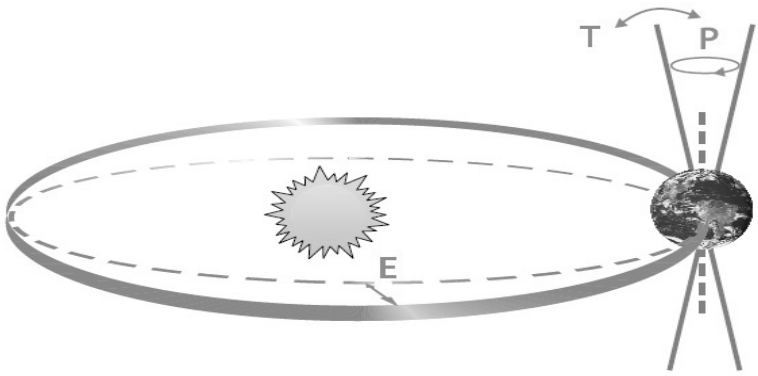
1. Biodiversity
2. Physical alterations and habitats
3. Pollution and Waste
4. Resource Consumption

1.2.4 Climate Change

Climate change represents a big challenge for humanity; it is a physical phenomenon that is happening all the time on Earth, the ice ages or periods of extreme warmth are examples of it. Scientists have given different reasons for this change in the climate such as: volcanic eruptions, asteroids impacts, cosmic radiation from exploding supernovas or the Milankovitch cycles.

The Milankovitch cycles (Milankovitch, 1920) explained that the shape of the earth's orbit around the sun is elliptic so that in some periods, approximately 100,000 years, the energy emitted by the sun reaches the earth faster, which causes higher temperature on the earths surface (Cunningham et al., 2003 and Chiras, 2006) (See fig. 1.4).

Figure 1.4 Milankovitch Cycles



Source: Rahmstorf and Schellnhuber, 2006

Milankovitch Cycles. Schematic of the Earth's orbital changes (Milankovitch cylces) that drive the ice ages cycles. T denotes changes in the tilt (or obliquity) of the Earth's axis, "E" denotes changes in the eccentricity of the orbit (due to variations in the minor axis of the ellipse), and "P" denotes

precession, that is changes in the direction of the axis tilt at a given point of the orbit.

In 1895 (Upperbrink, 1996), the Swedish chemistry scientist Svante Arrhenius discover that burning coal releases carbon dioxide (CO_2), identified nowadays as a greenhouse gas.

There are five Greenhouse Gases (GHG) (Cunningham, 2004): carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs) and sulfur hexafluoride.

These gases help to keep the planet's surface warm; the increase of their concentration causes a heat-trap effect which changes the climate on the earth (Webster, 2000).

One factor that is affecting climate change is the loss of forests. Vegetation photosynthesis absorbs and helps to reduce CO_2 (Cunningham, 2004).

With the industrial revolution in 18th century, man started to burn a lot of fossil fuels (coal and oil) which, as was stated above, generates CO_2 which contributes to the speed climate change.

During the period of 1906-2005 their concentrations increased, which according to the Intergovernmental Panel on Climate Change's 2007 Report (IPCC, 2007) caused the global average temperature to rise by 0.74 C.

In a study conducted by National Oceanic and Atmosphere Administration (NOAA, 2006) scientists NASA data showed that "the eight warmest years on record (since 1850) have all occurred since 1998, with the warmest year being 2005". Other aspects of the climate are also changing such as rainfall patterns, snow and ice cover, and sea level; in addition to that the IPCC stated that a lot of areas of the planet will become warmer. Extreme weather conditions such as [the increased frequency of] floods and droughts will become a threat to food supplies. Plants and animals adjustment incapability will cause their extinction (UNEP, 2007).

The United States' Transportation Research Board submitted a report where they explained (TRB, 2008) that since the temperatures are rising their atmosphere has water vapor which is causing longer and more extreme rainy seasons. Increases in global temperature also cause sea surface temperatures to rise, one of several important factors affecting hurricane intensity.

1.2.4.1 Tourism and Climate Change

The importance of the climate and the natural environment in the tourism industry and destination is crucial; both are essential resources for tourism. The effects of climate change on the environment affect tourism affecting tourism activities and patterns, which can affect the destination's stability, its economy, and society.

Tourism is a complex activity which needs different events to come together in order to take place. It needs to move people from one region to another, to accommodate these people in the hosting destination, to provide food and beverage, etcetera. All these activities are cause of CO_2 emission.

Table 1.2 shows the estimated emissions from global tourism in 2005, this includes same-day visitors (UNWTO, 2008).

Table 1.2 Estimated Emissions from Global Tourism in 2005

	CO2 (Mt)	**%**
Air transport	515	1.9
Car	420	1.6
Other transport	45	0.2
Accommodation	274	1.0
Activities	48	0.2
TOTAL	1320	4.9
Total World	26400	100%
Share (%)	4.9	

Source: UNWTO 2008: 33

The impacts of climate change on the tourism industry have been classified by the UNWTO (2008) in four categories:

1. Direct climatic impacts on one of the more important resources in the tourism industry: the climate. This will change the tourism seasonality, the operating costs and most likely the tourist preferences towards places with higher altitudes and latitudes.
2. Indirect environmental change impacts refers to the changes that the modification in the environment will produce in the agriculture, water supply, inundation and other effects of those changes.
3. Impacts of the mitigation policies on tourist mobility which most probably will increase the cost of transportation causing a diminution of tourist flows.
4. Indirect societal change impacts that could most likely be a threat for the economic growth resulting in political instability.

In World Climate News Report elaborated in June 2008 the World Meteorological Organization (WMO) enlists the consequences of the climate change in the tourism industry, such as (WMO, 2008):

- *Warmer temperatures would affect seasonality, increase heat stress for tourists, raise cooling costs and could change the range of infectious diseases;*
- *A decrease in snow amount and extent could increase snow-making costs, and decrease the length of winter sports seasons, making some current facilities untenable;*
- *An increase in frequency or intensity of extreme weather (such as tropical cyclones, hurricanes and mid-latitude winter storms) would increase risk for people and infrastructure, raise insurance costs and increase the cost of business interruptions, including travel delays;*
- *Reduced precipitation would create or increase water stress, could cause or increase competition between tourism and other users for water, could affect availability of locally produced food, would exacerbate desertification and increase the threat of wildfires, with consequent threats to infrastructure and tourist safety;*
- *Increased frequency of heavy precipitation would increase risk of flooding, affecting the safety of tourists and their hosts, increasing risk to tourism infrastructure and to cultural heritage assets, a major draw for destination choices;*
- *Sea-level rise would increase coastal erosion, reduce beach area, increase costs of protection*

and use of waterfronts and could reduce availability of freshwater supply as a result of salt water intrusion;

- *A rise in sea-surface temperatures would increase risk of coral bleaching, affect marine resources (including availability of marine food supply); and*
- *Changes in climate could affect the aesthetic quality of tourism areas, and cause harm to local ecology and biodiversity.*

In addition to all the climate changes effects, a destination affected will be very damaged by the tourist adaptability which will define new destinations and seasonality.

1.2.4.2 Climate Change Mitigation Policies and Measures

According with the Climate Change and Tourism-Responding to Global Challenges Report elaborated by the UNWTO (2008) the main objective of climate change mitigation policies and measurements consist in reducing the greenhouse gas emissions. It should combine voluntary, economic and regulatory instruments which include tourist, tour operators, accommodation managers, airlines, manufacturers of cars and aircraft and destination managers.

In 1997 the Kyoto Protocol took place in Japan, where 160 countries gather to discuss about climate change and GHG. They agreed to reduce the CO_2 emission levels by average 5.2% below their 1990 discharge. Regarding the emission of other GHG the level of reduction was not set, nevertheless the compromise of reducing the release of them was made (Cunningham et al., 2003).

There are several strategies that can be adopted by the accommodation establishments in order to reduce the greenhouse gas emissions (UNWTO and UNEP 2008).

1. Reducing energy replacing old equipment for machinery more energy efficient.
2. Improving energy efficiency; adopting environmental management systems (EMS) to save resources.
3. Use of Produced or bought renewable energy only.
4. Sequestering carbon through sinks by having carbon off-setting programs.
5. Recycling and reducing waste.
6. Rethinking food in restaurants can help to reduce greenhouse gases when buying from local producers to avoid transportation CO_2 emissions.
7. New constructions should consider the landscape in order to maximize its benefits and reduce the energy consumption as well as they should use low carbon, recycled materials and insulation to reduce air conditioner and heater use.
8. Communications of environmental efforts should become a key element in the hotels operations to encourage staff and influence tourist behavior to reduce GHG emission.

The UNEP (2008) has created a process that can be used in to achieve carbon neutrality in any tourism enterprise. This is a circular process where all its parts are working at the same time.

1. Eliminate activities that produce carbon emission without affecting the service quality or product.

2. Maximize the practice of energy efficient and minimize non-efficient activities
3. Replace activities with high GHG emission.
4. Implement activities to offset remaining carbon emission to become carbon neutral company.

In addition to the process mentioned above, the UNEP (2008) has created a list of mitigation measures that will support hotels and tourism attractions to adapt their procedures, actions and appliances to be more environmental friendly

- Energy conservation and efficiency in buildings and tourist attractions:
  - setting targets and benchmarking, apply certification;
  - integrating sustainability and customer comfort;
  - motivating employees and customers through awareness-raising and through incentives for energy reduction;
  - enhanced building sitting, and design (orientation, natural ventilation, insulation, etc.);
  - reducing the need for air conditioning where possible;
  - installation of devices that permit heating, cooling and lighting only when the room is occupied;
  - use of energy-efficient appliances (light bulbs, heat exchangers, etc.);
  - frequent maintenance and cleaning of heating, cooling and refrigeration equipment;
- Use of alternative fuels (e.g., biodiesel) and renewable energy sources (e.g., wind,

photovoltaic, solar, thermal, geothermal, biomass and waste);

- Integrated emission management (including supply chain management) and wider environmental management (e.g., waste), designating manager specified on environmental management systems (EMS) and emission issues;
- Awareness-raising among customers on recycling;
- Development of an environmental 'Code of Ethics', (checklist or criteria that a hotel chain can provide to its suppliers/providers, to help them perform their services to the sector in an environmentally respectful manner;
- Capacity building, and climate change and environment related education for managers of the accommodation establishments and in related sectors; such as architecture, construction and engineering;
- Inclusion of energy-efficiency and renewable energy use support programmes in national tourism policies and development plans.

1.2.5 Environmental Responsibility of Hotels

The hotel industry generates approximately 20% of the Greenhouse Gases emitted by the tourism industry; therefore, one of the most important issues in the contemporary hospitality industry is environment management. Many hotels have changed their practices to adopt more environmental friendly procedures. Worcester (1994) cited in Mensah (2004:4) reports that: *"environmental management, which emerged in the 1980s, is a new and important aspect of management and will be adopted by an increasing number of firms by 1990s"*.

According with Mensah (2004) there are four forces which contribute to environmentally conscious hotel practices: governmental regulations, changing consumer demand, NGO's and International organizations' initiatives and Ethics by professional associations.

There are several actions that Kirk (1995) mentioned that a hotel can follow in order to act with an environmental responsibility.

- Purchasing policies:
  - Develop partnerships with suppliers;
  - Identify sustainable products;
  - Choose products with sensible packaging.
- Waste management:
  - Minimize waste in operations;
  - Reuse as much waste as possible;
  - The segregate of waste which can be recycled.
- Waste disposal:
  - Establish partnerships with disposal companies;
  - Ensure disposal methods are sound;
  - Only use land-fill disposal as last resort.

The hotel industry worldwide has started to perform different actions that contribute to the offsetting of Carbon dioxide emission. Some of these initiatives are:

Radisson SAS Hotels has shown its compromise to reduce the GHG emission, one example of it is that in Edinburg, Scotland in 2007, the Radisson SAS Hotel started conducting several meetings and events in which ~~for~~ each guest assisting the hotel will contribute economically to carbon offsetting projects around the world. This contribution will not cause any charge to guests (Radisson, 2007).

Fairmont Hotels have developed different strategies within the company and to encourage guests to reduce CO_2

emissions. The strategies used with guest are: free parking for hybrid cars, waste management via guest room recycling, energy efficient lighting used in guest rooms, suites and meeting rooms. The processes implemented in Fairmont operations are purchasing green tags/energy certificates, back of the house recycling, eco-friendly cleaning products, alternate energy, such as renewable wind power and use of biodiesel, implemented where possible. (Fairmont, 2007).

InterContinental Hotel Group Asian Pacific Region have moved to Green Globe certification. In 2007, twelve hotels in this region were already benchmarked or certified while six had initiated the program to be certified. (InterContinental Hotel Group, 2008).

Marriott hotels is cutting down the emission of greenhouse gases by replacing light bulbs with fluorescent lighting and installing showerheads and toilets that use less water. In addition to that they have set goals to replace their power supply in 40 hotels, with solar cells by 2017 (Marriott, 2008).

1.2.6 Eco-labeling and Environmental Certifications

Eco-labeling describes a scheme in which a product or service may be awarded an ecological label on the basis of its "acceptable" level of environmental impact. The acceptable level of environmental impact may be determined by consideration of a single environmental hurdle or after undertaking an assessment of its overall impacts (Synergy, 2000).

Certification is a process by which a third party gives written assurance to the consumer that a product, process, service or management system conforms to specified requirements (Mensah, 2004).

Aubudon Green Leaf: It is a program for the hospitality industry that helps hotels to achieve their eco-

efficiency savings and environmental commitment. This program guarantees that audited lodging facilities have met environmental best practice standards that are required for a rating of one to five *Green Leafs*. Since 1998, this eco-label encourages and educates hotel staff throughout the U.S.A., Canada and Europe on environmentally friendly practices (Aubudon International, 2009).

Certification for Sustainable Tourism: It is regulated by the Costa Rican National Accreditation Commission and consists of a scale of 5 levels, based on the degree to which the accommodations and tourism operators comply with a sustainable model of natural, cultural and social resource management (Certification in Sustainable Tourism Program, 2008).

Eco-Certified Sustainable Travel Geographic Scope: It is a worldwide certification for travel providers such as: accommodation, visitor attractions, tourism operators and transportation service providers; and travelers. It provides guidelines to provide services and products that protect the local culture and environments (Sustainable Travel International, 2008).

Green Deal: is a certification started in Guatemala that provides service to accommodations, guides, restaurants, communities and tourism operators. The certification is based on process based management systems and specific performance- based criteria that cover quality control environmental and socio-cultural issues (Green Deal, 2008).

Green Globe 21 (Weaver, 2006); the pioneer tourist eco-label for products and destinations. It was created in 1994 by the WTTC. It has three-tier level according with the responsibility the hotel or destination has with the environment. Starting with Affiliated which means the company is aware and applying for Green Glove Certification. Second, benchmarked status represents that the company has adopted some of the "standards". Certified, which is the last level and shows that the

company has adhered to all the standards and procedures. It is also known as Evaluate Communicate Evolve (EC3) and it helps companies manage and achieve their sustainability targets (Evaluate Communicate, 2008).

Green Seal, Inc.: Since 1995 this certification identifies the most environmentally preferable products currently available for the accommodation establishments in order to safeguard the environment. It is mostly found in the United States (Green Seal, 2008).

Green Tourism Business Scheme Geographic Scope was founded in the UK, in 1998, it certifies through a rigorous set of criteria that covers energy, water efficiency, waste management, biodiversity and more (Green Business, 2008).

International Standard Organization (ISO)14001; It was launched in 1947 in Geneva, but it was not until 1996 that the version 14001, environmentally related, was developed. It can be implemented by any kind of organization that needs or wants to improve its environmental management system. It helps to maintain the environmental policies stated by the law regulations or company (ISO, 2008).

The Green Key is offering "diplomas" to responsible tourism providers, since 1994. This certification takes in consideration company policies and action plans (The Green Key, 2008).

The Green Leaf Foundation (Pradech, 2008) was established in 1997. It was developed by the Tourism Authority of Thailand (TAT), Thai Hotel Association (THA), UNEP, Electricity Generating Authority of Thailand (EGAT), Association for the Development of Environmental Quality (ADEQ) and Metropolitan Water Works Authority (MWA) in order to develop both the quality of the environment and tourism industry at the same time. Eleven sections are assessed to have a better management of environment policies, waste, energy and water efficiency, air quality, air and noise pollution, water

quality, fuel management, ecological impacts and collaboration with the community (Green Leaf Foundation, 2008).

VISIT: This organization uses phrases such as “Your VISIT makes the difference the choice is yours!, eco-label VISITS has incorporated in initiative to encourage consumers and accommodations, visitor attractions and tourism operators to start Voluntary Initiatives for Sustainable in Tourism (VISIT) in Europe (Your VISIT, 2008).

1.2.7 Environmental Responsiveness of Hotels in Thailand

The hotel industry in Thailand is changing the way their resources are being used. The Green Leaf Foundation was created in 1994, its aim is to alert the hospitality industry to environmental issues within it. The TAT, THA, EGAT, the UNEP, the MWA, ADEQ and the Green Leaf Foundation work together in order to conduct seminars, trainings and promote campaigns to increase the environmental friendly skills and knowledge of the Thai Hospitality Industry (THA directory, 2007).

“The Foundation ranks environmental standards of tourism operation in five levels which are distinguish by the acquirement between one to five leafs. Hotels that save energy, reduce waste and contaminants, promote the role of staff and guests in environmental conservation and continually join forces with communities in protecting natural resources and the environment on a broader scale will receive from one to five leaves, the top rating being five (THA Directory, 2007).

The ASEAN national tourism organizations have agreed to award "Green Hotels". The awards are the result of outstanding efforts in environmental conservation. In 2008, the awards were presented by H.E. Thailand's former Minister of Tourism and Sports, Dr. Suvit Yodmani. This event was witnessed by the ASEAN Secretary-General H.E. Dr. Surin

Pitsuwan. In this First ASEA Green Hotel Awards, 81 ASEAN hotels have participated and 10 Thai hotels have been awarded winners. Those hotels are: Le Meridien Phuket Beach Resort; Bangkok Marriott Resort and Spa Hotel; Grand Hyatt Erawan, Bangkok; Sofitel Centara Grand, Bangkok; Amari Atrium Hotel; Dusit Thani Pattaya; Siam Bayshore Resort and Spa, Pattaya; Siam Bayview Hotel, Pattaya; Laguna Beach Resort; and the Banyan Tree, Bangkok (TAT, 2008a and Thailand Hotelier, 2008):.

The criteria for the prizes are based on (TAT, 2008a):

- Waste management and reduction through waste separation, recycling, bulk buying and using returnable and recyclable containers. Hazardous waste is diligently separated.
- Wastewater is properly administered through connection to city-monitored wastewater treatment plants and the use of environmentally safe detergents and cleansing agents, which prevent water contamination. Grease collectors are installed in kitchens and emptied at least three times every week.
- Efficient use of water is encouraged and promoted to the staff and guests. Hotels install low consumption bathroom fittings to save water, leakage is monitored and consumption sub-metres are installed in heavy-usage areas, such as kitchens and the laundry.
- Energy-saving measures are implemented as well as investment in technology and equipment that help reduce environmental impact and consumption. These range from the use of energy-saving light bulbs, and individual light and air-conditioning switches, to effective management of fuel and gas which involve installation of

environmentally friendly air-conditioning systems that use ozone-friendly only

- Air pollution is further reduced by the installation of new boilers and heat pumps allowing the use of LPG gas instead of diesel.
- Cooling towers have been replaced at both properties to improve hot-air ventilation, reducing energy consumption.

1.2.8 Environmental Strategies by the Hotel Industry in Phuket

In spite of the importance of the climate change there has been surprisingly little research on the environmental strategies by the hotel industry in Phuket, to the best knowledge of this researcher the only previous survey about the environmental practices of hotel industry in Phuket was made by A. Oines in 2006.

Arnfinn Oines (2006) has identified three main areas used by the hotel industry in Phuket to approach their environmental concerns and practices these areas are: energy consumption, water consumption and waste production.

Table 1.3 Main Environmental Practices

Main Environmental Practices	
Energy Efficiency	Peak consumption control Energy saving light bulbs Low energy air conditions Insulation and natural ventilation High voltage underground cables Solar thermal heating Gas boilers Use of gravity

Water Management	Water saving faucets, shower heads and toilets Water reservoir Rain water catch Waste water treatment plant Gray water used for gardening
Waste Management	Recycling Composting Reuse of material and use of local material

Source: Oines, 2006

Additional information on the subject of environmental strategies by the hotel industry in Phuket can be gathered from the websites of some of the major Phuket hotels.

Laguna Phuket is a touristic complex which includes six deluxe resorts, five spas, a golf course, restaurants and bars, boutique, a wedding chapel and some other facilities. The hotels in Laguna are: Banyan Tree Phuket, Dusit Thani Laguna Phuket, Laguna Beach Resort, Sheraton Grande Laguna Phuket, Allamanda Laguna Phuket, Laguna Holiday Club Resort and Laguna Phuket Holiday Residences. It was founded in 1983 and it started to develop its work in 1984 on a devastated land where the soil had been so leached by chemicals that it was believed vegetation could never be sustained again. Laguna's commitment is to maintain the environment through improvement of performance and efficiency in areas such as phasing out environmentally damaging products. Day-to-day operations at the resort apply the Three Rs of green management: reduce, re-use and recycle. All resort facilities have adopted responsible purchasing policies and recycled materials are used wherever possible for maintenance, renovation and upgrading work. Each hotel has a staff education program to teach the importance of caring for the environment,

and consumption of energy and water is closely monitored. Hotel staff receives extensive checklists to complete, covering such areas as waste management, energy and water management, product purchase, air quality, noise pollution and community issues (Laguna, 2009).

The Banyan Tree Phuket's decision to change all their resort buggies from gas powered to electric, not only for environmental reasons, but also to reduce noise pollution.

"The Six Senses' Evason Phuket is set to become the first resort in Asia to implement a biomass system as an alternative energy source. This cutting-edge installation will operate on plant material only, which is harvested from the 64 acres, or 26 hectares, of tropical parkland in which the resort is set. The energy system will have the capability of running a 20-ton absorption chiller air-conditioning unit, which will fully service the storage areas at the resort's heart-of-the-house. These areas have been recently consolidated to further increase energy and manpower efficiency. In addition to that, non-polluting electric vehicles are being phased in to replace the iconic tramcars which use conventional fuel, another initiative that will result in Evason Phuket achieving carbon neutral status - en route to being carbon free" (Ernst & Young, 2008 and Hotels Magazine, 2008).

On September 27, 2008 Katathani Phuket Beach Resort is accredited for the second consecutive year with the Award for Outstanding Performance. This award recognizes outstanding quality and reliability of tourism services. It distinguishes achievements in quality management excellence in standards of service, competitiveness and, contributions to the conservation of natural and cultural resources, and support for sustainable tourism development (TAT, 2008b).

1.3. Objectives

Aim: Identify the awareness and responsiveness actions that hotels in Phuket are taking to minimize and adapt the effects of climate change.

1.3.1 Examine the current awareness of hotels in Phuket to climate change.
1.3.2 Examine the current responsiveness of hotels in Phuket to climate change and their strategies.
1.3.3 To propose recommendations for hotels to respond to, and prevent climate change.

1.4 Significance of the Study

Beach tourism being the major market segment and the most likely to be affected by climate change effects, such as coastal erosion, flooding, water shortages and water contamination, sea level rise, extreme climatic events (typhoons, storms, el Niño effect, etc) the importance of a study of the awareness and responsiveness of hotel industry to climate change is crucial to analyze the current activities that the different accommodation establishments, government and hotel associations are doing in order to contribute to minimize CO_2 emissions and adapt to new climate conditions.

The relevance of this study is based in the results that will allow us to see how the Hotel Industry in Phuket is responding to the Climate Change, and what environmentally friendly measures have been implemented by some hotels that other hotels could adopt as well.

This research can help government, professional organizations and environmental certifications to change the methodology and campaigns used to inform and press hotels to implement environmentally friendly processes.

This study can suggest alternatives the different participants in the tourism cluster in Phuket to start contributing to slow down the speed of global warming effects.

Hotels that do not have a lot of money to pay for an environmental certification can follow the suggestions and have a better management of resources.

This research can help students to understand the impacts of tourism on the environment and the importance of having an Environmental Management System.

1.5 Scope of the Study

1.5.1 Scope of Time

The study period was from September 2008 to June 2009. The questionnaires were sent to the General Managers of the 639 accommodation establishments identified in 2008 by the Tourist Authority of Thailand (TAT). In-depth interviews with Managers uncharged of environmental issues in three hotels recognized by their environmentally friendly procedures were conducted in February 2009.

1.5.2 Scope of Geography

For Hotels, distributions of questionnaires and in-depth interviews were conducted in Phuket. A total of 639 questionnaires were sent by mail.

1.5.3 Area of Research

The primary focus is to identify current awareness of hotels in Phuket to climate change, and seek to

determine the limitations and responsiveness of the hotels in Phuket.

1.5.4 Scope of Demography

The 639 accommodation establishments counted and published by the Tourism Authority of Thailand in 2008 in Phuket.

1.6 Definition of Key Terms

1.6.1 Tourism refers to the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited (UNWTO, 2008).

1.6.2 Weather is a state of the atmosphere at a moment in time, as determined by the simultaneous occurrence of several meteorological variables (temperature, wind, fluid cover, precipitation) at a specific geographical location. Weather is an element of the environment that nobody can escape. That weather is good or bad is subjective, and depends on personal preferences, activities and personal health. Weather is what tourists actually experience when at a destination, affecting their activities and holiday satisfaction. Weather also affects key aspects of tourism operation, including infrastructure, activity programming and operating costs (UNWTO, 2008).

1.6.3 Climate is usually defined as "average-weather" for a specific location. More rigorously, climate is the state of the climate system, including a statistical description in terms of the mean and variability of meteorological variables over a specified period of time. Averages of climate elements calculated over a uniform and relatively long period covering at least three consecutive ten-year periods are usually referred to as climate normals under the technical regulations. Climate is a key factor considered consciously or implicitly during travel planning and it is an important attribute taken into account in location planning, infrastructure development and destination marketing (UNWTO, 2008).

1.6.4 Climate Change refers to a statistically significant variation in either the mean state of the climate or in its spatial (micro-local) or temporal (seasonal) variability, persisting for an extended period (typically decades or longer (UNWTO, 2008).

1.6.5 Carbon compensation or offsetting is the process by which an amount of greenhouse gas emissions equal to that caused by a certain activity, e.g., a flight, is reduced, or offset, elsewhere (UNEP 2008).

1.6.6 CO_2 equivalent is the concentration of carbon dioxide that would cause the same amount of radiative forcing as a given mixture of carbon dioxide and other greenhouse gases (cf. Global Warming Potential) (UNEP 2008).

1.6.7 Greenhouse Gas are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorbs and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the greenhouse effect. Water vapor (H2O), carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), and ozone (O3) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine and bromine-containing substances which are dealt with under the Montreal Protocol. Beside CO2, N2O, and CH4, the Kyoto Protocol deals with the greenhouse gases sulphur hexaflouride (SF6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) (UNEP 2008).

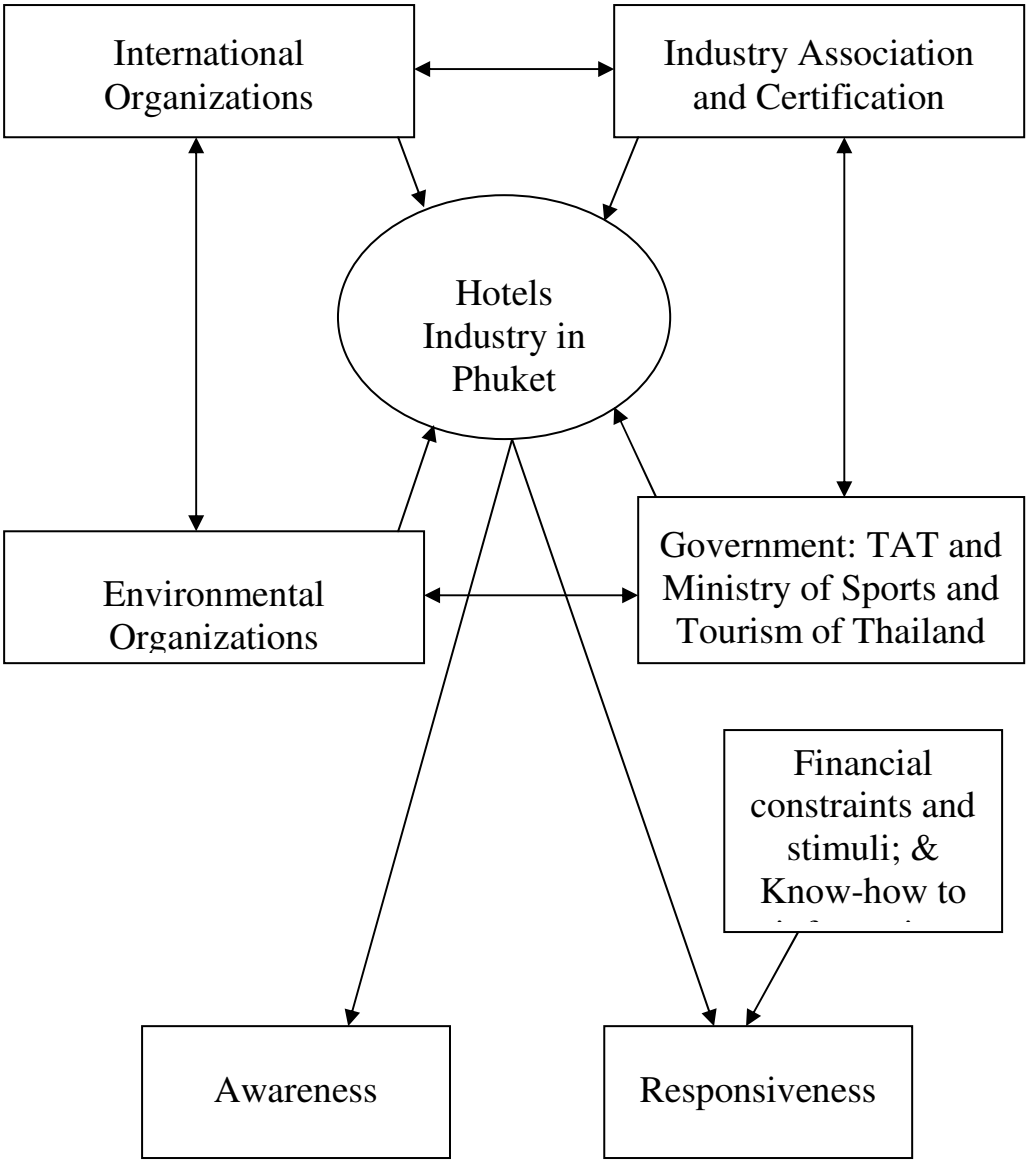
1.6.8 Mitigation is an anthropogenic intervention to reduce the output or enhance the sinks of greenhouse gases (UNEP 2008).

1.6.9 Sustainable Development, development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987).

1.6.10 United Nations Framework Convention on Climate Change (UNFCCC) The convention was adopted on 9 May 1992 in New York and signed at the 1992 earth Summit in Rio de Janeiro by more than 150 countries and the European community. Its ultimate objective is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that

would prevent dangerous anthropogenic interference with the climate system." It contains commitments for all Parties. Under the Convention, Parties included in Annex I aim to return greenhouse gas emissions not controlled by the Montreal Protocol to 1990 levels by the year 2000. The Convention entered into force in March 1994 (UNEP 2008).

1.7 Conceptual Framework



Many different domestic and international organizations have an impact on hotel industry in Phuket through regulations, development of standards, provision of know-how information. The result of these interactions is raising the awareness of the hotel industry to climate change implementing and stimulating its responsiveness to these impacts. The responsiveness of the industry however, it is subject to financial and know-how constraints, whilst at the same time stimulated by efficiency gains, cost reduction and positive image.

CHAPTER 2
METHODOLOGY

2.1 Population, sampling group and sampling method

2.1.1 Population

There are 2 target groups involved in this study:

1. The 639 accommodation establishments in Phuket. All hotels have a person in charge of creating the different process to operate the hotel, it could be a General manager, owner or person in charge of CSR.
2. Environmental practices hotel experts have been identified by use of purposive method, identifying the most outstanding environmentally friendly hotels in Phuket.

2.1.2 Sampling group

The Operations Managers of the Hotels or in its case Manager in charged with Corporate Social Responsibility.

2.1.3 Sampling Method

For the hotels in Phuket two methods were applied.

A. Census was used for the accommodations population. 639 questionnaires were sent by mail in December 2008 to the total amount of hotel population in Phuket, identified by the TAT in 2008, however due to the low responsiveness in January 2009 the questionnaires were sent again and population and sample size was changed to the 230 hotels

identified by the very well known website thaihotels.com

B. Semi-structured interviews were conducted with managers of three hotels in Phuket (Evason Hotel and Six Senses Spa, Holiday Inn, and Katathani).Purposive sampling method was applied to this population.

2.2 Type of Research

The research combines a qualitative and quantitative study, what is called mixed research method

2.2.1 Quantitative

Quantitative data was collected with the use of one type of questionnaire that was sent to the total population.

2.2.2 Qualitative

Qualitative data was gathered from semi-structured interviews with Phuket hotel managers.

2.3 Research Instruments

2.3.1 Questionnaires

A four page questionnaire in English with 63 questions was designed (see Appendix A).

The questionnaire is divided in four parts:

- Accommodation establishment's profile
- Hotel climate change awareness
- Threats of the hotel industry in Phuket
- Hotel climate change responsiveness

2.3.2 Semi-Structured Interviews

For hotel industry experts

The main questions were about (see Appendix B)

- Climate change awareness
- Environmental friendly policies and regulations
- Limitations to implement environmental friendly practices
- Stakeholder support towards reducing GHG emission.

2.4. Data Collection

2.4.1 Primary Data

The questionnaires were sent to the hotels in December 2008.

Semi-structured interviews were carried out in the period February 2009.

2.5 Data Analysis-Statistics

Using the Statistical Package for Social Science for Windows (SPSS Program) to analyze and conclude the result for this research.

2.5.1 Descriptive Statistics to measure the distribution of the data the average of Hotel awareness and responsiveness to climate change in Phuket.

2.5.2 Independent sample t-test and One-Way ANOVA were use to examine the impact of hotel profile on awareness and responsiveness of hotel industry.

2.5.3 Five-point Likert scale was used to assess hotel managers' perception towards climate change impacts and other possible threats to their company.

1 = Not affected at all
2 = Not affected/Almost No Affect
3 = Neither affected nor unaffected / Neutral
4 = Affect/Affected
5 = Extremely affect/Extremely affected

For the data analysis, mean was based on the interval level that is calculated by:

The interval level = (Maximum - Minimum) / n
= (5 - 1) / 5
= 0.80

The results of each sub-level were arranged as follows:

Mean	Climate Change Impact Level
1.00 - 1.80	Not Affected at All
1.81 - 2.60	Not Affected
2.61 - 3.40	Neither Affected nor Unaffected
3.41 - 4.20	Affected
4.21 - 5.00	Extremely Affected

2.5.4 Tree-point Likert scale was used to identify actions implemented in the hotel to reduce CO_2 emission

1 = Not yet decided
2 = Will Implement
3 = Have Implemented

For the data analysis, mean was based on the interval level that is calculated by:

The interval level = (Maximum - Minimum) / n
= (3 - 1) / 3
= 0.67

The results of each sub-level were arranged as follows:

Mean	Implementation Status
1.00 - 1.67	Not Yet Decided
1.68 - 2.33	Will Implement
2.34 - 3.00	Have Implemented

2.5.5 Manual Tabulation to analyze the open-ended questions and interviews.

2.5.6 Environmental Indices

2.5.6.1 Environment Concern Index

An index was created in order to estimate the hotel concerns in Phuket regarding climate change effect. To standardize the respondents answers to the 10 questions regarding climate change effects that could affect hotels in Phuket which are:

Factor 1: Rise in Temperature
Factor 2: Water Shortage
Factor 3: Coral bleaching and deterioration
Factor 4: Loss of land area, including beaches and wetlands, to sea-level rise
Factor 5: Loss of biodiversity
Factor 6: Health damage and deaths from heat waves and spread of tropical diseases
Factor 7: Disruption of weather patterns
Factor 8: Extreme weather conditions and their consequences
Factor 9: Increase cost of air conditioning
Factor 10: Loss of agricultural output due to drought

In the questionnaire the respondents could give answers with values between 1 - 5 where 1 means Not affected

at all, 2 Not affected, 3 Neither affected nor unaffected, 4 Affected and 5 Extremely affected.

In order to set the values in the range between 0 -1 which would be easier to interpret, the following transformation was done.

The formula suggested by Assenov (2009) was used to standardize the response $S_i = (F_i - 1) / 4$

where i takes values from 1 to 10 and F_1 is the response of a hotel to factor 1, F_2 is the response of a hotel to factor 2, and so on.

Thus the values of the responses were transformed as follows:

0.00 Very unimportant
0.25 Unimportant
0.50 Neutral
0.75 Important
1.00 Very important

The next step was to calculate the value of the Environmental Concern Index. This was done by the following formula:

$$ECI = \sum S_i / 10$$

An S_1 is the standardized response to factor 1 (taking values between 0 and 1), S_2 is the standardized response to factor 2, and so on.

Thus the final formula for the index calculation becomes:

$$ECI = \sum^{10}_{i=1} [(Fi -1)/4]/10$$

2.5.6.2 Environment Responsiveness Index

An index was created in order to estimate the hotel responsiveness in Phuket regarding climate change effect. To standardize the respondents answers to the 26 questions regarding procedures which are:

Factor 1: Use low energy light bulbs
Factor 2: Reduce the time lightening is in use
Factor 3: Light level sensors
Factor 4: Encourage visitors and Staff to turn off lights
Factor 5: Insulate the loft, hot water tanks, walls and floors
Factor 6: Encourage guest to towel/linen reuse
Factor 7: Change to a renewable energy supplier such as: solar, wind, rain or biomass
Factor 8: Help guest and staff to reduce car use by providing hotel transportation
Factor 9: Use of plug in hybrid vehicle or solar driven club carts
Factor 10: Bikes to be used by staff and guest to cycle short distance instead of using cars
Factor 11: Provide recycling and compost bins
Factor 12: Choose goods with minimal package
Factor 13: Purchasing from local growers
Factor 14: Restoration or rehabilitation of mangrove campaigns
Factor 15: Production of own vegetables
Factor 16: Tree planting campaigns
Factor 17: Plating trees to provide shade & reduce cooling cost
Factor 18: Green roofs (Garden in top floor) to cool buildings
Factor 19: Overhanging roofs creating shade for windows
Factor 20: Hot water heated by use of alternative methods such as: solar thermal, quantum heat or heat pumps
Factor 21: Use of medium voltage (6,6kV) electrical cables to reduce power loss

Factor 22: Energy monitoring system
Factor 23: Buy and use energy efficient appliances, equipment and machinery.
Factor 24: Moderate air conditioning or turnoff in unoccupied rooms
Factor 25: Communicate environmental efforts to guests, vendors, shareholders and the public
Factor 26: Natural ventilation (e.g. windows open for fresh air, open lobby, etc.)

In the questionnaire the respondents could give answers with values between 1 - 3 where 1 means Not yet decided, 2 Will implement and 3 Have implemented.

In order to set the values in the range between 0 -1 which would be easier to interpret, the following transformation was done.

Standardize the response $S_i = (F_i - 1) / 2$

Where i takes values from 1 to 26 and F_1 is the response of a hotel to factor 1, F_2 is the response of a hotel to factor 2, and so on.

Thus the values of the responses were transformed as follows:

0.0 Little Responsiveness
0.50 Responsiveness
1.00 High Responsiveness

The next step was to calculate the value of the Environmental Responsiveness Index. This was done by the following formula:

$ERI = \sum S_i / 26$

An S_1 is the standardized response to factor 1 (taking values between 0 and 1), S_2 is the standardized response to factor 2, and so on.

Thus the final formula for the index calculation becomes:

$$ERI = \sum^{26}_{i=1} [(Fi - 1)/2]/26$$

CHAPTER 3
RESULTS

For the purpose of this study, the research was conducted using a mixed method (qualitative and quantitative). The primary data was collected by the use of questionnaires from Phuket island hotels. In addition to that in-depth interviews with manager of environmental issue for hotels very well known for their environmental practices in Phuket were conducted. The collected data with the questionnaires was run in SPSS 15.00 for windows, what facilitates the presentation and analysis of information.

1) Hotel profile
2) Hotel concerns
3) Hotel environmental awareness
4) Hotel responsiveness
5) Statistical analysis
6) Respondents' comments
7) Interview with environmental hotel experts

From the 639 questionnaires sent in December 2008 to the accommodation establishments identified by the Tourism Authority of Thailand in 2008, only 10% were returned, which was reason why the researcher changed the sampling frame for the hotels listed in the well-known website thaihotels.com. This list does not include accommodations such as bungalows, pensions, guesthouses and apartments. Altogether total number of usable questioners was 117 over the 220 hotels counted in thaihotels.com.

3.1 Hotel Profile

Hotel profiles were analyzed individually using descriptive statistics. The factors included in this section are: location, management, number of rooms, room rate and hotel classification (See Table 3.1).

Location

The majority of the respondents were located in Patong 41.0%, followed by Kata with 12%, Karon with 11.1%, Other 9.4, Phuket Town 7.7%, Bang Tao 6.8%, Surin 2.6%, Kalim, Chalong, Maikhao Beach, Rawai and Nai Yang with 1.7% each of them and Nai Thon with 0.9%. The places mentioned in *other areas* option were mainly Kamala, Racha Island and Nakalay (See Table 3.1).

Management

It is important to determine what kind of hotels are working more for the environment, the independent managed hotels or the chain hotels. The independent hotels represented the majority of the respondents with 83.8% to 16.2% from chain hotels (See Table 3.1). However, such a compare between this two groups may be unreliable due to the significant differences in the sample sizes.

Number of Rooms

The majority of respondents were holding between 51-100 hotel rooms 30.8%, followed by; 21-50 rooms, 23.1%; 101-150 rooms, 14.5%; 151-200 rooms, 9.4%; 251-300 rooms, 7.7%; 201-250 rooms, 6.8%; over 300 rooms, 6.0% and up to 20 rooms 1.7% (See Table 3.1).

Average Room Rate

The majority of the respondents answered that the room rate average in their properties was 2,000-2,999 baht, 27.4%, followed by; 1,000-1,999 baht, 23.9%; 3,000-3,999 baht, 15.4%; more than 8,000 baht, 12.8%; 4,000-4,999 baht, 7.7%; 5,000-5,999 baht and 7,000-7,999 baht with 4.3% each of them, less than 1,000 baht, 2.6% and 6,000-6,999 baht with 1.7% (See Table 3.1).

Hotel Classification

The options given for this question were from one star to five stars, however, the respondents were just between two and five stars. The results showed that 35.9% of hotels had three stars, 35.0% four stars, 19.7% five star hotels and 9.4% two stars hotels (See Table 3.1).

Table 3.1 Hotel Respondents Profile

Location	**Frequency**	**%**	**Management**	**Frequency**	**%**
Patong	48	41.0	Chain Hotel	19	16.2
Kata	14	12.0	Independent Hotel	98	83.8
Karon	13	11.1	**Total**	**117**	**100**
Other	11	9.4			
Phuket town	9	7.7			
Bang Tao	8	6.8	**Average Room Rate in Bahts**	**Frequency**	**%**
Surin	3	2.6	Less than 1000	3	2.6
Chalong	2	1.7	1,000-1,999	28	23.9
Kalim	2	1.7	2,000-2,999	32	27.4

Maikhao Beach	2	1.7	3,000-3,999	18	15.4
Rawai	2	1.7	4,000-4,999	9	7.7
Nai Yang	2	1.7	5,000-5,999	5	4.3
Nai Thon	1	0.9	6,000-6,999	2	1.7
Total	**117**	**100**	7,000-7,999	5	4.3
# of Rooms	**Frequency**	**%**	more than 8,000	15	12.8
up to 20	2	1.70	**Total**	**117**	**100**
21-50	27	23.10			
51-100	36	30.80			
101-150	17	14.50	**Hotel Classification**	**Frequency**	**%**
151-200	11	9.40	2 stars	11	9.4
201-250	8	6.80	3 stars	42	35.9
251-300	9	7.70	4 stars	41	35.0
over 300	7	6.00	5 stars	23	19.7
Total	**117**	**100**	**Total**	**117**	**100**

3.2 Hotel Concerns

The purpose of determining hotel concerns was approached by the use of six questions where different hotel threats were presented. The main objective was to find out the hotel industry perceive about climate change effects as a threat.

The threats facing the hotel industry in Phuket measured in the questionnaire were: economic crisis, political instability, oil prices, climate changes, competitors in Phuket and other destination developments such as Bali, Maldives, etc. (Table 3.2).

Political instability represented the major threat to the hotel industry in Phuket, 88% of respondents answered to be extremely affected or affected, 7.7% neither affected nor unaffected and 4.3% almost not affected. It is important to notice that this is the only factor in which any of the respondents would not be affected at all.

Economic crisis was seen as the second factor affecting the hotel industry in Phuket, with a 49.6% extremely affected, 35.9% affected, neither affected nor unaffected and almost not affected with 6% each and 2.6% of respondents would not be affected at all.

Oil prices are a factor that would affect 53.8% of the respondents, 19.7% would be neither affect nor unaffected, 17.9% extremely affected, 7.7% almost not affected and 0.9% not affected at all.

The competitors in Phuket was mentioned by 52.1% of respondents as a threat that affects hotels, followed by 24.8 that declared to be neither affect nor unaffected by competitors, extremely affected and almost not affected, each of them was mentioned by 9.4% and 4.3% mentioned not to be affected at all.

The majority of respondents show their concern about climate changes as follows: 37.6% are affected, 34.2% neither affected nor unaffected, 15.4% almost not affected, 7.7% extremely affected and 5.1% not affected at all.

The threat of other destination developments was assessed to be for 41% neither affecting or unaffecting, for 39.3% affecting, for 12% almost not affecting, for 6% not affecting at all and for 1.7% extremely affecting hotels in Phuket.

Table 3.2 Hotel Treats

FACTOR	Not affected at all		Almost not affected		Neither affected nor unaffected		Affected		Extremely affected		Mean	Perceived threats level
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Political instability	0	0	5	4.3	9	7.7	37	31.6	66	56.4	4.40	Extremely affected
Economic crisis	3	2.6	7	6.0	7	6.0	42	35.9	58	49.6	4.24	Extremely affected
Oil prices	1	0.9	9	7.7	23	19.7	63	53.8	21	17.9	3.80	Affected
Competitors in Phuket	5	4.3	11	9.4	29	24.8	61	52.1	11	9.4	3.53	Affected
Climate changes	6	5.1	18	15.4	40	34.2	44	37.6	9	7.7	3.27	Neither affected nor unaffected
Other destination developments	7	6.0	14	12.0	48	41.0	46	39.3	2	1.7	3.19	Neither affected nor unaffected

3.3 Hotel Environmental Awareness

In order to determine the hotel industry awareness about climate change, in the questionnaire section II a list of possible effects of climate change in the environment was set, and the respondents were questioned consecutively to determine how affected would they be by these changes (See Table 3.3).

An increase in cost of air conditioning represented the climate change effect that would harm the hotel industry.

The majority of respondents have answered that having an increase in cost of air conditioning due to climate changes will affect 52.1% of the population studied, while 22.2% would be extremely affected, 13.7% almost not affected, 10.3% either affect nor unaffected and 1.7% answered they would not be affected at all.

The second climate change effect that would be detrimental to hotels in Phuket is water shortage: 61.1% of the respondents would be affected and extremely affected while 17.9% would be neither affected nor unaffected and 17.9% almost not affected or not affected at all.

Extreme weather conditions and their consequences such as storms, flash floods or landslides represented the third potential climate change effect that would harm the hotel industry occupancy or expenses, according to the respondents' answers. The populations' answers were divided as follows: 37.6% affected, 19.7% extremely affected, 20.5% neither affected nor unaffected, 15.4% almost not affected and 6.8% not affected at all.

The disruption of weather patterns, with increased frequency of typhoons and other extreme weather events is another factor that would affect hotels in Phuket. The respondents answered in the following way: 53% of respondents would be either affected or extremely affected, 27.4% neither affected nor unaffected and 19.6% not affected or not affected at all.

Losing agriculture is a climate change effect that would harm the hotel industry in Phuket, with a 39.3% of respondents affected by it, followed by 17.1% extremely affected, 21.4% nor neither affected nor unaffected, 14.5% almost not affected and 7.7% not affected at all.

The rise in temperatures was assessed as a factor by which hotels would be neither affected nor unaffected. The majority of respondents 38.5% would be affected, 28.2% neither

affected nor unaffected, 15.4 not affected, 9.4% extremely affected and 8.5% not affected at all.

Health damages and deaths from heat waves and spread of tropical diseases is another factor by which the hotels in Phuket would neither affect nor unaffected. One third of the respondents showed their concern by answering that they would be affected, followed by 26.5% neither affected nor unaffected, 18.8 almost not affected, 12.8% extremely affected and 8.5% not affected at all.

Loss of land area, including beaches and wetlands, to sea-level rise would affect 25.6% of respondents, 22.2% would be neither affected nor unaffected, 20.5% almost not affected, 18.8% extremely affected and 12.8% not affected at all.

The climate change effect causing coral bleaching and deterioration would affect 39.3% of respondents, 22.2% would be neither affected nor unaffected, 20.5% almost not affected, 18.8% extremely affected and 12.8% almost not affected. The mean was 3.15 this represented a majority neither affected nor unaffected.

The loss of biodiversity is having the same mean than coral bleaching and deterioration. 35% of respondents answered that this climate change effect would neither affected nor unaffected their hotels, 32.5% would be affected, 19.7% almost not affected, 6.8% extremely affected and 6% not affected at all.

Table 3.3 Climate Change Effects on Hotels

FACTOR	Not affect at all		Almost not affect		Neither affect nor unaffected		Affect		Extremely affect		Mean	Climate Change Effects Impact Level
	Freq.	%	Freq	%	Freq.	%	Freq.	%	Freq.	%		
Increase cost of air conditioning	2	1.7	16	13.7	12	10.3	61	52.1	26	22.2	3.79	Affect
Water shortage	8	6.8	13	11.1	21	17.9	47	40.2	28	23.9	3.63	Affect
Extreme weather conditions	8	6.8	18	15.4	24	20.5	44	37.6	23	19.7	3.48	Affect
Disruption on weather patterns	6	5.1	17	14.5	32	27.4	44	37.6	18	15.4	3.44	Affect
Loss of agriculture	9	7.7	17	14.5	25	21.4	46	39.3	20	17.1	3.44	Affect
Rise in temperatures	10	8.5	18	15.4	33	28.2	45	38.5	11	9.4	3.25	Neither affect nor unaffected
Health damages and deaths	10	8.5	22	18.8	31	26.5	39	33.3	15	12.8	3.23	Neither affect nor unaffected
Loss of land	15	12.8	24	20.5	26	22.2	30	25.6	22	18.8	3.17	Neither affect nor unaffected
Coral bleaching and deterioration	11	9.4	23	19.7	29	24.8	46	39.3	8	6.8	3.15	Neither affect nor unaffected
Loss of biodiversity	7	6.0	23	19.7	41	35.0	38	32.5	8	6.8	3.15	Neither affect nor unaffected

3.4 Hotel Responsiveness

For the purpose of inquiring hotel responsiveness to climate change, questions related with environmental certification, purchases policies, actions that reduce carbon emission and recycling, reuse and composting were asked.

Environmental Certification

From the 117 hotel responses, 26 hotels which correspond to the 22.2% have an environmental certification, while of 91 hotels, 77.8% did not have any certification (See Table 3.4).

The 22.2% of the total of respondents have an environmental certification, where the Thai Green Leaf is the mainly used by 80.0% of the respondents that have an environmental certification, followed by other environmental certifications such as TUI, ISO 14001 and Green Planet with 10.0% and Green Globe Certification 6.7%. It is important to notice that of the 26 hotels certified, 3 of them have two certifications (See Table 3.4).

Future Environmental Certification

The number of respondents that have answered that they will apply in the near future for an environmental certification was 55, which represents the 47.8%, when we add this number to the percentage of hotels already certified, it gives us 69.5% of Thai hotels will be certified in the near future.

It is also important to notice that 21 of the respondents to this question said that they will apply for the Thai Green Leaf certification, followed by 3 hotels that will apply for Green Globe and one hotel that will apply for Travel

Sustainability, the amount remaining did not answer what kind of environmental certification they will be implementing.

Table 3.4 Environmental Certification

ENVIRONMENTAL CERTIFICATION			
	FREQ.	**% OF ALL HOTELS**	**% OF CERTIFIED HOTELS**
Hotels with certification	26	22.2	100
Of them:			
Thai Green Leaf	24	20.5	82.8
Green Globe Certification	2	1.7	6.9
Other Environmental Certification	3	2.6	10.3
TOTAL CERTIFICATIONS	**29***	**100**	
Hotels planning certification	**55**	**47**	**100**
Of them:			
Thai Green Leaf	**21**	17.9	38.2
Green Globe	**3**	2.6	5.5
Travel Sustainability	**1**	0.9	1.8
Not specified	**30**	25.6	54.5

***Note:** Some hotels had more than one certification

Purchases from environmental friendly suppliers

The majority of the respondents, 68 what represents the 58.1% answered that they do not have any policies that state to buy from suppliers that have environmental friendly practices, while the 41.9% do (See Table 3.5).

Hotel Policies to Buy from Local Producers

Priority is given to local producers by 60.7% of the hotel respondents; however the product should fulfill their requirements (See Table 3.5).

Table 3.5 Environmental Friendly Suppliers

ENVIRONMENTALLY FRIENDLY SUPPLIERS	**Freq.**	**%**
Hotels with environmental friendly suppliers	49	41.9
Hotels without environmental friendly suppliers	68	58.1
TOTAL	**117**	**100**
LOCAL PRODUCER POLICIES	**Freq.**	**%**
Hotels with local producer policies	71	60.7
Hotels without local producer policies	46	39.3
TOTAL	**117**	**100**

CO_2 Offsetting Actions and Hotel Industry in Phuket

According with the literature review and some studies that the UNWTO have made, there are some methods that the hotels can implement in their procedures to reduce the CO_2 emission. The status of these methods in each hotel was questioned in order to determine which of these methods have been implemented, will be implemented or are not yet decided to be implemented in the hotels (See Table 3.6).

The most popular methods implemented in Phuket are moderate air conditioning, use of low energy bulbs, reduce time of lightening, encourage guest and staff to turn off the light and natural ventilation in lobbies, restaurants and public areas.

Moderate air conditioning was the method that has been implemented by the majority of the population, with a 92.3%, followed by 5.1% of population that will implement and 3% that is not decided yet.

The use of low energy bulbs is another method that have become very regular in the hotel industry in Phuket, 89.7% of respondents have implemented it meanwhile 6.8% will implement and 3.4% have not yet decided.

The reduction of lighting is another alternative method that hotels in Phuket are using to reduce CO_2 emission, 88% of respondents have implemented, for the moment 6.8% will implement and 5.1% are not yet decided.

Staff and guests are playing an important role for the hotels to decrease their energy consumption, encouraging the guests to turn off the light has become an action that 84.6% of respondents have implemented, 12% is in the process of doing it and 3.4% is not yet decided.

Natural ventilation is an option that many hotels are adopting to reduce the need of air conditioning; this alternative has been implemented by 82.1% of hotels, 11.1% will implement it and 6.8% have not yet decided.

As it was stated before, guests are a key element to reduce CO_2 emission. To encourage guests to reuse towels and bed clothes has become very acceptable in the hotel industry not only for its environmental benefits but for its reduction in operative costs. The 74.4% of respondents answered that they have implemented this method to their procedures, 15.4% will implement it and 10.3% have not yet decided.

The use, reuse and recycling of materials such as plastic, paper, metal and others is very important to reduce greenhouse gases emissions. It is important that hotels provide

employees and guests the elements needed to perform those methods. According with the results 73.5% are providing recycling and compost bins while 15.4% will implement it and 11.1% have not yet decided.

Another way to decrease GHG discharge is by reducing the emission that transportation causes, reason why purchasing from local growers is important. In Phuket, 74.4% are already buying from local growers, 13.7% will implement this procedure and 12% is not yet decided.

The importance of communicate environmental efforts to guest and staff helps hotels in different ways such as: good marketing, to reduce costs, to help the environment etc. 68.4% of respondents have implemented this action, 18.8% will implement and 12.8% are not yet decided.

Technology is helping people to reduce CO_2 emissions. By the acquisition and use of energy efficient appliances, 67.5% of respondents are helping to reduce energy consumption, 18.8% will implement this way of saving and 13.7% are still deciding.

Another natural and alternative method to minimize the use of air conditioning is by planting trees. This different way of reducing cooling cost has been implemented by 59.8% of respondents, 27.4% will implement it and 12.8% are still thinking about it.

Reducing materials that will not be useful for the hotels and that are generating more garbage is a tool that can help to minimize GHG emissions. The selection of goods and products with minimal packaging can help to drop down the discharge of CO_2 gases and 59% of hotels in Phuket are doing so, meanwhile 23.1% will implement it and 17.9% are not yet decided.

Regarding transportation, the majority of the respondents, 59.8% have implemented and are providing hotel transportation, 16.2% will implement nevertheless 23.9% are not yet decided.

Energy monitoring systems allow users to identify and explain an increase or decrease in energy use, 55.6% of respondents have implemented this system, 21.4% will be implementing it and 23.1% have not yet decide to implement it.

The reduction of energy consumption by insulating lots, water tanks, walls and floors has been implemented by 51.3% of respondents, 19.7% will implement and 29.1% are not yet decided.

Methods such as: tree planting campaigns, use of light level sensors, use of renewable energy suppliers, hot water heated by use of alternative methods, overhanging roofs, rehabilitation of mangroves, use of medium voltage, providing bikes to be used by staff and guests, and production of own vegetables, have been implemented by less than 50% of the respondents, on average the respondents will be implementing these actions.

The least popular methods implemented by the respondents are green roofs and hybrid vehicles.

A green roof helps to cool down a building. The implementation of this alternative method is not yet decided by 53.8% of respondents, while 25.6% will be implementing and 20.5% have implemented.

The use of hybrid vehicles is another factor that 70.1% the hotel respondents are not yet decided to implement, 17.9% will implement and just 12% have implemented.

Table 3.6 Implementation Status of Actions that Reduce Carbon Emission by Hotels in Phuket

FACTOR	Not yet decided		Will implement		Have implemented		Mean	Implementation status
	Freq.	%	Freq.	%	Freq.	%		
Moderate AC	3	2.6	6	5.1	108	92.3	2.90	Have implemented
Use of low energy bulbs	4	3.4	8	6.8	105	89.7	2.86	Have implemented
Reduce time of lightening	6	5.1	8	6.8	103	88.0	2.83	Have implemented
Encourage guest and staff to turn off the light	4	3.4	14	12.0	99	84.6	2.81	Have implemented
Natural ventilation	8	6.8	13	11.1	96	82.1	2.75	Have implemented
Encourage guest to reuse towels and bed clothes	12	10.3	18	15.4	87	74.4	2.64	Have implemented
Provide recycling and compost bins	13	11.1	18	15.4	86	73.5	2.62	Have implemented
Purchasing from local grower	14	12.0	16	13.7	87	74.4	2.62	Have implemented

Communicate environmental efforts to guest and staff	15	12.8	22	18.8	80	68.4	2.56	Have implemented
Buy and use energy efficient appliances	16	13.7	22	18.8	79	67.5	2.54	Have implemented
Reduce cooling cost by planting threes	15	12.8	32	27.4	70	59.8	2.47	Have implemented
Choose goods with minimal package	21	17.9	27	23.1	69	59.0	2.41	Have implemented
Hotel transportation	28	23.9	19	16.2	70	59.8	2.36	Have implemented

Table 3.6 (Continued)

FACTOR	**Not yet decided**		**Will implement**		**Have implemented**		**Mean**	**Implementation status**
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**		
Energy monitoring system	27	23.1	25	21.4	65	55.6	2.32	Will Implement
Insolate the loft, hot water tanks	34	29.1	23	19.7	60	51.3	2.22	Will Implement

Tree planting campaigns	33	28.2	31	26.5	53	45.3	2.17	Will Implement
Use of light level sensors	34	29.1	33	28.2	50	42.7	2.14	Will Implement
Use of renewable energy	38	32.5	31	26.5	48	41.0	2.09	Will Implement
Hot water heated by use of alternative methods.	47	40.2	22	18.8	48	41.0	2.01	Will Implement
Overhanging Roofs	50	42.7	23	19.7	44	37.6	1.95	Will Implement
Rehabilitation of mangrove	51	43.6	29	24.8	37	31.6	1.88	Will Implement
Use of medium voltage	57	48.7	24	20.5	36	30.8	1.82	Will Implement
Bikes to be used by staff and guest	60	51.3	21	17.9	36	30.8	1.79	Will Implement
Production of own vegetables	58	49.6	27	23.1	32	27.4	1.78	Will Implement
Green Roofs	63	53.8	30	25.6	24	20.5	1.67	Not yet decided
Hybrid vehicle	82	70.1	21	17.9	14	12.0	1.42	Not yet decided

It can be concluded that many of the measures that have been implemented have had different benefits for the hotel such as: ease of implementation and energy savings, cost effectiveness and they can be used for marketing purposes.

Most of the measures that will be implemented request a bigger investment or are not suitable for some hotels, example of these is the production of own vegetables which to be implemented would request land.

Finally the group of not yet decided mostly applies to newly built hotels because it is difficult to implement or once again some of these activities are not suitable for some hotels.

Recycle, Reuse and Compost

The population was questioned about the use of paper, plastic and other materials in order to know if they reuse or recycle them. The 94.9% of respondents are reusing and recycling paper, 53% plastic and 20.5% other materials such as metal, oil, water, glass, cans, food waste and batteries (See Table 3.7)

Composting being another method that benefits the environment and reduces greenhouse gases is used by 54.7% of the respondents.

Table 3.7 Recycle, Reuse and Compost

RECYCLE AND REUSE*	**Freq.**	**%**
Paper	111	94.9
Plastic	62	53.0
Others	24	20.5
TOTAL	**117**	
COMPOST	**Freq.**	**%**
Yes	64	54.7
No	53	45.3
TOTAL	**117**	**100**

***Note:** The sum of percentages exceeds 100 since multiple answers were allowed

Hotel Perception of Their Environmental Performance

There are several factors that complicate the implementation of methods that contribute to the reduction of CO_2 emission. The majority of respondents found firstly, that there is a lack of information about how to implement low carbon emission procedures; secondly, that it could be an inconvenience for a guest, and thirdly it is more expensive and finally other difficulties such as: capital expenditure, and the lack of infrastructure, recycling plants, and government support (See Table 3.8).

When respondents answered about the perception they have about their contribution to reduce carbon emission the results shown the following: 55.7% of respondents believe they are contributing to some degree, meanwhile 37.4% are contributing and just 7% answered not to be contributing.

The majority of the respondents answered that they could contribute more to offset carbon emissions.

Table 3.8 Hotel Perception of their Environmental Performance

DIFFICULTIES*	**Freq.**	**%**
Lack of Information	69	58.94
Inconvenience for guest	33	28.20
More expensive	26	22.22
Others	7	5.98
CONTRIBUTION TO REDUCE CO_2	**Freq.**	**%**
To some degree	65	55.6
Yes	44	37.4

No	8	7.0
TOTAL	**117**	**100**
COULD YOU DO MORE	**Freq.**	**%**
Yes	98	84.2
No	19	15.8
TOTAL	**117**	**100**

***Note:** The sum of percentages exceeds 100 since multiple answers were allowed

3.5 Environmental Indices Analysis

Environmental Concern and Responsiveness

The research developed two indices that measure the concerns and responsiveness of hotel industry in Phuket to climate change.

The first index, Environmental Concerns Index (ECI), takes values between 0-1, where 0 indicates less environmental concerns about the effects of climate change and 1 indicates more concerns about these changes.

The ECI was calculated using the following formula:

$$ECI = \sum^{10}_{i=1} [(F_i - 1)/4]/10$$

where F_i is the i^{th} factor in the selection of 10 factors used to measure the environmental concerns and it can take values of 1 for Not affected at all, 2 - Not affected, 3 - Neither affected nor unaffected, 4 - Affected and 5 - Extremely affected. The value of the index for the total population is 0.5929. (See Table 3.3 for the list of factors).

The second index, Environmental Responsiveness Index (ERI), takes values between 0-1, where 0 indicates less

environmental responsiveness and 1 indicates more environmental responsiveness.

The ERI was calculated using the formula presented below:

$$ERI = \sum^{26}_{i=1} [(Fi - 1)/2]/26$$

where F*i* is the ith factor in the selection of 26 factors used to measure the environmental responsiveness and it can take values of 1 for Not yet decided, 2 - Will implement and 3 - Have implemented. The value of the index for the total population is 0.6372 (See table 3.6 for the complete list of factors).

The Environmental Indices were analyzed with one-way ANOVA in order to determine whether hotel classification affected environmental concerns and responsiveness (See Table 3.9).

The value for the Environmental Concerns Index was higher for four and five stars hotels that it was for two and three star hotels; however, the difference between groups were statistically insignificant.

Higher rated hotels were more responsive. Environmental responsiveness clearly increases for hotels with four and five stars and the difference between the hotels was statistically significant.

Table 3.9 The One-Way ANOVA test of Differences in Environmental Indices between and Hotel with Different Classification

	Hotel Classification	**N**	**Mean**	**ANOVA**	
				F	**p-value**
ECI	2 stars	11	0.5568		

	3 stars	42	0.5423		
	4 stars	41	0.6378	1.674	.177
	5 stars	23	0.6228		
	Total	**117**	**0.5929**		
ERI	2 stars	11	0.4692		
	3 stars	42	0.6199		
	4 stars	41	0.6747	7.303	.000*
	5 stars	23	0.6825		
	Total	**117**	**0.6372**		

*Indicates statistically significant differences between the groups at $p \leq 0.05$

The value of the Environmental Concern Index is higher for hotels that are considered to be contributing to the reduction of CO_2 emission, than for hotels that considered not to be contributing. Nevertheless these results are statistically insignificant (See Table 3.10).

A statistically significant value was presented when Environmental Responsiveness Index was analyzed with ANOVA in order to determine whether there was a relation between hotels that perceive themselves to be contributing to reduce CO_2 emission, to those who are not. The results show a higher mean for those who are contributing than for those who are not contributing (See Table 3.10).

Table 3.10 The One-Way ANOVA test of Differences in Environmental Indices between Hotels with Different Perception of Contribution to Reduction of CO_2 Emissions

	Hotel CO_2 Emission Reduction	**N**	**Mean**	**ANOVA**	
				F	**p-value**
ECI	Yes	44	0.6057	1.067	0.347
	To some degree	65	0.5973		

	No	8	0.4875		
	Total	117	0.5929		
ERI	Yes	44	0.7082		
	To some degree	65	0.6055	11.06	0.000*
	No	8	0.5045		
	Total	117	0.6372		

*Indicates statistically significant difference between the groups at $p \leq 0.05$

The value of Environmental Concerns Index is increasing with the degree of hotel concerns to climate change, being the lowest mean for those hotels that perceived not to be affected at all by climate change and the highest mean for those hotels that would be extremely affected. The difference between groups is statistically significant (See Table 3.11).

The results show an increasing relation between the Environmental Responsiveness Index and the climate change as a hotel threat. The higher climate change concerned the more environmentally concerned and responsive (See Table 3.11).

Table 3.11 The One-Way ANOVA test of Differences in Environmental Indices between Hotels with Different Perception of Climate Change as a Hotel Threat

		N	Index Mean	ANOVA	
				F	p-value
ECI	Not affected at all	6	0.3625	13.457	0.000*
	Almost not affected	18	0.3708		
	Neutral	40	0.5981		
	Affected	44	0.6858		
	Extremely affected	9	0.7139		
	Total	117	0.5929		
ERI	Not affected at all	6	0.4100	5.761	0.000*
	Almost not affected	18	0.5774		
	Neutral	40	0.6500		
	Affected	44	0.6717		
	Extremely affected	9	0.6825		
	Total	117	0.6372		

*Indicates statistically significant difference between the groups at $p \leq 0.05$

One way ANOVA test was used was to determine whether the number of rooms affects the Environmental Indices. The results showed that there is no relation between the Environmental Concern Index and the number of rooms in a hotel, it is statistically insignificant. However the results showed that 7% of hotels with a greater number or rooms are more environmental responsive (See Table 3.12).

Table 3.12 The One-Way ANOVA test of Differences in Environmental Indices between Hotels with Different Number of Rooms

		N	Index Mean	ANOVA	
				F	p-value
ECI	up to 20	2	0.8250		
	21-50	27	0.5898		
	51-100	36	0.5847		
	101-150	17	0.5074		
	151-200	11	0.6886	1.128	0.351
	201-250	8	0.6281		
	251-300	9	0.6194		
	more than 300	7	0.5643		
	Totals	117	0.5929		
ERI	up to 20	2	0.66		
	21-50	27	0.5827		
	51-100	36	0.6052		
	101-150	17	0.6576		
	151-200	11	0.6818	1.967	0.066*
	201-250	8	0.6719		
	251-300	9	0.7143		
	more than 300	7	0.7474		
	Totals	117	0.6372		

*Indicates statistically significant difference between the groups at $p \leq 0.07$

The results of the ANOVA test of differences in Environmental Indices between the average room rates showed that there is no statistically significant difference between the concerns of a low room rate and a high room rate. However the differences in the responsiveness showed that hotels having a higher rate are more environmentally friendly, this difference is a statistically significant 6% (See Table 3.13).

Table 3.13 The One-Way ANOVA test of Differences in Environmental Indices between Hotels with Different Average Room Rate

		N	Index Mean	ANOVA	
				F	p-value
ECI	Less than 1,000	3	0.4250	0.553	0.814
	1,000-1,999	28	0.5661		
	2,000-2,999	32	0.6266		
	3,000-3,999	18	0.5639		
	4,000-4,999	9	0.5722		
	5,000-5,999	5	0.6400		
	6,000-6,999	2	0.5500		
	7,000-7,999	5	0.6600		
	more than 8,000	15	0.6200		
	Totals	117	0.5929		
ERI	Less than 1,000	3	0.4881	1.969	0.057*
	1,000-1,999	28	0.5670		
	2,000-2,999	32	0.6217		
	3,000-3,999	18	0.6677		
	4,000-4,999	9	0.6587		
	5,000-5,999	5	0.7321		
	6,000-6,999	2	0.7589		
	7,000-7,999	5	0.6929		
	more than 8,000	15	0.6726		
	Totals	117	0.6372		

*Indicates statistically significant difference between the groups at $p \leq 0.06$

The analysis shows that there is not a significant relationship between the number of rooms in a hotel and the hotel perception of climate change as a threat (See Table 3.14).

The values of climate change as a hotel threat increases in accordance with the hotel classification. It is clearly shown and with a statistical significance that there is a relation

between the classification and the hotel concern about climate change (See Table 3.14).

The ANOVA test was conducted in order to determine whether there was a relation between the room rate and the hotel perception of climate change as a threat to their operation. The values show in a 6% statistical significance that there is an increasing relation for hotels with higher room rates, higher room rate, higher responsiveness (See Table 3.14).

Table 3.14 The One-Way ANOVA test of Differences between Number of Rooms, Hotel Classification and Average Room Rate with Hotels Perception of Contribution to Reduction of CO_2 Emissions

		N	Index Mean	ANOVA	
				F	p-value
Number of Rooms	up to 20	2	4.50		
	21-50	27	3.07		
	51-100	36	3.28		
	101-150	17	3.06		
	151-200	11	3.55	1.049	0.402
	201-250	8	3.38		
	251-300	9	3.22		
	more than 300	7	3.71		
	Total	117	3.27		
Hotel Classification	2 stars	11	2.79		
	3 stars	42	3.02		
	4 stars	41	3.51	3.726	0.013*
	5 stars	23	3.57		
	Total	117	3.27		

Table 3.14 (Continued)

		N	Index Mean	ANOVA	
				F	p-value
Average Room Rate	Less than 1,000	3	1.67	1.96	0.058**
	1,000-1,999	28	3.29		
	2,000-2,999	32	3.00		
	3,000-3,999	18	3.39		
	4,000-4,999	9	3.67		
	5,000-5,999	5	3.80		
	6,000-6,999	2	3.5		
	7,000-7,999	5	3.4		
	more than 8,000	15	3.53		
	Total	117	3.27		

*Indicates statistically significant difference between the groups at $p \leq 0.05$

**Indicates statistically significant difference between the groups at $p \leq 0.06$

The results of the Indices for Environmental Concern and Environmental Responsiveness were higher for chain hotels than for independent hotels. However, the difference between the groups is statistically not significant and such a compare between this two groups may be unreliable due to the significant differences in the sample sizes. (See Table 3.15).

Table 3.15 The Independent Sample t-test of Differences in Environmental Indices between Hotels with Different Management Type

		N	Index Mean	t-test	
				t	Sig.
ECI	Chain Hotel	19	0.6355	1.087	0.286
	Independent	98	0.5847		
ERI	Chain Hotel	19	0.6889	1.754	0.091
	Independent	98	0.6272		

The values show that there is a positive relation between the hotel willingness to do more and the Environmental Concern and Responsiveness Indices, being higher for those hotels that want to do more than for those that do not want to do more. The results were statistical significant (See Table 3.16).

Table 3.16 The Independent Sample t-test of Differences in Environmental Indices between Hotels with Hotel Willingness to do More

	Hotel Willingness to do more	**N**	**Index Mean**	**t-test**	
				t	**Sig.**
ECI	Yes	98	0.6168	2.332	0.029*
	No	19	0.4697		
ERI	Yes	98	0.6611	4.155	0.000*
	No	19	0.5141		

*Indicates statistically significant difference between the groups at $p \leq 0.05$

An independent sample t-test between the Environmental Indices and the hotel environmental certification showed more consciousness and responsiveness to climate change that have adopted any kind of certification. The Environmental Responsiveness Index is statistically significant (See Table 3.17).

Table 3.17 The Independent Sample t-test of Differences in Hotels with Environmental Certifications between Environmental Indices

	Environmental Certification	**N**	**Mean**	**t-test**	
				t	**Sig.**
ECI	Yes	26	0.5885	-.121	0.215
	No	91	0.5942		
ERI	Yes	26	0.7191	4.228	0.008*
	No	91	0.6138		

*Indicates statistically significant difference between the groups at $p \leq 0.05$

Chi-Square test was conducted in order to determine whether the environmental certification was related to the hotel concerns impact on their operation. The results show that the attitude of hotels in adopting an environmental certification does not depend on their perception about climate change as a threat for their operations (See Table 3.18).

Table 3.18 Chi-Square test of differences in Impact Level of Climate Change as a Hotel Threat between Hotels with or without Environmental Certification

Impact Level of Climate Change as a Hotel Threat	**Environmental certification**			**Pearson Chi-Square**		
	Yes	**No**	**Total**	**Value**	**df**	**p-value**
Not affected at all	0	6	6	4.918	4	0.296
Almost not affected	3	15	18			
Neutral	8	32	40			
Affected	11	33	44			
Extremely Affected	4	5	9			
Total	26	91	117			

A comparison between the two indices was analyzed in order to determine what percentage of population concern and responsive to the climate change effect. The results show that 12.8% of the respondents have low concern about climate change, 3.4% are low responsive. 46.2 Medium concern and responsive, 41.0% high concern and 50.4% high responsive to climate change effect. There is a big difference between hotels awareness and concern about climate change (See Table 3.19).

Table 3.19 Environmental Indices Mean Comparison

HOTEL CONCERN			HOTEL RESPONSIVENESS		
MEAN	**FREQ.**	**%**	**MEAN**	**FREQ.**	**%**
0	1	0.9	0.04	1	0.9
0.03	1	0.9	0.25	1	0.9
0.05	1	0.9	0.29	2	1.7
0.1	1	0.9		4	3.4
0.2	2	1.7	0.34	1	0.9
0.25	3	2.6	0.36	3	2.6
0.28	3	2.6	0.38	1	0.9
0.3	2	1.7	0.39	1	0.9
0.33	1	0.9	0.43	2	1.7
	15	12.8	0.45	1	0.9
0.35	2	1.7	0.46	4	3.4
0.38	5	4.3	0.48	1	0.9
0.43	2	1.7	0.5	5	4.3
0.45	5	4.3	0.52	2	1.7
0.48	2	1.7	0.54	3	2.6
0.5	4	3.4	0.55	1	0.9
0.53	10	8.5	0.57	3	2.6
0.55	6	5.1	0.59	6	5.1
0.58	6	5.1	0.61	5	4.3
0.6	2	1.7	0.63	5	4.3
0.63	4	3.4	0.64	5	4.3
0.65	6	5.1	0.66	5	4.3
	54	**46.2**		**54**	**46.2**
0.68	3	2.6	0.68	11	9.4
0.7	4	3.4	0.7	2	1.7
0.73	7	6	0.71	12	10.3
0.75	6	5.1	0.73	5	4.3
0.78	6	5.1	0.75	5	4.3
0.8	2	1.7	0.77	7	6
0.83	6	5.1	0.79	6	5.1
0.85	5	4.3	0.8	3	2.6
0.88	3	2.6	0.82	2	1.7
0.9	2	1.7	0.84	1	0.9
0.93	2	1.7	0.88	4	3.4
0.95	1	0.9	0.93	1	0.9
1	1	0.9			
	48	**41**		**59**	**50.4**
	117	100		117	100

3.6 Respondents' Comments

The respondents were asked one open-ended question to specify if they could do more in CO_2 offsetting emission procedures and to specify the limitations concerning the implementation of these procedures.

The majority of the comments showed the importance of training the staff and encouraging guests to reduce energy consumption:

"To motivate all the staff to know more about global warming and environment by starting with their personal issues, then related to cost of living follow by their work place".

"To encourage guest and staff to turn off lights and air conditioning during lunch time".

"We convince all staff to use hotel cars".

"We can do our best and it sometimes depends on the guest. Almost guest think that they pay and they can use".

"We announce sustainable policy by acknowledgement the staff, suppliers and agencies".

Some of the respondents showed their concern about the cost of implementing energy efficient technology and environmental friendly procedures.

"The limitation about energy saving is the costs of investment".

"The most important of all is "education" not enough of the information is given to all laymen. Next to implement this program and have it succeeded, there is a substantial amount of cost involved and at the present it is a tough decision to make".

"We can invest in more new equipment but it is a cost matter".

"When project is finished we will adopt more "green" policies. The limitations may be availability and cost".

The popularity of the solar energy as an alternative energy supplier method was shown in many respondents' comments:

"Solar energy could be implemented"

"We should maximize usage of solar energy for heating of water"

"We are using solar cells to produce hot water"

Some of the comments revealed a lack of government support and information:

"At Raya Island there is no electricity provided by government so every hotel have to use the generator to create the power. We try to reduce by decided to use wind generation but its more expensive and higher cost so if the government have any project to support it would be appreciated".

"No intervention from government"

"In practical, local government support are minimum, only few relevant project has been introduced in reference to this topic".

3.7 Interviews with Environmental Hotel Experts

For the purpose of having more information from the hotel perspective about the effects of climate change and environmental practices in Phuket hotels three managers charged with the environment issues at their hotels were interviewed with semi-structured questionnaire. The experts interviewed work at Evason Hotel & Six Senses Spa, Holiday Inn Patong and Katathani Phuket Beach Resort. The main points discussed were:

1. Climate change effects on Phuket hotels
2. The benefits of adopting environmental friendly practices
3. The limitations when adopting environmentally friendly practices

4. Encouraging hotel industry responsiveness to climate change
5. Key elements when implementing environmentally friendly procedures
6. Financial Implications of implementing environmentally friendly procedures

3.7.1 Climate Change effects on Phuket

The experts agreed that the climate change effect that is mainly affecting Phuket is the water shortage, which makes small hotels that are not able to have water reservoirs dependant on pipes to fill up their tanks, thereby producing more CO_2 emissions and affecting the environment more. One expert stated that water shortage is a problem that many places are facing, but if on top of that one is on an island like Phuket, people have to take care of water since it is not cheap to convert salty water into drinking water. In addition to this another expert said that the dry season in Phuket is getting worse and the weather patterns are definitely changing, these two conditions are going to change the guests preferences to travel.

The bleaching of coral was mentioned as well however right now it has not been affected Phuket too much but it was recognized as a threat that will damage one of the biggest points of attraction of this destination.

3.7.2 The Benefits of Adopting Environmental Friendly Practices

The main benefit of implementing environmentally friendly practices is to improve operational cost, the experts agreed. An example given by two of the experts shows that by having a water reservoir they saved a lot of money since they do not pay anything to the municipality. The use of energy efficient light bulbs, energy monitoring systems, energy efficient

appliances, thermo solar heater and benchmarking the energy consumption are some of the alternatives to reduce the operation costs.

The second benefit mentioned was the marketing advantage that being environmentalist brings with it. This creates a better image of your hotel and sets your product in another market such as: LOHAS (Lifestyle of Health and Sustainability), which has a willingness to pay more for a quality product is not so affected by economic crisis. This also generates a better public relation which saves the hotel a lot of money in marketing because people want to visit the hotels in order to see what they do, how they do and then they write about it which creates free publicity. Moreover, big travel agencies and tour operators such as TUI Travel plc, Tomas Cook and Kuoni prefer to work with hotels which are environmentally concerned.

Other benefits of being environmentally friendly are that it creates a nice feeling for the staff and guests which help to do something good for the environment and also that a higher investing cost gives a higher brand value and a higher operational value.

3.7.3 The Limitations when Adopting Environmental Friendly Practices

There are many limitations and challenges when implementing environmental friendly procedures such as technology, government, suppliers, staff and access to information or “know-how to information”.

One of the biggest limitations is the lack of technology; there is not enough technology in Thailand so when a company wants to start an environmental project, hotels have

to look abroad for the technology which makes it more expensive since many taxes have to be paid. One of the differences between Thailand and countries in Europe or the US is that in Thailand you cannot choose the electricity provider so hotels have to use electricity generated by the government which is created with gas. This kind of electricity does not pollute as much as the generated with coal does but it stills pollute. In addition to that, if a hotel wants to use another kind of energy supplier such as: compress solar which produces electricity and heats water they cannot find it in Thailand. However there are other technologies such as biodiesel, solar heat for water or the biomass absorber chiller which is a partnership between a Danish company and a local supplier that can be found in Phuket.

The government can represent a limitation for the private sector when implementing environmentally friendly procedures because taxes make it more expensive to buy any kind of technology that is not available in Thailand. This is opposite to what is happening in other countries like China or the USA, where the government is cutting taxes or crediting companies that invest in green technology; for example, in 2002 the state of California in the USA subsided solar cells increasing the acquisition of this kind of renewable energy. Nevertheless, the EGAT can be very supportive with information about energy efficient appliances.

Finding green suppliers can be a challenge for the hotel industry, they have to understand what the objective of the company is, because the main point about managing garbage is not just to recycle it is to reduce the amount of garbage that is being produced, and the suppliers are a key element for this. By finding suppliers that use less packing and more reusable materials the amount of garbage will decrease and so does the energy spent on recycling. It is also not easy to find environmentally friendly and organic suppliers in Phuket; however, it is possible to find everything in Thailand.

Staff can be also be a challenge for implementing environmentally friendly practices, since they have not been educated in this area at the school, however once they understand the importance of it, they are happy to do it.

Regarding the availability of information the interviewees differ in their opinions. One of them said that there is plenty information in the internet if you really want to become a green hotel, the rest of interviewees agreed that there is a lack of information when you really want to start environmental practices, because most of the time you have to pay extra money for the information which makes it more difficult for hotels that want to get the money in the short term and do not want to make a big investment.

One of the respondents said that it is easier for hotels that want to minimize the effects of climate change to build a new hotel than to renovate an existing one due to the expense and inconveniences that the implementation, for instance, of green roofs or medium voltage cables would cause to guests and owners.

3.7.4 Encouraging Hotel Industry Responsiveness to Climate Change

There are two main factors discussed by the respondents that are going to push the hotel industry to change their actual procedures for ones more environmentally friendly. These are government and customer.

The interviewees agreed that in order to promote the implementation of technology that would reduce the CO_2 emissions the government should exempt the taxes on this kind of technology. One of the respondents stated that in his country, the government subsidized compress solar cells which increase the acquisition of this technology. In addition to this, the government should provide environmental classes in all educational levels, starting with kids, this would be a long-term

solution but it is the best way to guarantee that in the future the environment is going to be taken care of. Moreover the government should enforce the law by being stricter in the environmental laws against hotels that are not taking care of the environment.

The customer plays a very important role in the management of a hotel. They are the ones that decide where to stay and hotels are not going to change to be more environmental friendly until the customer decides not to stay in hotels that do not have green policies and procedures. “Most probably tour operators and big travel agencies in the near future are going to send a check list to the hotels, as they do now about security issues, to verify that hotels are environmentally friendly, when is this going to happen?. It is difficult to tell but not in the near future since the majority of costumers preferred to stay in a cheaper hotel than to pay more for the environmentally friendly hotel. Last year in the media; magazines, newspapers, TV news, everyday at least one new about climate change, but this year all it is shown is about economical crisis, is this year climate change less a threat?”, an expert said.

3.7.5 Key Elements when Implementing Environmentally Friendly Procedures

The interviewees agree that the most important things before implementing environmental friendly procedures are to get the owners, management and staff involved on it, to make it as important as providing good service quality in order to be consistent with it. They have to understand that this is something that makes financial sense and that it requires a heavy initial investment.

It is especially important first of all to measure and monitor: waste production, water, and electricity consumption. This is important because the hotels have to know where they

stand, how much water and electricity has been used, what hotel departments and areas are consuming the most and identify where consumption can be reduced. Once those factors have been identified, it is necessary to set consumption targets and be strict about it. This does not represent any charge it is just time consuming.

Another aspect that you have to look at is to change habits, remembering all the time to turn off lights, switch off the air conditioning, making sure that all doors are close when using air conditioning, fixing water drippings as soon as they are found and other small things that reduce the electricity consumption but which many people do not bother to do because they think that it does not affect too much.

3.7.6 Financial Implications of Implementing Environmentally Friendly Procedures

There are many environmentally friendly practices that can help hotels to reduce operating cost by reducing waste production and energy and water usage such as high efficient toilets, high efficient shower heads, water reservoirs, having plants that do not need a lot of water, solar water heater, acquisitions of more efficient appliances, energy saving lights, energy efficient and well-maintained air conditioning, energy monitoring systems, biomass absorber chiller, usage of bio-diesel, recycling paper, changing amenities in the room for big containers that can be refilled, giving guest the option of not washing the bed sheets every day, etc. However it is important for hotels to understand that every investment the hotel does has to be financially attractive because that is what the private sector and sustainability is about, it is not just social and environmental, but it also has an economic aspect.

The implementation of environmentally friendly procedures does make financial sense, it requires a heavy initial investment but if it is seen in a long term it will provide much

greater benefits. However, most of the hotels are trying to get quick money which at the end is a short term gain.

CHAPTER 4
SUMMARY

The aim of this research is to examine the knowledge and actions that the hotel industry in Phuket has implemented to minimize climate change effect. Secondary data from different related sources was collected in order to determine what methods are proposed to reduce CO_2 emissions and to respond to climate change effects. Different theories about climate change origins' were discussed in the literature review as well as how it received more attention by scientific and international organizations trough time.

The objective of this study is to examine the current awareness and responsiveness of hotels in Phuket in order to summarize the strategies implemented and propose guidelines to make the implementation of environmentally friendly procedures that would offset carbon emissions easier.

The importance of the environment has always been considered when developing touristic activities. The sustainability of a touristic destination is a must when a society wants to increase the positive impacts of tourism and minimize its bad aspects.

4.1 Conclusion

A total of 639 questionnaires were sent by mail to the different accommodation establishments in Phuket in December 2008, nevertheless by January a total of 60 questionnaires were received back, as a result 230 questionnaires were sent in January to the total number of hotels listed in the well know website www.thaihotels.com, where guesthouses, bungalows and pensions are not taken into consideration. There are 117 questionnaires collected from this study as primary data during the December 2008 to February 2009 through census method.

A one and a half hour in-depth interviews were conducted with those responsible for environmental practices of 3 hotels in Phuket distinguished for their environmentally friendly practices to get qualitative data for the study. The researcher gave special emphasis to collecting secondary data published by international organizations to design a questionnaire and interviews that will provide enough information to cover the research objectives.

4.1.1 Hotel Profile

The majority of respondents were located in Patong. The respondents were mainly independently managed hotels holding between 51 - 100 rooms with an average room rate between 2,000 - 2,999 baht. Most of the respondents were three and four star hotels (70%).

4.1.2 Hotel Concerns

The hotels concerns were determined by presenting a list of threats and asking the respondents how much they would be affected by those factors. The threats were rated as follows: the most impacting is political instability followed by economical crisis, oil prices, competitors in Phuket, climate change and the last one other destinations developments.

4.1.3 Hotel Environmental Awareness

The majority of respondents answered that they would be affected mainly by the increase in cost of air conditioning, water shortage, extreme weather conditions, disruption of weather patterns and loss of agriculture. However, the rise in temperatures, health damages and deaths, loss of land, coral bleaching and deterioration and loss of diversity would neither affect nor unaffected the respondents when asked about

the impact of these climate changes on hotel operations and occupancy.

4.1.4 Hotel Responsiveness

To analyze the hotel responsiveness to climate change it was necessary to determine the CO_2 offsetting actions that the respondents have included to their daily operations.

From the 117 hotel respondents just 22.2% had environmental certifications, of them 80% had Thai Green Leaf. However, 47.8% of the respondents will apply in the near future for a certification.

The results show that the majority do not have an environmentally friendly supplier; nevertheless most of the respondents give priority to local producers.

There are many actions and methods that hotels can do in order to reduce their greenhouse gases emissions. The researcher set a list of 26 procedures and the respondents had to answer whether they had implemented, will implement and not yet decided. The results are the following ones:

Have implemented: Moderate air conditioning, use of low energy bulbs, reduce time of lightening, encourage guests and staff to turn of the light, natural ventilation, encourage guests to reuse towels and bed cloth, provide recycling and composts bins, purchasing from local growers, communicate environmental efforts to guest and staff, buy and use energy efficient appliances, reduce cooling cost by planting threes, choose goods with minimal package and hotel transportation.

Will Implement: energy monitoring system, insolate the loft and hot water tanks, three planting campaigns, use of light level sensors, use of renewable energy, hot water heated by use of alternative methods, overhanging roofs, rehabilitation of mangrove, use of medium voltage, use of bikes by staff and guests, and production of own vegetables.

Not yet decided: green roofs and hybrid vehicles.

Recycling and reusing paper has become very popular by the majority of respondents, however a smaller proportion of the population use the same methods with other materials such as plastic, metal, oil, water, glass, cans, food waste, and batteries.

Composting is not as popular as recycling nevertheless 54.7% of respondents practice it.

Even though the majority of the respondents would like to contribute more to reduce carbon emissions, the lack of information represented the main difficulty when implementing methods to reduce CO2 emissions followed by the inconvenience that it could cause to guests and the cost of implementing procedures.

4.1.5 Environmental Indices Analysis

With the purpose of determining the concerns and responsiveness of hotel industry two indices were created: Environmental Concerns Index (ECI) and Environmental Responsiveness Index (ERI).

Environmental Concerns Index (ECI), takes values between 0-1, where 0 indicates less concerns about the effects of climate change and 1 indicates more concerns about these changes.

Environmental Responsiveness Index (ERI), takes values between 0-1, where 0 indicates less environmental responsiveness and 1 indicates more environmental responsiveness.

ANOVA test was used to identify how hotel classification affects its concerns the hotel concern and responsiveness to climate change. The results showed a higher concern and responsiveness from hotels with a higher classification than for those two and three stars. However, the results for the Environmental Concern Index were statistically

insignificant while for Environmental Responsiveness Index were statistically significant.

It was also compared with ANOVA to show the differences between hotels that think themselves to be contributing to the reduction of CO_2 emission and those not contributing with the Environmental Concern and Responsiveness Indices showing a higher Concern and Responsiveness for those hotels that consider to be contributing to reduce their gas emissions. The result was statistically significant for the Responsiveness Index.

Another ANOVA test was conducted in order to determine how the degree of hotel concerns to climate change as a threat influence the Environmental Concern and Environmental Responsiveness Indices, Number of Rooms, Hotel Classification and Average Room Rate. The results were statistically significant at 0.05%, showing more concern and responsiveness for hotels that are more affected by climate change and for hotels with a higher hotel rate classification than for those that are not affected. The impact of the room rate on the hotels degree of concern towards climate change is higher for more expensive hotels, this result is statistically significant at 0.06%. The relation between the degree of climate change as a hotel threat and the number of rooms was statistically insignificant.

The type of management and the hotel willingness to do more was t-tested in order to determine if those factors influence the hotels concern and responsiveness. The results shows that hotels that are willing to do more have a higher Environmental Concern and Responsive Indices than those that don't want to do more; these differences are statistically significant. According to the results chain hotels are more concerned and responsive to climate change than independent hotels; nevertheless, these results are statistically insignificant.

The Chi-square test was used to determine if hotels are adopting environmental certifications due to climate change

threat showing no relation between these two factors. The result was statistically insignificant.

4.1.6 Hotel Comments

The respondents were asked one open-ended question in order to know what more could be done and what are the limitations and difficulties to implement CO_2 offsetting procedures.

The majority of respondents mentioned that it is very important to encourage and train staff to reduce energy consumption; however, this will generate an extra expense, which is the second limitation in implementing green procedures, “the limitation about energy saving is the costs expenses”.

Heating hot water by the use of solar energy represented the most popular alternative that requires the biggest investment to reduce energy consumption.

The lack of government support or intervention was mentioned by many of the respondents as a difficulty to implement more procedures to reduce CO_2 emissions.

4.1.7 Interviews with Environmental Hotel Experts

The environmental hotel experts from Evason Hotel & Six Senses Spa, Holiday Inn Patong and Katathani Phuket Beach Resort were interviewed for the purpose of getting more information and details on environmentally friendly hotel practices. The main points discussed were:

The experts agreed that the climate change effect that is mainly affecting Phuket is the water shortage, which makes small hotels that are not able to have water reservoirs dependant on pipes to fill up their tanks, thereby producing more CO_2 emissions and affecting the environment more.

The bleaching of coral has not been affecting Phuket too much but it was recognized as a threat that will damage one of the biggest points of attraction of this destination.

The benefits of adopting environmentally friendly practices, for instance, the reduction of operating and marketing costs, provides a competitive advantage, makes easier to work with big tour operators, and it generates a good feeling for guest and employees.

There limitations and challenges when implementing environmental friendly procedures such as technology, government, suppliers, staff and access to information or "know-how to information".

The main factors to increase the hotel responsiveness to climate change are customers changing their decisions when choosing a hotel to those that have environmental policies and government enforcement of laws against polluter hotels and which subsidize and give tax exemptions to those hotels that invest in green technology.

The interviewees agree that the most important things before implementing environmental friendly procedures are to get the owners, management and staff involved on it, to make it as important as providing good service quality in order to be consistent with it. They have to understand that this is something that makes financial sense and that it requires a heavy initial investment.

The implementation of environmentally friendly procedures does make financial sense, it requires a heavy initial investment but if it is seen in a long term it will provide many more benefits. However, most of the hotels are trying to get quick money which at the end is a short term gain, the interviewees concluded.

4.2 Discussion

4.2.1 Examine the Current Awareness of Hotels in Phuket to Climate Change

The effects of climate change have been noticed since 1979 as a serious problem that would have effects in human activities; however, it was not until 2003 that the World Tourism Organization organized the first conference on the effects of Climate Change effect. This can give us an idea of how slow climate change awareness has been growing around the world; as a result, many hotels are not very aware of the consequences of climate change.

The participants of this study were asked to rate the degree that some hotel threats such as economic crisis, political instability, oil prices, climate changes, competitors in Phuket and other destinations would affect their operations and occupancy. Climate Change was rated as the second lowest after other destination developments. The two threats that represented the highest risk for them and from what they would be "extremely affected" were political instability and economic crisis; however, according with the literature reviewed the UNWTO have identified that climate change would cause indirect societal change impacts that could most likely be a threat for the economic growth resulting in political instability. In addition to that, if the governments decide to mitigate on tourist mobility most probably the cost of transportation would increase reducing the number of tourists.

To determine the awareness of hotels in Phuket the respondents were questioned to what degree the direct impacts of climate change in hotels would affect them. According to what the respondents have answered the rise in temperatures, health damages and deaths, loss of land, coral bleaching and deteriorations and loss of biodiversity would neither be affecting nor unaffecting to their operation; nevertheless, the UNWTO have listed the consequences of climate change and a rise in temperatures would raise cooling cost, an increase in cost of air

conditioning was the factor with the highest mean in this question. In addition to this, higher temperatures would affect a destination by the tourist adaptability which will define new destinations and seasonality. The disruption of weather patterns would cause more dry seasons and has been identified by the experts as generating more water shortage; this, as is stated in the literature review, would be a problem that could cause a competition between tourism and other users of water that could affect availability of locally produced food, loss of agriculture and loss of biodiversity.

The effects of climate change are interconnected, this means that having one of these effects in a destination will cause many other problems, unfortunately and based on this study's results we can conclude that most of the hotels in Phuket are not aware of all the climate change consequences, they are not looking at the whole picture and to how in the long term climate change could become the threat that would affect them the most.

4.2.2 Examine the Current Responsiveness of Hotels in Phuket to Climate Change

According to the literature review, a strategy that can help hotels to respond to climate change effects is to become certified by an environmental certification. In Thailand, The Green Leaf Foundation was developed in 1997 by different national and international organizations. The results show that from the respondents just 22.2% have been certified, the majority by the Thai Green Leaf. However, a total of 55 respondents answered that they would get an environmental certification in the near future, which could mean that hotel responsiveness to climate change is growing.

After reviewing the literature, the different strategies suggested by the UNWTO and UNEP to reduce greenhouse gas emissions, achieve carbon neutrality and the list of mitigation measures suggested for hotels to be more environmentally

friendly, section number IV of the questionnaire was elaborated. This section contains 26 strategies that can contribute directly or indirectly to reduce carbon emissions and the effects of climate change. The results show that 15 of the strategies proposed have been implemented by more than 50% of the respondents. Of the 15 strategies implemented by the respondents, the researcher could observe that most of these strategies are related with energy saving, reducing operating costs and do not require a big investment. Table 3.6, implementation status of actions that reduce carbon Emissions sorts out the strategy implementation status by mean, the results shows that 11 of the strategies "will be implemented" by the respondents. From this result two observations can be made; firstly, some of the strategies that will be implemented are not very related to reduce operating costs such as tree planting campaigns or rehabilitation of mangrove, secondly, the majority of these strategies request a bigger investment such as use of renewable energy or hot water heated by use of alternative methods, therefore it can be concluded that hotel industry in Phuket is becoming more environmental friendly.

The acquisition of hybrid vehicles and green roofs haven't been decided by the majority of respondents, nevertheless it is understandable since these two factors are more difficult to implement: green roofs, have to be planned prior hotel construction and the acquisition of hybrid vehicles require a big investment and many hotels do not need vehicles.

Purchasing policies play a fundamental role when implementing environmental friendly procedures, according to the UNWTO (2008) list of mitigation and Kirk's (1995) actions to be more environmental responsive, in order to reduce CO_2 emissions it is necessary to avoid transportation, to choose products with minimum packing and to use sustainable products. Moreover, the implementation of purchasing policies would help to the reduce hotel waste, which according with the hotel experts will minimize the energy consumption and effort

to recycle or get rid of the garbage. The majority of respondents showed to have implemented policies that give preference to local producers; however, the implementation of policies that mitigate the acquisition of environmental friendly products has not been implemented by the majority. This result could be mainly based on the challenge that to find organic and environmental friendly products in Phuket that was identified by the hotel experts.

Recycling and Reusing are two very popular ways to save money, to reduce waste and therefore to be more green. These two actions are very popular in Phuket 94.9% of the hotel respondents recycle paper followed by 53% reusing plastics and 20.5% recycling and reusing other materials such as metals, oils, cans, wood, glass bottles and food waste. Some hotel garbage such as food waste, wood and flowers is utilized by 54.7% of the respondents with compost purposes, which afterwards would be used as fertilizer for hotels' gardens. It can be said that the hotel industry in Phuket is using these measures in a very responsive way.

Contrary to the examples in the literature review that shows many chain hotels implementing environmentally friendly programs, the populations studied in Phuket did not show a higher responsiveness from the chain hotels. However this result is not statistically significant.

The Independent Sample t-test testing the relationship between the Environmental Responsiveness Index and Hotel Willingness to Do More showed a statistically significant positive relation. Moreover the results of the t-test between ERI and hotel certification show with a statistically significant meaning that hotel which have adopted environmental certifications are more responsible; moreover, according to the respondents 55 hotels will be applying for an environmental certification in the near future. These support the researchers' idea about the hotel industry in Phuket moving towards the green path.

4.3 Suggestions

4.3.1 Objective 3: To Propose Recommendations for Hotels to Respond to, and Prevent Climate Change

The sustainability of tourism is a goal towards which society, government and private sector have to work together. Due to the complexity of the tourism industry, the hotel responsiveness to climate change effect relies in different stakeholders, the tourism cluster of each destination has to make some reforms to support, facilitate and pursue the hotel industry to become greener.

The researcher suggested, based on the literature review and findings, some recommendations to avoid and mitigate the problems and limitations identified in the qualitative and quantitative data collected. These suggestions are proposed for different hotel industry stakeholders.

Government

The government is a key element to raise hotel industry awareness and responsiveness to climate change. There are many different strategies that the central and local government can use to increase the general green response. These are the strategies the researcher proposes:

Investment Tax Credits (ITC), Production Tax Credit (PTC) and Subsidies for alternative energy generators. These are three financial supports that governments from different countries have been giving to business and individuals. In China, the Ministry of Finances and Ministry of Science and Technology have subsided alternative energy automobiles (ENN, 2009) and in Germany the use of bio fuels was excepted since 2002 (Henke, Klepper, and Schmitz, 2004). In the United

States, the government has extended 8 years more the ITC for solar energy and the fuel cell industry. PTC was extended one year for wind energy and two years for Geothermal and marine renewable applications (News/Roundup, 2008 and SEIA, 2008)

Trough law enforcement, the government can set frameworks and policies for hotels such as:

- Determining how hotel should manage the resources and obliging them to publish environmental reports in terms of waste production, energy and water consumptions
- Setting hotel consumption targets, perusing reductions and in case that the targets were not reach charging polluters, the government can persuade the hotel industry to reduce their impacts on the environment

In addition to that, the government should organize reforestation and rehabilitation of mangrove and trees, every six months and make it obligatory for hotels to participate at least one time per year, the hotel participation could be done by helping with the planting or by financing the acquisition of trees or mangrove seeds. Government authorities such as the Ministry of Sports and Tourism can organize yearly compulsory courses for managers in order to raise their climate change awareness. For new hotels under construction the government should require an environmental plan that includes green roofs, open air areas and use of plants that does not require too much water.

Environmental education is a tool that the government should implement in all the school levels. To create efficient environmental programs that would engage people from their childhood with green practices is not an easy task; in addition to that sometimes when imparting the classes the results are not as expected. However, there are education evaluation consultants such as My Environmental Education Evaluation Resource Assistant (MEERA) that work with the government testing schools programs outcome.

Tour Operators

Tour operators can be very important drivers for hotels to change their procedures and to implement green strategies and technology. Tour operators can contribute to climate change efforts by working just with companies that have been awarded with an environmental certification. Or moreover, Tour operators can realize their environmental check list as some are doing with security check list. In this list they can include, waste management, energy management, water management and suppliers policies.

Tour Operators can work with hotels by elaborating on an informative document that should be given to hotel guest before arrival, communicating hotel environmental efforts, this can aware guest and most likely increase the number of people contributing by reusing bed sheets, separating garbage, reducing water, air conditioning and light usage, reducing more hotel operating costs and increasing profitability.

Professional Associations

The Professional Association such as Thai Hotel Associations and Kata Karon Hotel Business Association can realize series of conferences for hotels not associated that cannot pay for the services of an environmental certification program, to make hotels aware of the importance of implementing environmentally friendly procedures.

These associations can also create an informative brochure about low cost environmental practices to be implemented in small hotels.

Universities with Tourism Programs

Universities can raise students and future hotel industry professionals environmental awareness and responsiveness by:

Re-designing their programs implementing an environmental education course, focused in showing the impacts of the tourism industry in the environment, new environmental technologies and processes to reduce environmental impacts.

Creation of extracurricular activities such as: The "Green Club" that can be responsible the environmental program in the campus, elaborating informative notes to remind students to separate garbage, making sure bins for plastics, cans, food, papers can be easy identified, having outdoor activities to show the degradation of mangrove, municipality garbage location, touristic destinations where the bad environment management can be seen, participating in tree planting campaigns or turtle camps. Environmental yearly forum open to the public. Also, hotel experts in environmental issues can be invited to inform students what are the environmental measures that hotels are having in their properties. In these forum, first year students can be asked to build a booth representing a country and its environmental problems, waste generation, energy and water consumption and relevant information. Second year students can realize booths showing people what can be done at home to reduce environmental impacts and pollutions. Third year students could have a competition to develop creative environmental products. Fourth year students can be in charge of organizing the event, promoting it in Phuket, getting sponsors, selling food and beverages to collect money for an environmental cause.

Hotels

Hotels need to take in consideration the different stakeholders that can support them such as staff, guests and suppliers, to have a better environmental performance. The key elements when implementing environmental programs,

according to the experts, rely on the Management team; this team has to be engaged and pursue the implementation and performance of environmentally friendly processes as they are chasing service quality and profitability. Once the managers are supporting environmental efforts they will make sure staff is trained, informed, encourage and involved in environmental efforts. Managers should develop purchasing policies, waste management policies, invest in green technology and inform and motivate guests to participate in their environmental efforts. Subsequently the researcher presents suggestions of how managers can engage staff, guest and suppliers in their pro environmental brawl.

- **Staff**
  - **Training**

The most important tool that would help hotels to implement and perform in a green manner is staff environmental education, every employee has to clearly understand their role and responsibilities in the environmental program. The effectiveness of the education would depend on the regularity and motivational tools the trainer utilizes. It is compulsory to have an introductory course for new employees, specialized courses for: each position, hazardous materials, and managers. Refresher courses should be imparted to keep employees focused and motivated in their environmentally friendly behaviors and courses that show them how they can contribute in their daily life.

  - **Encourage, Motivate and Reward Staff**

Motivate guests by empowering them to develop their own initiatives. Create recognition programs for environmental performances where other employees can refer a college who is performing their environmentally friendly practices very well.

Creation of the environmental employee of the month and at the end of the year have a contest where other employees

would vote for one of the 12 environmental employees, the winner would be have an incentive such as money or paid days off.

For managers, the hotel can allocate profit-sharing bonuses or give a percentage of the money saved by the effective management of energy and water.

- **Communicate**

There are several strategies and changes that a hotel has to communicate to staff and guests about their environmental efforts. Firstly, the hotel can change policies, philosophy, objectives, and values for those showing the environment compromise.

Human resources departments can be in charge of producing an environmental brochure to communicate and share information internally and with the community and other stakeholders about environmental issues. This information can be also put on the boards.

- **Guest**

Communicate environmental efforts with guest and education on how to support recycling initiative and reducing water and energy usage and waste production.

Encourage guest participation in activities such as beach cleaning and donations for planting and rehabilitation of mangrove campaigns.

Encourage guest to re-use towel and bed sheets.

Encourage guest to use public transportation and provide information and time tables.

- **Suppliers**

Hotels must adopt policies to purchase environmentally sensitive products, items that are recyclable or biodegradable, and made from recycled materials. A check list for suppliers should be produced in order to get environmental suppliers information. One of the requirements that have to be a must is the use of minimal or reusable packaging.

Hotels should engage in chain supply management, in order to reduce the waste in food and other products. Bad communication between hotel and suppliers can represent a big waste of supplies and energy; this represents money and affects the profitability of the hotel. Much of this waste can be controlled through sound management practices

- **Monitoring Processes**

Usage of resources such as water, gas and electricity can be monitored. This can help a hotel to determine how, where and when these resources are utilized to manage there consumption. In addition to that these resources can be benchmarked with other hotels to determine how well managed and utilized these resources are and to make the changes needed in case other hotels with similar characteristics are consuming less.

The implementation of low energy light bulbs, energy pockets for hotel key cards in guest rooms, thus saving on use of electricity when our guests are out and motion detectors in certain public areas must become a must in order to reduce electricity consumption.

- **Waste Policies**

The implementation of what is called 3 R's policy is an alternative to have a good waste management. By Reducing, Recycling and Reusing the quantities of waste productions are minimized. This process should start by setting standards for suppliers that should deliver the products with a minimum or/and reusable packing. By doing so, the amount of waste would decrease as does the energy spent to recycle.

Table 4.1 presents the major problems identified by these study and suggest solutions for them and responsible institutions. Table 4.2 organizes these recommendations by responsible institution.

Table 4.1 Major Problems when Adopting Procedures than Reduce CO_2 Emissions, Recommendations and the Responsible Institutions

PROBLEM	RECOMMENDATION	RESPONSIBLE INSTITUTION
Lack of Information	Informative seasons about climate change effects and benefits of adopting green technology	Ministries of Tourism, Professional Associations, Hotels, Universities, Ministry of Education
	Training about environmental friendly procedures	Hotels, Tourism Authorities
	Formal courses about Climate Change and environment education	Ministry of Education in Thailand and Universities
	Informative brochures	Hotels, Tour Operators, Professional Associations, Ministries of Tourism
Lack of technology	Tax exempt	Government
	Subsides	Government
	Tax creditors	Government
Lack of green suppliers	Create green policies and be consistent about it	Hotels
Resources efficiency	Monitoring water, gas, electricity consumption and waste production	Hotels, Government
	Monitoring education	Government and Education Consultant companies

Table 4.1 (Continued)

PROBLEM	RECOMMENDATION	RESPONSIBLE INSTITUTION
Lack of leverage	Enforcing law by setting waste generating and energy and water consumption limits	Government
	Environmental Check list as a requirement to take a decision where to stay	Customer, Tour operators
	Create recognition programs for environmental performance	Hotels, Tour operators
	Profit-share bonus	Hotels

Table 4.2 Recommendations for Institutions to Contribute to Reduce CO_2 Emissions

INSTITUTIONS	RECOMMENDATIONS
Government	□ Investment Tax Credits (ITC), Production Tax Credit (PTC) and Subsidies for alternative energy generators □ Law enforcement by setting frameworks and policies for hotels in terms of waste production, energy and water consumptions □ Financial and other support for environmental education for tourism stakeholders
Tour Operators	□ Environmental Check list for hotels □ To work with environmentally friendly Hotels □ Hotel environmental efforts informative brochure for customers
Universities	□ Incorporate environmental studies in Tourism and Hospitality curricula □ Extracurricular activities □ Environmental yearly forum organized by students and open to the public

Table 4.2 (Continued)

INSTITUTIONS	RECOMMENDATIONS
Hotels	□ Environmental training for new employees and specialized courses for each position □ Staff encouragement, motivation and rewards for environmental efforts □ Communicate environmental efforts to guest and staff by providing information of how to support hotel environmentally friendly efforts □ Implementation of environmentally friendly purchases policies. □ Create a check list for suppliers □ Monitoring and benchmark water, gas and electricity consumption. □ Invest in energy efficient appliances □ Waste policies in order to reduce, reuse and recycle.

4.4 Limitations and Suggestions for Further Study

4.4.1 Limitations

There were some limitations for the development of this study the biggest being data collection time and accommodation establishments information.

The data was collected during the period December 2008-January 2009 which are the peak and high seasons in Phuket, so being the original objective of this study the 639 accommodation establishments, such hotels, bungalows, pensions and guesthouses, the response was very low. In addition to that limitation, the information contained in the guide of accommodation establishments distributed by the Tourism Authority of Thailand in 2008 was having wrong addresses information. These two reasons make the researcher to send the questionnaires one more time and to focus just in hotels.

This study does not include all the stakeholders such as government, professional organizations and environmental certifications because of time limitation.

4.4.2 Suggestions for Further Study

Further research could interview Thai government, Thai Green Leaf and Thai Hotel Association representatives in order to determine what these entities are doing in order to increase the awareness and responsiveness of hotel industry in Phuket to climate change. It is also suggested by the researcher to interview hotel managers of hotels that do not have many environmentally friendly practices, in order to investigate in more detail the reasons for low environmental awareness and responsiveness.

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APPENDICES

APPENDIX A

Questionnaire
"The Awareness and Responsiveness of the Hotels in Phuket to Climate Change"

Dear respondents,

The purpose of this questionnaire is to collect data and information for a research of the Master of Business Administration in Hospitality and Tourism Management (International Program) at Prince of Songkla University, Phuket Campus, Thailand.

Please answer the following questions. All Hotel information will be kept confidentially. The data collected will be beneficial to mitigate and adapt the Hotel business in Phuket to the Climate Change.

Best Regards,
Ruth Carrillo Campos
Researcher

Part I: Accommodation Establishment's Profile:
_____ (Hotel Name)

1. Location

☐ Phuket Town ☐ Kata ☐ Kalim

☐ Nai Thon ☐ Chalong ☐ Karon ☐ Surin

☐ Maikhao Beach ☐ Rawai ☐ Patong ☐ Bang Tao

☐ Nai Yang ☐ Other (please specify): _____

☐ Ownership ☐ Chain Hotel ☐ Independent

2. Number of Rooms
   ☐ Up to 20 ☐ 21 - 50 ☐ 51- 100 ☐ 101- 150
   ☐ 151- 200 ☐ 201 - 250 ☐ 251-300 ☐ Over 300

3. What is the average room rate of your hotel?
   ☐ Less than 1,000 baht ☐ 1,000-1,999 baht ☐ 2,000-2,999 baht
   ☐ 3,000-3,999 baht ☐ 4,000-4,999 baht ☐ 5,000-5,999 baht
   ☐ 6,000-6,999 baht ☐ 7,000-7,999 baht ☐ more than 8,000 baht

4. Hotel Classification
   ☐ 1 Star ☐ 2 Stars ☐ 3 Stars ☐ 4 Stars ☐ 5 Stars
   ☐ Others (please specify): _____

5. Does the Hotel have any environment certification? ☐ Yes
   ☐ No (go to question #8)
6. If yes, Which one?: _____
   ☐ Green Globe 21 Certified ☐ Thai Green Leaf Foundation
   ☐ Other (please, specify): _____

7. Does your hotel plan to apply for some type of environmental certification in the near future?
   ☐ Yes ☐ No
   ☐If yes, please specify: _____

8. Does your hotel have green policies or statements in order to buy from suppliers that have environmental friendly practices?

☐ Yes ☐ No

☐ If yes, Please provide details: _____

10. Do you have any Hotel policy in order to buy from local producer to decrease imports?

☐ Yes ☐ No

☐ If yes, Please provide details: _____

II. Hotel Climate Change Awareness

To what degree are the following Climate Changes are going to affect your Hotel (occupancy, expenses, etc.)

	Not Affected at all	Not Affected	Neither Affected Nor Unaffected	Affect	Extremely Affect
1. Rise in temperatures	☐	☐	☐	☐	☐
2. Water shortage	☐	☐	☐	☐	☐
3. Coral bleaching and deterioration	☐	☐	☐	☐	☐
4. Loss of land area, including beaches and wetlands, to sea-level rise.	☐	☐	☐	☐	☐
5. Loss of biodiversity	☐	☐	☐	☐	☐
6. Health damage and deaths from heat waves and spread of tropical diseases.	☐	☐	☐	☐	☐
7. Disruption of weather patterns, with increased frequency of typhoons and other extreme weather events).	☐	☐	☐	☐	☐
8. Extreme weather conditions and their consequences (storms, flash floods, landslides)	☐	☐	☐	☐	☐
9. Increase cost of air conditioning	☐	☐	☐	☐	☐
10. Loss of agricultural output due to drought (cost of operating increasing).	☐	☐	☐	☐	☐

III. Threats of Hotel Industry in Phuket

To what degree are you potentially affected by the following factors:

	Not affected at all	Almost No Affect	Neutral	Affected	Extremely Affected
1. Economic Crisis	□	□	□	□	□
2. Political instability	□	□	□	□	□
3. Oil prices	□	□	□	□	□
4. Climate Changes	□	□	□	□	□
5. Competitors in Phuket	□	□	□	□	□
6. Other destinations developments (Bali, Maldives, etc)	□	□	□	□	□

IV. Hotel Climate Change Responsiveness

What of the following actions that reduce the Carbon emission have you implemented in your Hotel procedures?

	Have Implemented	Will Implement	Not yet decided
1. Use low energy light bulbs	☐	☐	☐
2. Reduce the time lightening is in use	☐	☐	☐
3. Light level sensors	☐	☐	☐
4. Encourage visitors and Staff to turn off lights	☐	☐	☐
5. Insulate the loft, hot water tanks, walls and floors	☐	☐	☐
6. Encourage guest to towel/linen reuse	☐	☐	☐
7. Change to a renewable energy supplier such as: solar, wind, rain or biomass.	☐	☐	☐
8. Help your guest and staff to reduce car use by providing hotel transportation	☐	☐	☐
9. Use of plug in hybrid vehicle or solar driven club carts	☐	☐	☐
10. Bikes to be used by staff and guest to cycle short distance instead of using cars	☐	☐	☐
11. Provide recycling and compost bins	☐	☐	☐
12. Choose goods with minimal package	☐	☐	☐
13. Purchasing from local growers	☐	☐	☐
14. Restoration or rehabilitation of mangrove campaigns	☐	☐	☐

IV. Hotel Climate Change Responsiveness (Continued)

	Have Implemented	Will Implement	Not yet decided
15. Production of own vegetables	☐	☐	☐
16. Tree planting campaigns	☐	☐	☐
17. Plating trees to provide shade & reduce cooling cost	☐	☐	☐
18. Green roofs (Garden in top floor) to cool buildings	☐	☐	☐
19. Overhanging roofs creating shade for windows	☐	☐	☐
20. Hot water heated by use of alternative methods such as: solar thermal, quantum heat or heat pumps.	☐	☐	☐
21. Use of medium voltage (6,6kV) electrical cables to reduce power loss.	☐	☐	☐
22. Energy monitoring system	☐	☐	☐
23. Buy and use energy efficient appliances, equipment and machinery.	☐	☐	☐
24. Moderate air conditioning or turnoff in unoccupied rooms	☐	☐	☐
25. Communicate environmental efforts to guests, vendors, shareholders and the public	☐	☐	☐
26. Natural ventilation (e.g. windows open for fresh air, open lobby, etc.)	☐	☐	☐

Comments:

27. Does your hotel recycle or reuse paper, plastic or others?

☐ Yes, Paper ☐ Yes, Plastic ☐ Yes, Others ☐ No

28. Does your hotel utilize waste for compost purposes?

☐ Yes ☐ No

29. What are the major difficulties when implementing low Carbon Emission procedures?

☐ More expensive ☐ Lack of information about how to adopt these procedures

☐ Inconvenience for guest ☐ Others (please comment): _____

30. Do you consider that your hotel is contributing to reduce the emission of carbon?

☐ Yes ☐ To some degree ☐ No

31. Do you consider that you could do more to reduce the emissions of carbon?

☐ Yes ☐ No

32. If yes, please specify: What could you do? What are the limitations to do it?

_____

_____

_____

THANK YOU SO MUCH!

APPENDIX B

Interview with Hotel Managers Experts
"The Awareness and Responsiveness of the Hotels in Phuket to Climate Change"

The purpose of this interview is to collect data and information for a research of the Master of Business Administration in Hospitality and Tourism Management (International Program) at Prince of Songkla University, Phuket Campus, Thailand.

Please answer the following questions. All Hotel information will be kept confidentially. The collected data will be beneficial to mitigate and adapt the Hotel business in Phuket to the Climate Change.

Ruth Carrillo Campos
Researcher

1.What kind of environmental practices that reduces CO2 emissions and slows down the effects of climate change do you have?

2.What are the benefits and reasons of adopting environmental friendly practices?

i. for marketing reasons
ii. operating costs
iii. others

3.What is the position of the following stakeholders when adopting green policies and procedures?

iv. Staff
v. Technology
vi. Government
vii. Society
viii. Guest
ix. Tourist Authorities
x. Hotel Associations

4.Is the lack of information a limitation when implementing green procedures?
5.Is it easy to find environmental friendly suppliers in Phuket?
6.Do you separate, recycle, and reuse? How do you manage your waste?
7.Does the municipality have garbage collectors for different kind of waste?
8.Does it make financial sense to implement environmental friendly processes and technology?
9.What do you think should be done by Government to motivate hotels to increase the Hotel industry concern and responsiveness to climate change effects and reduce the CO2 emissions?
10.What are the key elements when implementing environmentally friendly procedures?
11.What do the Hotel Industry and professional organizations (e.g. Thai Hotel Association) to increase the awareness of hotels about climate change and to encourage responsiveness?
12.What would you recommend hotels to do in order to reduce CO_2 emissions? Without investing too much?
13.Do you consider that the Environmental Certifications have enough policies for offsetting carbon emissions?
14.Even though many hotels answered that they are not environmental concern, they seems to be doing many environmental friendly practices, what do you think is the reason?

16.Do you have planned to implement any other kind of environmental practices or certifications?
17.Do you have a chain policy or guideline or it is just this hotel in Phuket which is doing all this environmental efforts?
18.Do you provide any kind of information for guest about the activities that you do to save the environment?
19.Can I get a copy of all the documents that you have about environmental practices.

VITAE

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