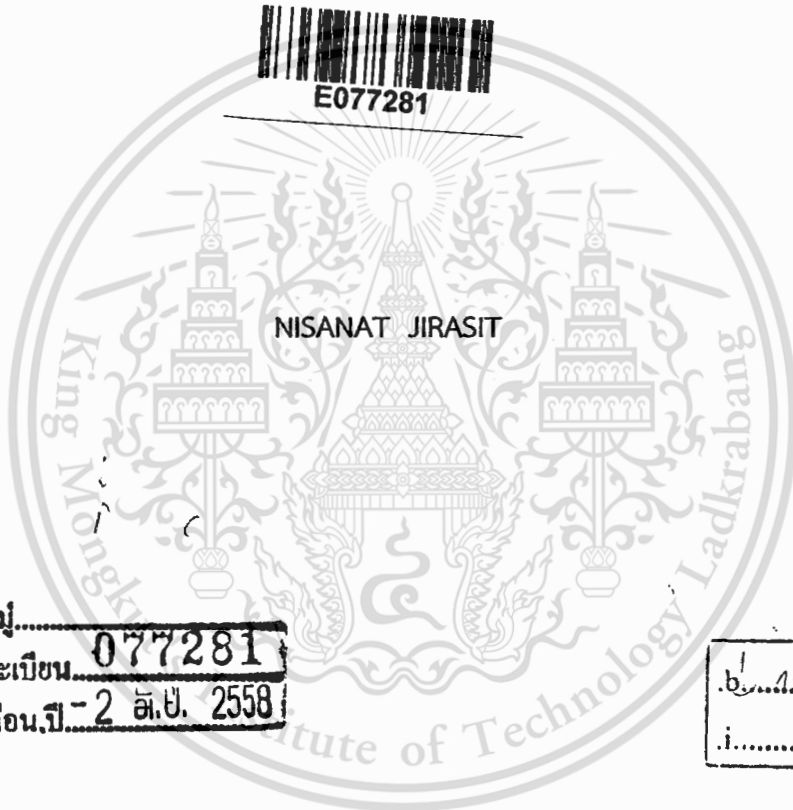


COMPARISON OF THE PERCEPTION REGARDING QUALITY OF LIFE  
AMONG STAKEHOLDERS IN GREEN AND NON-GREEN CAMPUS  
UNIVERSITIES



E077281



เลขหมู่.....  
เลขทะเบียน 077281  
วันเดือนปี- 2 ต.ย. 2558

b.....1222221.....  
i.....

A THESIS SUBMITTED IN PARTIAL FULLFILLMENT  
OF THE REQUIREMENT FOR THE DEGREE OF  
MASTER OF SCIENCE IN INTERNATIONAL MANAGEMENT OF RESOURCES AND  
ENVIRONMENT  
INTERNATIONAL COLLEGE

KING MONGKUT'S INSTITUTE OF TECHNOLOGY LADKRABANG

2014

KMITL-2013-IC-M-001-003



**COPYRIGHT 2014**

**INTERNATIONAL COLLEGE**

**KING MONGKUT'S INSTITUTE OF TECHNOLOGY LADKRABANG**

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.



The results show that those who study or work at MU rated their perception of overall quality of life higher than the others who study or work at KMITL. The study revealed statistically significant correlations between the opinion of both groups of respondents regarding environmental management and the amount of green space in their campuses. They indicated that these are important aspects to support good quality of life. Statistically significant differences ( $p$ -value  $<0.05$ ) between the respondents from MU and KMITL were found in four (4) statements from the survey: 1) respondents from MU consider environment management at the university more important than respondents from KMITL; 2) respondents from MU rated their satisfaction with the environmental management of the university higher than respondents from KMITL; 3) when asked whether the university provides enough green space to support a high quality of life the, respondents from MU agreed on a higher level than respondents from KMITL; and 4) respondents from MU rated their overall perception of quality of life on campus higher than those from KMITL. Finally, this study found that campus green spaces and perceptions of quality of life were related to each other.

## ACKNOWLEDGEMENTS

The success of this thesis is made possible from numerous individuals' supportive and aid. I would like to express my utmost gratitude and appreciation to my major advisor, Dr. Ronnchai Tiyarattanachai, who had guided and supervised me throughout the process of completing this thesis. I would also like to express my sincere appreciation and thankfulness to my co-advisor, Dr.-Ing. Nicholas Hollmann for providing comments designed to enhance the quality of this study. My appreciation is also extended to Prof. Dr. Monai Krairiksh, acting president of King Mongkut's Institute of Technology Ladkrabang, and Assoc. Prof. Dr. Supat Kittiratsatcha, dean of International College, King Mongkut's Institute of Technology Ladkrabang for their invaluable support and suggestions. My deep appreciation also goes to Dr. Jochen Amrehn, Head of International Management of resources and environmental program at King Mongkut's Institute of Technology Ladkrabang international college.

I would like to extend my thanks and gratitude to the Prof. Dr. Maleeya Kruatrachue, dean of Mahidol University International College and Ms. Sumalee Visetratana, associate dean for administration of Mahidol University International College and also to the respondents who had kindly given truthful responses to my questionnaires. I also would like to give the special thanks Ms Suthasinee Komoldit, the senior administrative staff at International College, King Mongkut's Institute of Technology Ladkrabang, for kindly providing me valuable assistance in all kinds of administration works. Moreover, this thesis could not be completed if without a support from my company. I also wish to thank all my friend and colleagues for their sincerity encouragements, genuine friendship and endless support. Finally, most importantly, nothing would have been possible without the understanding, supportiveness from my family.

Nişanat Jirasit

This material is reserved for educational use only, not allowed for commercial use.

# TABLE OF CONTENTS

	Page
ABSTRACT .....	I
ACKNOWLEDGEMENT.....	III
TABLE OF CONTENTS .....	IV
LIST OF TABLES.....	V
LIST OF FIGURES .....	VI
CHAPTER 1 INTRODUCTION .....	1
1.1 Background .....	1
1.2 Statement of the problem.....	3
1.3 Objective of the Study .....	3
1.4 Definition of Terms.....	4
CHAPTER 2 LITERATURES REVIEW .....	5
2.1 Quality of life.....	5
2.1.1 Component of quality of life.....	7
2.1.2 Quality of life and environment.....	8
2.1.3 Quality of life and environment in the university.....	9
2.2 Green Campus.....	10
2.2.1 Green Campus Concept.....	10
2.2.2 UI GreenMetric .....	11
2.3 Sustainability.....	13
2.4 University Background.....	14
2.4.1 Mahidol University.....	14
2.4.2 King Mongkut's Institute of Technology Ladkrabang.....	16

## TABLE OF CONTENTS (CONT.)

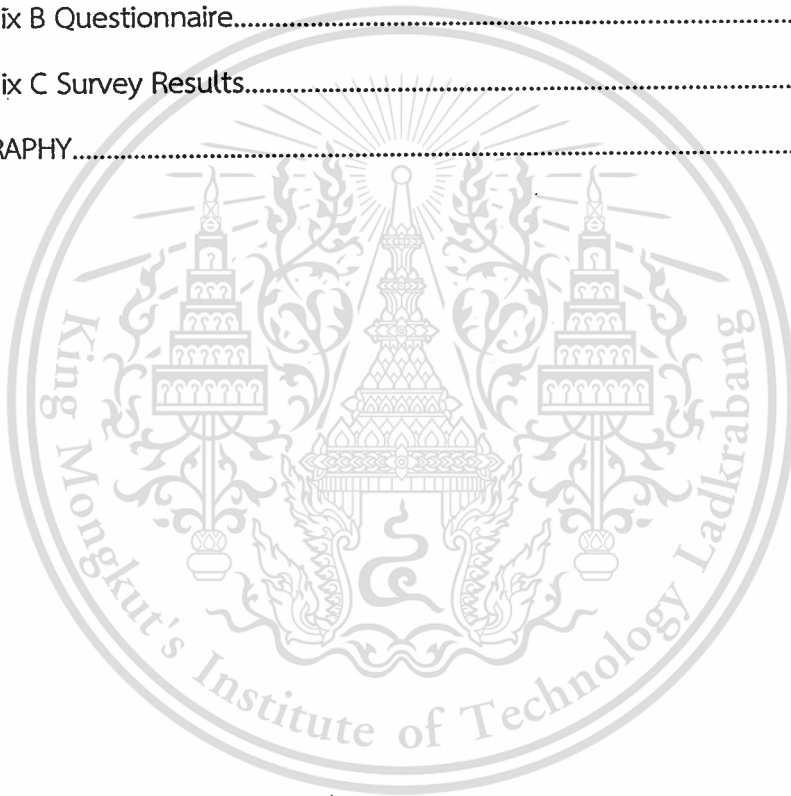
Page

CHAPTER 3 METHODOLOGY.....	18
3.1 Study Area .....	18
3.2 Study Population.....	18
3.3 Study Design .....	19
3.4 Questionnaire Form Design.....	20
3.5 Collection of Data.....	22
3.6 Analysis of Data and Statistic Procedures.....	23
3.7 Hypothesis.....	24
3.8 Basic Assumption.....	24
CHAPTER 4 RESULTS AND DISCUSSIONS.....	25
4.1 Profile of the Respondents .....	25
4.2 Satisfaction with the University's Environment Management.....	28
4.3 Green Space Availability.....	31
4.4 Overall Quality of Life.....	44
4.5 Gender.....	46
4.6 Transportation.....	50
4.7 Comparison of Views from Stakeholders Separated by Status.....	56
4.8 Student Grade Classification Comparisons.....	60
4.9 Nationality.....	66
4.10 Summarize and Discussion of University Management Interview.....	70
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS.....	85
5.1 Conclusion .....	85
5.1.1 Perception on Quality of Life.....	85
5.1.2 Satisfaction on Environmental Management Programs.....	85

This material is reserved for educational use only, not allowed for commercial use.

## TABLE OF CONTENTS (CONT.)

	Page
5.2 Recommendations.....	86
REFERENCES.....	89
APPENDIXES.....	93
Appendix A University Management Interview Report.....	94
Appendix B Questionnaire.....	109
Appendix C Survey Results.....	121
AUTHOR BIOGRAPHY.....	137



## LIST OF TABLES

Table	Page
3.1 Study Population.....	19
4.1 Demographic Characteristics.....	26
4.2 The Comparison between MUIC and KMITL-IC of Mean Scores, t-test values and p-values of Quality of Life and University’s Environmental Management of their Campus.....	29
4.3 Transportation Mode and Stakeholder in MUIC Perception.....	35
4.4 Transportation Mode and Stakeholder in KMITL Perception.....	38
4.5 Demographic of Stakeholders’ who Response in Question of Interested in Learning more About Green Campus .....	45
4.6 The Comparison of Mean Scores of the Quality of Life and University’s Environmental Management of a University’s Campus between Male and Female MUIC Stakeholders.....	46
4.7 The Comparison of Mean Scores of the Quality of Life and University’s Environmental Management of a University’s Campus between Male and Female KMITL-IC Stakeholders.....	48
4.8 The Number of Stakeholders who Want the University to Continue or Start Implementing Green Campus Activities.....	50
4.9 Difference of Quality of Life Levels between Groups of MUIC Stakeholders Traveling with Different Mode of Transportation.....	52
4.10 Difference of Quality of Life Levels Between Groups of MUIC Stakeholders Traveling with Different Mode of Transportation.....	53
4.11 Awareness of Sustainable Development as Part of University’s Mission Statement.....	53

This material is reserved for educational use only, not allowed for commercial use.

## LIST OF TABLES (CONT.)

Table	Page
4.12 Awareness of Sustainable Development as Part of University's Course Curriculum and Classes.....	54
4.13 The Number of Stakeholders who Regularly Participate in Green Campus Campaign.....	55
4.14 The Comparison of Mean Scores: Quality of Life and University's Environmental Management - Students and Staff of MUIC.....	57
4.15 The comparison of mean scores: quality of life and university's environmental management - students and staff of KMITL-IC.....	59
4.16 The comparison of mean scores: quality of life and university's environmental management-bachelor's degree and master degree students of MUIC.....	61
4.17 The comparison of mean scores: quality of life and university's environmental management – bachelor's degree student and master degree student of KMITL-IC.....	63
4.18 The Comparison of Mean Scores: Quality of Life and University's Environmental Management – Thai Nationality and Other Nationalities of MUIC.....	66
4.19 The Comparison of Mean Scores: Quality of Life and University's Environmental Management – Thai Nationality and Other Nationalities of KMITL-IC.....	68
4.20 The Summarized Information of MU and KMITL Management Interview.....	72

## LIST OF FIGURES

Figure	Page
2.1 The six (6) Categories Used in the Ranking and Their Weighting.....	12
4.1 Descriptive Statistics Indicating Stakeholders' Opinion of Amount of Campus Green Spaces and Perceptions of Quality of Life on Campus at MUIC.....	33
4.2 Descriptive Statistics Indicating Stakeholders' Opinion of Amount of Campus Green Spaces and Perceptions of Quality of Life on Campus at KMITL-IC.....	34
4.3 Mahidol University Improved Road Lane to Friendly Cycling and Walk Way in 2012.....	41
4.4 Mahidol University Outdoor Spaces Activity.....	42
4.5 Free Public Transportation inside Salaya Campus .....	42
4.6 Descriptive Indicating Stakeholders' Purpose of Use Campus Green Spaces.....	44

# CHAPTER 1

## INTRODUCTION

This chapter describes background of information about the study focusing on sustainability, quality of life, universities and green campus. It also explains the reasons for the needs for this study and its objectives to be accomplished.

### 1.1 Background

Over the past two decades, university rankings have become a global phenomenon and continue to be wide spread around the globe. They have emerged from professional, government, private and media-based sectors (UNESCO CEPES, 2004). They deal with various issues ranging from research and academic reputation, education, to environmental performance. Of these three perspectives, most of the university ranking designers often stress on the importance of research and academic reputation, followed by educational indicators, whereas environmental issues have received little or no attention (Alshuwaikhat and Abubakar, 2008).

However, the green campus revolution has gained momentum around the world since the declarations on Sustainability in Higher Education (SHE) have grown in number and significance over the last decade (Grindsted, 2012). There are several terms for green initiatives including, but not be limited to, green campus, eco-urbanism, green urbanism, green building, and high performance buildings. Though similar in nature, the key objectives and implementation of each of them are different. For example, a green building initiative such as LEED (Leadership in Energy & Environmental Design) initiated by the U.S. Green Building Council (USGBC) is meant to decrease production of waste and hazardous materials, reduce the level of energy consumption, and promote the design of energy efficient buildings (Mehta

and Wiesehan,2013). Many universities and colleges have already adopted the green concept to promote campus sustainability (Grindsted, 2012).

In 2010, the Universitas Indonesia (UI) established the GreenMetric ranking for universities around the world to share information and determine how to compare the university's commitment to the environment and sustainable resource usage. With respect to this specific issue of sustainability and the green campus, UI GreenMetric Ranking has played a different role among other sustainability surveys, scorecards, and rating systems (Hazelkorn, 2011). The ranking was based on the premise that there is room for a global ranking that will enforce measuring tools, which can be used for both developed and developing countries (Sari, 2012) The UI GreenMetric ranking of world universities is the first attempt to make a global ranking of universities' sustainable behavior (Grindsted, 2012).

The UI GreenMetric is based on six (6) main categories including green statistics, energy and climate change, waste management, water usage, transportation, and education. To comply with UI GreenMetric indicators, the universities will have to demonstrate sustainable practices in many ways as detailed in the six (6) main categories. Universities entering this UI GreenMetric ranking are so-called 'green campus' universities (Guidelines of UI GreenMetric World University Ranking, 2013). The number of participating universities from Thailand is increasing constantly. In 2012, there were only five (5) universities from Thailand ranked in the UI GreenMetric. The number of Thai universities participating in the ranking dramatically increased to thirteen (13) universities in 2013. Some other universities are still considering participation. Overall, a university's environmental management measure will be reflected the quality of life at university" (UI GreenMetric, 2014)

Interesting research topic recently has looked at quality of life. Though difficult to define and even harder to measure, quality of life has been important to everyone. According to Griffith (1994) "higher education leaders should reshape their priorities to include the creation of attractive, engaging campuses that are conducive  
This material is reserved for educational use only, not allowed for commercial use.

to both activity and tranquility” and a student’s perception of how a campus looks and feels plays a critical role in the choice of a higher education institution”. Furthermore, researchers have also found that the physical environment of the university particularly; affected students, and their academic experiences (Karmel, 1965).

In another study of university students, Ulrich (1979) found that students felt an increase in positive affect after exposure to nature scenes when compared to those exposed to urban scenes after experiencing a stressor in the form of a one-hour exam. Evidence has also suggested that the physical environment of the university was an important concern for students. Boyer (1987) found that the appearance of the campus was the most significant factor for students in deciding which university to attend.

## 1.2 Statement of the Problem

As now green campus was an interested topic around Thailand as thirteen (13) universities from Thailand have adopted this UI GreenMetric and been ranked in the index. There is a need for study to investigate the benefits of the initiative in terms of quality of life as it is one the ultimate goals to be achieved by the initiative. Existing ranked universities might need to the information to justify the level of efforts to be spent to pursue or promote the initiative. For non-ranked universities, results of the study would be beneficial for them to decide to enter the ranking system.

## 1.3 Objective of the Study

The primary objective of the study is to compare the perception of stakeholders in universities, both green and non-green campus labeled, regarding their quality of life. The study also aims to compare the perceptions of the stakeholders in aspects related to the six criteria of the UI GreenMetric. It also

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

analyze the differences in perceptions among different demographic of the stakeholders such as gender and mode of transport.

#### 1.4 Definition of Terms

Green space: “a plot of undeveloped land separating or surrounding areas of intensive residential or industrial use that is maintained for recreational enjoyment” (Dictionary.com, 2014).

Green education: “as the process of reducing the multitude of on- and off-site environmental impacts resulting from campus decisions and activities, as well as raising environmental awareness within the human communities of a college or university” (Creighton, 1999).

Sustainable campus: “as a concept describes a strategy to improve the sustainable performance within the University, and increase awareness among employees and students about sustainability and related issues.” It should be noted here that most of the efforts pertaining to a Sustainable Campus typically focus on managing environmental issues (Central European University Sustainable Campus, 2010).

Quality of life of university students: an indication of the subjective sense of well-being students experience in the specific social context of the university (Roberts and Clifton, 1991).

## CHAPTER 2

# LITERATURE REVIEW

This chapter lists studies related to the profound knowledge used in the design of this study. The literatures are summarized in three (3) topics including quality of life, green campus and sustainability.

### 2.1 Quality of Life

There is no single, universally, accepted definition of quality of life (Lauer, 1999). The World Health Organization's definition of quality of life, for example, focuses on the subjective perspective (WHOQOL group, 1997), whereas other constructs are broader and include objective indicators of health, housing and other material circumstances. According to recent reviews (Lauer, 1999), quality of life, as a construct, has frequently been the topic of social science research, though it has been difficult to define. Researchers in the fields of economics, psychology, sociology, political science, and education have defined quality of life using both objective and subjective terms (Schuessler and Fisher, 1985).

Objectively, quality of life has been studied using factors such as economic well-being, educational level, and health care access, quality of housing, crime rates, environmental quality, divorce rates and recreational activity (Dillman and Tremblay, 1977). Subjective measures of quality of life have focused on terms such as "happiness, satisfaction, sense of well-being, [and] aspirations" and suggests that "society exists to meet the needs of people in it, and to find out whether those needs are being met we should simply go out and ask them" (Dillman and Tremblay, 1977).

Researchers have used objective measures in an attempt to easily quantify and define social indicators of quality of life (Diener and Suh, 1997). Though

researchers have used a vast array of objective variables to study quality of life, one problem with them was the absence of a commonly accepted value system which was meaningful across nations, or even within a single culture (Liu, 1974). Dillman and Tremblay (1977) explained that objective measures of quality of life “fell short of describing exactly what those measures should be and whether specific changes in indicators reflect improvement or decline”. Diener and Suh (1997) also pointed out that even with objective measures, they were inevitably defined and interpreted in subjective ways.

Some researchers have defined subjective quality of life using psychological factors. For instance, Campbell et al. (1976) defined quality of life as referring to “a sense of achievement in one’s work, an appreciation of beauty in nature and the arts, a feeling of identification with one’s community, a sense of fulfillment of one’s potential” and a general sense of well-being. Allardt (1976), in contrast, defined quality of life as coming from feelings of self-realization from relationships.

While some researchers tried to account each aspect that contributed to quality of life, others suggested that Maslow’s “hierarchy of needs” (1943) appropriately reflected quality of life issues. In this hierarchy, physiological needs were the lowest category, which is composed of basic needs such as food and shelter, with the highest level of need being self-actualization needs, or emotional balance and growth. Numerous studies used Maslow’s hierarchy as a theoretical basis for quality of life (McCall, 1975; Schuessler and Fisher, 1985; Waliczek et al., 1996). In these studies, as higher level needs were met, the greater a person’s perceived quality of life.

Lastly, some researchers supported using a combination of objective and subjective factors to study the most accurate description of quality of life. Milbrath (1979), for example, argued in support of an “ecological” approach that looked at an

interaction among a number of factors. However, Schuessler and Fisher (1985) asserted that while objective factors may foster specific qualities of life, they did not comprise or produce them.

### 2.1.1 Component of Quality of Life

Quality of life composes of several factors that correlate to each other, UNESCO crates numerous factors associating with quality of life, for instance, food, healthy, nutrition, education, environment, resource, dwelling, settlement, job, value, religion, ethics, law, and psychological side. As far as WHOQOL Group (1997) is concerned, quality of life comprises of 5 sides thereafter:

1. Physical domain is the perception of the body's influence in daily life such as health, happiness, physical pain, stress management skill, amount of sleep and amount of rest.

2. Psychological domain is the perception of the mind, namely, positive feelings with oneself, identity of self, self-esteem, confidentiality, thinking process, memory, concentration, decision, learning skill, depression and concerned management skill, belief in general to influence daily life, for instance, belief in mind-spiritual, religion, meaning of life, trust in others that influence life-going positively and creating defend barriers, etc.

3. Level of Independence is the dependence on medicinal substances and medical aids and individual work capacity

4. The social relationship also includes the interaction among people in the society. This includes to help each other in social activities and to get assistance from other people, as well as to perceive sexual feeling or to have sexual intercourse.

5. Environment is all the surrounding factors that impact life, for sample, being independent, not detained under custody, safety and righteous style of life. Accordingly, environment includes perception of well being in good physical environment, deprived of pollution, having comfortable transportation and having

monetary dexterity and service for health and social. In addition, it also refers to acquiring information, having enough recreation and leisure time and so forth. As aforementioned, it may be concluded that there are two components to quality of life, namely, physical and psychological aspects. Physical aspects and qualities goes hand in hand with psychological aspects; for instance, developing thoughts, ethics, faith in teaching of religion, progress towards the goal in one's life, and living happily in the society.

### 2.1.2 Quality of life and Environment

Environment quality has always been one of the most important components of the quality of life. Evaluation of values such as beauty, fresh air, noise, fumes, and congestion cannot be precisely determined because people themselves are not very specific about their likes and dislikes. As rightly emphasized by O'Riordan (1976), no device and no matter how carefully thought out, can overcome the inherently contradictory psychological and social processes which cause any assessment of environmental quality to be problematic. To measure the quality of life provides one way for individuals to express their degree of integration with organizations. Quality of life refers to the degree of satisfaction or sense of well-being people experience in specific environments (Schuessler and Fisher, 1985). In general, the quality of life which people experience in organizations increases when people believe their interests are aligned with the goals of the organization, and as they perceive that the organization is serving their needs and interests.

The relationship between the quality of life and the environment has become an important subject in the study in the last several decades. (Ru'ien, 2012) Researcher found interesting results that investigated the relationship between physical environments and various aspects of quality of life. Kaplan and Kaplan (1989) reported, "People with access to nearby natural settings have been found to be healthier overall than other individuals. Similarly, Wolf (1996) revealed that urban forests provide a more satisfying quality of life for urban residents. Several

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

researchers have found physiological differences in individuals who worked close to plants or natural views when compared to those working in areas without natural. For example, Kaplan (1992) found that employees reported fewer incidences of headaches and other illness when having a view of nature at work. Dravigne (2006) found that people life in plants decoration and window views of green spaces showed to positively influence employees' perceptions of their overall life quality, and employees' perceptions of their physical work environment. Furthermore, Gottleib (1994) found environmental quality to be the highest ranking quality of life factor.

### 2.1.3 Quality of Life and Environment in the University

Griffith (1994) found that "Higher education leaders should reshape their priorities to include the creation of attractive, engaging campuses that are conducive to both activity and tranquility". Furthermore, she defined "Attractively landscaped formal open spaces or habitats left in their natural form, as woods and gorges, help establish a venerable campus identity, stir alumni sentimentalism, create a strong sense of community, and curb escalating campus densities". She emphasized, "A well laid out campus with sufficient open space will assist in the recruitment of top notch students and faculty member". In addition to theoretical perspectives, researchers have also found that the physical environment of the university, particularly, affected students, and their academic experiences. One of the earliest studies on students and the environment found that high school students in rooms with windows were generally happier (Karmel, 1965). In another study of university students, Ulrich (1979) found that students felt an increase in positive affect of high quality of life after exposure to nature scenes when compared to those exposed to urban scenes after experiencing a stressor driven by a one-hour exam. Evidence has also suggested that the physical environment of the university was an important concern for students. Boyer (1987) found that the appearance of the campus was the most significant factor for students in deciding which university to attend. Im (1984)

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

found that, vegetation coverage was one of three important predictors for visual preference of a familiar campus area for both undergraduates and graduate students. Furthermore, in a free-response question, the presence of vegetation was the most frequently cited reason for preference of an area.

## 2.2 Green Campus

Green campus initiative calls for the university environment management system to promote construction of green buildings and transportation facilities such as walkways, cycle-ways, greenways, etc. on the campus. Green buildings can reduce energy consumption and improve the well-being of the university community. The target of the energy-efficient green buildings is to have better lighting, temperature control, improved ventilation and indoor air quality which contribute to healthy environments by reducing the dangerous air-pollutants that cause respiratory disease in campus buildings. A building's energy use is a primary consideration in its long-term environmental impact because both the heating and cooling design and the equipment selected contribute to this impact. Energy efficiency improves as building spaces are used efficiently with intelligent control systems.

### 2.2.1 Green Campus Concept

The greening of higher educational institutions can be defined as the process of reducing the multitude of on- and off-site environmental impacts resulting from campus decisions and activities, as well as raising environmental awareness within the human communities of a college or university (Creighton, 1999).

Effective education are concerning to encourage individual persons to develop their potential. And educate the core values and attitudes that are necessary to daily life and prepare them to be outstanding persons from following factors curriculum, education background, teacher, student, atmosphere and good environment. Good environment is important factor that university management needs to pay attention because of good environment support a student life.

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

The concept of campus ecology can be defined as the study of the campus as an ecological system made up of three components organisms or inhabitants (students, faculty, staff, visitors, others), settings environments both social (the curriculum, the co-curriculum, the extra-curriculum, and other social functions) and the physical (buildings, landscapes, walkways, and other natural and built features of the environment), and the activities behaviors (learning, research, personal development, and other outcomes specific to higher education). Most importantly, the concept of campus ecology focuses our attention on the myriad of mutually interdependent relationships among inhabitants, environments, and behaviors with a special emphasis of how the ecology of the campus can support or hinder the traditional goals of student growth and development. To be a campus ecologist means to have a “mind set” that behavior is not just a function of intra and inter psychological variables, but the social and physical environment is always in a transactional relationship with the these important person variables. This website is dedicated to providing a “virtual” opportunity for the exchange of information, ideas, and resources about students and their environment.

### 2.2.2 UI GreenMetric

Universitas Indonesia, as an emerging world-class university, in 2010 has developed an online “green” ranking for world universities, aimed to offer the portrait of the current conditions and policies related to Green Campus and sustainability in the universities all over the world. Instead of using research and educational indicators, it mostly embraced the environmental ones. (Suwartha and Sari, 2013) With respect to this specific issue in sustainability and green campus, UI GreenMetric ranking has played a different role among other sustainability surveys, scorecards, and rating systems (Hazelkorn, 2011). The ranking was based on the premise that there is room for a global ranking that will enforce measuring tools, which can be used for both developed and developing countries (Sari, 2012).

The UI GreenMetric ranking was developed to provide a profile for and way of comparing the commitment of universities towards going green and promoting sustainable operations, with regard to all three important dimensions: research, educational and environmental (Suwartha and Sari, 2013). The UI GreenMetric ranking selected criteria that are generally thought to be of importance by universities concerned with sustainability. In 2013 UI GreenMetric world university ranking consist of six (6) main criteria to determined based on information provided by respective universities that demonstrates commitment to going green and being sustainable, namely environmental settings and infrastructure, energy and climate change, waste, water, transportation and education (Guidelines of UI GreenMetric world university ranking 2013). (Figure. 2.1)

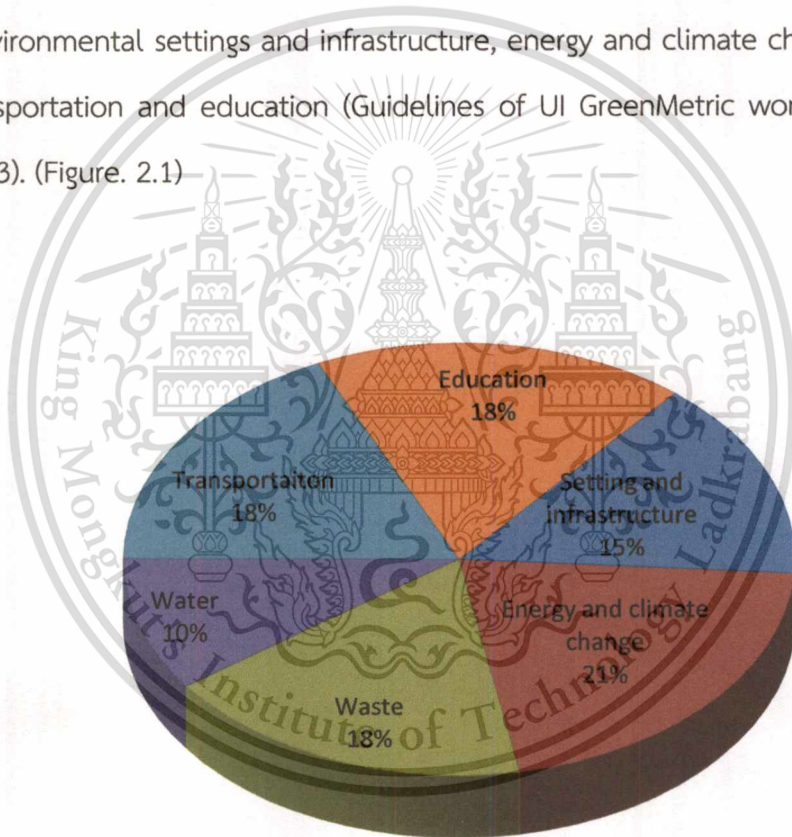


Figure 2.1 : The six (6) categories used in the ranking and their weighting

## 2.3 Sustainability

Sustainable development is the biggest challenge to universities in twenty-first century. Many term of different definitions and interpretations of the concept exist, is not surprising that the strategies of the universities that are beginning to strive for sustainability show some differences. Various universities have already become engaged in the process of integrating sustainable development in their activities. (Hans, 2000)

The declaration which has a link to university environmental sustainability was completed at the UNESCO Conference on Environment and Society: Education and Public Awareness for Sustainability, hosted by the Government of Greece (UNESCO, 1997). The declaration also recognized that sustainability initiatives must take place at all levels of society and must be interdisciplinary in nature. The declaration argued that the concept of environmental sustainability must be clearly linked with poverty, population, food security, democracy, human rights, peace and health and a respect for traditional cultural and ecological knowledge (University Leaders for a sustainable future, 1997).

Sustainable physical operation, the theme of sustainable physical operations is expressed generally, but is not of primary importance in the national and international declarations. The Kyoto Declaration, for example, encourages universities to review their physical operations to reflect best sustainable development practices. The Talloires Declaration also calls for more sustainable physical operations, and for higher education to set an example of environmental responsibility by “establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations” (University Leaders for a sustainable future, 1990). Regardless of how a university approaches its commitment to sustainability, there are foundational themes that exist in both macro and micro approaches to sustainability. These themes include sustainable physical operations, sustainable academic research, environmental

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

literacy, ethical and moral responsibility, cooperation amongst universities and countries, the development of interdisciplinary curriculum, and partnerships with government, non-governmental organizations and industry. (Wright, 2002)

## 2.4 University Background

### 2.4.1 Mahidol University

Mahidol University (MU) is one of Thailand's well-known public universities. MU has a long history beginning in 1888 as School of Medical Practitioners, Siriraj Hospital. Then, it was reorganized as University of Medical Sciences in 1943. Although MU emphasized on Health Sciences in the early age, it extended instruction in other branches over decades. Presently, MU offers bachelor's, master's and doctoral degree programs in a wide range of disciplines.

MU possesses several campuses in metropolitan and suburban areas. At Salaya, it is the large suburban campus in Nakhon Pathom province. In Bangkok, MU has metropolitan campuses in Bangkok Noi and Phayathai. The College of Management Mahidol University (CMMU) is located in Bangkok as well. In addition, other provinces including Kanchanaburi, Nakhon Sawan and Amnraj Charoen are where MU campuses are located. MU has a network of computers linking among campuses. With this electronic linkage, Mahidol's personnel and students at a wide range of departments can access to academic, research and administrative computing services. Mahidol Salaya Campus contains ten faculties, eight institutes, five colleges, and three centers. MU now offers 368 educational programs. Various fields of MU are medicine, science, public health, nursing, pharmacy, dentistry, engineering, environment and natural resources, veterinary science, sport science, information and communication technology, management, social sciences and humanities, innovative learning, music and arts. Besides, one of famous international colleges in Thailand is Mahidol University International College (MUIC) established in 1986. MUIC is the first international college funded by the government. MUIC offers

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

educational programs instructed in English language to different nationalities of overseas students at undergraduate level. (Mahidol university fact and figures, 2013-2014)

Moreover, MU launched the Master Plan of 2008 whose an objective was to create a suitable environment for learning, with a physical structure that is in harmony with the society and our environment. This policy was established for three main reasons: to provide students and employees with a pleasant studying and working atmosphere in order to enhance creativity as well as inspiration for learning, research and innovation; to offer transformative education and to cultivate the love of nature along with preserving the environment; and to provide support for energy conservation. MU is determined to turning its Salaya campus into a "green campus." The physical campus, including landscape, traffic circulation and infrastructural services are now established. Nonetheless, the university realizes that the physical aspect is only one factor. Another factor to consider is the lifestyle of people on the campus. Therefore, some policies have been revised as follows:

1. Land use development
2. Landscape system development,
3. Traffic system development
4. Infrastructure service system development
5. Building and construction control

MU started the green project by converted its six-lane roads that was originally just for cars into a 3-lane car and 3-lane bicycle and walking road. MU thought this was not enough and wanted to encourage more energy-conservation practices. Going green is not just about having a green campus, but also minimizing carbon footprint through more efficient use of technologies. The university has allocated 900 million baht to growing trees and building canals and ponds for more water sources. All 50,000 or more light bulbs have been changed to energy-efficient ones, and 2,256 air-conditioners that are older than five years were removed. More

This material is reserved for educational use only, not allowed for commercial use.

than 400 bicycles are offered for free use around campus, and 15 shuttle buses are offered for people to get around campus without using cars. There is also an organic farm, as the university has 5 rais of land for villagers to grow cheap and toxin-free vegetables for the university staff. More notably, there is a wind turbine producing 2 kilowatts of electricity per hour. There is also a solar cell installed on the rooftop of the science and technology building; it is able to generate 19.65 megawatts of electricity. This is a good example of MU.

#### 2.4.2 King Mongkut's Institute of Technology Ladkrabang

Founded in 1960, King Mongkut's Institute of Technology Ladkrabang (KMILT) aimed to be the center supporting research and development in science and technology for progressing Thai industrial and economic sectors. KMILT's students also are fostered an appreciation of social responsibility. KMILT was derived from the name of King Mongkut (King Rama IV) of the Chakri Dynasty. King Rama IV was named "Father of Thai Science" and royally permitted his name to be the name of KMILT. Located in Lat Krabang, KMILT is not far from Bangkok. It also initiated first remote campus in Chumphon Province, Southern part of Thailand. As a center of industrial development and promotion in south side, the remote campus contains 1,800 hectares of land. Now KMILT possess 9 Faculties as well as KMILT international College. Emphasized on various fields, the International College offers programs in science and technology and other fields including business and management.

The International College is the center to link students, staffs and researchers in different nations. With The International College, KMILT becomes one of outstanding universities that generate new successful graduates to domestic and international arena. Over times, research and development to multiple industries has been conducted through the cooperation between KMILT and industrial sector. In addition, KMILT has cooperated with over fifty countries worldwide to conduct international research projects.

KMITL has included "sustainable development" as part of its university mission. The strategy aims to develop the university into an educational institute that offers research alongside with its curricula. It aims to offer such activities while engaging students on a continual basis. There will also be many environmental management programs that help aid students in creating green innovation technology and environmentally friendly facilities, such as the faculty of engineering's "success in green technology" project. KMITL also has curricula that pertain to environmental development and making development last. For example, there is the Bachelor of Science Program in Environmental Resource Chemistry and Master of Urban and Regional Planning Program in Urban and Environmental Planning. There are also campaigns for the following: reducing the use of energy inside the KMITL campus, separating trash within faculties, and supporting the local community. All of these are open to participation by staff and students. In addition, The Southeast Asian Center for Urban Sustainability (SEACUS) has been established to promote education, research, professional training and expert to increase the quality of life in urban areas and support urban sustainability (King Mongkut's Institute of Technology Ladkrabang, 2009).

## CHAPTER 3

# RESEARCH METHODOLOGY

This chapter presents the research methodology conducted to complete the study. It explains how the study area and study population were set. It also describes how data were collected and how results were interpreted.

### 3.1 Study Area

The study was conducted through questions with stakeholder in Mahidol University International College (MUIC) and King Mongkut's Institute of Technology Ladkrabang International College (KMITL-IC). These two universities were selected for the study because of Mahidol University was first ranked UI GreenMetric ranked campus in Thailand. The college is used as the representative of Green Campus.

KMITL has not yet submitted any data to UI to be ranked in the UI GreenMetric. Geographically, both campuses are located in suburb areas of Thailand. International colleges of both universities were selected for the study based on an assumption that the study populations would reflect a greater variety concerning nationalities of stakeholders (e.g., multi-nationality students) compared to traditional Thai academic units. This diversity would allow the comparison of perspectives between those of Thai and foreign stakeholders. Stakeholders, which include students, lectures, and staff at these institutions, were set as the study population.

### 3.2 Study Population

The subjects participating in this study consist of stakeholders from the two international colleges. Each college consists of stakeholders with different demographic profiles such as status, level of education, gender, and age. The total

numbers of the stakeholders at MUIC and KMITL-IC are 4,013 and 268, respectively. Study population listed by their statuses is summarized in Table 3.1.

Table 3.1: Study population

Population \ Campus	MUIC	KMITL-IC
Number of students	3,632	244
Number of lecturer	272	16
Number of staff	109	6
Total of stakeholders	4,013	268

\* Updates as of Jan 2014

### 3.3 Survey Design

The number of sample size was calculated by a simplified formula for proportions. The simplified formula to calculate sample sizes was provided by Yamane (Yamane, 1967). The sample size is determined by level of precision and population, confidence level and proportion are designated as specific number.

The researcher has used random sampling and to select the sample, the formula of Taro Yamane has been used with the following formula.

$$\text{formula} \quad n = \frac{N}{1 + Ne^2}$$

When  $n$  = size of sample group

$N$  = size of all population

$e$  = the missing adjusting rate in random sampling at level 0.05

The sample size of this study was considered appropriate at 95% confidence level with a precision rate of  $\pm 5\%$  and the degree of maximum variability is .5

The degree of maximum variability is 0.5, the minimum size of sample populations were set to be total 524 that included 364 from MUIC and 160 from KMITL-IC.

### 3.4 Questionnaire Form Design

A questionnaire was used as the primary tool to collect data for the study. The questionnaire was developed in English. Thai translations were also incorporated in the questionnaire form to minimize the problems of ambiguity, misinterpretation, and opacity of the content since the some stakeholders have limited English proficiencies. The procedures of constructing the questionnaire were described as follows:

- a) Literature, research and theory related to Green Campus, quality of life in university, sustainability (such as environment management program, etc.) and the participation in university's environment management were studied in detail in line with the scope of the study. An interview with university's management was also conducted to gather some perspectives that can be useful for the design of the questionnaire. The interview report is presented as Appendix A.

A draft questionnaire was constructed for emphasizing the purposes of the study and the research questions. The questionnaire was then examined and revised under the supervision of the thesis advisors and experts in the field in order to ensure the validity of the questionnaire

- b) After that, the questionnaires were tried out with 20 respondents in others universities. The major purpose of this trial was to indicate whether the rubric, phrases, expressions and language used in the instructions and the questionnaire items could be clear and understandable to the respondents. An additional page asking about the respondents' opinion toward the questionnaires was attached at the end of each set so that the respondents

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

could write down their comments and/or suggestions which might be beneficial for improving the questionnaires.

- c) After the questionnaire was tried out, it was revised according to suggestions of the experts and the results from the pilot. The researcher changed some ambiguous questions and the form of the questionnaire to be more understandable.

Using questionnaire consists of 2 parts:

Part 1 Demography data

Part 1 consist of ten (10) questions, which were designed to collect general information and profiles of the respondents. The questions were aimed to ask about the age, gender, status, lifestyle, living conditions, and mean of transportation.

Part 2 Perception of the respondents in quality of life.

Part 2 of the questionnaire consists of 21 questions designed to ask about the aspects related to Green Campus and the perception of the respondents' quality of life. These questions were mainly based on the 6 categories of the UI GreenMetric criteria including:

- 1) setting and infrastructure;
- 2) energy and climate change;
- 3) waste;
- 4) water;
- 5) transportation;
- 6) education.

Scoring, The responses were measured using a five-point Likert rating scales ranging from 5="strongly agree" to 4= "agree", 3= "Neither Agree nor Disagree", 2= "Disagree"and 1= "Strong Disagree" for stakeholders to check in the column

appropriate to their opinion. It is designed to demonstrate the respondents' perception of the university's environmental management and Green Campus.

### Perception

- 5-refers to Strongly Agree
- 4-refers to Agree
- 3-refers to Neither Agree nor Disagree
- 2-refers to Disagree
- 1-refers to Strong Disagree

### Opinion

- 5-refers to Very important
- 4-refers to Fairly important
- 3-refers to Neutral
- 2-refers to Not so important
- 1-refers to Not at all important

### Quality of life

- 5-refers to Very good
- 4-refers to Fairly good
- 3-refers to Neither good or bad
- 2-refers to Not very good
- 1-refers to Not good at all

(The questionnaire is presented as Appendix B.)

## 3.5 Collection of Data

Three channels were used for the distribution of questionnaires. A web-based survey tool (Survey Monkey®) was used as the first channel. The second one was by distributing hard-copy questionnaires manually at the two colleges. Finally the

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

management of MUIC and KMITL-IC sent hard copies of the questionnaire to their staffs.

By sending the link to the web-based survey through MUIC and KMITL IC webmail systems and the posting that link in closed-group Facebook accounts the study received in total 530 respondents, which include 370 respondents from MUIC and 160 respondents from KMITL-IC. All participants remained anonymous with demographic information being collected for comparative analysis only. All questionnaires remained confidential.

### 3.6 Analysis of Data and Statistical Procedures

From the collection of research data, statistical analysis based on descriptive and inferential methods were used to analyze data by utilizing the Statistical Package for Social Science (SPSS), a computer software package for Microsoft Windows Version 13.0. The statistical devices used for analyzing the data were described as follows:

- 1) Percentage and Frequency was used in the analysis of the answers concerning background information.
- 2) Arithmetic Mean was used to calculate the average level of needs for the fivepoint Likert scale and the modified Likert scale.
- 3) The Cronbach Alpha Method was employed to ascertain the reliability of the responses for the items based on the five-point Likert scale.
- 4) A t- test and one-way ANOVA (F-test) method was employed to find the difference in the attitudes between stakeholders in Green and Non-Green Campus. Throughout this study, the determination of significant level at .05 was used.
- 5) P -value, a measure of probability that a difference between groups during

an experiment happened by chance. For example, a p-value of .01 ( $p = .01$ ) means there is a 1 in 100 chance the result occurred by chance. The lower the p-value, the more likely it is that the difference between groups was caused by treatment.

Survey responses were automatically collected by the web-based survey tool. The raw survey results are presented as Appendix C.

### 3.7 Hypothesis

1. Stakeholders in Green Campus have perceptions of quality of life in university higher than stakeholders' in Non-Green Campus.
2. University's environmental management is correlated with quality of life of stakeholders in Green and Non-Green Campus.

### 3.8 Basic Assumptions

1. It was assumed that respondents answered the survey questionnaire honestly, and were not informed or biased based on the information provided in the survey or from any other outside source.
2. It was assumed that respondents responded to the survey only once.
3. It was assumed that the population sample was representative of the target population.

## CHAPTER 4

# RESULTS AND DISCUSSION

This chapter presents the results of the research questions. Descriptive statistics and data analysis of the surveys completed by 530 respondent stakeholders are presented and reviewed. Demographic information was collected from the respondents so comparisons could be made between those who for lived on Green Campus and those who did not.

### 4.1. Profile of the Respondents

Of the sample of 4,281 stakeholders randomly selected to receive surveys, 530 responded, yielding a response rate of approximately 12.38%. As presented in Table 4.1, approximately 56.23% of the respondents are female, while approximately 43.77% of them are male (Table 4.1).

Many respondents are younger than 20 years old (39 %), with a mean of age between 21-24 years old ( $SD=1.532$ ). Approximately 8.5% of the study group are 25-29 years old, 7.0% of them are 30-34 years old, 6.8% of them are 35-39 years old and 4.5% are older than 40 years, which is the smallest group.

The nationalities of the respondents from both group showed that the majority at MUIC (95.68%) and KMITL-IC (97%) are Thai. Other nations are underrepresented so they were grouped as others (Table4.1).

Most respondents identified themselves as being students; 71.35% of MUIC and 95% of KMITL-IC. A similar distribution can be found regarding students' status. Approximately 98.1% at MUIC are undergraduate and 1.9% of graduate student. MUIC offers a wide range of undergraduate programs more than graduate programs.

At KMITL-IC, approximately 70.41% are undergraduate students and 29.59 are graduate students. Approximately 29 % of the respondents at MUIC are lecturers and

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

administrative staff, while KMITL-IC had only 5% lecturer and administrative staff amongst the respondents.

More than half (57.51%) of the respondents from MUIC reported that they commute to university by private vehicle, while only 41% of KMITL-IC respondents use this mode of transportation. When asked about their time spent at the campus, more than half of the respondents (MUIC = 62.2 %, KMITL-IC = 58.8%) indicated that they usually come to campus more than 4 days per week. About one-third of the respondents (33.4%) spend 3-4 days on the campus a week.

Table 4.1 Demographic characteristics

Demographic characteristics	MUIC		KMITL-IC		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Gender (N=530)						
Male	144	38.90	88	55	232	43.77
Female	226	61.10	72	45	298	56.23
Age (years)						
≤20	146	39.5	58	36.3	204	38.49
21-24	115	31.1	69	43.1	184	34.72
25-29	26	7.0	19	11.9	45	8.49
30-34	31	8.4	6	3.8	37	6.98
35-40	32	8.6	4	2.5	36	6.79
≥40	20	5.4	4	2.5	24	4.53

Table 4.1 (Continued)

Demographic characteristics	MUIC		KMITL-IC		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Nationality						
Thai	354	95.68	155	96.88	509	96.04
South Korean	5	1.35	0	0	5	0.94
American	2	0.54	0	0	2	0.38
Bhutanese	2	0.54	0	0	2	0.38
Chinese	2	0.54	1	0.63	3	0.57
Laotian	0	0	2	1.25	2	0.38
Belarusian	1	0.27	0	0	1	0.19
Filipino	1	0.27	0	0	1	0.19
German	1	0.27	1	0.63	2	0.38
Indian	1	0.27	0	0	1	0.19
Taiwanese	1	0.27	0	0	1	0.19
Vietnamese	0	0	1	0.63	1	0.19
Status						
Student	264	71.35	152	95	416	78.49
Staff	106	28.65	8	5	114	21.51
Level of study	N=264		N=152		N=416	100
Under Graduate	259	98.1	107	70.41	366	87.98
Graduate student	5	1.9	45	29.59	50	12.02

Table 4.1 (Continued)

Demographic characteristics	MUIC		KMITL-IC		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Mode of Transportation	N=353		N=137		N=490	100
Walk	33	9.35	21	15.33	54	11.02
Bicycle	15	4.25	11	8.03	26	5.31
Private vehicle	203	57.51	57	41.61	260	53.06
Public transportation	102	28.9	48	35.04	150	30.61
Time spend on-Campus						
≥ 5 days/week	230	62.2	94	58.8	324	61.1
3-4 days/week	130	35.1	47	29.4	177	33.4
≤ 1 day/week	10	1.1	19	1.9	29	5.5

#### 4.2 Satisfaction with the University's Environmental Management

As presented in Table 4.2, respondents were asked questions about their perception towards the environmental management of the university by using a t-test. The results found significant difference between the mean scores between groups of the stakeholders at p-value = 0.000. This means that there is significance between green campus stakeholders' satisfaction on environmental management as compared to non-green campus stakeholders. The data show that green campus stakeholders deem environmental management more important and are more satisfied with environmental management in their campus.

These results are agreeable with what McFarland et al (2008) concluded about undergraduate students' preference. They found that undergraduate students deem green space as a positive impact to their quality of life. Therefore, it is

important for campus planners to consider the relationship between the student experience and green spaces on campus (McFarland, 2008). Interesting point in stakeholders who walk to campus both Green and Non-Green Campus felt least satisfied with this aspect. However, people in both groups who usually walk to campus are least satisfied with the university's environmental management.

**Table 4.2** The Comparison between MUIC and KMITL-IC of Mean Scores, T-test Values and P-Values of quality of life and university's environmental management of their campus

Quality of life and university's environmental management	MEAN		t-test value	p-value
	MUIC	KMITL-IC		
1. Environment management is important for a university's campus	4.50	4.22	3.965	0.000*
2. Satisfied with environmental management of your university	3.95	3.52	5.203	0.000*
3. Importance of university green space available	4.25	4.19	0.767	0.443
4. The university does provide enough green space to support a high quality of life	3.99	3.61	4.104	0.000*
5. Energy saving is a very important practice for your university	4.11	3.99	1.579	0.115
6. The Universities energy saving practice does support a high quality of life.	4.07	4.06	0.195	0.845
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.84	3.86	-1.73	0.863

Table 4.2 (Continued)

Quality of life and university's environmental management	MEAN		t-test value	p-value
	MUIC	KMITL-IC		
8. Waste management (example waste separation, waste reduction) is a very important practice for your university.	4.18	4.05	1.655	0.099
9. Universities waste management (example waste separation, waste reduction) does support a high quality of life.	4.10	3.99	1.424	0.155
10. Universities water management (water saving) does support a high quality of life.	4.07	4.04	.314	0.754
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.84	3.84	-.035	0.972
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.16	4.08	1.032	0.302
13. Overall the quality of your life on campus.	4.05	3.59	6.289	0.000*
14. If you are an applicant university, would a Green Campus be a university's selection?	3.79	3.78	.062	0.951
15. Universities Green campus does support a high quality of life on campus.	3.81	3.75	.723	0.470

\* Significant at or below the 0.05 level

### 4.3 Green Space Availability

This study compared two groups of stakeholders, based on demographics, to observe whether any particular group appeared to be more satisfied with available green space. These findings showed that stakeholders on the Green Campus who reported that green spaces are important tended to be satisfied with availability of green spaces in their campus and rated their overall quality of life higher than stakeholders in a non-green campus. (Figure 4.1-4.2)

Figure 4.1 included two questions asking the respondent to indicate their perception regarding the sufficiency of the green space provided on campus and, then, their overall quality of life on campus. From the survey, the majority of MUIC stakeholders provided a positive feedback on the availability of green space area on campus. Over 47% of the stakeholder response "agreed", with another 28.6% selected "strongly agreed", to the question asking their opinion towards the existing green space area on campus provided to support their high quality of life. The result of the survey also indicated that, in overall, the majority of respondent from MUIC rated their overall quality of life "fairly good" (59.2%) and "very good" (24.1%). Considering the feedback regarding the sufficiency of green space on campus along with the high rating of the stakeholder's quality of life, it could be claimed that the green space area contributes to the overall quality of life.

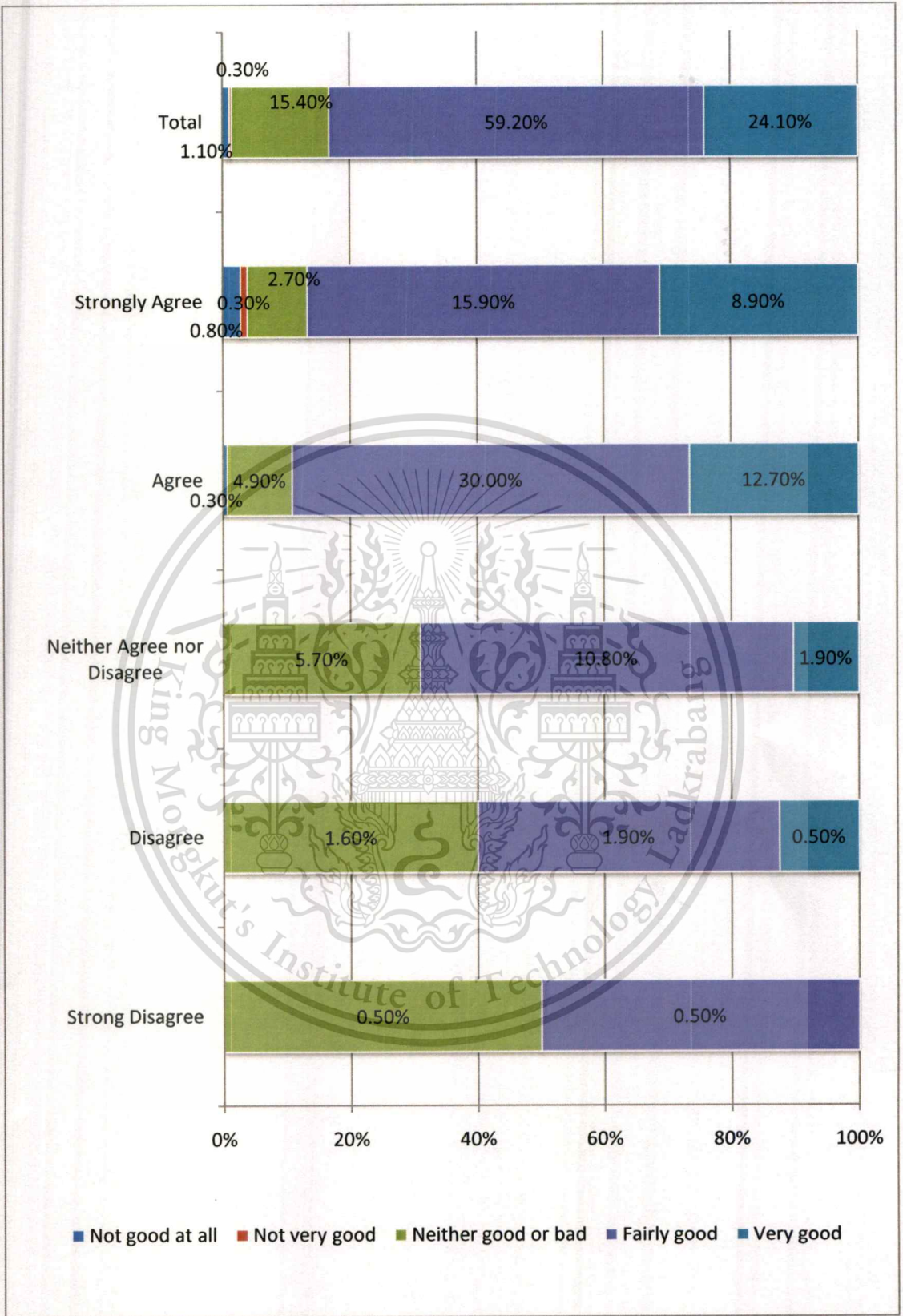
Figure 4.2 included two questions asking the respondent to indicate their perception regarding the sufficiency of the green space provided on campus and, then, their overall quality of life on campus. From the survey, the majority of KMITL-IC stakeholders provided a positive feedback on the availability of green space area on campus. Over 41.3% of the stakeholder response "agreed", with another 25.6% selected "neither agree nor disagree", to the question asking their opinion towards the existing green space area on campus provided to support their high quality of life. The result of the survey also indicated that, in overall, the most respondent from KMITL-IC rated their overall quality of life "fairly good" (45 %) and "Neither good

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

or bad " (38.8 %) which was different from MUIC (Figure 4.1) that more than 70% of respondent rated their overall quality of life at fairly good and very good.





**Figure 4.1** Descriptive statistics indicating stakeholders' opinion of amount of campus green spaces and perceptions of quality of life on campus at MUIC.

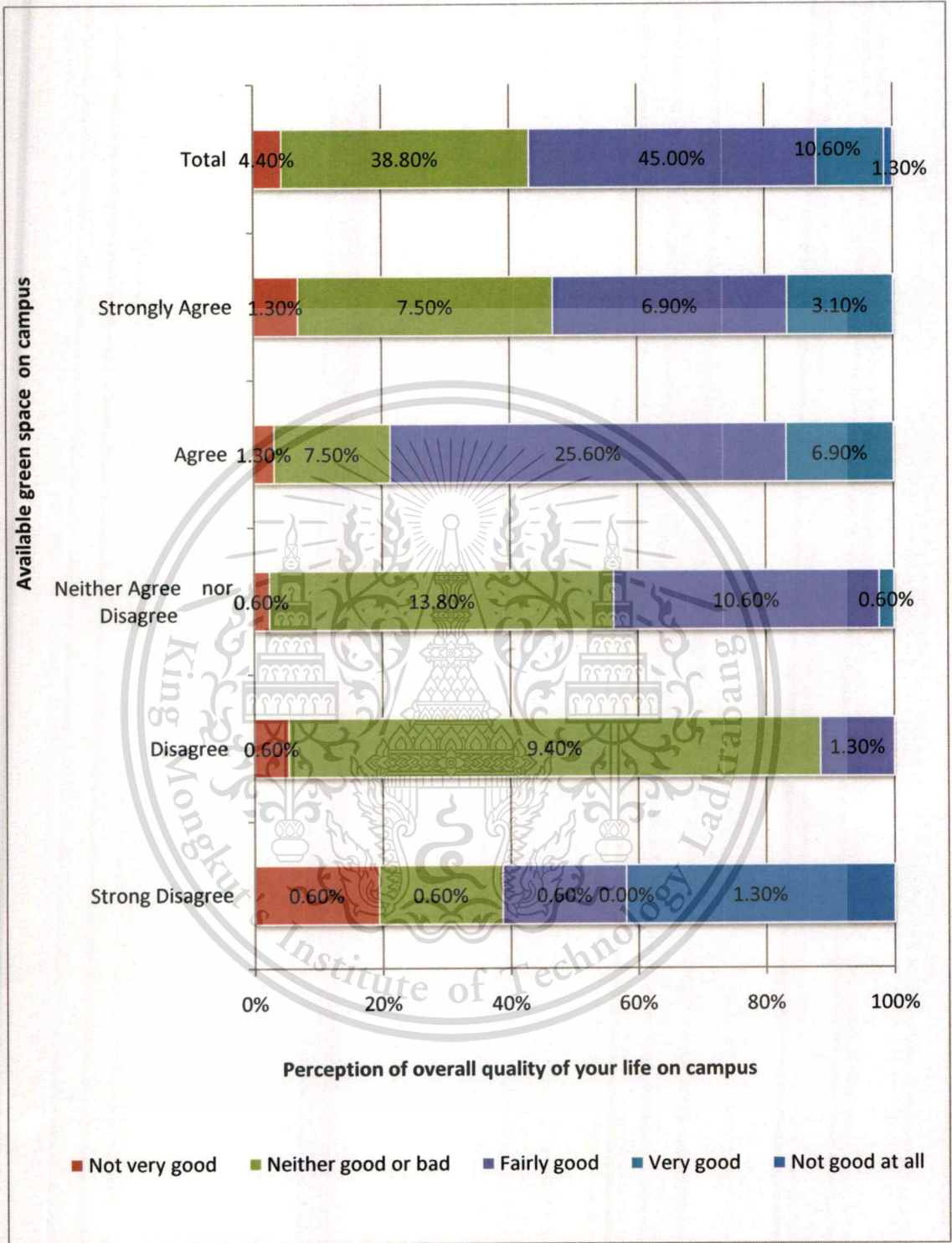


Figure 4.2 Descriptive statistics indicating stakeholders' opinion of amount of campus green spaces and perceptions of quality of life on campus at KMITL.

However, stakeholders who walked to university at both the green and the non-green campus felt least satisfied with green space availability on campus (Table 4.3-4.4) if compared with others modes of transportation. The mean score of stakeholders on the green campus was higher than the non-green campus it can be seen from Figure 4.3 that MU had improved a lot of green space to comply with the UI GreenMetric criteria and support the ideas from the interview with MU management (Appendix A) that MU improved pathways on the campus to be more suitable for walking, cycling and public transportation. Also, outdoor spaces have been provided to support various kinds of activities and gatherings activity. (Figure 4.4) Furthermore, MU developed and improved the road system as well as public transportation system for the stakeholders on Salaya campus by operating campus-trolleys that will service inside campus as presented on Figure 4.5.

Table 4.3 Transportation mode and stakeholder in MUIC perception

Quality of life and university's environmental management of a university's campus	MEAN				F-test value	p-value
	Walk	Bicycle	Private car	Public car		
1. Environment management is important of a university's campus	4.64	4.53	4.57	4.31	4.062	0.007*
2. Satisfied with environmental management of your university	3.85	3.73	3.97	4.00	0.653	0.581
3. Importance of university green space available*	4.27	4.47	4.30	4.16	1.220	0.302

Table 4.3 (Continued)

Quality of life and university's environmental management of a university's campus	MEAN				F-test value	p-value
	Walk	Bicycle	Private car	Public car		
4. The university does provide enough green space to support a high quality of life	3.88	4.00	4.03	3.95	0.428	0.733
5. Energy saving is a very important practice for your university	4.09	4.27	4.19	4.01	1.472	0.222
6. The Universities energy saving practice does support a high quality of life.	3.88	4.20	4.09	4.06	0.759	0.518
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.42	4.07	3.91	3.82	2.712	0.045*
8. Waste management (example waste separation, waste reduction) is a very important practice for your university.	4.09	4.40	4.24	4.13	0.870	0.457

Table 4.3 (Continued)

Transportation mode	MEAN				F-test value	p- value
	Walk	Bicycle	Private car	Public car		
9. Universities waste management (example waste separation, waste reduction) does support a high quality of life.	3.94	4.07	4.18	4.00	1.716	0.163
10. Universities water management (water saving) does support a high quality of life.	4.09	3.93	4.13	3.97	1.055	0.368
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.70	3.60	3.89	3.83	0.715	0.544
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.15	4.00	4.19	4.17	0.245	0.865
13. Overall the quality of your life on campus	3.97	4.40	4.07	4.03	1.425	0.235

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.3 (Continued)

Quality of life and university's environmental management of a university's campus	MEAN				F-test value	p-value
	Walk	Bicycle	Private car	Public car		
14. If you are an applicant university, would a Green Campus be a university's selection?	3.76	4.00	3.85	3.71	0.836	0.475
15. Universities Green campus does support a high quality of life on campus.	3.85	3.93	3.79	3.84	0.178	0.911

\* Significant at or below the 0.05 level

Table 4.4 Transportation mode and stakeholder in KMITL stakeholders' perception

Quality of life and university's environmental management of a university's campus	MEAN				F-test value	p-value
	Walk	Bicycle	Private car	Public car		
1. Environment management is important of a university's campus	4.19	4.09	4.21	4.25	0.132	0.941
2. Satisfied with environmental management of your university	3.14	3.82	3.54	3.69	2.236	0.087

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.4 (Continued)

Transportation mode	MEAN				F-test value	p- value
	Walk	Bicycle	Private car	Public car		
3. Importance of university green space available*	4.33	3.82	4.28	4.13	1.633	0.185
4. The university does provide enough green space to support a high quality of life	3.14	3.73	3.58	3.85	2.632	0.053
5. Energy saving is a very important practice for your university	3.76	3.64	4.11	3.96	1.725	0.165
6. The Universities energy saving practice does support a high quality of life.	4.10	4.00	4.14	3.92	0.872	0.457
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.71	4.36	3.91	3.73	1.624	0.187
8. Waste management (example waste separation, waste reduction) is a very important practice for your university.	4.19	4.27	4.07	3.94	0.797	0.498

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.4 (Continued)

Transportation mode	MEAN				F-test value	p-value
	Walk	Bicycle	Private car	Public car		
9. Universities waste management (example waste separation, waste reduction) does support a high quality of life.	4.19	4.00	4.02	3.94	0.526	0.665
10. Universities water management (water saving) does support a high quality of life.	4.43	3.91	3.98	4.04	1.864	0.134
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	4.48	4.18	3.96	4.15	1.921	0.129
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	1.57	1.55	1.46	1.50	0.105	0.957

Table 4.4 (Continued)

Transportation mode	MEAN				F-test value	p-value
	Walk	Bicycle	Private car	Public car		
13. Overall the quality of your life on campus	3.05	3.73	3.75	3.71	5.060	0.002*
14. If you are an applicant university, would a Green Campus be a university's selection?	3.67	4.09	3.86	3.58	1.466	0.227
15. Universities Green campus does support a high quality of life on campus.	3.43	4.27	3.86	3.69	2.705	0.048*

\* Significant at or below the 0.05 level



Figure 4.3 Mahidol university improved road lane to friendly cycling and walk way

This material is reserved for educational use only, not allowed for commercial use. in 2012.

Forbidden to modify the content, and cite the document when use.



Figure 4.4 Mahidol university outdoor spaces activity.



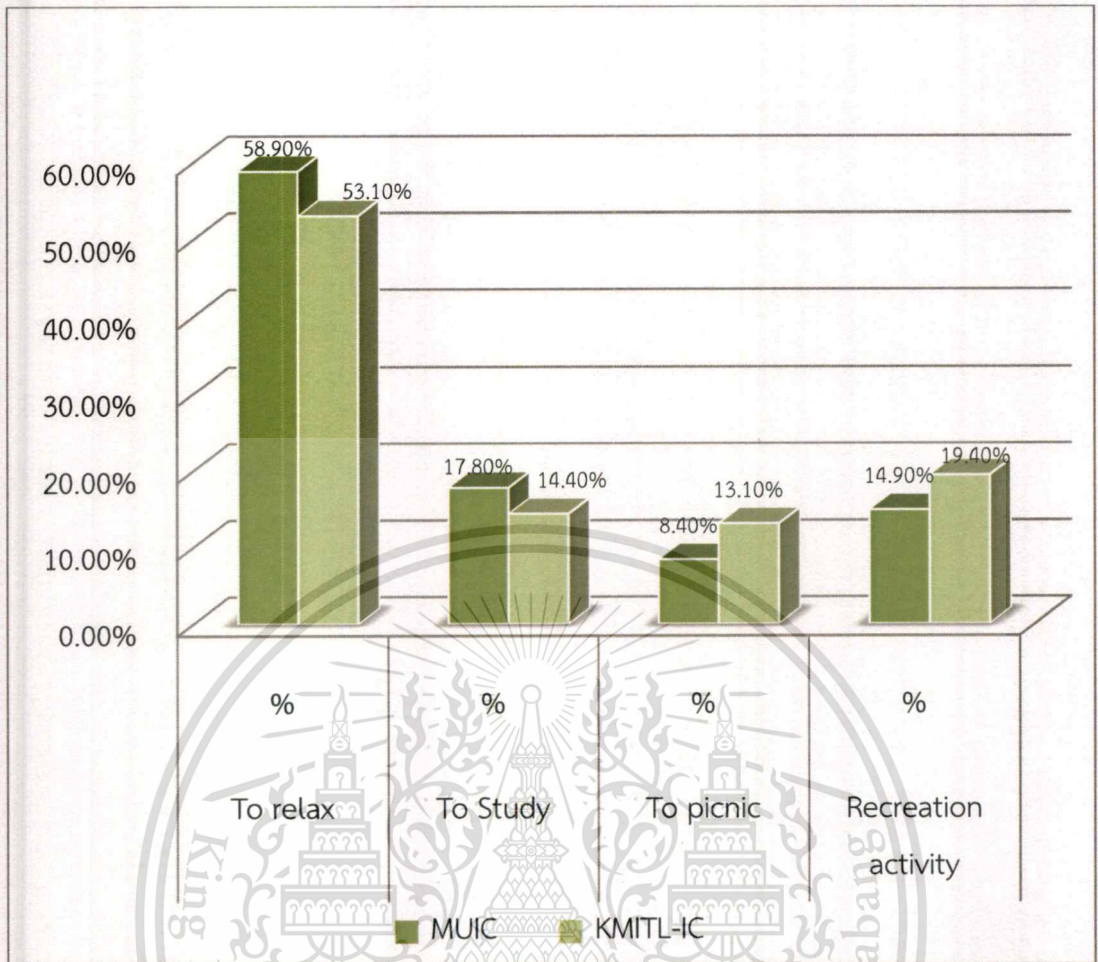
Figure 4.5 Free public transportation inside Salaya Campus  
(Mahidol university office of president, 2012).

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Overall, stakeholders on the green campus seemed to indicate an overwhelming preference (58.9 %) for using green space for relaxation rather than for other activities. This was followed by 14.9% users of green space for recreation activities, 17.8% for studying and 8.4% to picnic. The number of people who used green spaces to relax from the non-green campus was also greater than for other activities (to relax=85 persons or 53.1 %; recreation activity = 31 persons (19.4%); to study = 23 persons (14.4 %); and 21 persons used green spaces to picnic (13.1%) (Figure 4.6)





**Figures 4.6** Descriptive indicating stakeholders' purpose of use campus green spaces

Figure 4.6 the study shows that the majority of the stakeholders' uses green spaces on the campus to relax at both MUIC and KMITL-IC campuses, 58.9% and 53.1% respectively. Following the "to relax" purpose, the stakeholders at MUIC (total of 370) use the green space to study, to do the recreation activity and, least using the green space, to picnic (8.4%). However, the study shows the different result at KMITL-IC campus where the stakeholders (total of 160) use the green space the least to picnic (13.1%).

#### 4.4 Overall Quality of Life

A t-test compared two groups of stakeholders' perception of quality of life based on stakeholder status classification. Statistically significant differences were

found in overall quality of life of stakeholders' scores on the scale ( $p=0.000$ ). Green Campus stakeholders had significantly higher mean scores scale when compared to Non-Green Campus. However, stakeholders who walk to university with Green or Non Green Campus felt least satisfied with green space available on campus (Table 4.3). Moreover, the stakeholders who reported that their overall quality of life higher than those who rated it as less satisfied also tended to have a positive perception in the availability of university green space this statement connect to a high quality of life.

The results also showed stakeholders in both Green and Non-Green Campuses mostly use green spaces to relax themselves, followed by for studying, conducting recreational activities, and picnicking, respectively.

Most respondents of both MUIC (68.9%) and KMITL-IC (72.5%) are interested in learning more about Green Campus. At both campuses, almost 99% of the stakeholders want the university to continue or start implementing Green Campus activities as they think that it would support a higher quality of life (Table 4.5).

**Table 4.5** Demographic of stakeholders' who response in question of interested in learning more about green campus

Are you interested in learning more about green campus?		MUIC	KMITL-IC	TOTAL
Yes	Count	255	116	371
	%	68.9%	72.5%	70%
No	Count	8	2	10
	%	2.2%	1.3%	1.9%
Not sure	Count	107	42	149
	%	28.9%	26.3%	28.1%
Total	Count	370	160	530
	%	100%	100%	100%

Table 4.5 shows that 68.9% stakeholders from MUIC are interested in learning more about the green campus initiative with 28.9 % being not sure about that and 2.2% stated not to be interested. A very similar result can be seen for KMITL-IC. 72.5% of are interested in learning more about the green campus initiative, 26.3% are not sure, and only 1.3% stressed they are not interested in this topic.

#### 4.5 Gender

The results from respondents of both MUIC and KMITL-IC indicate that there is no significant difference at  $p$ -value  $< 0.05$  between mean score of male and female and university's environmental management (Table 4.6 and Table 4.7). However, the result related to item six (6) "The universities energy saving practices do support a high quality of life." shows a significant difference between the mean score of male and female of MUIC with  $p$ -value  $< 0.05$  For the mean score level we found that women are more satisfied with their university's energy saving practices than men.

Table 4.6 The comparison of mean scores of the quality of life and university's environmental management of a university's campus between male and female MUIC stakeholders.

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Male	Female		
1. Environment management is important of a university's campus	4.52	4.49	.479	0.633
2. Satisfied with environmental management of your university	4.03	3.91	1.429	0.154
3. Importance of university green space available*	4.26	4.24	.298	0.766

Table 4.6 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Male	Female		
4. The university does provide enough green space to support a high quality of life	3.98	4.00	-1.80	0.858
5. Energy saving is a very important practice for your university	4.06	4.13	-0.836	0.404
6. The Universities energy saving practice does support a high quality of life.	3.95	4.15	-2.185	0.030*
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.92	3.79	1.323	0.187
8. Waste management (example waste separation, waste reduction) is a very important practice for your university.	4.18	4.18	0.570	0.993
9. Universities waste management (example waste separation, waste reduction) does support a high quality of life.	4.12	4.09	0.348	0.728
10. Universities water management (water saving) does support a high quality of life.	4.10	4.05	0.590	0.556
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.85	3.84	0.105	0.916
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.21	4.14	0.776	0.438

Table 4.6 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Male	Female		
13. Overall the quality of your life on campus	4.05	4.05	-0.001	0.999
14. 14. If you are an applicant university, would a Green Campus be a university's selection?	3.84	3.74	1.168	0.243
15. Universities Green campus does support a high quality of life on campus.	3.73	3.86	-1.409	0.160

\* Significant at or below the 0.05 level

Table 4.7 The comparison of mean scores of the quality of life and university's environmental management of a university's campus between male and female KMITL-IC stakeholders

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Male	Female		
1. Environment management is important of a university's campus	4.17	4.28	-0.862	0.390
2. Satisfied with environmental management of your university	3.56	3.47	0.588	0.588
3. Importance of university green space available*	4.18	4.21	-0.225	0.822
4. The university does provide enough green space to support a high quality of life	3.60	3.63	-0.140	0.889
5. Energy saving is a very important practice for your university	3.95	4.03	-5.80	0.563
6. The Universities energy saving practice does support a high quality of life.	4.02	4.10	-0.650	0.517

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.7 (Continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Male	Female		
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.85	3.86	-0.058	0.954
8. Waste management (example waste separation, waste reduction) is a very important practice for your university.	4.06	4.04	0.116	0.908
9. Universities waste management (example waste separation, waste reduction) does support a high quality of life.	4.03	3.94	0.729	0.467
10. Universities water management (water saving) does support a high quality of life.	4.11	3.96	0.124	0.216
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.92	3.75	1.148	0.253
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.09	4.07	0.159	0.874
13. Overall the quality of your life on campus	3.64	3.54	0.772	0.441
14. If you are an applicant university, would a Green Campus be a university's selection?	3.82	3.74	0.590	0.556

Table 4.7 (Continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Male	Female		
15. Universities Green campus does support a high quality of life on campus.	3.74	3.76	-0.179	0.858

\* Significant at or below the 0.05 level

From Table 4.8 illustrates a very positive response from all respondents concerning the statement that the university should continue or start with green campus activities. A majority of 98.9% and 98.8% from MUIC and KMITL-IC respectively do support the green campus activities of their university or want KMITL to start with these kinds of activities

Table 4.8 The number of stakeholders who want the university to continue or start implementing Green Campus activities.

Do you want university to continue or start implements Green Campus activities?		MUIC	KMITL-IC	TOTAL
Yes	Count	366	158	524
	%	98.9%	98.8%	70%
No	Count	4	2	6
	%	1.1%	1.3%	1.1%
Total	Count	370	160	530
	%	100%	100%	100%

#### 4.6 Transportation

The results of using one way ANOVA test compared quality of life and university's environmental management and transportation mode in universities. The

results from respondents of MUIC indicate that there is no significant difference at p-value = 0.235 between stakeholder traveling with different modes of transportation and quality of life (Table 4.12). However, the result from KMITL-IC shows a significant difference between the traveling with different modes of transportation and quality of life with p-value < 0.05. For the mean score level we found that stakeholders who walk to university felt least satisfied with their quality of life

The results of using one way ANOVA test compared quality of life and university's environmental management and transportation mode in universities.

**Hypothesis of table 4.9:** MUIC Stakeholders traveling with different modes of transportation have different levels of quality of life on campus

Statistical hypotheses can be stated as follow:

H0: MUIC Stakeholders traveling with different mode of transportation have the same Level of quality of life on campus

H1: MUIC Stakeholders traveling with different mode of transportation have different Levels of quality of life on campus

Table 4.9 shows that the means of quality of life levels are different between groups of MUIC stakeholders traveling with different modes of transportation. These differences were tested using one way ANOVAs Test at predetermined significance level (p-value) = 0.05. The significance level (Sig.) derived was 0.235, which was higher than the p-value. Therefore, the null hypothesis H0 was accepted and the alternate hypothesis H1 was rejected. Thus, MUIC stakeholders traveling with different modes of transportation have, overall, the same level of quality of life on campus.

**Table 4.9** Difference of quality of life levels between groups of MUIC stakeholders traveling with different mode of transportation

Transportation mode	Overall quality life on campus			F	Sig.
	amount	( $\bar{X}$ )	(S.D.)		
Walk	33	3.97	0.684	1.425	0.235
Bicycle	15	4.40	0.507		
Private vehicle	203	4.07	0.728		
Public transportation	102	4.03	0.682		
Total	353	4.06	0.704		

**Hypothesis of table 4.10:** KMITL-IC Stakeholders traveling with different modes of transportation have different levels of quality of life on campus Statistical hypotheses can be stated as follow:

H0: KMITL-IC Stakeholders traveling with different modes of transportation have the same level of quality of life on campus

H1: KMITL-IC Stakeholders traveling with different modes of transportation have different levels of quality of life on campus

Table 4.10 shows that the means of quality of life levels are different between groups of KMITL-IC stakeholders traveling with different means of transportation. These differences were tested using one way ANOVAs Test at predetermined significance level ( $p$ -value) = 0.05. The significance level (Sig.) derived was 0.002, which was less than the  $p$ -value. Therefore, the null hypothesis  $H_0$  was rejected and the alternate hypothesis  $H_1$  was accepted. Thus, MUIC Stakeholders traveling with different means of transportation perceive the overall quality of life differently.

**Table 4.10** Difference of quality of life levels between groups of KMITL-IC stakeholders traveling with different means of transportation

Transportation mode	Overall quality life on campus			F	Sig.
	amount	( $\bar{X}$ )	(S.D.)		
Walk	21	3.05	0.805	5.060	0.002*
Bicycle	11	3.73	0.647		
Private vehicle	57	3.75	0.662		
Public transportation	48	3.71	0.824		
Total	137	3.63	0.777		

From Table 4.11 shows number of MUIC stakeholders who are aware that sustainable development is a part of the university's mission statement (269 stakeholders, 72.7%) was significantly higher compared to those who are not aware of that (101 stakeholders, 27.3%). Regarding KMITL-IC stakeholders the difference is much less; only 61.3% are aware of the fact that sustainable development is a part of KMITL's mission statement (98 stakeholders) compared to 38.8% (62 stackers) who do not know this fact (Table 4.11).

**Table 4.11** Awareness of sustainable development as part of university's mission statement

Do you know sustainable development is a part of university's mission statement?		MUIC	KMITL-IC	TOTAL
Yes	Count	269	98	367
	%	72.7%	61.3%	69.2%

Table 4.11 (Continued)

Do you know sustainable development is a part of university's mission statement?		MUIC	KMITL-IC	TOTAL
No	Count	101	62	163
	%	27.3%	38.8%	30.8%
Total	Count	370	160	530
	%	100%	100%	100%

A result from Table 4.12 of the survey sustainable development seems to be quite important in the university education. 80.8% from MUIC reported that sustainable development is part of their curriculum/work, was much greater than has not been a topic (71 stakeholders, 19.2%). From KMITL-IC the survey received a very similar result with 78.1% stating that sustainable development is part of their university education was also greater than that of who never know (35 stakeholders, 21.9%)

Table 4.12 Awareness of sustainable development as part of university's course curriculums and classes

Sustainable development is a part of my curriculum /work or has been a topic in one of my classes?		MUIC	KMITL-IC	TOTAL
Yes	Count	299	125	424
	%	80.8%	78.1%	80%

Table 4.12 (Continued)

Sustainable development is a part of my curriculum /work or has been a topic in one of my classes?		MUIC	KMITL-IC	TOTAL
No	Count	71	35	106
	%	19.2%	21.9 %	20%
Total	Count	370	160	530
	%	100%	100%	100%

Table 4.13 shows the responded of of stakeholders, who regularly participate in green campus campaigns in both university campuses at MUIC and KMITL-IC, were in the same range of percentage of stakeholders in KMITL-IC (263 stakeholders, 71.1%, 122 stakeholders, 76.3%)

Table 4.13 The number of stakeholders who regularly participate in green campus campaign

You regularly participate in green campus campaign (energy saving, water saving, etc.)		MUIC	KMITL-IC	TOTAL
Yes	Count	263	122	385
	%	71.1%	76,3%	72.6%
No	Count	107	38	145
	%	28.9%	23.8%	27.4%
Total	Count	370	160	530
	%	100%	100%	100%

#### 4.7 Comparison of Views from Stakeholders Separated by Status

This is a comparison of views about perception of quality of life at the two universities. Here, the MU and KMITL students and staff members were asked about their opinions on organizing a "green campus", with a focus on its effect on their individual lives. A t-test compared the two groups based on status classification.

The results shown in Table 4.14 scores of staff and students were compared using a t-test to investigate whether or not a specific classification appeared to perception of quality of life in green and non-green campus from MUIIC respondents, indicate that there are significant differences at  $p\text{-value} < 0.05$  between the mean scores of its staff and students. These MUIIC staff members rated their scores at agree level ( $\geq 4$ ) in almost all quality of life related questions, being higher than those of students, except in certain criteria.

1. The criterion of "satisfaction" with the university's environmental surroundings.
2. Green space and trees in the university can support a high quality of life.
3. Arranging this green space can help foster a better quality of life within the university.

However, the findings reveal that there were no significant in these among factors in terms of mean scores, compared to those found in students. For all factors, there was a mean score of higher than four (4). This means that most of the staff were generally agree to the term of green campus initiatives.

Furthermore, from Table 4.15 of KMITL-IC, found only two aspects showing a significant difference between students and staff and the result related to items "Importance of university green space available" and "Energy saving is very a important practice for your university" shows a significant difference between the mean score of staff and students of KMITL-IC with  $p\text{-value} < 0.05$ . (Table 4.18) The mean score level implies found that staff are more satisfaction with the availability of green space in the university and energy saving practices than students.

**Table 4.14** The comparison of mean scores: quality of life and university's environmental management - students and staff of MUIC.

Quality of life and university's environmental management of a university campus	MEAN		t-test value	p-value
	Students	Staff		
1. Environment management is important to a campus	4.44	4.66	-3.275	0.001*
2. Satisfaction with environmental management of your university	3.90	4.09	-2.053	0.043
3. Importance of availability of green space	4.16	4.47	-3.925	0.000*
4. The university does provide enough green space to support a high quality of life	3.95	4.09	-.501	0.134
5. Energy saving practices are important for your university	3.96	4.47	-5.925	0.000*
6. The university's energy saving practice does support a high quality of life.	3.91	4.47	-6.107	0.000*
7. The climate change mitigation programs (greenhouse gas emission reduction) are a very important practice for your university.	3.73	4.10	-3.371	0.001*
8. Waste management (for example: waste separation, waste reduction) is a very important practice for your university.	4.04	4.54	-6.135	0.000*
9. Universities' waste management (for example: waste separation, waste reduction) does foster a higher quality of life.	3.95	4.47	-5.958	0.000*
10. Universities water management (water saving) does support a high quality of life.	3.93	4.41	-5.278	0.000*

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.14 (Continued)

Quality of life and university's environmental management of a university campus	MEAN		t-test value	p-value
	Students	Staff		
11. Universities transportation conditions (traffic congestion, availability of public transportation, etc.) do support a higher quality of life	3.75	4.08	-2.973	0.003*
12. Universities education for environmental concerns (academic courses and activities related to environmental factors) does support a high quality of life	4.02	4.54	-5.489	0.000*
13. Overall quality of your life on campus	3.94	4.32	-4.822	0.000*
14. If you are an applicant to a university, would a Green Campus be factor in choosing a university?	3.70	4.00	-2.915	0.004*
15. Universities' green campus does support a high quality of life on campus.	3.73	4.00	-2.668	0.008

\* Significant at or below the 0.05 level

Table 4.15 The comparison of mean scores: quality of life and university's environmental management - students and staff of KMITL-IC.

The quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Students	Staff		
1. Environmental management is important to a university's campus	4.21	4.38	-0.58	0.56
2. Satisfaction with environmental management of your university	3.54	3.13	1.27	0.21
3. Importance of university's green space availability	4.16	4.75	-2.21	0.03*
4. The university does provide enough green space to support a high quality of life	3.58	4.25	-1.84	0.07
5. Energy saving is a very important practice for your university	3.95	4.63	-2.37	0.02*
6. The Universities energy saving practice does foster a higher quality of life.	4.04	4.38	-1.29	0.20
7. The climate change mitigation program (greenhouse gas emission reduction) is a very important practice for your university.	3.88	3.50	0.69	0.51
8. Waste management (for example: waste separation, waste reduction) is a very important practice for your university.	4.06	3.88	0.62	0.54
9. Universities' waste management (for example: waste separation, waste reduction) does support a high quality of life.	3.99	4.13	-0.49	0.62

Table 4.15 (Continued)

The quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Students	Staff		
10. Universities' water management (water saving) does lead to a higher quality of life.	4.05	3.88	0.62	0.54
11. Universities transportation conditions (traffic congestion, availability of public transportation, etc.) do support a high quality of life	3.88	3.25	1.86	0.07
12. Universities' education for green (academic courses and activities related to environmental care) does support a high quality of life	4.09	4.00	0.28	0.78
13. Overall the quality of your life on campus	3.59	3.63	-0.11	0.91
14. If you are an applicant to a university, would a Green Campus be factor in choosing a university?	3.80	3.50	0.93	0.35
15. Universities Green campus does support a higher quality of life on campus.	3.73	4.13	-1.23	0.22

\* Significant at or below the 0.05 level

#### 4.8 Student Grade Classification Comparisons

The results from respondents of both MUIC and KMITL-IC indicate that there is no significant difference at  $p\text{-value} < 0.05$  between the mean score of undergraduate students and graduate students (Table 4.16 and Table 4.17).

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

**Table 4.16** The comparison of mean scores: quality of life and university's environmental management-bachelor's degree and master degree students of MUIC.

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Undergraduate students	Graduate students		
1. Environmental management is important to a university's campus	4.43	4.44	-0.021	0.984
2. Satisfaction with environmental management of your university	3.92	3.89	0.291	0.772
3. Importance of availability of university green space	4.13	4.17	0-360	0.719
4. The university does provide enough green space to support a high quality of life	4.00	3.93	0.626	0.532
5. Energy saving is a very important practice for your university	4.04	3.93	1.060	0.290
6. The universities' energy saving practice does foster a higher quality of life.	3.95	3.89	0.462	0.644
7. The climate change mitigation program (greenhouse gas emission reduction) is a very important practice for your university.	3.64	3.77	-0.967	0.334
8. Waste management (for example: waste separation, waste reduction) is a very important practice for your university.	4.09	4.02	0.610	0.543

Table 4.16 (Continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Undergraduate students	Graduate students		
9. Universities' waste management (for example: waste separation, waste reduction) does support a higher quality of life.	3.92	3.96	-0.383	0.702
10. Universities water management (water saving) does support a higher quality of life.	3.87	3.96	-0.812	0.417
11. Universities' transportation condition (amount of traffic, availability of public transportation, etc.) does support a higher quality of life	3.89	3.70	1.161	0.247
12. Universities education for green (academic courses and activities related to environmental causes) does support a higher quality of life	4.16	3.96	1.640	0.102
13. Overall quality of life on campus	3.95	3.94	0.114	0.909
14. If you are an applicant university, would a Green Campus be a factor in choosing a university?	3.66	3.72	-0.500	0.617

Table 4.16 (Continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Undergraduate students	Graduate students		
15. Universities Green campus does support a high quality of life on campus.	3.82	3.70	0.932	0.352

\* Significant at or below the 0.05 level

Table 4.17 The comparison of mean scores: quality of life and university's environmental management – bachelor's degree student and master degree student of KMITL-IC.

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Undergraduate students	Graduate students		
1. Environmental management is important to a university's campus	4.24	4.14	0.739	0.461
2. Satisfaction with environmental management of your university	3.49	3.65	-1.076	.284
3. Importance of university green space available	4.21	4.06	1.187	0.237
4. The university does provide enough green space to support a high quality of life	3.60	3.53	0.407	0.684
5. Energy saving is very important practices for your university	3.94	3.98	-0.275	0.784

Table 4.17 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Undergraduate students	Graduate students		
6. The university's energy saving practice does support a high quality of life.	4.05	4.02	0.225	0.822
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.79	4.06	-1.741	0.084
8. Waste management (for example: waste separation, waste reduction) is very important practices for your university.	4.05	4.08	-0.229	0.820
9. Universities waste management (for example: waste separation, waste reduction) does support a high quality of life.	3.99	3.98	0.079	0.937
10. Universities water management (water saving) does support a high quality of life.	4.09	3.98	0.780	0.437
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.85	3.92	-0.405	0.686

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.17 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Undergraduate students	Graduate students		
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.16	3.94	1.496	0.137
13. Overall the quality of your life on campus	3.55	3.67	-0.873	0.384
14. If you are an applicant university, would a Green Campus be factor in choosing a university?	3.78	3.84	-0.392	0.695
15. Universities Green campus does support a high quality of life on campus.	3.75	3.69	0.349	0.728

\* Significant at or below the 0.05 level

## 4.9 Nationality

The results from respondents of both MUIC and KMITL-IC indicate that there is no significant difference at  $p\text{-value} < 0.05$  between mean score of Thai nationality and other nationalities (Table 4.21 and Table 4.22). However, for the mean score level of both college indicate that other nationalities except Thai stakeholders felt least satisfaction with their quality of life in university.

**Table 4.18** The comparison of mean scores: quality of life and university's environmental management – Thai nationality and other nationalities of MUIC.

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Thai Nationality	Other Nationalities		
1. Environment management is important to a university's campus	4.51	4.38	0.765	0.445
2. Satisfaction with environmental management of your university	3.96	3.81	0.692	0.490
3. Importance of university green space available*	4.26	4.00	1.333	0.183
4. The university does provide enough green space to support a high quality of life	4.01	3.56	2.049	0.041
5. Energy saving is very important practices for your university	4.11	4.00	0.547	0.585
6. The Universities energy saving practice does support a high quality of life.	4.09	3.63	2.180	0.030

Table 4.18 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Thai Nationality	Other Nationalities		
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.86	3.50	1.445	0.149
8. Waste management (for example: waste separation, waste reduction) is very important practices for your university.	4.19	3.88	1.442	0.150
9. Universities waste management (for example: waste separation, waste reduction) does support a high quality of life.	4.11	3.88	1.158	0.248
10. Universities water management (water saving) does support a high quality of life.	4.08	3.69	1.929	0.054
11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.85	3.69	0.642	0.521
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.18	3.75	1.980	0.048

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.18 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Thai Nationality	Other Nationalities		
13. Overall the quality of your life on campus	4.06	3.88	1.003	0.317
14. If you are an applicant university, would a Green Campus be factor in choosing a university?	3.79	3.63	0.735	0.465
15. Universities Green campus does support a high quality of life on campus.	3.82	3.63	0.853	0.394

\* Significant at or below the 0.05 level

Table 4.19 The comparison of mean scores: quality of life and university's environmental management – Thai nationality and other nationalities of KMITL-IC.

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Thai Nationality	Other Nationalities		
1. Environment management is important to a university's campus	4.22	4.20	0.054	0.957
2. Satisfaction with environmental management of your university	3.51	3.80	-0.706	0.481
3. Importance of university green space available*	4.20	4.00	0.594	0.553

Table 4.19 (continued)

Quality of life and university's environmental management of a university's campus	MEAN		t-test value	p-value
	Thai Nationality	Other Nationalities		
4. The university does provide enough green space to support a high quality of life	3.61	3.60	0.028	0.978
5. Energy saving is very important practices for your university	3.99	3.80	0.536	0.593
6. The Universities energy saving practice does support a high quality of life.	4.06	4.00	0.177	0.860
7. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university.	3.85	4.00	-0.343	0.732
8. Waste management (for example: waste separation, waste reduction) is very important practices for your university.	4.05	4.00	0.138	0.891
9. Universities waste management (for example: waste separation, waste reduction) does support a high quality of life.	3.98	4.40	-1.196	0.234
10. Universities water management (water saving) does support a high quality of life.	4.03	4.40	-1.027	0.306

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Table 4.19 (continued)

11. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life	3.81	4.80	-2.356	0.020
12. Universities education for green (academic courses and activities related to environmental) does support a high quality of life	4.06	4.80	-1.946	0.053
13. Overall the quality of your life on campus	3.59	3.80	-0.594	0.553
14. If you are an applicant university, would a Green Campus be factor in choosing a university?	3.79	3.40	0.991	0.323
15. Universities Green campus does support a high quality of life on campus.	3.77	3.00	1.946	0.053

\*Significant at or below the 0.05 level

#### 4.10 Summarize and Discussion of University Management Interview

Based on the summary of the interview in Table 4.20 with the acting president of KMITL's and dean of KMITL-IC, MU is already regarded as a green campus based on rankings. On the other hand, KMTTL has not applied for the green campus ranking yet. Therefore, some of the criteria listed here will not pertain to KMITL. The two universities carried out the following actions in their green campus scheme:

1. There is an "environmental sustainability" clause in the university mission statement.
2. There is a university department that takes care of the environment.
3. There are subjects regarding environmental management.

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

4. The same expectations and mindset exist for improving the environment: the goal is to produce an environment conducive for teaching and learning, and to increase the quality of life.

5. The "environment management plan" is specifically stated.

6. Key factors for success of the green campus initiatives at two universities are as follows:

- 1) The management team provides full support of the program
- 2) The strong collaboration among the team member in committee.
- 3) Financial resources.
- 4) The management directions.
- 5) The advisory team that includes professionals in green.

However, the interview results of both universities show that key different factors between MU and KMITL are:

- 1) MU already has the establishment of green campus policy and its executions with the set up concrete master plan and KPI, while nothing similar to this observed in KMITL.
- 2) MU already established the task force team in every faculty for university level collaboration, while this also not existed yet in KMITL.

From these key observations, it is suggested that KMITL should adopt the approach of MU by setting up the dedicated team to support the campus in order to be green campus and ranked in UI GreenMetric.

Table 4.20 The summarized information of MU and KMITL management interview.

Question	Associate Dean for Administration of MUJIC	Acting President of KMITL	Dean of KMITL-IC
1. Is environmental sustainability part of your university's mission statement, guiding principles, or any other document of a similar nature?	As for the university's mission, MU also set a mission that includes the environmental aspect that consider the environmentally friendly campus as a key part of its campus.	As for the university's mission, KMITL has included sustainable development as part of the university mission.	KMITL-IC has not yet included an environmental sustainability in the college mission, due to constraints with the college area.
2. Does your university have an assigned committee for overseeing the campus environmental initiatives?	Yes, the university has an assigned team that is responsible for environmental initiatives.	Yes, the institute has a land and building division that is responsible for environmental initiatives.	No, currently KMITL-IC does not have a team that takes care of environmental initiatives.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMITL	Dean of KMITL-IC
<p>3. How is your college/university involved in the university's green campus initiatives?</p>	<p>The college has appointed a committee that carries out the overall green campus program and execution. The committee also has to create initiatives and activities to support the Green Campus program. The past programs include the recycling of beverage cartons for green roof donation campaign and the appointment of Energy Saving Promotion and Evaluation Committee</p>	<p>The university is not involved in any green campus initiatives yet.</p>	<p>KMITL's mission does not include green campus initiatives in its master plan. KMITL-IC ourselves has only small projects that concern environmental management programs. We promote waste separation activities, which is a pilot plan in our college, to increase environmental awareness among students and staff.</p>

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMTL	Dean of KMTIL-IC
4. Has your university made an official commitment to reducing its impacts by setting goals of emission reduction according to UI GreenMetric requirements?	The official commitment is made and announced by the university's central office.	There is no official commitment based on the UI GreenMetric announced by the university's office.	There is no official commitment based on the UI GreenMetric announced by the university's office.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMITL	Dean of KMITL-IC
<p>5. What kind and amount of resources has your university invested on green campus initiatives? If green campus does not exist at your university, what is the level of investment that has been put on improving environmental quality of your university?</p>	<p>The MUIC invests, using MUIC's budget, on the Green Campus initiatives and environmental improvement. In the last fiscal year, MUIC invested approximately 90,000 THB in the program.</p>	<p>N/A</p>	<p>The KMITL-C invests, using the college's budget, on the environmental initiatives promotion. In the last fiscal year, KMITL-IC invested approximately 50,000 THB in the recycling program.</p>

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMITL	Dean of KMITL-IC
6. What are the environmental- and/or sustainability-related majors, such as environmental studies, ecology, or sustainable agriculture, if any, offered at your university?	MU offers 57 different sustainability-related majors.	KMITL offers around 26 different sustainability-related majors.	KMITL-IC offers M.Sc. in Logistics and Supply Chain Management that is a major related to sustainability and in 2015 the program of International Management of Resources and Environment will be opened for new applicants. Moreover, KMITL-IC established Southeast Asian Center for Urban Sustainability (SEACUS) to provide academic education, research, professional training and consultancy to increase the quality of life in urban areas and meet the needs of urban sustainability.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUJC	Acting President of KMITL	Dean of KMITL-IC
7. Why has your university adopted the green campus initiatives?	Initially, the management team of MUJC see the importance of the global warming crisis and the energy saving. Then, the college adopted the energy reduction program, to reduce the impact of the global warming, which later becomes the Green Campus program. The university also sees such importance and provides the additional supports to the college regarding the Green Campus program.	The university is not involved in any green campus initiatives yet. But in the future, if the university implements the green campus initiative, from my point of view, I think green environment initiatives will be important for KMITL and I would support the research team to study the green campus initiatives and create a pilot plan to make the university become a green campus.	To implement green campus at KMITL, KMITL-IC can be a leader to promote environmental activities across the campus as we have a professional staffs, core subjects and organization like SEACUS to support the activity with strong and useful information.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUJC	Acting President of KMTL	Dean of KMTIL-IC
8. What are your university's management expectations on implementing green campus initiatives? Have they been accomplished?	Regarding the goal and expectation of the program, the college and the team has achieved the target of the utility usage reduction.	Green campus efforts to enhance the university's image as an environmentally conscious institution.	

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMITL	Dean of KMITL-IC
9. Does the UI GreenMetric ranking have any influence on the amount of student applications?	It is impossible to have a clear response to this as currently, there is no study or survey conducted specifically for this concern. However, it might be claimed that the improved environment after the Green Campus implementation has a big impact to the visitors which provide the positive feedback to the university.	As KMITL has not applied the UI GreenMetric ranking yet, I can only say that academic qualifications and reputations affected the number of applications.	Currently, KMITL does not apply the UI GreenMetric ranking yet; the good environment atmosphere in the college will foster a higher quality of life and create a good impression for visitors.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMTL	Dean of KMTIL-IC
10. Does the UI GreenMetric ranking have any influence on the employment rate of your university graduates?	<p>There is no study or survey conducted regarding the specific impact of UI Green ranking on the university. However, after the Green Campus implementation, the university observed a greater amount of the visitors coming to the campus to see the university's Green Campus programs.</p>	N/A	N/A

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMITL	Dean of KMITL-IC
11. Has the UI GreenMetric ranking improved the university's image?	The university's green campus program is well known in the country and has become the lead-model for other universities.	As now KMITL has not applied the UI GreenMetric ranking yet, from my point of view, the UI green campus program itself, which is well known in the country and the ranking, will demonstrate that the university is committed to enhancing environmental and socially responsible practices. For KMITL we are now focusing on a high quality academic program.	The university's green campus program, with its well known in ranking, will be a material to promote university's environmental friendly image to outside.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUIC	Acting President of KMITL	Dean of KMITL-IC
12. In what areas of the green campus would you say your college is strongest?	<p>In 2012, Mahidol University was ranked at number 36 of the world while the ranking was improved in 2013 as the university was ranked at number 31. This ranking improvement shows the positive progress of the university, which also will be evaluated and improved consistently. Specifically for MUIC, the strength of the college is the college's building and infrastructure.</p>	<p>KMITL emphasizes on research in science and technology. We have no specific plan concerned with green campus.</p>	<p>KMITL-IC is an academic unit providing internationally recognized study programs, research, and academic services.</p>

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUJC	Acting President of KMITL	Dean of KMITL-IC
13. In what areas of green campus would you say the college is weakest?	The weakest point is the collaboration among the stakeholders of MUJC which still has low motivation to support the green campus program.	Initially, KMITL focuses on academic reputation in science and technology. We do not have an environmental management program or green campus in KMITL, which is the weakest point from my opinion.	KMITL-IC needs support from KMITL's council as we can develop a lot from our valuable human resources.
14. Does your university/college have a green campus management plan?	The management plan is created by the university's committee each year. This will be conducted prior the end of the fiscal year.	We KMITL have 4 missions that environmental management can apply to.	No, KMITL-IC do not have a green campus master plan.

Table 4.20 (Continued)

Question	Associate Dean for Administration of MUJIC	Acting President of KMITL	Dean of KMITL-IC
15. Please describe the key success factors of the green campus initiatives at your university/college?	<p>Key factors to achieve the green campus initiative in KMITL are following</p> <ol style="list-style-type: none"> <li>1. The management team provides the full support to the program</li> <li>2. The strong collaboration among the team member.</li> <li>3. The regular meeting for the program every month</li> <li>4. The communication both to the staff and students</li> <li>5. Promotion</li> </ol>	<p>Key factors to achieve the green campus initiative in KMITL are following</p> <ol style="list-style-type: none"> <li>1. The management directions.</li> <li>2. The strong collaboration among faculty.</li> <li>3. The advisory team that includes professional in green campus to support information and guidelines.</li> <li>4. Set up committee that has specific responsibility on green campus activity.</li> </ol>	<p>For KMITL to achieve green campus initiatives, there are three main categories as</p> <ol style="list-style-type: none"> <li>1. Financial resources.</li> <li>2. The collaboration in university between faculties.</li> <li>3. Working team.</li> </ol>

Appendix A: University management interview sheet

## CHAPTER 5

# CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

The study aimed to investigate and compare quality of life as perceived by stakeholders in green campus and non-green campus universities. MUIC and KMITL-IC were used as the representatives for green campus and non-green campus universities, respectively. Results of the study can be concluded by the following aspects:

#### 5.1.1. Perception on quality of life

Overall, the results showed that stakeholders in MUIC deem their overall quality of life to be higher than stakeholders in KMITL-IC do. The study revealed statistically significant correlations between the opinion of both groups of respondents regarding environmental management and the amount of green space in their campuses. These are important aspects to support good quality of life. The same group of people also believes that they have better quality of life compared to that of KMITL-C stakeholders. The aggregation of the relationship between in green and non-green campus user and the perception of quality of life indicated that perception was different about staff when compared to students. Researchers have suggested that staff experience greater enjoyment when compared to students on university environmental management program is of importance to them. Therefore, it is concluded that stakeholders in green campus have better quality of life than those in non-green campus.

#### 5.1.2. Satisfaction on environmental management programs

As for environmental management, MUIC has developed an environmental management program that covers all six (6) main functions of the UI GreenMetric to

support stakeholder quality of life and the attributes of green campus. This environmental management program comprised, for instance, the development of a new traffic system and regulations on campus, prohibiting motorized vehicle use in the academic zone, and the improvement of roads on campus to have dedicated friendly pedestrian walkways and cycle ways. The environmental management program also included a campaign to promote on-campus public transportation by providing a shuttle service system and the establishment of land infrastructure services to handle energy conservation activities and the waste management system. In addition to the importance of environmental management, the stakeholders from both campuses agreed that the sufficient green space on campus would support their quality of life. Specifically, in recognition of stakeholder high-rating of quality of campus life, the MU council created activities concerning with the green space improvement by adopting a landscape development and improvement approach, by specifying the significant green areas and open spaces on campus. The MU council also regularly organized green network activities including a campaign to conserve green areas and preserve the ecosystem of the campus. Ultimately, the MU council also converted various parking spaces in different areas into green space to accommodate stakeholder's activities and to promote an eco-friendly learning atmosphere on the campus. From the study, such programs promoting the green space on campus is not widely observed on the KMITL-IC campus. MUIC stakeholders indicated that they are more satisfied with environmental programs in their campus than KMITL-IC stakeholders.

## 5.2 Recommendations

Based on the results of the study, it is evident that the Green Campus initiative is preferable by university stakeholders studied as part of the study. It also entails better quality of life for them. After all, the initiative was firstly designed to promote sustainable development. Therefore, universities in Thailand should further

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

promote the initiative and improve their operation according to the UI GreenMetric. For universities that have not entered the ranking system yet, it is recommended that some actions should be taken as soon as possible.

The initiative will not only help improve quality of life and satisfaction of their stakeholders, but may also be used to help promote the universities themselves. If successfully implemented, the universities may use the initiative for marketing purposes to recruit students.

As for recommendations for future studies, it is recommended that they should be focused on the following areas:

- It is recommended that similar studies be conducted with other universities to expand the groups of the study population and to increase the sample size with greater demographically diversity, of the population.
- Further research should focus in detail on the relationship between the opinions of stakeholders and the profile of different stakeholders so as to explore the impact of stakeholder backgrounds towards their perceptions of environmental management, Green campuses and quality of campus life.
- Further research could include the study of the relationship between indicated levels of perception of quality of life and scientific data (such as air quality and health conditions on campuses). Such research would help to ensure that the Green Campus initiatives tangibly improve the quality of life rather than only be perceived to do so by stakeholders. In addition, the scientific data would assist university management to clearly set environmental management standards and to maintain and evaluate the implementation of green campus activities.
- The results of the study showed that MUIC stakeholders are more satisfied with the available green space. However, KMITL stakeholders are also somewhat satisfied with the amount of green spaces even though with

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

less level. Therefore, it is recommended that more studies be conducted to further explore effects of available green spaces per student needed. The study could also explore the size of green spaces available on campus per total number of student and the overall perception towards their quality of life.

- According to interview results, executives at both MU and KMITL expressed the vision to turn their university into a green campus. But the different is MU has already turned its university into a green campus, and ranked in UI GreenMetric, therefore MU has clearly defined mechanisms to achieved green campus. On the other hand, KMITL has not acted upon its green campus initiative yet. The key differences are the green campus policy and the task force team.
- A data gap analysis should be conducted to compare the difference in all fields of UI GreenMetric between Green and Non-green campuses. Specifically for MUIC and KMITL-IC, it might be interesting to quantify and investigate the difference between the data gaps and the difference in perception of quality of life between the two campuses

## REFERENCES

- Allardt, E. 1976. Dimensions of welfare in the comparative Scandinavian study , *Acta Sociologica*. 9 : 227-239.
- Alshuwaikhat, M.H. and Abubakar, I. 2008. An integrated approach to achieving campus sustainability assessment of the current campus environmental management practices , *Journal of Cleaner Production*. 16 : 1777-1785.
- Boyer, E.L. 1987. *College: The undergraduate experience in America*. New York: Harper and Row Publishers.
- Campbell, A. Converse, P. and Rodgers, W. 1976. *The quality of American life*. New York: Russell Sage Foundation.
- Central European University Sustainable Campus. 2010 *What is Sustainability?* [Online]. Available: <http://actjust.ceu.hu/framework%20concept>
- Creighton, S.H.1999, *Greening the Ivory Tower. Improving the Environmental Track Record of Universities, Colleges, and Other Institutions*. Cambridge Massachusetts MIT Press
- Dictionary.com, "Green space," in Dictionary.com's 21st Century Lexicon. [Online]. Available : [http://dictionary.reference.com/browse/Green space](http://dictionary.reference.com/browse/Green%20space).
- Diener, E., and E. Suh. 1997. Measuring quality of life: Economic, social, and subjective indicators. *Social Indicators Research*, 40 :189-216.
- Dillman, D. and K. Tremblay. 1977. The quality of life in rural America . *Annals of the American Academy of Political and Social Science*, 429 : 115-129.
- Dravigne, A. 2006. The effect of life plants and window views of green spaces on employee perceptions of job satisfaction. Unpublished

master s thesis, Texas State University-San Marcos, San Marcos, Texas.

Gottlieb, P. D., Amenities as an Economic Development Tool: Is There Enough Evidence? *Economic Development Quarterly*, Vol. 8, No. 3, August 1994, pp. 270-285

Griffith, J.C. 1994. Open space preservation. *Journal of Higher Education*, 65(6) : 645-669.

Grindsted, T. H. 2012. Thematic development of declarations on sustainability in higher education *Journal of Environmental Economics*, 3 (1) : 32-40

GUIDELINES of UI GREENMETRIC WORLD UNIVERSITY RANKING 2013. [Online].

Available:

[http://greenmetric.ui.ac.id/web/upload/\\_pdf/Guideline2013\\_GREENMETRIC%20WORLD%20UNIVERSITY%20RANKING\\_1.2\\_23052013.pdf](http://greenmetric.ui.ac.id/web/upload/_pdf/Guideline2013_GREENMETRIC%20WORLD%20UNIVERSITY%20RANKING_1.2_23052013.pdf)

Hans, V. W. 2000 "Towards a vision of a sustainable university", *International Journal of Sustainability in Higher Education*, 1: 20-34

Hazelkorn, E., 2011. World-class Universities or World-class Systems? Rankings and Higher Education Policy Choices. 2011. UNESCO Forum on Rankings and Accountability in Higher Education, Paris, 16e17

Im, S. 1984. Visual preferences in enclosed urban spaces: An exploration of a scientific approach to environmental design. *Environment and Behavior*, 16(2): 235-262.

Kaplan, R. and Kaplan, S. 1989. *The experience of nature: A psychological perspective*. Cambridge, New York , Cambridge University Press.

Kaplan, R. 1992. The psychological benefits of nearby nature. In: D. Relf (ed.) *The role of horticulture in human well-being and social development*, Oregon: Timber press.

Karmel, L.J. 1965. Effects of windowless classroom environment on high school students. *Perceptual and Motor Skills*, 20: 277-278.

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

King Mongkut's Institute of Technology Ladkrabang, 2009. [Online].

Available: <http://www.kmitl.ac.th/en/about.main.php?page=main>

Lauer, G. 1999. Concepts of quality of life in mental health care. In *Quality of Life and Mental Health Care* (eds S. Priebe, J. P. J. Oliver & W. Kaiser), Philadelphia: 19 -34.

Liu, B. 1974. Quality of life indicators: A preliminary investigation. *Social Indicators Research*, 1: 187-208. Mahidol university Office of President, 2012 [Online].

Available:[http://www.op.mahidol.ac.th/oppe/img/mu\\_eco/1mahidol%20Green%20campus.pdf](http://www.op.mahidol.ac.th/oppe/img/mu_eco/1mahidol%20Green%20campus.pdf)

Mahidol Sustainable University, 2013 [Online]. Available: <http://mahidol.ac.th/green/>

Mahidol university fact and figures. 2013-2014 [Online]. Available:

<http://www.mahidol.ac.th/en/facts-figures/Fact2013-2014.pdf>

Maslow, A.H. 1943. A theory of human motivation. *Psychological Review*, 50: 370-396.

McFarland, A.L. Waliczek, T.M. and Zajicek, J.M. 2008. The Relationship Between Student Use of Campus Green Spaces and Perceptions of Quality of Life, *HortTechnology*,18 (2): 232-238

McCall, S. 1975. Quality of life. *Social Indicators Research*, 2, 229-248.

Mehta, P. and Wiesehan, M. 2013. Sustainable Energy in Building Systems. *Procedia Computer Science* 19: 628 635

Milbrath, L. 1979. Policy relevant quality of life research. *Annals of the American Academy of Political and Social Science*, 444: 32-45.

O Riordan,T.,(1976), *Environmentalism*, Pion Ltd., London

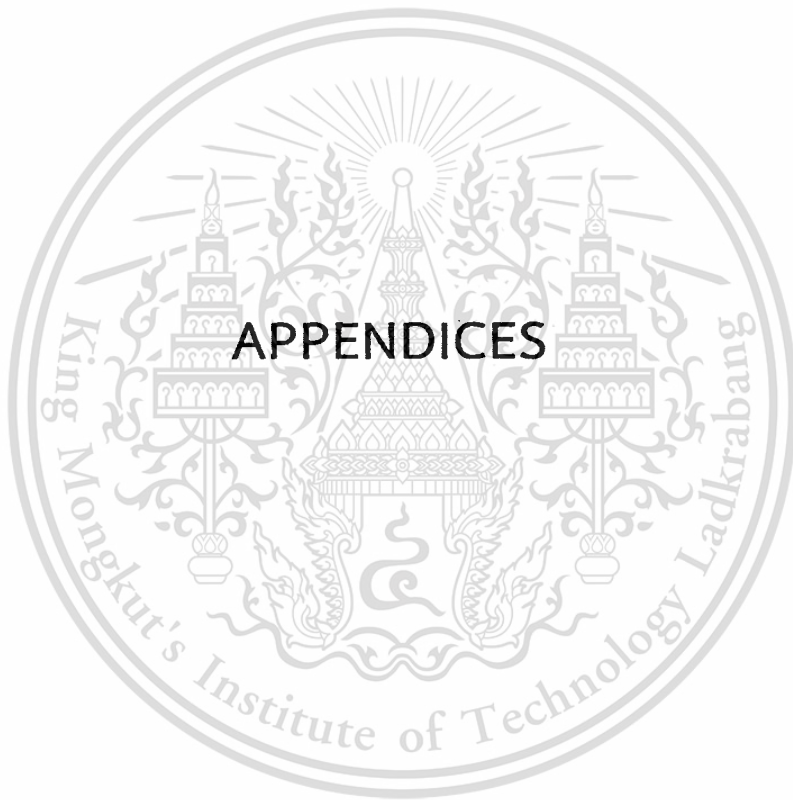
Roberts, L.W. and R.A. Clifton. 1991. *Measuring the quality of university student life*. Winnipeg: University of Manitoba, Centre for Higher Education Research and Development.

Ru en, K. 2012. The Quality of Life and the Environment, *Procedia - Social and Behavioral Sciences*, 35: 23 32

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

- Sari, R.F. 2012. Methodology and evaluation of green and sustainable campus indicators for world university ranking Proceeding of the International Ranking Expert Group-6 (IREG- 6), Taipei
- Schuessler, K.F. and Fisher, G.A. 1985. Quality of life research and sociology. *Annual Review of Sociology*, 11: 129-149.
- Suwartha, N. Sari, R. F. 2013 Evaluating UI GreenMetric as a tool to support green universities development: assessment of the year 2011 ranking. *Journal of Cleaner Production*, Volume 61: 46-53
- UI Greenmetric. 2014. GreenMetric Ranking. [Online].  
Available: <http://greenmetric.ui.ac.id/ranking>.
- Ulrich, R.S. 1979. Visual landscapes and psychological well-being. *Landscape Research*, 4, 17-23.
- UNESCO. 1997. Thessaloniki Declaration. Gland: UNESCO
- UNESCO CEPES. 2004 Higher Education Ranking Systems and Methodologies Centre for Higher Education.: How They Work, What They Do,
- University Leaders for a sustainable future. 1990. The Talloires Declaration. [Online].  
Available: [http://www.ulsf.org/programs\\_talloires\\_history.html](http://www.ulsf.org/programs_talloires_history.html)
- WHOQOL Group. 1997 Measuring Quality of Life: The Development of the World Health Organization Quality of Life Instrument (WHOQOL). Geneva.
- Wolf, K. L. 1996. Psycho-Social Dynamics of the Urban Forest in Business Districts.
- Waliczek, T.M. Mattson, R.H. and Zajicek, J.M. 1996. Benefits of community gardening on quality of life issues. *Journal of Environmental Horticulture*, 14(4)
- Wright, T. S. A. (2002). Definitions and frameworks for environmental sustainability in higher education. *Higher Education Policy* 15 :105 120
- Yamane T. 1967. *Statistics, An Introductory Analysis*. New York: Harper and Row.



This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

The seal of King Mongkut's Institute of Technology Ladkrabang is a circular emblem. It features a central sunburst with rays emanating from a central point. Below the sunburst are two traditional Thai stupas (chedis) flanking a central, more ornate structure. The entire emblem is surrounded by a decorative border. The text "King Mongkut's Institute of Technology Ladkrabang" is inscribed around the perimeter of the seal.

**Appendix A:**  
**University Management Interview Report**

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

## Interview form for university's management concerning Green Campus

**Interview with Sumalee Visetratana, Associate Dean for Administration,  
International College, Mahidol University, 24 March 2014**

1. Is environmental sustainability part of university's mission statement, guiding principles, or similar document?

Answer As for the university's mission, Mahidol University also set the mission of the university which includes the environmental aspect. We consider the environmental friendly campus as a key part of its campus. The university's management has set a clear KPI to control and manage the campus, especially regarding the environment in the campus. For instance, the university will have the target to reduce the water consumption and the paper usage across the campus. Most important, the university's central office will set the core strategy, regarding the green campus management, and then share among each faculty/college with the clear proportion of the responsibility to be taken from each department. Each department across the university will take the responsibility to create the program to manage and improve the environment in their areas. Ultimately, the plan and the strategy of each department regarding the green campus will be an important part of each department's mission.

Vision: Mahidol University is determined to be A World Class University

Mission: To excel in health, sciences, arts and innovation with integrity for the betterment of Thai society and the benefit of mankind.

Strategy 7: Eco University

Vision : Healthy and Happy Workplace

Mission : A Learning University that lives with nature

Policies : - Green Campus in 2010 - Creative Sustainable University in 2015

Eco Index Corporate KPI: adjusted consumption rate of

1. Electrical Power
2. Water usage
3. Gasoline Usage
4. Paper usage

2. Does your university dedicate a committee to overseeing the campus environmental initiatives?

Answer Yes, the university has the dedicated team to take the responsibility on the environmental initiatives.

.3. How is your college involved in the university's green campus initiatives?

Answer The college has appointed the committee the Energy Saving Promotion and Evaluation Committee to carry out the overall green campus program and execution. Each committee will be in charge for a period of 2 years. Then a new committee will be appointed. Each month, the committee takes responsibility for collecting and reporting the utility usage reduction (water, electricity, paper) following the plan to the university's central office. The committee also has to create initiatives and activities to support the Green Campus program. The past programs included the recycling of beverage cartons to support a green roof donation campaign.

4. Has your university made an official commitment to reducing its impacts by setting goals of emission reduction according to UI Green Metric requirements?

Answer The official commitment is made and announced by the university's central office.

5. What kind and amount of resources has your university invested on green campus initiatives?

Answer If green campus does not exist at your university, what is the level of investment has been put on improving environmental quality of your university? The MUIC invests, using MUIC's budget, on the Green Campus initiatives and environmental improvement. In the last fiscal year, MUIC invested in the program approximately 90,000 THB.

6. What are the environmental- and/or sustainability-related majors, such as environmental studies, ecology, or sustainable agriculture, if any, offered at your university?

Answer MUIC offers 57 different sustainability-related majors.

7. Why has your university adopted the green campus initiatives?

Answer Initially, the management team of MUIC saw the importance of the global warming crisis and energy saving. Then, the college adopted the energy reduction program, to reduce the impact of the global warming, which later became the Green Campus program. The university also sees such importance and provides the additional supports to the college regarding the Green Campus program.

8. What are your university's management expectations on implementing green campus initiatives? Have they been accomplished?

Answer Considering the goal and expectation of the program, the college and the team has achieved the target of the utility usage reduction. For example, the program delivered the expected the water and electricity usage reduction as planned. Though, it is noticed that the result of the program is from the investment in infrastructure. The return on this investment requires a period of 3-4 years. Such investments include replacing the old air conditioner with new models which are

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

more environmental friendly and require less energy consumption, and replacing over 4,000 old light bulbs with the T5 model for better performance.

9. Does the UI Green Metric ranking have any influence on the amount of student applications?

Answer It is impossible to have a clear response to this as, currently; there is no study or survey conducted specifically for this concern. Though, it might be claimed that the improved environment after the Green Campus implementation, such as the provision of bicycle lane and the dedicated walking path, and the increase green spaces on campus, has a big impact to the visitors which provide the positive feedback to the university.

10. Does the UI green ranking have any influence on the employment rate of your university graduates?

Answer There is no study or survey conducted regarding the specific impact of UI Green ranking on the university. Though, after the Green Campus implementation, it is observed a greater amount of visitors coming to the campus to get to know the university's Green Campus programs.

11. Has the UI green ranking improved the university's image?

Answer The university's Green Campus program is well known in the country and has become the lead-model for other universities.

12. In what areas of green campus would you say university is strongest?

Answer In 2012, the Mahidol University was ranked at number 36 of the world while the ranking was improved in 2013 as the university was ranked at number 31. This ranking improvement shows the positive progress of the university which also will be evaluated and improved consistently. Specifically for the MUIC, the strength of the

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

college is the college's building and infrastructure for example we create a relax area for student and staff and provide them with a lot of trees. Furthermore, central unit also improve pathways on the campus to be more suitable for walking, cycling and public transport.

13. In what areas of green campus would you say the university is weakest?

Answer The weakest point is the collaboration among the stakeholders of MUIC which still have low motivation to support the Green Campus program. Thus, the college creates the activity to improve the program and the collaboration, for example the energy saving awards provided for the best college's office and departments which deliver the best energy reduction. In addition, the college also has the committee to do the audit and to evaluate randomly every 3 months on the program.

14. Does your university/college have a green campus management plan?

Answer The management plan is created by the university's committee each year. This will be conducted prior the end of fiscal year. The committee will provide the clear tasks and timeline for the program by considering 3 key areas - water, electricity and paper usage reduction.

15. Please describe the key success factors of the green campus initiatives at your university/college?

Answer

1. The management team provides full support to the program
2. The strong collaboration among the team member
3. Regular monthly meetings.
4. The communication both to the staff and students across platforms – both online (e-mail) and offline (information board)

5. The program and information about the Green Campus are added into the student orientation day.



This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

## Interview form for university's management concerning Green Campus

Interview with Prof. Dr. Monai Krairiksh, Acting President, King Mongkut's  
Institute of Technology Ladkrabang, 12 June 2014

1. Is environmental sustainability part of university's mission statement, guiding principles, or similar document?

Answer As for the university's mission, King Mongkut's Institute of Technology Ladkrabang has set the mission of the university which includes the sustainable development. The institute's management has included the sustainability in one of four categories mission This is shown in the statement of "Advancement of knowledge and research in science, engineering, and technology to support the sustainable development of the nation and toward international excellence".

2. Does your university dedicate a committee to overseeing the campus environmental initiatives?

Answer Yes, the institute has a land and building division to take responsibility on the environmental initiatives.

3. How is your university involved in the university's green campus initiatives?

Answer The university is not involved in any green campus initiatives yet.

4. Has your university made an official commitment to reducing its impacts by setting goals of emission reduction according to UI Green Metric requirements?

Answer There is no official commitment according to UI green Metric announced by the university's office.

5. What kind and amount of resources has your university invested on green campus initiatives?

Answer N/A

6. What are the environmental- and/or sustainability-related majors, such as environmental studies, ecology, or sustainable agriculture, if any, offered at your university?

Answer KMITL offers around 26 different sustainability-related majors.

7. Why has your university adopted the green campus initiatives?

Answer The university is not involved in any green campus initiatives yet. But in the future, if university implements the Green Campus, from my point of view, I think green environment initiatives will be important for KMITL and I would support the researcher team to study the green campus initiatives and create a pilot plan to make the university become a Green campus.

8. What are your university's management expectations on implementing green campus initiatives? Have they been accomplished?

Answer The most important expectation of the program is good environment that support excellent learning experience.

9. Does the UI Green Metric ranking have any influence on the amount of student applications?

Answer As now KMITL does not apply the UI Green ranking yet, I can tell only that academic qualifications and reputations affected to the number of applications.

10. Does the UI green ranking have any influence on the employment rate of your university graduates?

Answer N/A

11. Has the UI Green ranking improved the university's image?

Answer As now KMITL does not apply the UI Green ranking yet, from my point of view UI Green Campus program itself, which is well known in the country and the ranking, will demonstrates that university commits to enhancing environmental and socially responsible practices. For KMITL now we are focusing on a high quality academic program.

12. In what areas of green campus would you say university is strongest?

Answer KMITL emphasizes on research in science and technology we are no specific plan concerned on green campus.

13. In what areas of green campus would you say the university is weakest?

Answer Initially, KMITL focuses on academic reputation in science and technology. We do not have an environmental management program or Green Campus in KMITL that is the weakest point from my opinion. But to develop and set up it in the university master plan, we need to get approve from KMITL's board directors, so we can start a small unit to be a pilot plan. After we get a concrete results, we could easily present the advantages of Green Campus initiatives to others member, showing that Green Campus can support a high quality of life among stakeholder in KMITL

14. Does your university/college have a green campus management plan?

Answer We KMITL have 4 missions that environmental management can apply to. We have to start improve from the inside of KMITL then expand to outside and nationwide.

15. Please describe the key success factors of the green campus initiatives at your university/college?

Answer Key factors to achieve the Green Campus initiative in KMITL are following

1. The management directions.
2. The strong collaboration among faculty.
3. The advisory team that includes professional in Green Campus to support information and guidelines that KMITL-IC can be a leader.
4. Set up committee that has specific responsibility on Green Campus activity.



## Interview form for university's management concerning Green Campus

Interview with Assoc. Prof. Dr. Supat Kittiratsatcha, Dean, International College, King Mongkut's Institute of Technology Ladkrabang, 12 June 2014

1. Is environmental sustainability part of university's mission statement, guiding principles, or similar document?

Answer KMITL-IC is mainly focusing on an academic unit providing internationally recognized study programs and research. KMITL-IC does not yet set an environmental sustainability in the college mission, due to the limit of college's area.

2. Does your university dedicate a committee to overseeing the campus environmental initiatives?

Answer In current situation KMITL-IC does not have a team to take care of the environmental initiatives but in the near future, after KMITL-IC has our own areas, the environment committee should establish to control and take responsibility in, environment initiatives. This committee will provide a good environment management that supports high quality of life to students and staffs.

3. How is your college involved in the university's green campus initiatives?

Answer KMITL's mission does not include Green Campus initiatives in the master plan. KMITL-IC ourselves has only small projects that concern to environment management program. We promote the waste separation activity, which is a pilot plan in our college, to increase environmental awareness to student and staff.

4. Has your university made an official commitment to reducing its impacts by setting goals of emission reduction according to UI Green Metric requirements?

Answer There is no official commitment according to UI green Metric announced by the university's office.

5. What kind and amount of resources has your university invested on green campus initiatives? If green campus does not exist at your university, what is the level of investment has been put on improving environmental quality of your university?

Answer The KMITL-C invests, using college's budget, on the environmental initiatives promotion. In the last fiscal year, KMITL-IC invested in the recycling program approximately 50,000 THB.

6. What are the environmental- and/or sustainability-related majors, such as environmental studies, ecology, or sustainable agriculture, if any, offered at your university?

Answer KMITL-IC offers M.Sc. in Logistics and Supply Chain Management that is a major related to sustainability and in 2015 the program of International Management of Resources and Environment will be opened for new applicants. Moreover, KMITL-IC established Southeast Asian Center for Urban Sustainability (SEA-CUS) to provide academic education, research, professional training and consultancy to increase the quality of life in urban areas and meet the needs of urban sustainability.

7. Why has your university adopted the green campus initiatives?

Answer To implement green campus at KMITL, KMITL-IC can be a leader to promote environmental activities across the campus as we have a professional staffs, core subjects and organization like SEA-CUS to support the activity with strong and useful information.

8. What are your university's management expectations on implementing green campus initiatives? Have they been accomplished?

Answer Green Campus effort to enhance the university's image as an environmentally conscious institution.

9. Does the UI Green Metric ranking have any influence on the amount of student applications?

Answer Currently, KMITL does not apply the UI Green ranking yet; the good environment atmosphere in the college will support high quality of life and make a good impression to visitors.

10. Does the UI green ranking have any influence on the employment rate of your university graduates?

Answer There is no study or survey conducted regarding the specific impact of UI Green ranking on the university. From my opinion the employment factors are mainly student qualifications and academic courses.

11. Has the UI green ranking improved the university's image?

Answer The university's Green Campus program, with its well known in ranking, will be a material to promote university's environmental friendly image to outside.

12. In what areas of green campus would you say college is strongest?

Answer KMITL-IC is an academic unit providing internationally recognized study programs, research, and academic services.

13. In what areas of green campus would you say the college is weakest?

Answer KMITL-IC needs a support form KMITL's council as we can develop a lot from our valuable human resources.

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

14. Does your university/college have a green campus management plan?

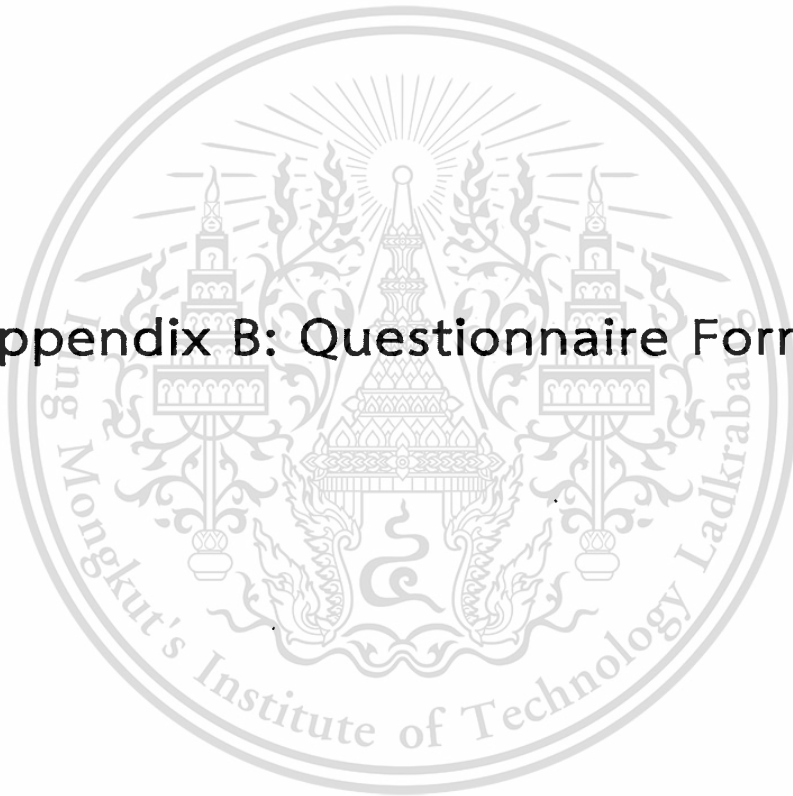
Answer No, we do not have a green campus master plan. For starting firstly, we need to establish committees to run the activities by establishing policy and clear direction from university. Moreover, the management team has to understand and support Green Campus initiative. Then we need corporate engagements from all sections to set up a green campus management plan.

15. Please describe the key success factors of the green campus initiatives at your university/college?

Answer For KMITL to achieve Green Campus initiatives consists of three main categories as

1. Financial resources.
2. The collaboration in university between faculties.
3. Finally, KMITL-IC's readiness. KMITL-IC is ready to be a role model because we have a professional team and research documents to promote KMITL to be a Green Campus.

## Appendix B: Questionnaire Form



This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

## Questionnaire:

### COMPARISON OF THE PERCEPTION REGARDING QUALITY OF LIFE AMONG STAKEHOLDERS IN GREEN AND NON-GREEN CAMPUS UNIVERSITIES

(แบบสอบถาม: การเปรียบเทียบความคิดเห็นต่อการรับรู้คุณภาพชีวิตของผู้มีส่วนได้ส่วนเสียในมหาวิทยาลัยที่มีการดำเนินกิจกรรมสถาบันสีเขียวและสถาบันที่ไม่ได้มีการดำเนินกิจกรรมสถาบันสีเขียว)

This questionnaire is part of a research by Ms. Nisanat Jirasit to fulfill her thesis requirements of Master Program in International Management of Resources and Environment (International Program), KMITL International College, entitled as "Comparison perception of Quality of Life among Stakeholder in Green and Non-Green Campus Universities."

(แบบสัมภาษณ์นี้เป็นส่วนหนึ่งของงานวิจัยโดยน.ส.นิตานาด จิรสัทธี เพื่อเป็นส่วนหนึ่งของการศึกษาตามหลักสูตรการจัดการทรัพยากรและสิ่งแวดล้อมระหว่างประเทศมหาบัณฑิต (หลักสูตรนานาชาติ) สถาบันเทคโนโลยีพระจอมเกล้า เจ้าคุณทหารลาดกระบัง ในหัวข้อ "การเปรียบเทียบความคิดเห็นการรับรู้คุณภาพชีวิตของผู้มีส่วนได้ส่วนเสียในมหาวิทยาลัยที่มีการดำเนินกิจกรรมสถาบันสีเขียวและสถาบันที่ไม่ได้มีการดำเนินกิจกรรมสถาบันสีเขียว")

Notes (หมายเหตุ):

This questionnaire is designed to investigate perception and concerns of stakeholders in green and non-green campus universities. A green campus is a higher education community that is improving energy efficiency, conserving resources and enhancing environmental quality by educating for sustainability and creating healthy living and learning environment. This survey is anonymous and your response will be treated completely confidential.

(การศึกษาครั้งนี้มีกลุ่มเป้าหมายทางการสำรวจเป็นของกลุ่มตัวอย่างในสถาบันการศึกษา ที่มีการดำเนินกิจกรรมสถาบันสีเขียวและสถาบันที่ไม่ได้มีการดำเนินกิจกรรมเป็นตัวแทนที่จะได้รับการสำรวจ

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

มหาวิทยาลัยสีเขียวหมายถึง มหาวิทยาลัยที่มีการบูรณาการอนุรักษ์ด้านพลังงาน และสิ่งแวดล้อมเข้าไปในการเรียนการสอน การวิจัย และในทุกกิจกรรมของมหาวิทยาลัย ทั้งนี้เพื่อให้เกิดการทำงานในบรรยากาศที่มีความปลอดภัย เป็นมิตรกับสิ่งแวดล้อมและประหยัดพลังงาน อันก่อให้เกิดผลดีต่อสิ่งแวดล้อมและชุมชนของชาติ โดยข้อมูลที่ได้จากการตอบแบบสอบถาม ข้อมูลทั้งหมดจะถือเป็นความลับ)

Instruction (คำแนะนำ):

The questionnaire is divided into two parts; (แบบสอบถามแบ่งออกเป็น 2 ส่วน)

Part One - General information (ส่วนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม)

Part Two - Quality of life and university's environmental management (ส่วนที่ 2 คุณภาพ ชีวิตและการจัดการสิ่งแวดล้อมของมหาวิทยาลัย)

Should you have any questions or comments, please contact

Ms. Nisanat Jirasit at: Phone: 081-421-1050 Email: nisanat.jir@gmail.com

Or her principal, Dr. Ronnchai Tiyarattanachai, lecturer of KMITL International

College at: Phone: 081-659-8619 Email: rtiyarattanachai@gmail.com

(ผู้ที่มีความประสงค์จะสอบถามหรือให้คำแนะนำสามารถติดต่อ น.ส. นิสานาถ จิรสิทธิ์

โทรศัพท์: 081-421-1050 อีเมล: nisanat.jir@gmail.com

หรือติดต่ออาจารย์ที่ปรึกษาวิทยานิพนธ์ ดร.รณชัย ติยะรัตนาชัย

โทรศัพท์: 081-659-8619 อีเมล: rtiyarattanachai@gmail.com)

Part One: General Information (ส่วนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม)

Please select your answer by check ✓ in the  according to your information and fill in your answer\_\_\_\_\_on for the open-ended questions.

(โปรดทำเครื่องหมาย ✓ ลงในช่อง  ที่ตรงกับความจริงของท่านมากที่สุด และกรอกข้อมูลลงใน \_\_\_\_\_สำหรับคำถามแบบอัตนัย กรุณาเติมคำตอบจนครบทุกข้อ)

1. What university are you affiliated with? (คุณสังกัดอยู่มหาวิทยาลัยใด)

Mahidol University (มหาวิทยาลัยมหิดล)

King Mongkut's Institute of Technology Ladkrabang

(สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง)

2. Gender (เพศ)

Male (ชาย)

Female (หญิง)

3. Which category below includes your age? (อายุ)

≤20 (น้อยกว่าหรือเท่ากับ 20 ปี)

Between 21 and 24 (21-24 ปี)

Between 25 and 29 (25-29 ปี)

Between 30 and 34 (30-34 ปี)

Between 35 and 40 (35-40 ปี)

≥40 (มากกว่าหรือเท่ากับ 40 ปี)

4. What is your nationality? (เชื้อชาติ)

Thai (ไทย)

other, please specify (อื่นๆโปรดระบุ) \_\_\_\_\_

5. How many members are there in your family? (จำนวนสมาชิกในครอบครัว)

1-2

3-4

≥5

## 6. What is your status? (สถานภาพ)

- Freshman (นักศึกษาชั้นปีที่ 1)                       Sophomore (นักศึกษาชั้นปีที่ 2)
- Junior (นักศึกษาชั้นปีที่ 3)                       Senior (นักศึกษาชั้นปีที่ 4)
- Grad student (นักศึกษามหาบัณฑิต)
- Lecturer Note: please skip to Question #8 (อาจารย์ กรุณาข้ามไปตอบข้อ 8)
- Administrators Note: please skip to Question #8  
(เจ้าหน้าที่กรรณาข้ามไปตอบข้อ 8)

7. If you are student please identify, what is your major?

(นักศึกษาโปรดระบุสาขาที่กำลังศึกษาอยู่)

---

## 8. Where do you currently live? (คุณอาศัยอยู่ที่ใด)

- On-campus Note: please skip to Question # 10  
(ภายในมหาวิทยาลัย กรุณาข้ามไปตอบข้อ10)
- Off-campus;  $\leq 5$  km.  
(ภายนอกมหาวิทยาลัยระยะทางน้อยกว่าหรือเท่ากับ 5 กิโลเมตร)
- Off-campus; 6-10 km.  
(ภายนอกมหาวิทยาลัยระยะทางระหว่าง6-10 กิโลเมตร)
- Off-campus; (11-15 km.  
(ภายนอกมหาวิทยาลัยระยะทางระหว่าง 11-15 กิโลเมตร)
- Off-campus; 16-20 km.  
(ภายนอกมหาวิทยาลัยระยะทางระหว่าง 16-20 กิโลเมตร)
- Off-campus; more than 20km.  
(ภายนอกมหาวิทยาลัยระยะทางมากกว่า 20 กิโลเมตร)

9. If you live off-campus, what is your most frequently used mode of transportation for commuting from home to university? (หากคุณอาศัยอยู่ภายนอกมหาวิทยาลัยคุณเดินทางจากบ้านมามหาวิทยาลัยโดยใช้วิธีการเดินทางวิธีใดบ่อยที่สุด)

- Walk (เดิน)
- Bicycle (จักรยาน)
- Personal Motorcycle (จักรยานยนต์ส่วนบุคคล)
- Personal car (รถยนต์ส่วนบุคคล)
- Public transit (ขนส่งสาธารณะ)
- University's shuttle bus (รถรับส่งของมหาวิทยาลัย)
- Combined mode please specify (หลายช่องทางโปรดระบุ) \_\_\_\_\_

10. On average how often you are on-campus a week?

(โดยเฉลี่ยคุณมามหาวิทยาลัยกี่วันต่อสัปดาห์)

- $\geq 5$  days/week (มากกว่าหรือเท่ากับ 5 วันต่อสัปดาห์)
- 3-4 days/week (3-4 วันต่อสัปดาห์)
- 1-2 days/week (1-2 วันต่อสัปดาห์)
- $\leq 1$  day/week (น้อยกว่าหรือเท่ากับ 1 วันต่อสัปดาห์)

## Part Two - Quality of life and university's environmental management

### (ส่วนที่ 2 คุณภาพชีวิตและการจัดการสิ่งแวดล้อมของมหาวิทยาลัย)

#### Definition ความหมาย

**Sustainable Development:** “Sustainable Development is development that meets to needs of the present without compromising the ability of the future generations to meet their own needs” (WCED. 1987) (การพัฒนาอย่างยั่งยืน หมายถึง รูปแบบของการพัฒนาที่สนองความต้องการของคนในรุ่นปัจจุบัน โดยไม่ทำให้คนรุ่นต่อไปในอนาคตต้องประนีประนอมยอมลดทอนความสามารถในการที่จะตอบสนองความต้องการของตนเอง)

This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

Quality of life : Quality of life refers to the level of well-being of the society and the degree of satisfaction of a number of human needs. (UNESCO 1993) (คุณภาพชีวิตหมายถึง ระดับความเป็นอยู่ที่ดีของสังคม และระดับความพึงพอใจในความต้องการส่วนหนึ่งของมนุษย์)

Please select your answer by check  in the  according to your information and fill in your answer on \_\_\_\_\_ for the open-ended questions.

(โปรดทำเครื่องหมาย  ลงในช่องที่ตรงกับความจริงของท่านมากที่สุด และกรอกข้อมูลลงใน \_\_\_\_\_ สำหรับคำถามแบบอัตนัย กรุณาเติมคำตอบจนครบทุกข้อ)

- 5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)  
 4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)  
 3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)  
 2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)  
 1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)

11. Environment management is very important of a university's campus.

(การจัดการสิ่งแวดล้อมเป็นสิ่งจำเป็นมากในมหาวิทยาลัย)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
 (เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง) (ไม่มีความคิดเห็น)

12. You are satisfied with environmental management of your university.

(คุณพึงพอใจต่อการจัดการสิ่งแวดล้อมในมหาวิทยาลัยของคุณ)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
 (เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง) (ไม่มีความคิดเห็น)

13. Do you know sustainable development is a part of university's mission statement? (คุณทราบหรือไม่ว่าการพัฒนาอย่างยั่งยืนเป็นส่วนหนึ่งของพันธกิจของมหาวิทยาลัย)

Yes (ทราบ)  No (ไม่ทราบ)

14. Sustainable development is a part of my curriculum/work or has been a topic in one of my classes? (การพัฒนาอย่างยั่งยืนเป็นส่วนหนึ่งของหลักสูตร/การทำงานหรือเป็นหัวข้อหนึ่งการเรียนในชั้นเรียน)

Yes (ใช่)

No (ไม่ใช่)

N/A (ไม่เกี่ยวข้อง)

15. You regularly participate in green campus campaign (energy saving, water saving, etc.) (คุณมีส่วนร่วมในกิจกรรม การรณรงค์มหาวิทยาลัยสีเขียวเป็นประจำ ยกตัวอย่างเช่น การประหยัดพลังงาน, การประหยัดน้ำ ฯลฯ)

Yes (ใช่)

No (ไม่ใช่)

16. How important university green space available for you? (พื้นที่สีเขียวในมหาวิทยาลัยมีความจำเป็นต่อคุณในระดับใด)

5-refers to Very important (สำคัญมาก)

4-refers to Fairly important (ค่อนข้างสำคัญ)

3-refers to Neutral (ปานกลาง)

2-refers to Not so important (ค่อนข้างไม่สำคัญ)

1-refers to Not at all important (ไม่สำคัญ)

17. For which purpose do you use green spaces on the campus? (คุณใช้พื้นที่สีเขียวในมหาวิทยาลัยสำหรับกิจกรรมใด)

To relax (การพักผ่อน)

To study (การศึกษา)

To picnic (การพักผ่อนอาหารร่วมกัน)

Recreation activity (กิจกรรมนันทนาการ)

18. The university does provide enough green space to support a high quality of life. (มหาวิทยาลัยมีพื้นที่สีเขียวเพียงพอสำหรับการสนับสนุนคุณภาพชีวิตที่ดี)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง (ไม่มีความคิดเห็น))

19. Energy saving is a very important practice for your university. (การประหยัดพลังงานของมหาวิทยาลัยเป็นกิจกรรมสำคัญสำหรับมหาวิทยาลัยของคุณ)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง (ไม่มีความคิดเห็น))

20. The Universities energy saving practice does support a high quality of life. (กิจกรรมการประหยัดพลังงานของมหาวิทยาลัยสนับสนุนคุณภาพชีวิตที่ดี)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง (ไม่มีความคิดเห็น))

21. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university. (นโยบายการบรรเทาผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศของมหาวิทยาลัย (โครงการลดการปล่อยก๊าซเรือนกระจก) เป็นกิจกรรมสำคัญสำหรับมหาวิทยาลัยของคุณ)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง (ไม่มีความคิดเห็น))

22. Waste management (example waste separation, waste reduction) is a very important practice for your university. (การจัดการของเสีย เช่นการคัดแยกขยะ, การลดขยะ เป็นกิจกรรมสำคัญสำหรับมหาวิทยาลัยของคุณ)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง (ไม่มีความคิดเห็น))

23. Universities waste management(example waste separation, waste reduction) does support a high quality of life. (การจัดการของเสียของมหาวิทยาลัย เช่นการคัดแยกขยะ, การลดขยะ สนับสนุนคุณภาพชีวิตที่ดี)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง) (ไม่มีความคิดเห็น)

24. Universities water management (water saving) does support a high quality of life.

(การจัดการน้ำของมหาวิทยาลัย เช่นการ ประหยัดน้ำ สนับสนุนคุณภาพชีวิตที่ดี)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง) (ไม่มีความคิดเห็น)

25. Universities transportation condition (amount of traffic, availability of public

transportation, etc.) does support a high quality of life. (ระบบขนส่งของมหาวิทยาลัย เช่นการจราจรและจำนวนระบบขนส่งสาธารณะของมหาวิทยาลัยสนับสนุนคุณภาพชีวิตที่ดี)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง) (ไม่มีความคิดเห็น)

26. Universities education for green (academic courses and activities related to environmental) does support a high quality of life. (ระบบการเรียนการสอนเพื่อ

สิ่งแวดล้อมของมหาวิทยาลัยเช่น หลักสูตรที่เกี่ยวข้องกับสิ่งแวดล้อมช่วยสนับสนุนคุณภาพชีวิตที่ดี)

Strongly Agree  5  4  3  2  1 Strongly Disagree  N/A  
(เห็นด้วยอย่างยิ่ง) (ไม่เห็นด้วยอย่างยิ่ง) (ไม่มีความคิดเห็น)

27. Are you interested in learning more about green campus? (คุณมีความสนใจที่จะศึกษาเพิ่มเติมเกี่ยวกับมหาวิทยาลัยสีเขียว)

Yes (ใช่)  No (ไม่ใช่)  Not Sure (ไม่แน่ใจ)

28. Overall how would you rank the quality of your life on campus? (โดยภาพรวมแล้ว  
คุณคิดว่าคุณภาพชีวิตในมหาวิทยาลัยของคุณอยู่ในระดับใด)

- 5-refers to Very good (ดีมาก)
- 4-refers to Fairly good (ค่อนข้างดี)
- 3-refers to Neither good or bad (ปานกลาง)
- 2-refers to Not very good (ค่อนข้างไม่ดี)
- 1-refers to Not good at all (ไม่ดีเลย)

29. Do you want university to continue or start implements Green Campus activities?  
(คุณต้องการให้มหาวิทยาลัย ดำเนินการต่อ/เริ่มดำเนินการ กิจกรรมมหาวิทยาลัยสีเขียวหรือไม่)

- Yes (ต้องการ)  No (ไม่ต้องการ)

30. If you are an applicant university, would a Green Campus be a university's  
selection? หากคุณเป็นผู้สมัครเข้าศึกษาต่อมหาวิทยาลัย คุณจะใช้การได้รับ การรับรอง  
สถาบันสีเขียวเป็นปัจจัยในการเลือกสถานศึกษาหรือไม่

- 5-refers to Very good (ดีมาก)
- 4-refers to Fairly good (ค่อนข้างดี)
- 3-refers to Neither good or bad (ปานกลาง)
- 2-refers to Not very good (ค่อนข้างไม่ดี)
- 1-refers to Not good at all (ไม่ดีเลย)

31. Universities Green campus does support a high quality of life on campus. Please specify your answer (คุณคิดว่าโครงการมหาวิทยาลัยสีเขียวมีส่วนช่วยให้คุณภาพชีวิตในมหาวิทยาลัยของคุณดีขึ้น กรุณาระบุเหตุผล)

5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)

Please specify (โปรดระบุเหตุผล) \_\_\_\_\_

4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)

Please specify (โปรดระบุเหตุผล) \_\_\_\_\_

3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)

Please specify (โปรดระบุเหตุผล) \_\_\_\_\_

2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)

Please specify (โปรดระบุเหตุผล) \_\_\_\_\_

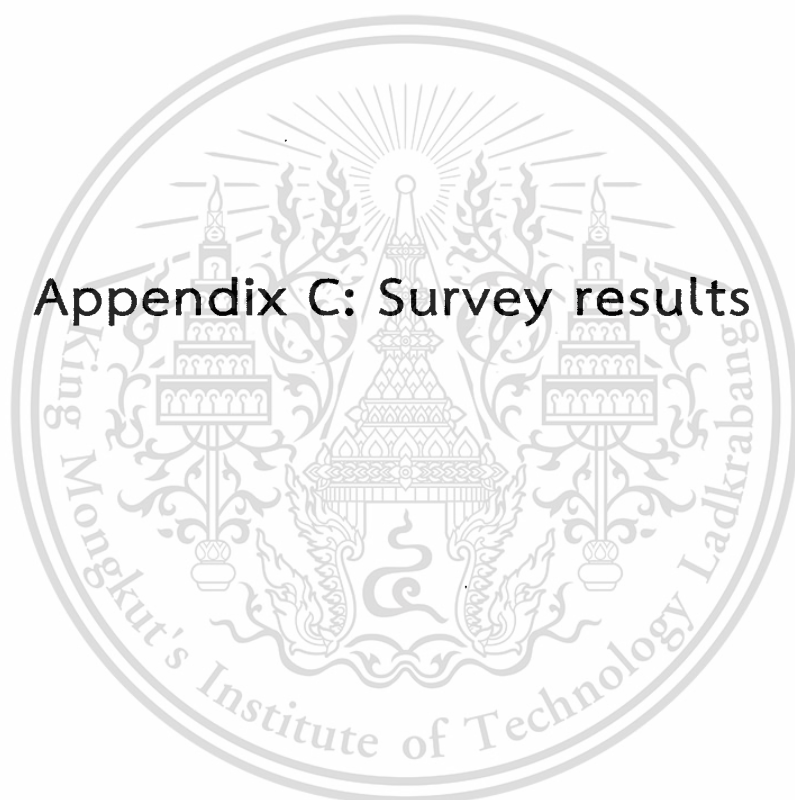
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)

Please specify (โปรดระบุเหตุผล) \_\_\_\_\_

N/A

*Thank you very much for your cooperation in filling questionnaire perfectly.*

**(ขอขอบคุณทุกท่านสำหรับความร่วมมือในการตอบคำถาม)**



This material is reserved for educational use only, not allowed for commercial use.

Forbidden to modify the content, and cite the document when use.

## COMPARISON OF THE PERCEPTION REGARDING QUALITY OF LIFE AMONG STAKEHOLDERS IN GREEN AND NON-GREEN CAMPUS UNIVERSITIES

### 1. What university are you affiliated with? (คุณสังกัดอยู่มหาวิทยาลัยใด)

Answer Options	Response	Response
	Percent	Count
Mahidol University (มหาวิทยาลัยมหิดล)	69.8%	370
	30.2%	160
	<i>answered question</i>	530
	<i>skipped question</i>	3

### 2. Gender (เพศ)

Answer Options	Response	Response
	Percent	Count
Male (ชาย)	43.8%	232
Female (หญิง)	56.2%	298
	<i>answered question</i>	530
	<i>skipped question</i>	3

### 3. Which category below includes your age? (อายุ)

Answer Options	Response	Response
	Percent	Count
20 or younger (น้อยกว่าหรือเท่ากับ 20 ปี)	38.5%	204
21-24	34.7%	184
25-29	8.5%	45
30-34	7.0%	37
35-39	6.8%	36
40 or older (มากกว่าหรือเท่ากับ 40 ปี)	4.5%	24
	<i>answered question</i>	530
	<i>skipped question</i>	3

#### 4. What is your nationality? (เชื้อชาติ)

Answer Options	Response	Response
	Percent	Count
American	0.4%	2
Belarusian	0.2%	1
Bhutanese	0.4%	2
Chinese	0.6%	3
Filipino	0.2%	1
German	0.4%	2
Indian	0.2%	1
Laotian	0.4%	2
South Korean	0.9%	5
Taiwanese	0.2%	1
Thai (ไทย)	96.04%	509
Vietnamese	0.2%	1
	<i>answered question</i>	530
	<i>skipped question</i>	3

#### 5. How many members are there in your family? (จำนวนสมาชิกในครอบครัว)

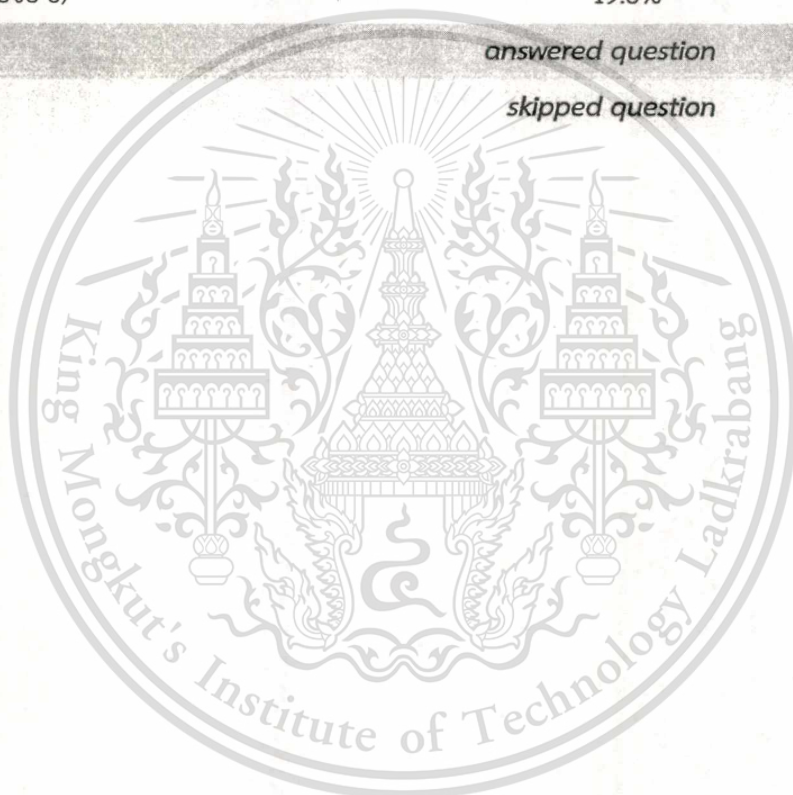
Answer Options	Response	Response
	Percent	Count
1-2	7.9%	42
3-4	49.1%	260
≥5	43.0%	228
	<i>answered question</i>	530
	<i>skipped question</i>	3

## 6. What is your status? (สถานภาพ)

Answer Options	Response	Response
	Percent	Count
Freshman (นักศึกษาชั้นปีที่ 1)	15.3%	81
Sophomore (นักศึกษาชั้นปีที่ 2)	22.8%	121
Junior (นักศึกษาชั้นปีที่ 3)	19.2%	102
Senior (นักศึกษาชั้นปีที่ 4)	11.7%	62
Grad student (นักศึกษามหาบัณฑิต)	9.4%	50
ข้ามไปตอบข้อ 8)	1.7%	9
กรุณาข้ามไปตอบข้อ 8)	19.8%	105

answered question 530

skipped question 3



7. If you are student please identify ,What is your major? (นักศึกษาโปรดระบุสาขาที่กำลังศึกษาอยู่)

Answer Options	Response	Response
	Percent	Count
BACHELOR OF ARTS(B.A.) ; Communication Design	0.5%	2
BACHELOR OF ARTS(B.A.) ; Animation Production	0.2%	1
BACHELOR OF ARTS(B.A.) ; Film Production	1.0%	4
BACHELOR OF ARTS(B.A.) ; Television Production	0.0%	0
BACHELOR OF ARTS(B.A.) ; Social Science	1.7%	7
BACHELOR OF SCIENCE(B.Sc.) ; Applied Mathematics	0.2%	1
BACHELOR OF SCIENCE(B.Sc.) ; Biological Sciences	6.3%	26
BACHELOR OF SCIENCE(B.Sc.) ; Chemistry	1.5%	6
BACHELOR OF SCIENCE(B.Sc.) ; Computer Science	1.5%	6
BACHELOR OF SCIENCE(B.Sc.) ; Environmental Science	0.7%	3
Technology	3.7%	15
BACHELOR OF SCIENCE(B.Sc.) ; Physics	1.7%	7
BACHELOR OF ENGINEERING (B.Eng.) ; Computer Engineering	2.0%	8
BACHELOR OF ENGINEERING (B.Eng.) ; Software Engineering	25.9%	106
Business Economics	5.1%	21
BACHELOR OF BUSINESS ADMINISTRATION (B.B.A.) ; Finance	6.6%	27
Information Systems	3.7%	15
International Business	8.3%	34
Marketing	7.3%	30
International Hospitality Management	11.0%	45
Hospitality Management	0.5%	2
Modeling and Development	0.7%	3
MASTER OF ENGINEERING (M.Eng.) ; Automotive Engineering	1.5%	6
Engineering Systems	3.9%	16
Management	4.6%	19
Other (please specify)		6
<i>answered question</i>		416
<i>skipped question</i>		123

## 8. Where do you currently live? (คุณอาศัยอยู่ที่ใด)

Answer Options	Response	Response
	Percent	Count
On-campus (ภายในมหาวิทยาลัย) Note: please skip to Question # 10 (ภายในมหาวิทยาลัย กรุณาข้ามไปตอบข้อ10)	7.5%	40
น้อยกว่าหรือเท่ากับ 5 กิโลเมตร)	33.0%	175
6-10 กิโลเมตร)	17.0%	90
11-15 กิโลเมตร)	11.3%	60
16-20 กิโลเมตร)	11.5%	61
มากกว่า 20 กิโลเมตร)	19.6%	104
	<i>answered question</i>	530
	<i>skipped question</i>	3

## 9. If you live off-campus, what is your most frequently used mode of transportation for commuting from home to university? (หากคุณอาศัยอยู่ภายนอกมหาวิทยาลัยคุณเดินทางจากบ้านมามหาวิทยาลัยโดยใช้วิธีการเดินทางวิธีใดบ่อยที่สุด)

Answer Options	Response	Response
	Percent	Count
Walk (เดิน)	13.3%	67
Bicycle (จักรยาน)	6.3%	32
Personal car (รถยนต์ส่วนบุคคล)	42.3%	213
Personal Motorcycle (จักรยานยนต์ส่วนบุคคล)	11.1%	56
Public transit (ขนส่งสาธารณะ)	25.4%	128
University's shuttle bus (รถรับส่งของมหาวิทยาลัย)	4.4%	22
		4
Combined mode please specify (หลายช่องทางโปรดระบุ)		
	<i>answered question</i>	504
	<i>skipped question</i>	29

10. On average how often you are on-campus a week? (โดยเฉลี่ยคุณมามหาวิทยาลัยกี่วันต่อสัปดาห์)

Answer Options	Response	Response
	Percent	Count
≥ 5 days/week (มากกว่าหรือเท่ากับ 5 วันต่อสัปดาห์)	61.1%	324
3-4 days/week (3-4 วันต่อสัปดาห์)	33.2%	176
1-2 days/week (1-2 วันต่อสัปดาห์)	4.2%	22
≤1 day/week (น้อยกว่าหรือเท่ากับ 1 วันต่อสัปดาห์)	1.5%	8
<i>answered question</i>		530
<i>skipped question</i>		3

11. Environment management is very important of a university's campus. (การจัดการสิ่งแวดล้อมเป็นสิ่งจำเป็นมากในมหาวิทยาลัย)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	54.8%	285
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	36.2%	188
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	8.1%	42
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	0.6%	3
1-refers to Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.2%	1
N/A (ไม่มีความคิดเห็น)	0.2%	1
<i>answered question</i>		520
<i>skipped question</i>		13

12. You are satisfied with environmental management of your university. (คุณพึงพอใจต่อการจัดการสิ่งแวดล้อมในมหาวิทยาลัยของคุณ)

Answer Options	Response Percent	Response Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	22.7%	118
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	46.7%	243
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	23.1%	120
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	6.3%	33
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	1.0%	5
N/A (ไม่มีความคิดเห็น)	0.2%	1
	<i>answered question</i>	520
	<i>skipped question</i>	13

13. Do you know sustainable development is a part of university's mission statement? (คุณทราบหรือไม่ว่าการพัฒนาอย่างยั่งยืนเป็นส่วนหนึ่งของพันธกิจของมหาวิทยาลัย)

Answer Options	Response Percent	Response Count
Yes (ทราบ)	68.7%	357
No (ไม่ทราบ)	31.3%	163
	<i>answered question</i>	520
	<i>skipped question</i>	13

14. Sustainable development is a part of my curriculum/work or has been a topic in one of my classes? (การพัฒนาอย่างยั่งยืนเป็นส่วนหนึ่งของหลักสูตร/การทำงานหรือเป็นหัวข้อหนึ่งการเรียนในชั้นเรียน)

Answer Options	Response	Response
	Percent	Count
Yes (ใช่)	61.7%	321
No (ไม่ใช่)	20.2%	105
N/A (ไม่เกี่ยวข้อง)	18.1%	94
<i>answered question</i>		520
<i>skipped question</i>		13

15. You regularly participate in green campus campaign (energy saving, water saving, etc.) (คุณมีส่วนร่วมในกิจกรรมการรณรงค์มหาวิทยาลัยสีเขียวเป็นประจำ ยกตัวอย่างเช่น การประหยัดพลังงาน, การประหยัดน้ำ ฯลฯ)

Answer Options	Response	Response
	Percent	Count
Yes (ใช่)	72.1%	375
No (ไม่ใช่)	27.9%	145
<i>answered question</i>		520
<i>skipped question</i>		13

16. How important university green space available for you? (พื้นที่สีเขียวในมหาวิทยาลัยมีความจำเป็นต่อคุณในระดับใด)

Answer Options	Response	Response
	Percent	Count
5-refers to Very important (สำคัญมาก)	42.7%	222
4-refers to Fairly important (ค่อนข้างสำคัญ)	41.2%	214
3-refers to Neutral (ปานกลาง)	15.6%	81
2-refers to Not so important (ค่อนข้างไม่สำคัญ)	0.4%	2
1-refers to Not at all important (ไม่สำคัญ)	0.2%	1
<i>answered question</i>		520
<i>skipped question</i>		13

17. For which purpose do you use green spaces on the campus? (คุณใช้พื้นที่สีเขียวในมหาวิทยาลัยสำหรับกิจกรรมใด)

Answer Options	Response	Response
	Percent	Count
To relax (การพักผ่อน)	58.3%	303
To study (การศึกษา)	17.1%	89
To picnic (การพักผ่อนอาหารร่วมกัน)	7.9%	41
Recreation activity (กิจกรรมนันทนาการ)	16.7%	87
<i>answered question</i>		520
<i>skipped question</i>		13

18. The university does provide enough green space to support a high quality of life. (มหาวิทยาลัยมีพื้นที่สีเขียวเพียงพอสำหรับการสนับสนุนคุณภาพชีวิตที่ดี)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	26.2%	136
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	46.9%	244
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	18.8%	98
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	6.2%	32
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	1.7%	9
N/A (ไม่มีความคิดเห็น)	0.2%	1
<i>answered question</i>		520
<i>skipped question</i>		13

19. Energy saving is very important practices for your university. (การประหยัดพลังงานของมหาวิทยาลัยเป็นกิจกรรมสำคัญสำหรับมหาวิทยาลัยของคุณ)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	33.1%	172
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	45.6%	237
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	18.8%	98
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	1.5%	8
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.0%	0
N/A (ไม่มีความคิดเห็น)	1.0%	5
	<i>answered question</i>	520
	<i>skipped question</i>	13

20. The Universities energy saving practices does support a high quality of life. (กิจกรรมการประหยัดพลังงานของมหาวิทยาลัยสนับสนุนคุณภาพชีวิตที่ดี)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	33.1%	172
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	46.2%	240
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	17.3%	90
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	1.7%	9
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.0%	0
N/A (ไม่มีความคิดเห็น)	1.7%	9
	<i>answered question</i>	520
	<i>skipped question</i>	13

21. The climate change mitigation programs (greenhouse gas emission reduction) are very important practices for your university. (นโยบายการบรรเทาผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศของมหาวิทยาลัย (โครงการลดการปล่อยก๊าซเรือนกระจก) เป็นกิจกรรมสำคัญสำหรับ

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	29.0%	151
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	38.8%	202
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	22.1%	115
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	3.1%	16
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.6%	3
N/A (ไม่มีความคิดเห็น)	6.3%	33
	<i>answered question</i>	520
	<i>skipped question</i>	13

22. Waste management (example waste separation, waste reduction) is very important practices for your university. (การจัดการของเสีย เช่นการคัดแยกขยะ, การลดขยะ เป็นกิจกรรมสำคัญสำหรับมหาวิทยาลัยของคุณ)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	40.8%	212
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	39.4%	205
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	15.8%	82
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	1.7%	9
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.4%	2
N/A (ไม่มีความคิดเห็น)	1.9%	10
	<i>answered question</i>	520
	<i>skipped question</i>	13

23. Universities waste management (example waste separation, waste reduction) does support a high quality of life. (การจัดการของเสียของมหาวิทยาลัย เช่นการคัดแยกขยะ, การลดขยะ สนับสนุนคุณภาพชีวิตที่ดี)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	40.6%	211
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	40.0%	208
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	16.3%	85
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	1.5%	8
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.6%	3
N/A (ไม่มีความคิดเห็น)	1.7%	9
	<i>answered question</i>	520
	<i>skipped question</i>	13

24. Universities water management (water saving) does support a high quality of life. (การจัดการน้ำของมหาวิทยาลัย เช่นการ ประหยัดน้ำ สนับสนุนคุณภาพชีวิตที่ดี)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	31.0%	161
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	47.7%	248
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	17.9%	93
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	1.0%	5
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.4%	2
N/A (ไม่มีความคิดเห็น)	2.1%	11
	<i>answered question</i>	520
	<i>skipped question</i>	13

25. Universities transportation condition (amount of traffic, availability of public transportation, etc.) does support a high quality of life. (ระบบขนส่งของมหาวิทยาลัย เช่น การจราจรและจำนวนระบบขนส่งสาธารณะ สำหรับมหาวิทยาลัยสนับสนุนคุณภาพชีวิตที่ดี)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	32.9%	171
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	41.9%	218
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	16.9%	88
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	4.8%	25
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	1.3%	7
N/A (ไม่มีความคิดเห็น)	2.1%	11
	<i>answered question</i>	520
	<i>skipped question</i>	13

26. Universities education for green (academic courses and activities related to environmental) does support a high quality of life. (ระบบการเรียนการสอนเพื่อสิ่งแวดล้อมของมหาวิทยาลัย เช่น หลักสูตรที่เกี่ยวข้องกับสิ่งแวดล้อม สนับสนุนคุณภาพชีวิตที่ดี)

Answer Options	Response	Response
	Percent	Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	29.4%	153
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	46.0%	239
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	18.1%	94
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	2.7%	14
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.4%	2
N/A (ไม่มีความคิดเห็น)	3.5%	18
	<i>answered question</i>	520
	<i>skipped question</i>	13

27. Are you interested in learning more about Green Campus? (คุณมีความสนใจที่จะศึกษาเพิ่มเติมเกี่ยวกับสถาบันสีเขียว)

Answer Options	Response	Response
	Percent	Count
Yes (ใช่)	63.7%	331
No (ไม่ใช่)	9.4%	49
Not Sure (ไม่แน่ใจ)	26.9%	140
<i>answered question</i>		520
<i>skipped question</i>		13

28. Overall how would you rank the quality of your life on campus? (โดยภาพรวมแล้วคุณคิดว่าคุณภาพชีวิตในมหาวิทยาลัยของคุณอยู่ในระดับใด)

Answer Options	Response	Response
	Percent	Count
5-refers to Very good (ดีมาก)	20.4%	106
4-refers to Fairly good (ค่อนข้างดี)	56.0%	291
3-refers to Neither good or bad (ปานกลาง)	21.0%	109
2-refers to Not very good (ค่อนข้างไม่ดี)	1.5%	8
1-refers to Not good at all (ไม่ดีเลย)	1.2%	6
<i>answered question</i>		520
<i>skipped question</i>		13

29. Do you want university to continue or start implements Green Campus activities? (คุณต้องการให้มหาวิทยาลัย ดำเนินการต่อ/เริ่มดำเนินการ กิจกรรมมหาวิทยาลัยสีเขียวหรือไม่)

Answer Options	Response	Response
	Percent	Count
Yes (ต้องการ)	98.8%	514
No (ไม่ต้องการ)	1.2%	6
<i>answered question</i>		520
<i>skipped question</i>		13

30. If you are an applicant university, would a Green Campus be a university's selection?

หากคุณเป็นผู้สมัครเข้าศึกษาต่อมหาวิทยาลัย คุณจะใช้การได้รับ การรับรองสถาบันสีเขียวเป็นปัจจัยในการเลือกสถานศึกษาหรือไม่

Answer Options	Response Percent	Response Count
5-refers to Strongly Agree (ระดับคะแนน 5 หมายถึง เห็นด้วยอย่างยิ่ง)	22.3%	116
4-refers to Agree (ระดับคะแนน 4 หมายถึง เห็นด้วย)	44.4%	231
3-refers to Neither Agree nor Disagree (ระดับคะแนน 3 หมายถึง ไม่แน่ใจ)	25.2%	131
2-refers to Disagree (ระดับคะแนน 2 หมายถึง ไม่เห็นด้วย)	4.4%	23
1-refers to Strong Disagree (ระดับคะแนน 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.8%	4
N/A (ไม่มีความคิดเห็น)	2.9%	15
	<i>answered question</i>	520
	<i>skipped question</i>	13

31. Universities Green campus does support a high quality of life on campus.please specify your answer (คุณคิดว่าโครงการมหาวิทยาลัยสีเขียวมีส่วนช่วยให้คุณภาพชีวิตในมหาวิทยาลัยของคุณดีขึ้น กรุณาระบุเหตุผล)

Answer Options	Response Percent	Response Count
5-refers to Strongly Agree (คะแนนระดับ 5 หมายถึง เห็นด้วยอย่างยิ่ง)	22.7%	115
4-refers to Agree (คะแนนระดับ 4 หมายถึง เห็นด้วย)	22.5%	114
3-refers to Neither Agree nor Disagree (คะแนนระดับ 3 หมายถึง ไม่แน่ใจ)	6.7%	34
2-refers to Disagree (คะแนนระดับ 2 หมายถึง ไม่เห็นด้วย)	0.2%	1
1-refers to Strong Disagree (คะแนนระดับ 1 หมายถึง ไม่เห็นด้วยอย่างยิ่ง)	0.0%	0
N/A	47.8%	242
	<i>answered question</i>	506
	<i>skipped question</i>	27

## AUTHOR BIOGRAPHY

**NAME** MISS NISANAT JIRASIT

**DATE OF BIRTH** 22 FEBUARY 1986

**ADDRESS** 72/55 SOI RAMKHAMHAENG164 RAMKHAMHAENGRoad, MINBURI  
BANGKOK 10510

**EDUCATIONAL  
BACKGROUND** 2008 BACHELOR OF SCIENCE (ENVIRONMENTAL HEALTH SCIENCE)  
MAHIDOL UNIVERSITY

**SPECIALTIES** 1.) ISO 14001 SYSTEMS  
2.) ENVIRONMENTAL EDUCATION PROGRAM

**EXPERIANCES**

2010 - CURRENT ENVIRONMENTAL SPECIALIST  
TOYOTA MOTOR ASIA PACIFIC ENGINEERING& MANUFACTURING CO.,  
LTD.

