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Varsity Carnival 2019

PROCEEDINGS

Seminar on

Empowering Local Wisdom towards Human Wellness

23 - 28 August 2019

Walailak University

Nakhon Si Thammarat, Thailand





**The 21st Indonesia-Malaysia-Thailand Growth Triangle (IMT - GT)
Varsity Carnival 2019 Seminar on**

“Empowering Local Wisdom towards Human Wellness”

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Walailak University
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FOREWORD

Dear authors, esteemed readers,

This foreword is written with my deep satisfaction to the proceedings as part of the 21st IMT-GT Varsity Carnival held at Walailak University on August 23-29, 2019. The theme “Empowering Local Wisdom towards Human Wellness” and its sub-theme “Economy, Society (Health and Politics), Environment and Technology” have challenged both students and academics to reflect upon the ASEAN practice of wellness. The seminar has broadened our view on local wisdom and engaged the youths in academic interaction over the 4-day event. Such opportunity to exchange ideas has surely strengthened our relationship as members of a growing ASEAN and academic community. Those research papers contributed by research students are compiled in these proceedings in front of you. They portray a variety of interests related to local wisdom and human wellness ranging from tradition, agriculture, entertainment, science and technology.

The diverse interests by no means betray the unity in the region. Contributions from all 12 universities from the Golden Triangle network: Indonesia, Malaysia, and Thailand reflect collaboration, mutual understanding, and integration of different identities for our recognizable existence at the global level.

Particularly in the current volume, information and pictures from the event are on display as a memento of the unforgettable event. Students interacted with others to satisfy their thirst for knowledge while the scholars cooperated in order to bring the best to the event and probably the-once-in-a-life-time experience.

Despite being written by novice researchers, I trust that this collection of papers will be an impetus to stimulate further study and research for our uniqueness. We thank all authors and participants for their contributions.

I appreciate Universitas Sumatera Utara (USU), Institut Teknologi Medan (ITM), Universitas Negeri Medan (UNIMED), and Universitas Syiah Kuala (UNSYIAH) from Indonesia for their great support. I shall thank Universiti Teknologi MARA (UiTM, Arau), Universiti Malaysia Perlis (UniMAP), Universiti Utara Malaysia (UUM), Universiti Sains Malaysia (USM) from Malaysia for, if I may, raising the academic standard of IMT-GT carnival. And, most of all, I thank Prince of Songkla University (PSU), Thaksin University (TSU), Rajamangala University of Technology Srivijaya (RUTS), our local companions, for being efficient team players. Walailak University (WU) would not have been successful in hosting the event without their great contributions.



Assoc.Prof. Charun Bunyakan, Ph.D.

Vice-President of Academic Affairs, Walailak University

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Malays Traditional House: A Review of Local Wisdom in Housing Design towards Environmental and Sustainable Human Wellness

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Abstract

The special characteristics of traditional Malay houses show that every house has its own speciality and uniqueness. Every traditional house shows the state's culture based on the structure and design of the house. Furthermore, traditional Malay houses are also special due to the way on how it is built. The history of every traditional house has proved that traditional Malay houses have values in its architecture. Based on this research, the traditional Malay houses ideology and creativity that originally came from the craftsmen and locals are splendid and could be used as reference in today's architecture. In this article, the values of traditional architecture can be discovered in order to demonstrate the potential and importance of traditional architecture. Moreover, the authors of this article will uncover the true essence of these traditional houses architectures and characteristics which could probably advance along in this industrial revolution era. The architecture of traditional Malay house is a product of high creativity and craftsmanship by the Malays that existed for centuries and should be preserved and well blended with the current technology in the 4th Industry Revolution (IR 4.0). Therefore, the value and originality of the traditional architectural design should be preserved by considering the traditional values and attributes.

Keywords: Traditional Malay House; architecture; traditional values; preservation; Industry Revolution (IR 4.0)

I. Introduction

The existence of traditional Malay houses in Malaysia is considered as one of the miracles that could have happen in this country. These traditional Malay houses are Malaysia's signature and one of the most valuable components in Malaysia's cultural heritage, originated from the ideology and creativity of the villagers itself and designed based on the local climate, culture and notions of the villagers.

Tradition usually refers to doings of the space and time of the past. The local craftsmen are upholding and treasuring their culture by participating in designing and constructing their houses by utilizing their traditional technologies. It is observed and understood that different traditional Malay houses have different architecture and design due to their creativity and expertise. On the other hand, the architecture of every traditional Malay houses also has significant design values based on their beliefs to meet their needs and demands of each family. Through findings, it is said that the traditional architecture to build these houses establishes from the experience of the ancient architects or designers which are acknowledged substantial to contemporary architecture.

In Malaysia, there are 14 states and each state has their own traditional Malay house as a representative to clarify the image of the state itself. Those 14 states are *Johore, Malacca, Negeri Sembilan, Selangor, Wilayah Persekutuan, Pahang, Perak, Kedah, Penang, Kelantan, Terengganu, Perlis, Sarawak* and *Sabah*. From these

states, it gives rise to their different speculative perspectives to support their concept of traditions. The perception of the intellectual has unmasked the beliefs of traditional and their provincial architecture. The approaches used to develop these houses are proposing towards sustainable and essential components and materials.

However, as modernization began to revolve simultaneously with Industrial Revolution, the preservation of these houses originality, architecture and values have become more important and should be taken care thoroughly. This act should be done to ensure that the future generations can acknowledge the existence of these houses in the next modernization era.

II. Significant of Traditional Malay Houses

The traditional Malay houses possesses an antique value and uniqueness in terms of the structure, elements, history and these traditional Malay houses also represent the identity of every states in Malaysia. It is said that the implications in the philosophy of the Malay architecture are based on the belief in moral and religion. It can be seen clearly in the woodcarving pattern or handwritten calligraphy on the particular segment or wall of the traditional Malay houses. The carving is mostly related and inspired by the flora which illustrate that the traditional Malay houses are close to the nature and its originality of culture (Taufik et al., 2015). In addition, the beautiful calligraphy that has been handwritten can be seen widely in the mosque and in several traditional Malay houses.

Most and foremost, the physical and structural characteristics of traditional Malay houses and building have been influenced by the requirement and customs of purity in Malay tradition. The arrangements of the segments in traditional Malay houses are more strategic than modern houses as the design prioritised the privacy of host and also the guests (Nasir & Teh, 1996). For example, the places to entertain the men guest located at the main room (*Rumah Ibu*) of the house while the middle room specifically for entertaining the women guests. This shows that traditional Malay houses are particular in terms of privacy of the owner of the house and also the guests of the house in order to perpetuate the moral and boundaries between the women and men according to the Islamic laws (Rahim and Hassan, 2008).

Besides, in terms of its structural elements, the Malay traditional houses also have the good ventilation that matches the climate in Malaysia which is hot and humid all year (Kamal et al., 2004). This can be proved by looking at the structure and the way the roof of the house has been built. The roof of the traditional Malay house is made steep and has a wide projection. The body of the house is fully occupied with the window openings and lattice engraving for the good air circulation in the house.

Last but not least, most of the traditional Malay houses are built by the local people that have experience and knowledge in carpentry (Yuan, 2014). The extraordinary knowledge and experience are the factors that envisioned them to build the unique and amazing traditional Malay houses. Hence, the locals are not relying on professional architects to build the houses, since there are talented local people that have the ability to do so.

III. Traditional Design Values

The traditional Malay house can be categorized as one of the richest components of Malaysia's cultural heritage. Every tradition has its own specific characteristic that could attract many people from their own unique designs. The interior of the traditional houses is also unique as each house has its own way of decoration, house arrangement and interior design. The design values found through this research are aesthetic value, social value and environment value.

Aesthetic value is undeniably one of the traditional Malay house values that most people looked up to. This aesthetic value has been created by the local's ideas while designing the houses. One of the aesthetic values can be seen in the structure of the traditional house itself. The aesthetic value is also based on the nature and organic design value. The design value for traditional Malay houses has risen up due to the aesthetical value that are uncommon nowadays. Therefore, these houses should not be demolished but should be maintained well.

Moreover, traditional Malay house also portrays social value as per research. Without realising, the social value is hinted through the house arrangement and its culture. In terms of house arrangement, one of the parts of the house is called '*serambi*' where it is used to strengthen relationship and entertain the guests. However, some of the culture of traditional houses included the part called '*Rumah ibu*' as a media to socialize with the guests and family members. Next, with regard to the culture, traditional Malay houses are built based on the local people needs, practices and beliefs. This situation depicts that the value of socio-cultural environment is embedded in the process of building these houses.

Last but not least, in order to build these houses the local people values the environment. It can be seen that the material used to build these houses are natural materials. For instance, wood, timber and bamboo. These houses are usually built on stilts in rural areas. Comparing to modern houses, the material used are not natural nor environment friendly. The materials used are such as nails, asbestos, cement, tiles and metals.

IV. Theoretical Perspective and Concepts of Traditional Malay House Design

Theoretically, there are various theories and perspectives have been found regarding the concept of these traditional Malay houses. From this researched, the importance of precedent to contemporary in terms of the characteristics and cultural context in the architecture of each traditional Malay houses are indicated in the principle of regionalism theory (Kassim et. al, 2018). Regionalism is the theory or practice of emphasizing the regional characteristics of local by stressing local needs and ideas.

Based on this research, the houses are normally divided into 3 sections (Figure 1). The 3 basic sections are the veranda known as '*serambi*', main house known as '*rumah ibu*' and the kitchen known as '*dapur*' (Shah, 1988). It is created and separated by slight floor level changes and different doorway positions. In a natural point of view, these houses seem to blend in pleasantly with the environment surrounding it. It is known that the *serambi* is usually used and specially created for the guests. This is also where the villagers sit and gather with their family especially during tea time or breakfast. Meanwhile, in the main house, there are sleeping rooms.

4.1 Perspectives

As mentioned, traditional Malay houses are built to meet their satisfactory and requirements in terms of culture, notions, socioeconomics and environment. For example, one of the traditional Malay houses in Johor are built based on the Johor-Bugisnese beliefs. The local people assumed that their traditional Malay house resembles or a representation of a cosmic man (Teh, 1994). The most decorated part of their traditional Malay house is the *serambi* part. The local people refer universe as their source of reference for decorative motives such as animals, patterns, and plants. They belief in the concept of anthropomorphism gives the characteristics in their traditional Malay house architecture (Ariffin, 2001). Anthropomorphism may be defined as an 'attribution of human form or personality to god, animal, etc.

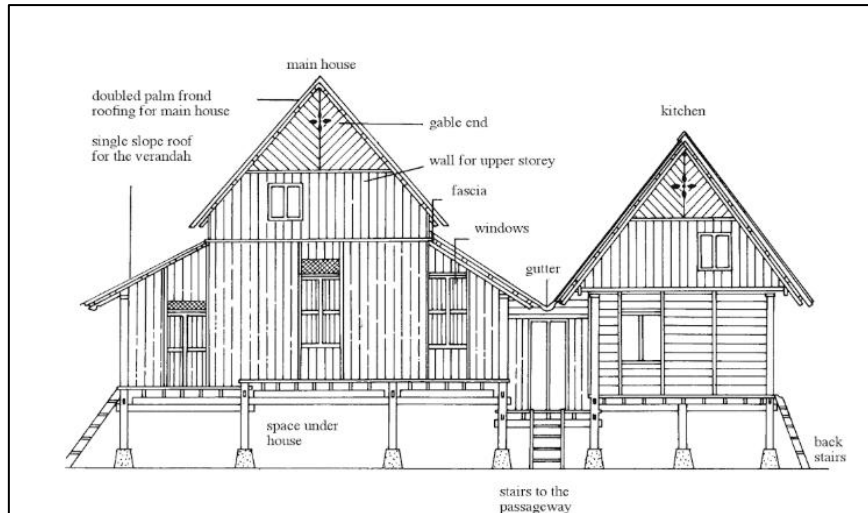


Figure 1: Example of the designs of traditional Malay house (Nasir, 2011)

4.2 Structures and Environment

In terms of its structures and components of most traditional Malay houses, starting from the roof known as 'attap', they usually made it out of natural materials or zinc, creating hot and cold interior during daytime and night respectively. Certain houses have transparent attap due to their beliefs in certain things. Moreover, the windows are usually made of wood. The wooden windows have two wide openable doors for creating great air ventilation throughout the house. Figure 2 depicts the common environment of traditional Malay house.

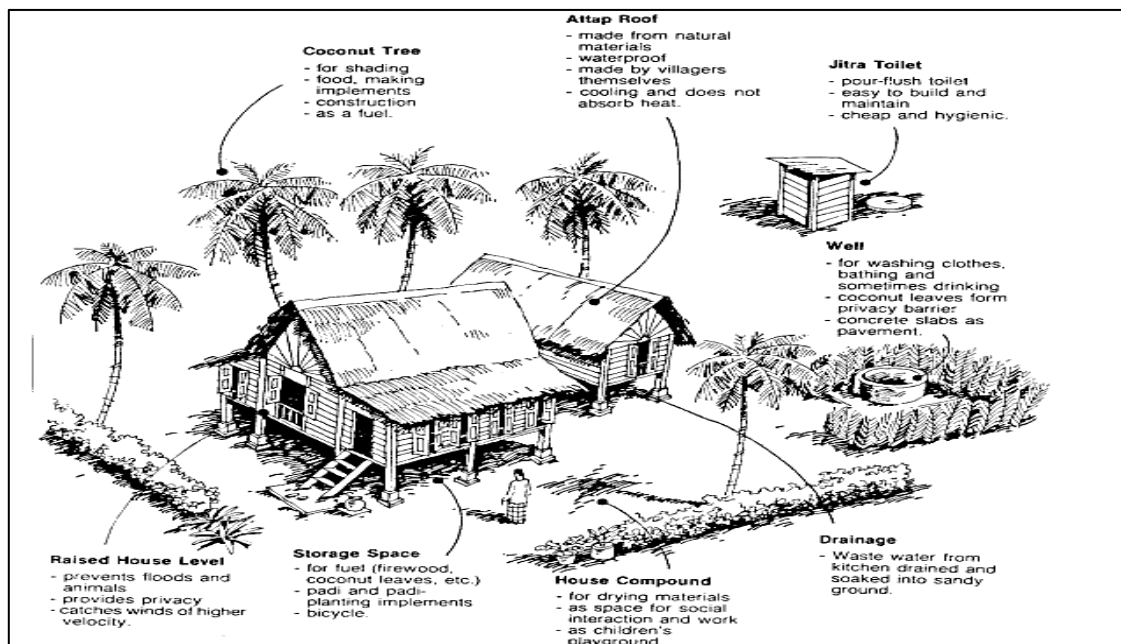


Figure 2: External environment of a traditional Malay house (Yuan, 1987)

V. Industrial Revolution

The 4th Industry Revolution (IR 4.0) is the new resolution to combining traditional manufacturing process and technology such as the Internet of Things (IOT) to enhance communication, automation and real-time data. One of the core technologies in IR 4.0 is Artificial Intelligence also known as AI which is a system that created to learn from its' surrounding and used the data collected to connect with humans, tools and other technologies. How does

IR 4.0 relate to traditional Malay house? IR 3.0 emerged in late 1960s and is known as the digital revolution era where electronic devices such as radios, televisions and camera were invented. As time passed by, this shows that the title 'traditional' will simultaneously faded as the revolution evolve. Hence, the signature of Malaysia and image of each states could disappear thus, affecting the stability of Malaysia's socioeconomics and heritage.

Therefore, generation nowadays, should acknowledge the existence and values in order to protect and treasure these houses. One of the ways to solve this problem is by encouraging young entrepreneurs and young graduates to involve themselves in business or job that could promote the existence of traditional Malay houses to the world. For example, young entrepreneurs in interior designing and architecture business or firm could publicize the interior design and architecture of the traditional Malay house. Other than that, the originality of traditional Malay house should be preserved. In this modernization era, people would install automated door, pipe, wardrobe and other technology that could affect the environment such as air-conditioner. Therefore, these houses should be preserved to attract tourist attention by its uniqueness and sustainability practiced. Through this way, the design and architecture could revolve in other countries.

Besides, the traditional Malay house need to be maintained as the structure of the house blend in well with the climate changes in Malaysia (warm and humid throughout the year). Most and foremost, the traditional Malay house can be identified by looking at the shape of the roof (*bumbung*). The *bumbung panjang*, *bumbung lima*, *bumbung perak* and *bumbung limas* are the common basic house forms. The most common house form is *bumbung panjang* which is known as the simplest among all of other house forms. The *bumbung panjang* is made of the *attap* which is a thatch that made from *nipah* and also palm trees, which can be found in the local natural vegetation. In term of local wisdom, the *Bumbung panjang* is easy to construct and has a good property of the ventilation system that allows the house to cool efficiently and effectively (Yuan, 2014). Thus, the structure of the traditional Malay house has a good ventilation system that allows the air to ventilate out and in more systematic compare to modern houses. At night, the environment in the house is comfortable and cool without the need of technologies such as air conditioner and fan. This can save the used of the electricity since the ventilation of the house is depending on the nature. Therefore, this could reduce the effect of thinning of ozone layer, greenhouse effect and etc.

Furthermore, the traditional Malay houses have an organized space that has been divided accordingly based on spatial, functional and physical of the house itself. *Serambi*, *rumah ibu* and *dapur* are considered as the most common basic spaces in traditional Malay houses. Every each of these spatial elements have its' own purposes which focuses on the privacy of the owner of the house as well as the guests. For instance, *serambi* is the place where to greet and treat the guests and also for the male entrance. Meanwhile, the entrance for the female is known as *selang* and this place is giving the privacy for the female to have the conversation among the female only (Sahabuddin, 2012). Next, *rumah ibu* is the largest area in the house where most of the activities have been conducted such as praying, reciting or reading, sleeping, meeting and also feasting. Last but not least, the place to prepare the food, cook the meal, wash the dishes and eat together with the family is known as *dapur*. This place is also where the womenfolk used to gather and chat while doing the household chores (Yuan, 2014). Traditional Malay houses are comparatively bigger compared to modern house because of lots of spaces has been divided respect to the roles and privacy in the house itself but at the same time, it utilises a minimum energy in air cooling system at a longer run.

If such the above-mentioned traditional local wisdom technologies can be embedded and well blended with the current housing design and IR 4.0, it could uphold Malaysian designing and architecture industry and so does the technologies and materials used towards sustainable and eco-friendly local resources but at the same time preserved and enrich the traditional Malay houses to the next level.

VI. Case Study

The aim of this research is to determine the level of acknowledgement and interest of people nowadays towards traditional Malay houses from different age groups. The social media such as WhatsApp, Facebook and etc. are used as the major platform in order to get the feedback from the respondents by creating the Google form. By using this qualitative analysis, the Google form will be summarized all the information obtained to get

to know about the responders' opinions and thoughts about traditional Malay houses and Modern houses. The Google form consisting of several questions is distributed among students, lecturers, relatives, etc. and is used for data collection. Based on data collected, the youth (20-23 years old) are the most to respond. This is in conjunction with the focus to obtain viewpoint from the building blocks of nation.

Findings revealed that approximately three quarter of the respondents acknowledged the existence of traditional Malay houses as shown in Figure 6.1, Figure 6.2, Figure 6.3, Figure 6.4 and Figure 6.5 respectively. Meanwhile, there is still a handful of Malaysian that does not notice the existence of these traditional houses. Maximum of the respondents are preferred traditional Malay houses more in terms of the structure and house arrangement. However, in terms of the comparison of house technologies, the technologies of modern houses are preferable by majority of the respondents. Despite in this period of globalisation and modernization era, a large proportion (98.1%) of respondents affirmed that the traditional Malay houses should be preserved and treasure. For this reason, such unique architectural aspect of Malay traditional house (as previously discussed in Section 4.0) i.e., engraving the pattern of flora at particular sections of the house, house design and arrangement, the structures and the environment should be well blended into the modern and contemporary house. Thus, this ensured that all the aspects of local wisdom of the Malay house architectural design, function and philosophy is well preserved.

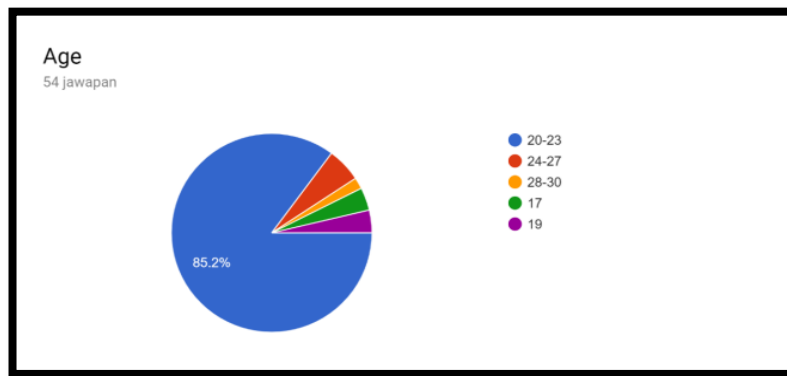


Figure 6.1: Respondent group of ages.

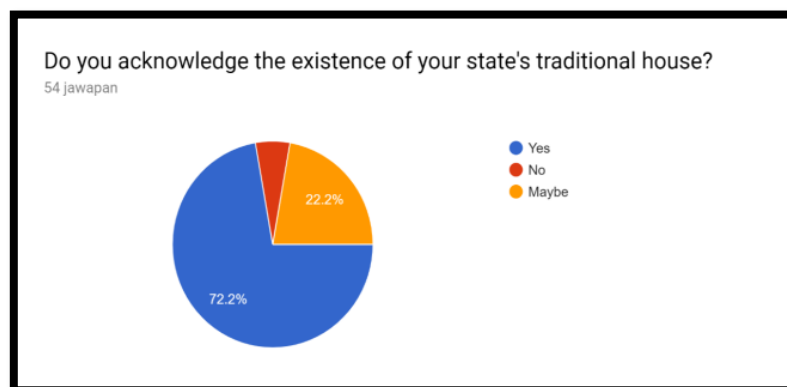


Figure 6.2: Analysis on the acknowledgement of the existence of the state's traditional house according to their respective states.

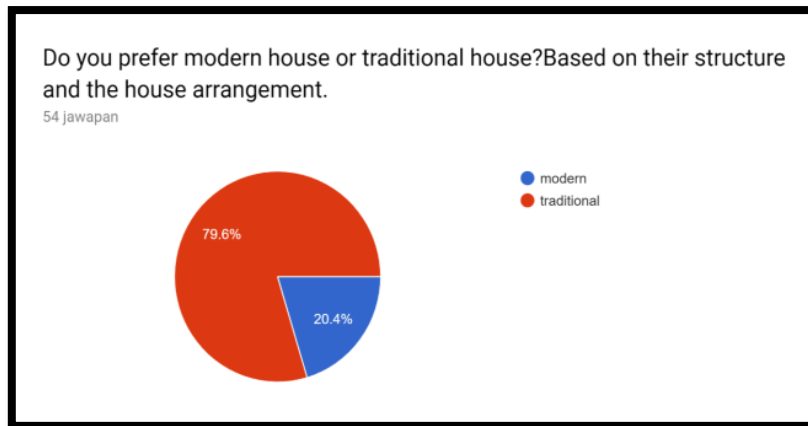


Figure 6.3: Analysis on the preference of modern house or traditional house.

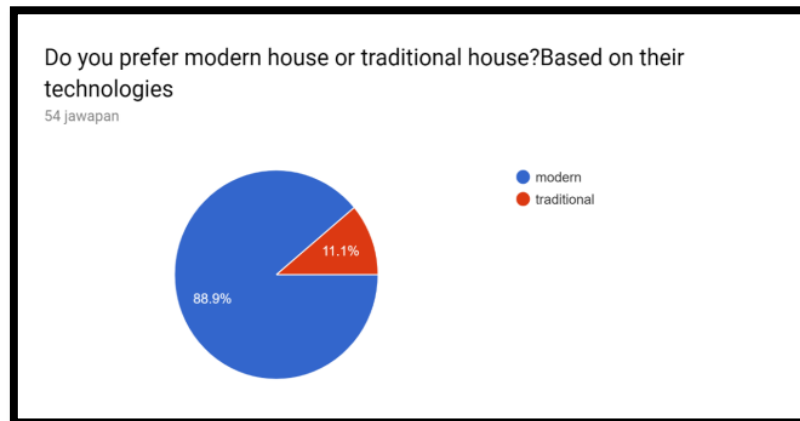


Figure 6.4: Analysis of the respondent house preferences based on the technologies.

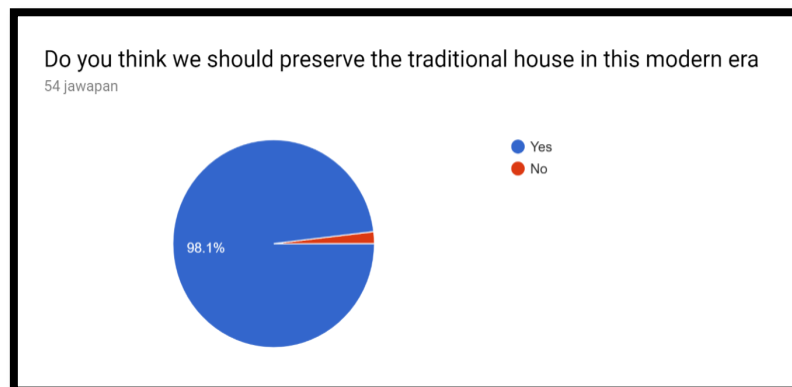


Figure 6.5: Respondent views on preserving the Malay traditional houses.

Moreover Table 6.1 shows the reasons of why the traditional houses need to be preserved in this modern era. There are a few reasons that have been identified based on the survey. The reasons are to preserve the traditional house, to maintain the tradition, for Malay heritage, for new generation future and others. There are 8 respondents agree with the reason to preserve traditional house, 12 respondents agree with the reason to maintain the tradition, 12 respondents agree it is for Malay heritage, while 10 respondents agree the reason for new generation future and the others are 8 respondents. Besides, the traditional house contains its own meaning and its architecture much worthy and neat than modern. Besides, traditional houses reflect creativity and pride for its structure. Next, the specialty of traditional houses will be able to attract tourists to come over to Malaysia. Great number of tourists will eventually help the economy development in Malaysia and make Malaysia a well-known

country. Last but not least, there are also respondents that claimed traditional houses can help in reducing the greenhouse effect because the ventilation system of Malay traditional houses is depending naturally to the nature.

Table 6.1: Analysis on the reasons of why we should preserve traditional house in this modern era

Reasons	Quantity of respondent	Percentage (%)
To preserve traditional house	8	16
To maintain the tradition	12	24
To sustain the Malay heritage	12	24
To protect for the future generation	10	20
Others	8	16

It was also found that the traditional Malay house ideology is based on the people's beliefs and ethics which is according to the Malay culture. Normally, the physical characteristic of the interior and exterior spaces in the traditional Malay house play an important role since every each of the rooms has its own function and purpose (Sahabuddin, 2012). Therefore, the essential requirements in creating a satisfactory design is by giving priority and focus to make use and build quality spatial in each part of the house. Most and foremost, every theory and elements in building the traditional Malay houses can be understood based on the perspectives and explanation of it theoretically. Thus, the points explained shows the significance of the region, tradition and history that act as a benchmark between the architecture of the house in the past and future. Lastly, it is understood that the traditional Malay houses design value is influenced by the approach of the ventricular system, critical regionalism and modern regionalism.

VII. Conclusion

To conclude, the traditional Malay houses should be preserved in order to ensure that the precious Malay heritage and tradition are acknowledged from one generation to another generation. The traditional Malay houses also have its own theoretical explanation for every segment in the house together with its particular functions and reasons. Furthermore, the wooden carvings that have been found on the traditional Malay house walls are shown the remarkable symbolic to the house itself. In this modern era, it is hard to find traditional Malay houses being built in the city since most of the people nowadays are more prefer to live in the modern houses instead of traditional Malay houses. The generation nowadays thought that the modern houses are more elegant and simpler compared to traditional Malay houses that are too big and old-style. Next, to be built the traditional Malay house normally it is required a large space of the land since the house is going to be quite huge and the ventilation system is basically depending to the environment of the nature around the house. Therefore, traditional Malay houses are not really suitable to be built in the city because of the environment of the city itself that have been surrounded with many tall buildings and also the vehicles. This is one of the factors that caused the traditional Malay houses to be forgotten day by day.

Therefore, this heritage and tradition should be exposed more to the society especially to the Malay people, so that the people will be realized and appreciated the precious culture and tradition. Thus, by maintaining these traditional Malay houses from one generation to another, the Malay culture can be very well-known among the citizens regardless of the race, religion and culture in Malaysia. This way, Malay cultures and traditions can be introduced to the tourists by exposing the true nature of traditional Malay houses to the tourists.

The traditional Malay house, which is an autonomous housing process using self-help and mutual-help approaches, can throw some light on the development of a modern autonomous housing model which is based on the needs and aspirations of its users, rather than being imposed by others on the users. The importance of this housing solution is reflected in its ability to solve the housing problems of especially the poor in a manner that is most appropriate to their socio-economic and cultural needs. This people-centred approach to housing, without the intervention of the state, professionals, contractors and developers could be used as an important input into solving the massive housing problems of the poor in the Third World. The perception of the

intellectual has unmasked the beliefs of traditional and their provincial architecture. The approaches used to develop these houses are proposing towards sustainable and essential components and materials and proven the significant local wisdom of traditional Malay houses towards sustainable human wellness.

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Picardnary Congklak Charades (Integrating Congklak and Cards): An Effort to Teach Health Education and to Preserve Congklak as Traditional Game

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Abstract

Picardnary Congklak Charades is an effort which is aimed to teach basic health education to kids and to promote congklak as a traditional game. Health education is a very important matter to learn especially by kids. This can influence the way they will live their life with healthy habits or not. According to Masterman (1999), learning requires hard work and sometimes will make students frustrated and lose focus, it results to them losing their attention to the lesson. Therefore, teaching media can be very beneficial to solve this issue. This paper will integrate congklak as a game and cards to teach kids about health education. This can be effective because kids will learn about health education all the while they play congklak, the nature of game will create a competitive atmosphere which can motivate the students to win which also mean that they will also learn more about health education. Congklak will also has new values to it which will also promote it as a game which currently has lost its popularity through the wave of modernation and the existence of digital game which has more negative impacts.

Keywords: Health Education; Congklak; Cards; Teaching Media; Traditional Game

I. Introduction

1.1 Background

Health is a very important matter to be learnt by kids. Basic health education can provide kids with several knowledges as to how to take a good care of themselves. Health education builds students' knowledge, skills, and positive attitudes about health. Health education teaches about physical, mental, emotional and social health. It motivates students to improve and maintain their health, prevent disease, and reduce risky behaviors.

According to New Hampshire Department of Education (2012) Health education and instructions help students learn skills they will use to make healthy choices throughout their lifetime. Effective teaching result in positive changes in behavior that lower student risks around ; alcohol, tobacco, and other drugs, injury prevention, mental and emotional health, nutrition, physical activity, prevention of diseases and sexuality and family life.

Learning requires hard work and sometimes will make students frustrated and lose focus, it results to them losing their attention to the lesson. In this case, the use of media in teaching - learning process is needed to attract students' attention back to the lesson and to make teaching-learning activities more interesting and also effective. Teaching media can encourage students to take more responsibility for and control over their own

learning, engage in joint planning of the syllabus, and take longer-term perspectives on their own learning (Masterman. 1999).

Therefore, in learning, kids need to be provided with a situation in which they can feel comfortable so that they can be more focused on what they are learning since kids tend to be easily distracted. One of the ways to provide this situation is by using game. Game can provide a fun way of learning when it is integrated as a media to teach the material. Therefore, game can effectively encourage students to pay more attention and make the teaching – learning process more interesting.

This paper will discuss about the integration of cards and congklak as the media to support the process of teaching and learning health for kids. The cards will be contained with questions regarding basic health issues. Furthermore, in the process of playing the congklak, the cards will be taken everytime you fill the storehouse with your shells. Then, you will have to answer the question on the card regarding basic health issues. If you can't answer the questions, you will not be allowed to fill the storehouse with your shell.

Congklak, in and on itself is a traditional game that is originally from African and Arabian but brought and spread throughout Southeast Asia by the Arabian merchants.

Particularly in Indonesia, congklak used to be a very popular game for kids to play as it is also very accessible to be purchased by every layer of the society since it is affordable and can be found in traditional markets. It is also considered as a traditional game in Indonesia. As a traditional game, it also promotes interpersonal interaction between both of the players as it requires direct interaction to play. Unfortunately in this modern era, this game has lost its popularity among kids and being replaced by other digitally based games or even other technology tools such as smartphones, personal computer, tablets, etc. which are much more preferred by nowadays youngsters especially kids. This trend has led youngsters into being individualistic and ignorant towards their surroundings. Therefore, this paper tries to promote congklak by renewing it. This renewal will integrate congklak and cards in order to make it more appealing to millennial kids since it has more values which is not only considered as a fun game but also a platform to learn basic health care for kids.

1.2 Objectives

Based on the background, here are the purposes of this paper :

1. To teach basic health education through Picardnary Congklak Charades.
2. To promote congklak as a traditional game.

II. Discussion

2.1 Health Education

Health education as applied to health and disease issues is defined as "A process with intellectual, psychological, and social dimensions relating to activities which increase the abilities of people to make informed decisions affecting their personal, family, and community well being. This process, based on scientific principles facilitates learning and behavioral change in both health personnel and consumers, including children and youth," (Joint Committee 8, 1973). Health education also covers areas such as physical, mental, emotional, and social health. These are very crucial to the development of the young generation. They need to understand how to take a good care of their body, mind, and soul. Moreover, teaching kids about health education can make them accustomed to it and it can stick to them as a habit until they grow up.

According to WHO catalogue, health education focuses on building individuals' capacities through educational, motivational, skill-building and consciousness-raising techniques. Health education forms an important part of the health promotion activities currently occurring in the countries that make up the WHO countries. These activities occur in schools, workplaces, clinics and communities and include topics such as healthy eating, physical activity, tobacco use prevention, mental health, HIV/AIDS prevention and safety.

As pointed out earlier, for an educational program to be successful, it is important to take into account the reality of the students and of their community, their habits, beliefs, cognitive characteristics, interests and motivations. When discussing about children, it is important to be alert to their developmental phase, to investigate their intuitive concepts of health and sickness, their perception of reality, so as to avoid any dissonance, conflict or inefficacy of information.

"No matter how simple they may appear to be, the perceptions of the pupils are paths that will lead them to the necessary knowledge about health. Starting from these perceptions, they will become aware of the relations existing in their community or region between the ways of life and the level of health, to the discovery and categorization of the factors that condition health or sickness, to an understanding of the world that surrounds them, where not only people but also other living beings such as animals, plants and microorganisms, have with them the space for life, revealing the same basic needs for food and shelter and behaving with remarkable powers for adaptation and for the struggle for survival". (Hollanda, 1981: 20-21).

Health education can be taught formally and informally. The formal one is the health lesson obtained from school which has been arranged by the curriculum. Furthermore, the teaching of health education can also be done informally. These informal teachings can be obtained from home, with parents as teachers to teach their students about the basic of what is health education itself and several healthy habits such as washing hands, taking baths, etc. Furthermore, these informal teachings can also be obtained from platforms such as seminar, campaign, demo, or even youtube series for example.

2.2 Teaching Media

Learning media is a tools or equipment to implement processes that enable educators and learners to carry out learning activities (Prasetyo, et al., 2011: 16), then learning media is used to assist the educator to communicate the messages between recipient and source. The messages will stimulate the thoughts, feelings, attention or willingness of students so that will encourage the learning process.

The use of instructional media should be tailored to the characteristics of students such as age, a level of intelligence, cultural factors, socioeconomic, and related characteristics and directly affect the content of the lesson (Mukminan and Saliman, 2008). Learners' age determines the types of learning media which is used to deliver the content of subject. Kids' distraction and focus rely on what makes them interested in learning. It is very important to have kids' focus during learning process in order they understand learning material.

The function of learning media such as aids to create a more effective learning situation, one of the components that are interconnected with other components in order to create expected learning situation, abstracts the abstract so as to reduce the occurrence of verbalism disease, improve the stimulation of learners in learning activities, reduce the misunderstanding of learners to the explanation given by educators, overcome the limited experience possessed by the learners, allowing direct interaction between learners with the environment, generate uniform observations, and generate motivation and stimulate children to learn (Nurseto, 2011; Ali, 2009; Sudrajat, 2008).

It is necessary to choose a compitable learning media to create an expected learning process and to solve learners' limited knowledge. These days learning media depends on its flexibility, it is not only as a learning media but it should be joyful too. Game is a compitable learning media for kids because they are into it. There are many games that have been used to assist cognitive and psychomotoric learning process.

2.2.1 Using Game as a Teaching Media

Children psychologically need a fun learning, then children closely relate to game. Game will expose much fun through interactive communication. Games are effective because what they embody and what the learners are doing as they play. But, digital game has brought bad impression and changed parents' belief about it.

We consider the contradiction between parents' belief and the huge function and benefit of game, so we need an alternative media to promote learning through games. Traditional games are as the alternative to promote joyful learning for kids but parents do not worry about the effect of digital based game's addiction.

A study was carried out for the cognitive outcomes to determine whether children learn more by playing the iPhone game than by playing a traditional game. No statistically significant differences were found between the learning outcomes of playing the iPhone game or playing the traditional game.

2.2.2 Using Cards as a Teaching Media

The differences between the adult and kids in term of learning a certain study have unique traits. They are developing and growing quickly as individuals themselves, learn in various kinds of ways, for instance by watching, by listening, by imitating, by doing things and others – this assists them to learn things easier.

To channel this, kids are more comfortable to have a media to trigger them in order to comprehend the lesson material easily. One of the media that can be utilized for conducting an interesting learning for kids is card. A card is used as a learning aid developed from the compilation ideas of some basic health knowledge.

Based on the previous study conducted by Sukarno (2008: 62), using media in teaching kids help the teacher creates classroom situations to be more alive. Media also helps the teacher conveys materials and helps the students comprehend the given materials.

Card is chosen as an identity that this media is not only a usual card game, but a modified card that consists of questions about basic health knowledge. In addition, this card itself will be merged with the use of it with a traditional game called Congklak.

The card as it is designed to be used in pairs with Congklak. When playing Congklak, the moment when player fill the storehouse with the player's shells. The player must pick the card and answer the question written on it. If the player is able to answer the question, they can put their shells in the storehouse. In contrast, if the player is unable to answer, they can not put any of their shells in the storehouse but still continue to play until they fill the empty holes and they must stop and let the other players to play. In conclusion, the score will be counted by how many shells in the storehouse. Therefore, the use of cards as teaching media is important.

2.3 Congklak

One of the most fascinating things about living in Indonesia is the discovery of Indonesian cultures and its local wisdom. Indonesia also has lots of diversities regarding to its traditional games throughout its provinces that are labelled under a different name due to the variety of Indonesian tribes languages and cultures. One of the examples is traditional game called Congklak.

Congklak is known by different names from region to region in Indonesia. Congklak is the most commonly used name. While in Java, other than Congklak, it is known as dakon, dhakon or dhakonan. In Lampung, it is called as dentuman lamban. In Sulawesi, it is referred to as Mokaotan, Maggaleceng, Aggalacang and Nogarata.

Regarding to the historical references of Congklak, it referred to the game played by young Javanese nobility girls. It is most likely that foreign traders, due to their close contact with the upper classes, introduced Congklak to them. With the passage of time, Congklak' s popularity rose until its now widely played by the common people as well. In most regions, Congklak play was limited to young girls, teens and women in their leisure time and its seen as a 'girl's game'. In only a few regions was Congklak played by men and boys as well.

In Sulawesi, historically, the game was reserved for play only during grieving periods, after the death of a loved one. It was considered taboo to play the game at any other time. In Central Java, in pre-historic times, Congklak was used by farmers to calculate the seasons, to know when to plant and harvest, as well as to predict the future.

From the explanation above, Congklak is a tool that has existed since ancient times, and handed down through generations. It spreads many positive values. For example, Congklak requires direct interaction as the

game is played by at least 2 people. Moreover, when we play Congklak in a group, the members also have to determine a strategy, communicate and collaborate with team members.

Congkak has been a traditional game played among Indonesian since then. Unfortunately, like any other traditional games, there is a great shifting of interest among Indonesian millennials due to popularity of digital based games. Therefore, this paper attempts to improvise Congklak by integrating the use of card with Congklak as it gives the interactive element that is expected to trigger the preference of millennials' interest to play the game traditionally rather than those most multimedia-based games in order to reverse the existence of Congklak back within the Indonesian millennials.

2.4 Picardnary Congklak Charades

As a game, congklak itself can be a media to improve the quality of the teaching and learning process itself and cards can also be used as a media and a platform to display and deliver the matter taught, this paper will further integrate these two medias in order to teach and deliver matters regarding health education. Learning in general and learning health in specific can be draining, especially for kids who is also by fact one of the most important groups to be introduced to health education since they will carry it as a good habit all the way until they are grown up. Therefore, in the effort to provide a fun and exciting way of learning health for kids, this paper integrates congklak and game to overcome this problem.

Congklak card is basically a game which has a twist of educational value to it. It will still mainly adapt the rules of regular congklak game in it. The tools will also be the same which include a board with seven holes on each side of the board and one storehouse on each corner of the board. It will also use 98 shells which will be distributed evenly to 14 holes on each side, so each hole will have 7 shells before the game started.

Figure 1. Congklak board before the game starts.

After the board is ready to play, the two players will compete opposite each other across the board. They will have their side as their territory with the shells that they have as their responsibility to be put in the storehouse as much as possible.

Figure 2. How the game will look like

This is where the conventional way of playing the game will have a little twist to it. A deck of cards will be placed near the board. Each of these cards already contain a question regarding health education. These questions will circle around informations regarding basic health education including areas like physical, emotional, mental, and social health. Since the target is younger generation or kids in particular so the questions will only discuss basic health matters. There will also be an answer key to the questions when neither of the players know the correct one. Furthermore, an instruction of how to play the game will also be provided. These questions will discuss mainly about the activities that they can do on a daily basis to create better habits by exposing them with these activities through questions. Here are some of the questions that will be on the cards :

1. How many times do we have to brush our teeth in a day?
2. How often do we have to visit a dentist in a year?
3. Mention 3 food that contain vitamin C!
4. Mention another food that we normally eat for breakfast except rice!
5. How many times do we have to drink milk in a day?
6. How many times do we have to take a bath in a day?
7. Mention 3 food that contains protein!
8. What nutrients does milk contain!

Then, everytime a player wants to fill his/her side of storehouse, the player will have to take a card and must answer the question on it regarding health education. When the player can answer the question correctly then the player can fill the storehouse with one shell and continue to fill the other holes all the way until the player is about to fill the storehouse again and at the moment, the player will have to take one more card and answer it once more and it will keep happening until the player put the last shell in an empty hole and give the turn to the other player. The player in turn will also do the game exactly as explained above.

However, when the player can not answer the question on the card correctly, the player will lose the chance to fill his/her storehouse with the shell. Instead, the player can continue to play by continuing to filling the hole next to the storehouse and skip filling the storehouse and keep continuing until the player is about to fill the storehouse again that the player needs to take another card and answer it. This will serve as consequence for not being able to answer the question about health education. The goal of playing congklak itself is to fill the storehouse with as many shells as possible so that it can have more shells in it than the storehouse of our opponent so that the player can win over the opponent. Therefore, not being able to fill the storehouse and lose a point will be a motivation for the player to answer the questions correctly so that they can continue to fill the storehouse and can win.

Since it is essentially a game, this will create a competitive atmosphere where the players will try to win by filling the storehouse as many as possible which also means that they will have to answer as many questions as possible regarding the health education which means that it will maximise the knowledge being obtained by these students. It might be different from obtaining the knowledge from school through preaching or learning from the book. This will not make the students feel bored and lose focus because they are driven to win and they will of course focus on the question in order to win. So, the lesson is still there but it is done by a way that is much more fun and will mostlikely engage the kids to be more attentive in health education.

This game can be played everywhere. Moreover, since this game is a renewed version of the conventional congklak, of course it will hold a different value from the conventional one and can be a source of business income. Since health education can also be done informally like from home, this game can be sold and be bought by parents who are interested to introduce health education to their kids. Furthermore, rather than just selling it to mainstream society, since we target kids to play this game, this game can be sold to kindergartens or primary schools. Of course it will be economically beneficial too.

To make this happen, a team of university students can be formed in Universitas Negeri Medan (UNIMED). Under the supervision of a lecturer, this team will consists of students from English, Biology, Economy and Art department who will work together to get the products ready and able to be sold.

This project is also expected to promote congklak to a new level. Congklak will not only be seen as a simple game but as a platform which has educational values to it. Parents will start buying congklak to teach their kids about health education. Most importantly, parents can provide their children a much more beneficial way of playing game, not just by playing online game which has many disadvantages but a game which has values such as educative, interpersonal, and fun in it. This will bounce congklak reputation back to where it used to be as a very popular traditional game among children. As congklak is also a traditional game, it will also promote the traditional culture and keep fresh to the modern era kids.

III. Conclusion

Health education is an important matter for kids. They need to be introduced to it in order to create a habit in which they will live with until they grow up. The main problem with teaching kids is that they are very easy to lose focus and attention. Hence, a media is needed to attract their interest back to the lesson.

An innovation is made as a way to cope with this situation by using congklak and integrate it with the use of cards. These cards will contain questions regarding basic health education. By using this as a media for the students to learn, it can attract students attention to learn in a fun way through game.

It will also elevate congklak's reputation as a traditional game which has lost popularity among young kids and further promote it. Society will be interested because it has more values and not just a game but also an education platform.

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Empowering Rice Farming towards Human Wellness

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Abstract

Rice farming is a part of Thai people's life, for rice is a main food of Thai people. However, rice farming is not the career that many Thai people want to do. Now, the place that used to do rice farming changed to growing other plans because of higher profits. Farmers do not engage in rice farming due to many reasons. For example, rice farming has high cost of production and low selling price. Farmers must pay a considerable amount of money for every process of rice farming such as selecting the seed, preparing the soil, taking care of the rice and harvesting it. Moreover, farmers do not have the right to control the price of rice. If the cost of rice is too low, farmers do not have the choice to increase the price. Rice farming cannot be the only way to produce the rice as a main food of humans. It must be applied with sufficient knowledge to empower this wisdom to increase the value of the product. Rice farming from the past needs to change. Farming needs to allocate the land to do rice farming and new knowledge to empower the wisdom.

Keywords: Empowering, Rice farming, Human wellness

I. Introduction

Nowadays, rice farming is a career that many Thai people do not want to do due to low profits. Thai farmers must spend high cost of production while the selling price is too low. Thai farmers need to use technologies and apply their knowledge to increase the profits. Farming is a main career of Thai people, but they encounter several problems such as natural disasters, high price of production, and low selling price which tend to discourage many Thai people from pursuing this career. However, rice farming is really important for Thai people. Farmers need to apply sufficiency economy to the rice farming process and use new knowledge to solve the problems in rice farming such as food processing. Rice farming's trends need to change now to increase profits.

II. Literature review

This section details some of the literature related to the role of rice farming in human wellness.

2.1 What is empowering?

Cambridge Online Dictionary (2019) defines empowering as having the confidence and feeling of control over one's own life.

2.2 What is wellness?

Cambridge Online Dictionary (2019) defines wellness as the state of being healthy.

Objectives

This report has three objectives:

1. to prepare young generations to aware of the importance of rice farming,
2. to study how to empower rice farming in the present, and
3. to empower residential farmers to upgrade their quality of life by using Self-Sufficient Economy.

Questions:

1. Why is rice architecture important for Thai people?
2. How can rice farming in Thailand be empowered?
3. What are the differences between farmers' lives then and now?

III. Discussion

Rice is an important food for humans. Rice contains many nutrients that humans need. It is a staple food for many Asian nations such as Thailand, making rice a part of Thai people's life. Moreover, rice has an important role in exportation and is a source of income for Thai people. Rice farming is a way of life and represents the cultural wisdom of Thai people, which is inherited from previous generations. For these reasons, farming is an important career for Thai people. However, this career is unstable, for farmers cannot control the price and quantity of the product. There are times when the farmers plant too much rice, so the price of rice is cheaper according to the demand and supply of the market. In addition, farmers may face natural disasters such as flood, pests, and drought that destroy the product. Presently, rice consumption is decreasing, and some people consume more wheat instead of rice. These are the reasons why farming in Thailand is an unstable career. Even if farming is an important career as the quote "farmers are the backbone of the nation" says, the human's body will be disabled if the backbone is broken. However, many Thai people do not want to take this job because farming is a hard and unstable career. Some people quit this career and take other jobs instead. Despite this, some farmers still do this because they do not know how to start a new career, and they have a lot of debt due to the low price of rice.

I interviewed my grandmother and my father who used to be farmers. My grandmother told me that rice farming is the main career of Thai people, and it involves hard work. Farmers must do every process by themselves and use animal labor such as buffaloes, and oxen. In the past, farmers did rice farming mainly for the consumption of the family and the excess rice were sold. The rice market did not have enough to support all of the quantity of rice. Farmers must take the rice to the market and sell it by themselves. Moreover, mills bought rice from farmers directly. However, the mills bought limited amount of rice because they did not have many markets to sell the rice. These are the reasons why farming is not the career that generates a lot of money. Moreover, my grandmother told me that rice farming in the present used a lot of chemical fertilizer, pesticide, and insecticide. Rice farming in the present is less hard than the past because farmers have equipment to help them, but they must pay a lot of money for rice farming. That can be the reason for the farmers' debts if they do not have a place to sell the rice or if the middlemen give them low price for the rice. She said that "Being an officer is better than being a farmer. This career should be the last choice to do" because farmers do not have a stable salary and lose a lot of profits from the middlemen.

My father told me that he started rice farming when he was 9 years old. The price of rice was cheaper than in the present, but farmers did not lose the profits because the cost of production was lower too. Farmers used animal labors and natural fertilizers such as dung from animal labors, so they did not pay for the fertilizer or the petrol of the engine. The price of the rice in the present is higher than the price of rice in the past because the cost of production is higher now than in the past. Hence, farming is an unstable career.

If farming is compared with other occupations, it may be perceived that being a farmer is not good enough. For example, between being a farmer and an officer, many parents in Thailand will want their children to be an officer more than a farmer because being an officer is a career that is more stable in salary and has more state welfare benefits, but the income of farmers is not stable and cannot gain a lot of profit.

IV. The farmers of Thailand in the past

Thirty years ago, it is said that Thailand is a land of milk and honey. Almost every household had rice fields and rice farming equipment. They used manure that was a by-product from pet food. The use of manure would cause a balance in the ecosystem. Rice in the field grew well without chemical fertilizers. Therefore, most of the cost of farming in this period was the cost of labor. The farmers did not have to ask for loans to be used in farming. Once, manure helped increase the income for the farmers as well.

Thirty years later, it is found that the buffaloes are not seen in the field. Many families have stopped raising buffaloes and that many families would raise cattle instead with the belief that cows are expensive so they will gain profits well, and that rural people prefer beef more than buffalo meat. Among the farmers, tractors have replaced the buffaloes since they believed that such are fast working machines, and there is no need to feed or take care of the equipment.

There are three important reasons the farmers in the past failed in their farming. The first reason is low yield per Rai¹. Thailand has a total area of about 71 million rai, which is about 44 million rai, and which is 27 million rai in Nodon. Rice production is both large and off-season. Approximately 38 million wagons produce an average of 71 million per rai. While Vietnam produces an average of 900 kilograms of rice per rai, Indonesia produces an average of 700 kilograms per kilogram of rice, and the Philippines produces 600 kilograms per rai. Average production is close to Myanmar and Cambodia. The second reason is high production costs. As mentioned, farmers use the tractors instead of buffaloes; however, there are additional expenses due to the need to buy oil for the tractor to work. Tractors can cause pollution. There is no manure, which is from buffaloes, to use in the field, therefore the farmers buy chemical fertilizers instead of manure to put in the field. When chemical fertilizer is put in large quantities, it damages the soil structure. The ecosystem is destroyed because of the lack of soil microorganisms and water. The small or big animals cannot survive themselves or if they can, the farmers use chemicals to kill them and the grass. Therefore, the use of chemicals in greater quantities leads to higher farming cost. The next reason is selling rice at a lower price. While the production cost of the farmer is very high, the selling price is sold according to the world market price, deducted by the middleman's profit and the cost of trading of all middlemen. The price that reaches the farmer's hand is lower than the cost of the farmer spent. As a result, farmers have to sell rice and get low profit. The last reason is that the farmers lack knowledge to add value to rice. The world has been changing, but the farmers are still lagging behind. The farmers did not adjust themselves, so they sold only rice and do not earn much.

V. Self-sufficiency

Self-sufficiency is the overlapping states of people who or organizations which are independent or need little help from others. This principle is part of "Sufficiency economy", a Thai development approach attributed to the late King Bhumibol Adulyadej's.

¹ 1 Rai equals 1,600 Square meters

According to the principle of sufficiency economy, areas can be divided into four main parts:

1. 30 % of rice fields
2. 30 % of horticultural crops
3. 30% of water source or fish pond
4. 10% of living area

We can manage the area on the ridge to plant other plants such as watermelon, banana, and palmyra trees. By this principle, people can get their food and also make income from the principle.

Even if sufficiency economy = self-sufficiency, self-sufficiency, it does not mean that we have to follow the principle of sufficiency economy. We just have to be self-being.

News



#Thailandtoday #NBTWorld #ราชการThailandToday
Thailand Today 089: Thai Rice NAMA ▼
campaign launched to reduce global w...

Climate change is major problem of the world that everyone realizes how serious it is. Approximately 55 per cent of greenhouse gas emissions from agriculture in Thailand is from rice farming. The Thai Rice NAMA was developed by the Thai Ministry of Agriculture to decrease emission and support national mitigation goals. The objective of this project is to introduce around 100,000 rice farmers in six pilot provinces in central Thailand to low-emission farming techniques. Emissions in rice farming are projected to decrease by about 29 per cent in 2023 (NAMA Facility, n.d.).

Trend



Riceberry is a registered brown rice variety from Thailand, a cross-breed of Jao Hom Nin (JHN), and Khoa Dawk Mali 105 (hom mali rice). The breed was created by the Rice Science Center, Kasetsart University, Thailand. The result is whole grain that is deep purple in color and is soft and flavorful. Riceberry has been popular due to its health promoting properties. Consumption of more brown rice could reduce diabetes, heart disease, high blood cholesterol, obesity, and cancers. Riceberry has become popular for health enthusiasts and patients (Tourism Authority of Thailand, n.d.).

VI. Possible solutions

To make Thai rice more valuable, farmers and related organizations have to find ways to make people realize how important rice architecture is. Adding value to rice and fields also means adding more money to farmers and government. There are three solutions that we find to empower rice.

Tourism

1. Homestay

Build the huts at the rice fields. The tourists may be impressed by the beautiful view of the rice fields. Also, organize an activity such as growing rice so that the tourists can participate in the rice farming experience.

2. Café in the field (sell produce from rice)

The view of the café is the rice field. People can immerse themselves in the atmosphere of green fields while drinking beverage or eating food. Moreover, customers can eat and drink food made of rice such as Rice Pizza, in which the pizza dough sheet is made from steamed rice, then baked until it is crispy and is decorated with toppings.

3. Learning Center

The farmers can share the local wisdom of rice farming by narrating or describing the process to the visitors. After the narration, farmers can organize activities such as harvesting and growing rice. The visitors may have and absorb the local wisdom.

Case study

Na Po Kae



It is a local learning center where we can learn the way of life of Phatthalung's farmers; for example, how to plow, how to plant rice, how to train buffaloes to plow, and other information about agriculture such as organic fertilizers.

VII. New produce from rice

1. Crispy brown rice

The taste is unique and addictively crunchy twist on tabbouleh which will impress the people who eat this product.

2. Baby powder from rice flour

Baby powder often has some hidden ingredients. Some regular baby powder contains talc, which is closely related to asbestos and has been linked to various cancers. There are natural alternatives that are easy to make and work better without the side-effect of cancer.

3. Energy drink extracted from rice

Such drinks may provide energy extracted from rice and contain natural ingredients such as extract Vitamin B3, B6, B12 L-Arginine, including nutrients that are useful.

4. Rice Bran Non-Dairy Creamer

The produce from the introduction of rice bran oil can be done through physical processes by chilling to crystallize several steps under controlled conditions until softening rice bran oil into the main ingredient in the production of artificial cream. This helps health lovers to enjoy their favorite drinks without worrying about cholesterol, transfats, saturated fats as well as products that are free from genetic modification.

Case study

Sung Yud rice crispy



Besides rice for the main course, rice can be made into snacks too. For example, Sung Yud rice crispy is a snack made from Sung Yud rice, a local rice breed that is grown only in Phatthalung province, Thailand.

In brief, rice is not just food for the Thai people's consumption. It is our ethnicity, our culture that is connected to a rice-growing circle. This is the time to empower our rice and show the world how proud we are.

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The Role of Youth in Introducing Bataknesse Local Wisdom through Local Tourism

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Abstract

Local Wisdom is the embodiment of durability and ability to grow which manifested the way of life, knowledge, and life strategies in the form of various activities undertaken by local communities to address various problem in the fulfillment of their needs, while preserving its culture (Kartawinata, 2011). This study aims to analyze the role of youth in introducing Bataknesse local wisdom by utilizing local tourism as the platform. The location of this tourism is in Huta Tinggi, Pusuk Buhit, as the nuance this location offers is really historical and traditional. The way of the people live there could be implemented and bring benefit in the daily life of the tourists. The tour in Pusuk Buhit would be exciting to explore and to learn. However, the infrastructure and the human resources there still need to be improved in managing tourism activities. Youth can take part in improving the human resources, as they understand about the local wisdom, and can creatively deliver this to the tourists. This is expected to optimize the potential of the tourism destinations, while at the same time maintaining the sustainability of the local wisdom

Keywords: Youth, Bataknesse local wisdom, tourism

I. Introduction

It is well known that Indonesia is a country with more than 700 hundreds tribes with a rich cultural diversity. Each tribe possesses valuable local wisdom with rich of good values, which could be part of the myriad of wonderful tourism objects in Indonesia. Among them, North Sumatera, with its famous Lake Toba, provides various local wisdoms with many beautiful places. North Sumatera is known for its majority of Bataknesse. Batak actually consists of 7 sub-ethnics – Toba, Karo, Pakpak, Simalungun, Mandailing and Angkola. Each of them yields distinct culture as well as local wisdom, which in this case will be introduced through tourism. Lake Toba is the largest and deepest lake in South East Asia and also famously known as the second in the world after Victoria Lake in Africa. This tourism attracted many tourists from all around the world to visit Lake Toba, reaching 23,430 visitors in August 2018 (Head of Central Bureau of Statistics (BPS) of North Sumatera in Analisa Daily, 2018). It is known as the land of Bataknesse, particularly Batak Toba.

However, people do not know the fact that Pusuk Buhit is the zero point of the civilization of Batak Toba. It holds a line of history as well as local wisdoms about Batak Toba. It is located in Huta Tinggi. Tourism is chosen as the entry point as more and more millennial are likely travelling all over the world. However, for Indonesian youth, as the tourist themselves and being open to global culture, many of them tend to less understand and aware of their own culture. For foreigners, the unique Batak Toba's local wisdom could be a

very new information that they could find in Pusuk Buhit. Therefore, the Batak Toba's local wisdom could be introduced for both Indonesian and foreigners. Youth could be the most understanding millennials' interest, thus giving creative possible alternatives in introducing the local wisdom.

II. Literature Review

Local Wisdom

Local Wisdom is the embodiment of durability and ability to grow which manifested the way of life, knowledge, and life strategies in the form of various activities undertaken by local communities to address various problem in the fulfillment of their needs, while preserving its culture (Kartawinata, 2011). Local Wisdom contain social norms and values that govern how a balance should be established between the carrying capacity of the natural environment and the life style and needs of human beings. Soerjani (2005 in Cahyanto, 2012) explains that exploring and developing local knowledge could also help maintaining resource sustainability for the next generation.

Tourism

Tourism is a bundle of activities away from home which brings a travel experience covering many hospitality services provided for individuals or groups. Local Tourism or Domestic Tourism is tourism involving residents of one country travelling only within that country. Unlike domestic tourism, international tourism involves residents of one country travelling outside the country.

According to the United Nation World Tourism Organization (WTO), there are some characteristic about domestic tourists. Domestic tourist know destination, its language, its customs, its laws, its climate, its cultural context in which this may have two consequences such as in general rule the domestic tourists are more demanding especially when it comes to the quality of products, and also with regard to their consumer-protection rights and out of the four main motivations of tourist (discovery, encountering others, experiencing something unique, resting) the last two are certainly prominent among domestic tourists. In addition, they also seek a very wide diversity of types of destinations and tourism activities. In other words, the range of products offering should be as broad as possible. Overall, the domestic tourism cost much lower in which the domestic travelers seek the best price-quality ratio, or often the lowest possible price, in all segments of the tourism value chain such as: food, service, tourism activities shopping and etc.

Bataknese Local Wisdom in Pusuk Buhit

According to the belief of Bataknese, water is the beginning of life. Exactly, according to *Parmalim*, Bataknese's ancient religious belief, approximately on 30 BC, King Ihat Manisia and Boru Ihat Manisia, Bataknese's noble progenitor, were created by the combination of goddess's holy water. The body where human is born should be introduced to their original place – that is water. *Martutuaek* means coming through the water resource and introducing a newly-born to the water which is the primary source of life. In Bataknese, as a message from King Ihat Manisia and Boru Ihat Manisia, mankind are obliged to protect all elements on earth. Furthermore, that is becoming the reminder for preserving water such as river, lake, and sea from being contaminated by the waste.

Every time citizens there build any new house in the village, they will hold the ceremony of "Mompo", which means entering the house for the first time. Before the owner/s of the house get/s into the house officially, they must fulfill the first procedure by bringing water into the house one day before, and this is called as "Panguhatan". Panguhatan is the source of water on ground pot but nowadays they change the container into a bucket or a pail. Along with it, they also bring "sipusipu" which means small embers that is still alive until the next day the owner of the house gets inside of the house and doing the cooking. Here, the belief says that they have found their life resource which is "water" and source of energy which is the "small embers".

III. Method

This study plans to find the answer for our questions:

1. How to maximize and utilize these opportunities?
2. Who will conduct the strategy?

We have to analyze this location using 7P Strategic Marketing Analysis method. By then, this study can analyze the strength, weakness, as well as the opportunity and the threat this location may gain by SWOT analysis method. Next, we can define the marketing strategy for this location by SPIN selling analysis method.

Strategic 7P Analysis Method

Strategic 7P is the effective solution. 7P consists of product, price, promotion, process, physical evidence, place, and people.

S.P.I.N Selling Analysis Method

SPIN works from the theory that relationship selling is customer-centric - this theory emphasizes to build an appetite for the product. SPIN is an acronym for the four types of questions that lead to good rapport, interest and ultimately sales. It requires you to adapt your selling process to your customer, and it delivers personal solutions. SPIN selling focuses on four areas—*Situation, Problem, Implication, and Need-payoff*. *The Situation* refers to the real situation the location provides and/or offers. *The problem* focuses at challenges, shortcomings, and difficulties. The weaknesses we have analyzed above are the problems. *The Implication* is designed to explore the implications of those problems. Last but not least, *The Need-payoff* is to define the need payoff. What offering does this location need and what is the payoff for acquiring this solution?

IV. Analysis

Analysis of Pusuk Buhit and Bukit Hobon in North Sumatra using Strategic 7P Analysis Method

1. The product is Pusuk Buhit and Batu Hobon with its local wisdom, rich heritage and unique characteristics they have within;
2. The price of the tourism will be approximately fairly affordable, owing to the fact that the place is still traditional and pure and the key of this local tourism is the educative tourism;
3. The promotion can be done through virtual and/or physical promotion;
4. The process is that we have to maximize the potential of the tour guides;
5. Physical evidence, this location offers comfortable and fresh atmosphere;
6. The place is located not so far from Lake Toba;
7. The people there are friendly and welcoming.

Analysis of Pusuk Buhit and Bukit Hobon in North Sumatra using SWOT Analysis Method

<p>Strengths</p> <p><i>Historical and Traditional Nuance;</i></p> <p><i>Educative Tourism;</i></p> <p><i>Good Reputation</i></p>	<p>Weakness</p> <p><i>Infrastructure</i></p> <p>(In terms of mobility and accomodation);</p> <p><i>Less Promotion;</i></p> <p><i>Practical Regulation</i> (Track and Monitor the regulation)</p>
<p>Opportunities</p> <p>Growth of New Market;</p> <p>Arrival of New Technologies</p>	<p>Threats</p> <p>A cheaper competitor cost (<i>Toba Lake</i>);</p> <p>Lack of Human Resource;</p> <p>High Cost to Make New Regulations;</p> <p>Complicated Bureaucracy</p>

Analysis of Pusuk Buhit and Bukit Hobon in North Sumatra using SPIN Selling Analysis Method

1. The Situation

According to the analysis, the strengths and weaknesses of the local tourism itself as we have analyzed above visualize the situation of the location itself. The table above has shown the strengths and weaknesses this location possesses.

2. The problem

The weaknesses we have analyzed above are the problems.

3. The Implication

The existing weaknesses are potential and/or indeed realize the threats to this location.

4. The Need-payoff

By this, we have to develop awareness by focusing on solutions and not problems anymore, conducting investigations or extracting from clear needs.

V. Result

As we can see from the table above, Pusuk Buhit and Batu Hobon have the potential to be a high-quality tourism destination. This could be the biggest opportunity for North Sumatera to increase the income through tourism and to introduce the local wisdom there by maximizing the strengths that Pusuk Buhit and Batu Hobon have.

The location of Batu Hobon is in Pusuk Buhit and in Pusuk Buhit we are not only able to find Batu Hobon but also other things, e.g. the statue of Bataknese’s King as one of their cultural heritage. The nuance this location provides is really historical as it was the exact location of the origin of Batak’s civilization – no wonder it is so historical. Another thing is that this location is still traditional and does not utilize technology for advance. No wonder that it makes the location is still pure and most activity is still done in traditional way by maximizing the traditional materials around the location. In fact, local wisdom is still so much being practiced in here, e.g., they still uphold the idea of *Mangase Homban* as Local Wisdom in their daily life. This traditional nuance could bring the good effect for every tourist that comes to Pusuk Buhit.

This local tourism have the potential to be the center of destination of learning Bataknese deeply and therefore to be the most powerful destination. Owing to the fact that this place is historical, it will allow tourist to experience themselves as the real Bataknese.

Furthermore, this location has a good reputation and has no bad or negative report published in media so far. (“Disinilah Titik Nol Peradaban Suku Batak”. *On the Spot*. Trans 7. Pusuk Buhit, Sumatera Utara. September, 06. 2018.)

we believe that by making Pusuk Buhit as the tourist destination it could create new market in terms of tourism, despite of having Lake Toba as the tourism that provide the beautiful view of Lake Toba, as well as Samosir Island, Pusuk Buhit provides educative tourism which the tourists are expected to learn and explore Batak Toba culture further.

Not only that, it could be the chance for arrival of new technology which is Wifi that will be provided for marketing and promoting the location through internet. it will be easier for the youth to spread the information widely from internet as a lot of tourists will come to Pusuk Buhit.

Then again, this location has bad infrastructure, less promotion as well as the lack of practical regulation which makes the mobility of people is very bad there. It is proven by the fact that people should take off our shoes to get into the location, lack of lights as well as signposts. In addition, people also need to get there around 15 minutes (or more) by foot - without transportation.

Furthermore, practical regulation needs to be improved. It needs to be considered for this place to strive to be an amazing place of destination.

These weaknesses are potential to cause threats to this location. We have acknowledged that Lake Toba is the most famous destination in North Sumatra and it serves many affordable accommodation as well as various facilities such as banana boat and coastline and has better mobility, which are just unlike Pusuk Buhit. Lack of human resource makes the place remained unmaintained - unlike Lake Toba which is facilitated and monitored constantly by government. The cost to create the new regulation for this tourism would cost so many.

VI. Discussion

The Role of Youth

a. Promoting Pusuk Buhit as Educative Tourism

The answer of our question on how to maximize and utilize these opportunities is to promote Pusuk Buhit as Educative Tourism. Even if the location has a bunch of weaknesses that will cause threats, we still believe that there are many ways to cater those problems. We have to maximize both of the opportunities and the strengths by maximizing the marketing strategy of Pusuk Buhit owing to the fact that this location, despite of its strengths and opportunities it will gain, is lack of recognition.

It needs more recognition through attraction by promotion such as advertisement in Mass Media and Social Media to promote Pusuk Buhit as the educative tourism. In the Pusuk Buhit, there are many things that the tourists could do such as experiencing to live in the local community, learning the way of the local people in protecting their water spring and growing plants which ensure the environment wouldn't be harmed. The tourists also could learn Batak language from the local people.

By promoting Pusuk Buhit as the educative tourism it could also promote the local wisdom there such as *Mangase Homban*. The promotion can be done through youtube vlog, Facebook posts, and blog. Here we can write the information about the local wisdom in Pusuk Buhit and also attach the video and pictures to make people able to see and attract tourists to come to Pusuk Buhit.

b. Youth as Agent of Change

The answer of our question of who will conduct the strategy is youth, as we know that youth act as agent of change. According to Yohalem, N., & Martin, S. (2007), the role of youth is to build positive and meaningful relationships with marginalized young people who are limited to get information and also education by

cooperating respectfully and involving young people in a youth-friendly way, started by youth as the pioneer of successfulness of the local wisdom.

Youth have to keep our local wisdom by maintaining and preserving its originality as the key to maintain this local tourism and as the foundation of this location. It needs more attraction through promoting such as advertisement in Mass Media and Social Media. Youth can help by using their creativity. Their creativity then might be shared to communities that concern to help local tourism – for example, many foreigners recognize Toba Lake because of virtual marketing. For promotion, there are 2 (two) options; we can use physical promotion, for example open-booth campaign, or via virtual promotion.

In fact, Local wisdom and Local tourism are acting very influential not only to Indonesia, but also for the Malaysia and Thailand as the Growth Triangle (IMT-GT). Or, as fellow youth as well as fellow millennial, we can achieve to make our local wisdom well known in the world by establishing cross-cultural relationship. In other words, we can establish relationship through IMT growth triangle to help developing our local wisdom. As we know that youth are energetic, youth from Indonesia, as well as from Malaysia and Thailand can volunteer to help out empowering these local wisdoms. By that, we can empower the local wisdoms to the human wellness.

VII. Conclusion add Suggestion

Nowadays, local wisdom has been forgotten by the latter generation, millennials. It becomes the challenge for us, the millennials, the youth, regarding on how to keep the local wisdom as the soul of life, so our environment especially water, land, forest and etc. can sustain for good, for the sake of our future as well as our next generation. Every single one of us should eventually remember that local wisdom is the treasure of life to keep the world and its whole components sustainable. Pusuk Buhit is the only place that is known as its originality for the local wisdom called “*Mangase Homban*” which the belief from this action is very good for the environment such as water spring that always being cleaned by the local people there, not only that but Pusuk Buhit also the zero place for Batakese civilization. By looking at this, Pusuk Buhit could be one of the educative local tourism which can be the source for every tourists that want to learn about Batakese culture as well as the local wisdom and to explore the Batakese civilization. But we see that Pusuk Buhit has two weakness such as in the infrastructure which still needs accommodation for the tourists place to stay in Pusuk Buhit and also the mobility to reach Pusuk Buhit that still rocky too. Not to mention that Pusuk Buhit needs promotion to gain tourists to come to Pusuk Buhit because it still lacks of tourists. Therefore, Youth has a bigger role here in promoting Pusuk Buhit to be the famous tourism in the future, and through this IMT-GT the authors also hope to make relationships with other participants from Indonesia, Malaysia and Thailand Pusuk Buhit and the local wisdom so it can gain a lot of tourists. The authors have analyzed Pusuk Buhit by the SWOT analysis, SPIN Selling and 7P. We found that there are several opportunities and strengths that could be maximized. Youths here have a big role in doing this to contribute to one of the local tourism that North Sumatera has. By promoting one of the local wisdom such as *Mangase Homban* which expected to be learn by the tourists and could be implemented in their city so it can help to preserve our environment. Tourists will learn the importance on upholding the local wisdom in their daily life and in the end the local wisdom will not be forgotten and extinct.

At the last we suggest exposure first to the youth. As youth, we have to give attention to the cultural problem for local wisdom that we have. Besides that, youths also need to understand that local wisdom is our identity that makes us unique and must be proud to have a lot of local wisdoms in our country, Indonesia. Especially living in North Sumatera which the land of Batakese is located here, we need to give our attention in this problem. Secondly, we suggest that both youth and government could be collaborated in conducting this Pusuk Buhit as local tourism for learning the Batakese local wisdom in Huta Tinggi. Just the love for the local wisdom of our ancestor will touch back our thought especially the Batakese to develop the traditional value. The opportunity has given to us after the practice of regional autonomy, so as the youth we need to grab this opportunity and never let this gone away.

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Upholding Herd Immunity through Local Wisdom Empowerment in Aceh

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As one of tropical countries, Indonesians are often the target of tropical diseases, most of which are present as infectious diseases. On the basis of such consideration, individual immunity needs to be prepared by immunization, as one of ways to prevent infection, particularly vaccine-preventable diseases.

Immunization is the front line to prevent infectious diseases. Unfortunately, the Ministry of Health of the Republic of Indonesia shows that around 1.7 million children have not received immunization status, updated from 2014 to 2016. This plunges many uninfected people to death caused by diseases that can actually be prevented, especially through immunization. For instance, measles has the potential to become an epidemic if the immunization coverage is low. When a person has measles, 90% of people who interact with measles sufferers can get infected if they are not immune or have not been immunized against measles.¹ One of regions of Indonesia who has a big number of refusals is Aceh. Amid 2018, the Health Ministry has announced that Aceh was the province with the lowest coverage rate, only 4,94 percent. it's equal to 76.461 vaccinated children, out of the target of 1.5 million. This indicated that Aceh should get intense attention to control its immunity coverage in order to conduct a healthy society.²

Immunity is formed through immunization or has been infected by certain infections before. **The fact also shows that people who refuse to be immunized will be very susceptible to similar diseases and become spread agents to other healthy people or people who have not been immunized.** This understanding has fueled the government's enthusiasm to campaign for immunization as a fundamental effort in preventing disease. The more people are vaccinated, the fewer people are infected with the infection, which is what is called the concept of **herd immunity**. This concept is different for each disease depending on *basic reproductive number* (R_0); (R_0 = reproductive number; R_0 is the average number of infection cases that can occur from one infection). For example, for R_0 measles are 12 to 18 and R_0 pertussis is 12 to 17 (as mentioned in Figure 1), of which the two diseases have the highest basic reproduction number (R_0). The average threshold of herd immunity that must be achieved for both is about 94%, which shows that measles has the potential to spread to 12-18 people, while pertussis can spread to 12-17 people.^{2,3}

Disease	R0	Threshold (%)
Mumps	4-7	75–86
Polio	5-7	80–86
Smallpox	5-7	80–85
Diphtheria	6-7	85
Rubella	6-7	83–85
Pertussis	12-17	92–94
Measles	12-18	83–94

Figure 1. Relationship between R^0 and threshold level needed for herd immunity⁴

The development of a nation must also consider the great opportunities in terms of the country's demographics in health sector. According to the Central Bureau of Statistics (Badan Pusat Statistik; BPS), Indonesia will face an era of demographic bonus in 2020-2035, which means that the population of productive age is at the highest value in history, reaching 64 percent of the total population of Indonesia, amounting to 297 million. This large amount of people definitely must be prepared to be able to keep developing the nation. A developing nation certainly cannot be separated from a healthy nation and thus can make a productive age to develop Indonesia.⁵

The low number of immunity coverage is influenced by certain groups of society who do refusal on immunization. At present, immunization creates a polemic and is opposed by certain community groups acting on behalf of the anti-vaccine movement. This happens in certain countries including Indonesia, moreover in Aceh. Although the anti-vaccine movement is promoted by a handful of people, this movement must be anticipated immediately, due to its expansion can be carried out and provoke others to participate in encouraging immunization.⁶

Various factors that cause refusal of immunization including, (1) weak enforcement of immunization laws so that they cannot be fully implemented in the community and (2) the public does not know yet regarding the benefits of law enforcement. Certain efforts must be done so that the implementation of the immunization program for children can be well received by all communities including, for example, the legal structure must be addressed, the existence of more contextual public policies with real conditions in the field, the social norms must be applied, and law will be being socialized.⁷

The social norms, as the closest part of the community's life, is closely related to the local wisdom existing in the community itself. The local wisdom in certain places must be understood and considered as the essential part to keep approaching its society. **Respecting the local wisdom may lead to the respect of the people towards the government's lead.** The local wisdom itself can be the gap between government and society to collaborate. The collaboration between both sides may create a welfare so the synergy for development can be formed. The local wisdom among Acehese society as follows:

1. The Indonesian Ulema Council (MUI) collaborates with religious leaders to support the primacy of vaccines to achieve group immunity
2. The importance of upholding religious values such as attempting on certain health importance and releasing disease as a form of gratitude for the health that has been given.
3. Communicating lessons through local languages, to make relationships that are full of kinship, impresses linking with culture.

Those three points are the main things that health workers and government can approach to achieve the society's attention regarding immunization. Related to the first point, Aceh MUI has emphasized the importance of immunization that has many benefits in saving lives. Such noble effort, as the key of public health, must be supported its existence by MUI. This fact shows that society should consider immunization as the important part in gaining healthy life. Moreover, the central MUI has declared *fatwa* (religious decision), consisting the law of measles and rubella (MR) vaccine is *mubah* (allowed for Muslims), although the vaccine

contains materials derived from pigs, due to the necessity of preventing an MR epidemic.² This point of view must be published throughout the society leaders, like *Geuchik* (Aceh village's leader) and *Ustadzs* (religious teachers), so they can inform the Acehese society to be alerted of being immunized. Such roles may have power to influence and tend to be respected easily by local people.⁸ As a region with a high culture implementation, language should also be considered to collaborate with the local people easily. Language as the inseparable part of the approach because it is the most important aspect in interaction in social life. Beyond the language role as a communication tool, language is the most important factor in maintaining the ethnic identities among ethnic groups and generations. Using local language should be attempted in approaching local people in terms of promoting the avoided ones, like vaccination. This is the picturization on how we can try to approach certain groups of society, not always in a generalized way.⁹

MUI also warned Indonesian society, especially the society from certain regions with low number of immunization coverage to be aware of religious necessity in having healthy condition. Some young mothers got their babies deaf, suffer from heart and brain diseases, also blind from cataracts just because of avoiding MR vaccination. The society must realize the emergency situation of having the immunity coverage to have the massive healthy condition. The phenomenon is so close to negligence if only they keep refusing vaccination, without tracing out the main root of the problems is lacking of immunization. This is exactly not in line with the religious point of view by keeping ignorance towards immunization.^{2,10}

Beside the benefits of immunization, the Acehese society also need to be exposed to the quality of Indonesian vaccine company production is trusted by some other countries, even other Islam countries. Such company in Indonesia is PT Bio Farma (Persero) as an Indonesian state-owned enterprise based in Bandung, Indonesia. Bio Farma has been in the pre-qualification list of the World Health Organization (WHO). Its production consists of virus (vaccines against polio, measles, and hepatitis B), and bacterial vaccines (vaccine Tetanus-Toxoid (TT), vaccine Diphtheria-Tetanus-Pertussis (DTP), vaccines Bacille Calmette-Guérin (BCG), and vaccine Diphtheria and Tetanus (DT)). This enterprise has supplied vaccines to multiple countries through Pan American Health Organization (PAHO), United Nations Children's Fund (UNICEF), and other organizations.¹¹ This fact shows us about Indonesian vaccines are internationally approved. In terms of controlling and maintaining the vaccine quality and *halal* qualification, Bio Farma conducted a partnership with MUI to keep attempting the production of *halal* vaccines.¹² This fact should be known by the whole Acehese society so they may put trust on the vaccine provider.

Immunization is one of steps that supports several points of the Sustainable Development Goals (SDGs) simultaneously. The issues regarding SDGs should be brought into society in order to intensify the importance of world's attention upon certain areas with low immunization coverage. Immunization can help reducing poverty by increasing the number of healthy productive age communities, equivalent to an investment of US \$ 43 per expenditure of US \$ 1, which means supporting the point one SDGs namely 'No poverty'. Point 2, namely 'Zero hunger', immunization accompanied by good nutrition can form a healthier family which is in line with expected outcomes with this point. Of course, immunization is also in line with point 3 or 'Good health and well-being' because immunization has saved 2-3 million lives and many more have avoided diseases that can be prevented by immunization. In the other sides, this means the more productive ages, the more potential a country can increase its economic growth, as the goal of the 8th SDGs point, 'Decent work and economic growth'. The health of the community also supports the teaching and learning process, ensuring the health and cognitive growth of children or anyone who is immunized, which means it is in line with the 4th point, namely 'Quality education'. More broadly, immunization is even in line with the 5th point of the SDGs, 'Gender equality', because immunization in young women can reduce or prevent 90% of cases of human papillomavirus (HPV). Some SDGs points that can be realized synergistically with immunization, require the government and the community to be aware and have a high willingness to support the immunization for the sake of nation's health.¹³

Firming the awareness of local people towards immunization is a must to create the healthy community. Promoting such thing through local wisdoms will potentially affect the behaviour and mindset of Acehese society to accept the changes that they need to do. The immunization heading to herd immunity can be the part of Acehese society's awareness, fused in their habitual life to prevent tropical and infectious diseases.

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Mangrove i-Labs: Innovation for the Hidden Green Gold towards Human Wellness

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Abstract

The destruction of mangrove forests in Indonesia continues to increase, as much as 1.81 million hectares of mangroves have been damaged due to a lack of human awareness in protecting the environment. The destruction of mangrove forests has such a large negative impact that it causes damage to the environment and decreases the level of income of economic values in the surrounding community. So the need of discussing mangrove forests and their benefits becomes a point of human awareness of how important it is to protect the environment of mangrove forests. Mangrove i-Labs (mangrove innovation labs) is one solution to introduce the benefits of mangrove forests extensively. This innovation aims to provide several benefits such as: introducing mangrove products to international level, creating new innovations collaboratively, providing education to the community, inviting tourists, conserving sustainable environment. All these benefits are expectedly improve human wellness.

Keywords: Mangrove; Mangrove i-Lab; Environment; Human wellness

I. Introduction

Indonesia, Malaysia and Thailand are countries that have extensive coastal areas. One of the coastal ecosystems owned by the three countries is mangrove forest. Having 81,000 km² of coastline, Indonesia, as an island nation, is a country that has the largest mangrove forest in ASEAN. Surprisingly one third of the world's mangrove forests is in Indonesia.

Mangrove forest is a typical tropical forest that grows along the coast or river estuary that is renewed by tides. Mangroves are mostly found on shallow bay beaches, estuaries, deltas and protected beaches. Mangrove forests have various types of plants such as *Avicennia*, *Sonneratia*, *Rhizophora*, *Bruguiera*, *Ceriops*, *Lumnitzera*, *Excoecaria*, *Xylocarpus*, *Scyphyphora* and *Nypa* (Soerianegara, 1987).






According to the Ministry of Environment and Forestry of the Republic of Indonesia, 1.81 millions hectares of mangroves in Indonesia have been damaged. The main cause of the damage is the act of humans, themselves, who cannot protect the mangrove ecosystem properly. Mangrove forests are experiencing degradation and deforestation systematically due to human interests. A change in the function of mangrove forests has resulted in the decrease of the forest to absorb carbon in the atmosphere and the degradation of carbon stored through the process of decomposition into the atmosphere. Therefore, the current state of Indonesia's mangrove forests is very alarming. Protection of mangrove forests is an important thing to do considering that mangroves have extensive benefits in terms of various aspects, such as social and economic. One of the uses of mangrove forests that are currently becoming a trending topic in Indonesia today is ecotourism, a recreation and education-based recreation area. In addition, mangrove products can be used as important commodities such as medicines, various snack products, and drinks. The existence of mangrove

resources has a major influence on people's living standards, especially in coastal villages that highly depend on their sources of income. There are three important elements of the great benefits of mangrove forests, namely:

1.1 Local Herbs

Based on research conducted by Mahmud et al in 2014, five tribes in Papua have used mangrove vegetation as traditional medicines. The results of the study indicate that seven types of five families of mangrove vegetation are used as medicinal plants, that give impact in treating twelve diseases or symptoms of the disease, including natural pesticides. More details can be seen in table 1 below.

Table 1. Mangrove Vegetation Utilized As Medicinal Plants

Name	The part that is utilized	Usability
<p><i>Rhizophoraapiculata</i></p>  <p>(Source: Chidiyatapu, 2010)</p>	<p>Young roots Stems Twigs Skin</p>	<p>As a medicine for toothache Strengthens bones and warmers for pregnant women. For diarrhea medication</p>
<p><i>Someratia alba J. Sum</i></p>  <p>(Source: Yeo, 2011)</p>	<p>Skin Leaf</p>	<p>Toothache medicine Speed up childbirth</p>
<p><i>Heritalittoralis</i></p>  <p>(Source: Ghosh, 2010)</p>	<p>Fruit with a diameter of 5-6cm</p>	<p>Strengthen immune system</p>
<p><i>Xylocarpusmoluccensis</i></p>  <p>(Source: Kudo, 2015)</p>	<p>Skin</p>	<p>Medicines for scurvy</p>
<p><i>Lumnitzeralittorea</i></p>  <p>(Source: Sukatarno, 2013)</p>	<p>Flower</p>	<p>Itchy Medication</p>

Various research on mangrove plants as a service for the environment and health is quite a lot to do but the dissemination of the potential and efficacy of mangroves has not been done optimally so that there are still many parties who are not even aware of it yet. Mangrove forests provide traditional medicine, and the world needs it.

1.2 Economy

Various types of commodities have economic value in the form of forest products, such as: wood (for firewood, building materials, raw materials for charcoal), and fishery products, such as: fish, shrimp, crabs, and shellfish. This potential is a great asset for economic development in the region if it is managed sustainably.

Negative impacts will arise due to the use of mangrove forests, in case of physical damage or even loss of mangrove ecosystems, this will have an impact on the ecological, economic and social functions of the community. The impact of this damage will happen continuously if there is no solution to maintain the existence of the mangrove forest. Therefore, it is deemed necessary to conduct a detailed economic study of the benefits and functions of mangrove forests from an economic standpoint to be used as a basis for policy making. The following are the results of research conducted Niapele et al (2017) at Mare Kofo Village, Tidore City, Kepulauan.

Table 2. The Economic Value Of Direct Benefits Of Mangrove Forests In The Village Of Mare Kofo

Utilization	Total Economic Value (Rp/Year)	Average Economic Value (Rp/Ha/Year)
Firewood	105.120.000	10.950.000
Fish	127.630.000	13.267.151,77
Shellfish	45.500.000	4.729.729,80
Crab	17.280.000	1.729.257,80
Squid	36.550.000	3.799.376,30
Total	332.080.000	34.542.515,59

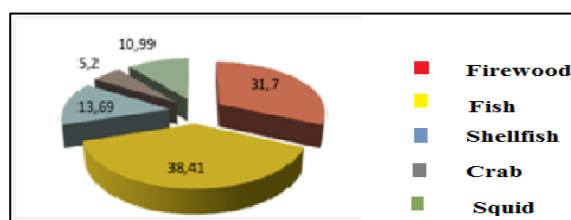


Figure 1. Percentage Of Direct Use Of Mangrove Forests In The Village Of Mare Kofo

Table 3. The Economic Value Of Indirect Benefits Of Mangrove Forests In The Village Of Mare Kofo

Types of Benefits	Value of Benefits (Rp/year)	Value of Benefits (Rp/Ha/year)
Abrasion Retaining	673.400.000	70.000.000
Guardians of Food Chain Stability	1.793.649	186.450
Carbon Absorber	799.409.207,03	83.098.670,17
Total	1.474.602.856,03	153.285.120,17

Based on the Table and graph above, the total economic value of the utilization of mangrove forests in Mare Kofo Village is: direct benefits of Rp. 34,542,515.59 / ha / year, indirect benefits of Rp. 153,285,120.17 / ha / year, optional benefits of Rp. 171,897.38 / ha / year, and the benefit of being Rp. 4,800,000 / ha / year, so the total economic value is: Rp. 192,799,533,1 / ha / year. The existence of mangrove resources has a major influence on people's living standards, especially in coastal villages that depend heavily on their sources of income.

1.3 Environment

Mangrove vegetation has the ability to produce organic carbon from filtering carbon dioxide. Which carbon dioxide (CO₂) is the emissions produced by industrial activities, transportation, deforestation and forest degradation. The high concentration of carbon dioxide in the atmosphere is one of the biggest causes of global warming (Sunu, 2001).

Currently, one way to reduce carbon dioxide (CO₂) emissions is by using coastal ecosystems as CO₂ absorbers which is known as blue carbon (Nelleman et al., 2009). Through the process of photosynthesis, mangroves can absorb carbon dioxide (CO₂) and convert it into organic carbon in the form of biomass.

The potential for carbon sequestration by mangrove forests varies. As a global comparison the blue carbon ecosystem is estimated to absorb 42 billion CO₂eq (Siikamaki et al., 2012), Korea's blue ecosystem 1.01 million CO₂eq (Sondak et al, 2015), the Abu Dhabi blue ecosystem 39.16 million t CO₂eq and 138.23 million CO₂eq for Indonesia's blue carbon ecosystem. The absorbing carbon dioxide which is done by mangrove can be seen in Figure 2 below.

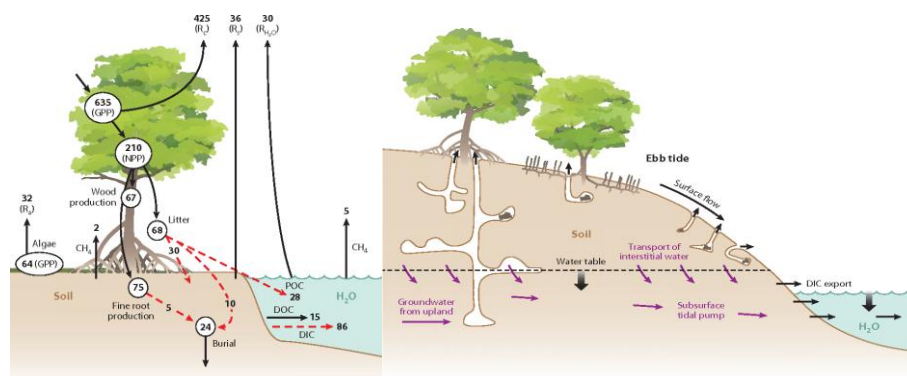


Figure 2. Photosynthesis, Mangroves Can Absorb Carbon Dioxide (CO₂)

By the picture above, it is seen that mangroves as green gold are not only a shield to protect land, because mangroves can reduce world climate change and sea level rise. Aside from being a filter, mangrove planting is also one of the mitigation efforts to deal with erosion problems on the coast.

II. "I-Labs" As a Solution to Maintain the Existence of Mangrove Products

Innovation teams often refer to innovation labs, funds or units. They comes in a variety of sizes, use a range of techniques, equipped by different resources, and try to tackle different issues and challenges. What unites innovation teams and labs, and also differentiates them from other well-run organizations or teams is that they are all adopting experimental methods to tackle both social and public issues.

The basic operating system of any innovation team or lab includes:

1. Scanning and identifying key issues, priorities and tasks.
2. Developing ideas that impact on these areas
3. Testing and prototyping solutions
4. Creating routes into larger scale impact or systems change

The argument for innovation is largely won. Most would agree that facing with fiscal pressure, rising demands and complex problems, governments and a range of other institutions have no choice but to **innovate**. Yet too often innovation efforts are at best patchy, or at worst, non-exist. The reason for this are often quite understandable that is: staff are usually focused on day-to-day activities; there is limited time to be thinking about new approaches; mainstream budgets are more likely to sustain incumbent approaches rather than foster new ones; and the very nature of bureaucracy can reject and hinder experimentation and change.

The benefits of an innovation team:

1. Tackling the dissatisfaction with current innovation capabilities in achieving improved outcomes and cost savings
2. Improving specific stages of the innovation process, such as idea generation testing or implementation and scale, by bolstering innovative capabilities.
3. Tackle seemingly unsolvable and entrenched challenges, such as education or criminal justice
4. Providing a novel or unique method, such as design thinking or behavioural economics, to foster a structured approach to the innovation process
5. Listening to citizens and others outside of the organization in ways that have traditionally been problematic

Although innovation teams vary in size, funding, and scope, there are six key elements that are common across all teams. These are :



Figure 3. Six Key Elements

These are the five steps involved in setting up an innovation team or lab:

1. Clarifying your aims and assessing capabilities: The first step in creating an innovation team is to determine why it is needed, and to identify the current issues or opportunities it could help tackle. It's also important to understand what your innovation capabilities and gaps are – both currently and going forwards – in terms of skills, resources, leadership, impact measurement, and methods.
2. Designing your team model: Once you are clear on the aims of your team and what capabilities you can draw on, you can start to think about the design of the team. There are several factors you need to consider, ranging from your relationship with government, to your funding and potential partners.
3. Building your team : Although innovation teams will be built to suit the overarching mission or goal, there are a number of required assets and skills needed to create an effective team. It's important to think about both the leadership and the range of skills you will need for your team, as well as how you will recruit staff.
4. Implementing and delivering : Innovation teams will draw upon their capabilities to develop a programme of work that addresses their objectives, and enables the innovation team to achieve high impact delivery.
5. Measuring impact : Innovation teams will draw upon their capabilities to develop a programme of work that addresses their objectives, and enables the innovation team to achieve high impact delivery.

2.1 Mangrove i-Labs

Mangrove i-Labs is one of the environment-based i-labs in Indonesia formed by two youth as the founders (Satia Ras and Putri Zalida). The purpose of Mangrove Labs is to introduce mangrove local products to an international level as well as to educate the public that it is important to maintain the mangrove ecosystem as a source of life and to find as many partners as possible by utilizing networking and partnerships. These mangrove labs have collaborated with other innovation labs and jointly participated in the impact xl

innovation lab exchange in Myanmar in March 2019. With the aim of introducing each Ilabs, hoping that they would be known to be setra in the future in wich everybody are able to collaborate in building a more sustainable innovation labs.



Figure 5. Mangrove i-Labs

The objectives of the mangrove labs are as follows:

1. The product can be recognized internationally
2. Get a partner to work both for marketing and creating new innovations for these products
4. Provide education to the community that the importance of safeguarding to the mangrove ecosystem.
5. Can invite tourists to visit as a place for ecotourism which is also an environmental conservation.

The stages that have been carried out by mangrove labs are marketing, promoting, and having network with the private and public. Using the citizen engagement method and challenge prize. In addition, official website and search for funding sources are still in process. So far, other ilabs partners who are willing to help are ilabs from the Philippines.

Furthermore, future plans continue to promote international events, and promote the benefits and products produced by the mangrove area. Then there will be a workshop on innovative mangrove products and good packaging which will be held in North Sumatra and Kalimantan.

As ambassadors for mangrove labs, we have an important role in introducing our Ilabs to international forums. IMT-GT is the right forum for us to convey about ilabs. We will help mangrove labs to create a sustainable mangrove ecotourism in Indonesia.

Mangrove labs will expand the information to the public and help to attract visitors and consumers. The mangrove ecotourism will be success by doing sustainable management. This could be a strong model because it's only focused with Ecotourism and Product Promotion and Marketing. We believe this platform can give good contribution in achieving the target.

III. Conclusion

Mangrove as a green gold has many benefits that can support the human wellness. Almost all parts from the root to the mangrove fruit can be used as traditional medicines. Mangrove plants are also profitable plants because the trunk can be used as firewood and building materials and the mangrove forest can be a habitat for fish, shrimp, crabs and shellfish. Another important benefit is that mangroves can reduce global climate change and sea level rise. However, at this time, not many people are aware of the myriad benefits of mangrove plants, conditions like this make traditional heritage will eventually experience extinction.

Therefore, efforts should be made to document the benefits of mangroves for knowledge, conservation and community welfare. One way that can be done is by Mangrove i-Labs. Mangrove i-Labs is one of the environmental based i-Labs in Indonesia which aims to introduce local mangrove products to the international level as well as to educate the public that it is important to preserve mangrove ecosystems as a source of life.

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Local Wisdom on Harumanis Mango Cultivation for the Wellness of the People of Perlis

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Abstract

Local wisdom is a form of traditional knowledge that is considered as valuable and useful based but has been forgotten and obliterated by the younger generation. Since local wisdom is considered to be relevant, this paper aims to highlight and discuss the roles and practices of local wisdom specifically in “Harumanis” mango cultivation activities based on the literature and descriptive approach. As such, it also tries to discuss the true meaning behind local wisdom based on the four (4) stages of agricultural activities which are pre-planting, planting, nurturing and harvesting stages. The results show that local wisdom plays a significant role in mango cultivation resulting in human wellness of the rural farmers in Perlis. In this context, it is perceived that the local wisdom applied in agriculture of Harumanis has some impacts on the quality of the fruits, thus increasing the economic wellbeing of the population in Perlis.

Keywords: Harumanis; Local Wisdom; Human Wellness; Tradition; Perlis

I. Introduction

According to Mohammed H. Musleh (2018), local wisdom is defined as inherited tradition and knowledge that are geographically unique. Each country has its own unique local wisdom which, to a certain extent, may either be similar or different from other countries. Historically, local wisdom has been used as guidance for the locals to go about their daily chores. For example, long ago, local wisdom was used as a reference to maintain good health, diagnose illness, prevent disease as well as treat ailment. A soothsayer or shaman would be sought to deal with these sorts of problems. That was the time when it had been effective in dealing with the problems especially when modern medicine was scarce. The words of wisdom from the elders which were passed from one generation to the other had been used as points of reference. Even now, some conservative elders may feel that going against local wisdom can probably lead to dire consequences not only on oneself but also the community itself.

In fact, they may even regard that defying the wise thinking or advice of the forefathers also means they are displaying insolent attitudes towards their elders. Consequently, it is their beliefs that local wisdom and local knowledge must be respected and obeyed. On the other hand, the younger generation might think or consider that the local wisdom is not only absurd but also should not be taken seriously. Their reliance on technology and scientific information have cast away the role of local wisdom. Priority has been given to the scientific approach more than the conservative approach.

The issue remains whether local wisdom is still relevant to human wellness. The contradicting ideas on the role of local wisdom in human wellness have led to the development of this paper. This paper only discusses and provides some insights on the role of local wisdom towards human wellness. Specifically, this paper intends to

present and highlight the application of local wisdom in agricultural development in the cultivation of Harumanis Mango in the State of Perlis Malaysia and how it can benefit the agricultural development in Perlis.

II. Perlis and its Harumanis

Perlis, located in the northern part of Peninsular Malaysia, is the smallest state in Malaysia. Despite being the smallest state, the poverty rate is relatively high with the lowest household income per capita at RM 4,445 in 2014 and RM4998 in 2016 (Ministry of Rural Development Malaysia, 2018) compared to other states in Malaysia. However, the figure has indicated some improvements to the livelihood of the people in Perlis. A close up on the factor contributing to this trending can probably trace back to the Harumanis factor.

Perlis is known for its Harumanis, a type of cultivar mango that can grow well in Perlis. Such condition is attributed to its geographical structure as well as its climate which leads to the planting of the trees in large, medium and small-scales (Utusan Online, 2016). Unlike other states in Malaysia, the temperature in Perlis can reach up to 40 degree Celsius at daylight especially during the dry season and 25 to 27 degree Celsius at night making it the most conducive area in Malaysia to grow Harumanis. The high demand for the fruit has resulted in an increase in the price of the fruit. In 2018, the Federal Agricultural Marketing Authority (FAMA) has exported twelve tones of Harumanis to Singapore because of the high demand at the market price of SDG10 per kg (Utusan Borneo, 2018). Nasree Mardi, for example, earned RM72000 (17507.88 USD) in 5 days (Majalah Niaga, 2016).

According to MARDI, there are about 1037.19 hectares of Harumanis crops in Perlis, which cover about 1.3% of Perlis's land (Ismail, 2018). This mango is fruiting for the period between one and two months, from April to June. According to the Agricultural Department of Perlis, Harumanis needs an extreme drought condition to make it grow or called "Stress Period" (Myasin, et. al, 2019). Since the supply of this mango has been limited, many experiments have been conducted to cultivate this mango. For example, Universiti Malaysia Perlis has successfully developed a new technology to produce the Harumanis mango throughout the year by cultivating it in a weather-controlled greenhouse (Malaysiakini, 2016).

III. Methodology

The sources of data collected for this study came from both primary and secondary data. This study used two methods of data collections to identify and present the practice of local wisdom by local towards Harumanis cultivation. First, a literature search was conducted regarding local wisdom. In general, the World Wide Web (i.e. www) was used and the search was conducted from 23rd July 2019 until 6th August 2019. In order to verify the source of the web search, two experts (i.e. lecturers from the Faculty of Agriculture, UiTM Perlis) were consulted. Second, unstructured survey interviews were conducted with some local planters in Perlis regarding the local wisdom practices in Harumanis cultivation. Out of the five respondents identified, interviews were administered with only two (2) of the respondents. The interviews were conducted on 31st July 2019. All the interviewed questions were based on the four (4) stages of agricultural activities namely pre-planting, planting, nurturing and harvesting stages and were recorded in the data collection form.

IV. Findings and discussion

The cultivation of harumanis involves the stages of pre-planting, planting, nurturing and harvesting which are guided by both the scientific knowledge and the wisdom of the locals in planting. However, this paper only successfully discussed and highlighted information on local wisdom gathered from both the literature and interviews that were conducted on some respondents. Table 1 presents a summary of the finding on local wisdom in Harumanis cultivation.

Table 1: Summary of finding on local wisdom in Harumanis cultivation

	Stage in Harumanis Cultivation	Description of local Wisdom
1.	Pre-planting	<ol style="list-style-type: none"> 1. Timing of the planting 2. Recitation of prayers
2.	Planting stage	<ol style="list-style-type: none"> 1. supporting young roots 2. Gender of the planters 3. Avoiding negative words
3.	Nurturing stage	<ol style="list-style-type: none"> 1. Watering of the plant 2. Fertilizing the trees
4.	Harvesting stage	<ol style="list-style-type: none"> 1. Recitation of prayers 2. Plucking the fruits

A. Local wisdom in harumanis cultivation

In early days, local wisdom was actively practised by Malaysians planters in order to ensure the growth of their crops. Even though it was not scientifically proven, the locals believed that the local wisdom practice on their trees was effective. Delusional or not, as long as it did not cause harm to any party, it was fine to apply the local wisdom. Local wisdom has been passed generation by generation and there are possibilities that some local wisdom was abandoned and forgotten.

A.1 Pre-planting stage

Based on our interview session, the first respondent stated that his father once informed him, the seedlings of Harumanis must be planted early in the morning before the sun rises to produce the best outcome. Local wisdom can be related to the scientific facts that the morning sun helps the photosynthesis process. In the process of growing, the leaves will move in the direction of the light source in order to receive a maximum source of light for the photosynthesis process (Ien, 1970).

The second respondent said that to gain something good, there is a need to set the priorities straight. This includes the recitation of prayers to God so that the plants would be blessed and become healthy and produce a lot of Harumanis. In Islam, it is taught that a good intention will lead to a good outcome while a bad intention will have negative consequences. Allah said “so patiently persevere: for verily the promise of Allah is true: nor let those shake thy firmness, who have (themselves) no certainty of faith” (Quran: Ar-Ruum, 30:60)

A.2 Planting Harumanis

Local wisdom is often applied after planting the Harumanis mango seedlings to encourage stronger roots to grow. Planters often use a technique where they place small or suitable sized timbers to support young trees from being blown away by strong wind.

Planting Harumanis obviously starts with the planting of the seedlings. According to Abu, one of the local planters that were interviewed, there are a few unique things, rather than typical routines that need to be performed in order for Harumanis to grow well. He said that it is not encouraged for women to plant the seedlings. This is because the plant needs strong aura and energy, which are usually found in men. If women insist on planting the seedlings, the tree will become weak and have a higher risk of being infected with diseases. Children are also not encouraged to be around the area during the planting due to similar reasons. Abu also said taboo words like die, steal, infertile or any negative phrases should not be mentioned in front of the plant or it would most likely happen to the tree itself.

Some findings also mentioned that pointing finger to the trees after planting them is not advisable as well. Pointing fingers will result in the withering of the leaves and the tree will not produce any fruit (Suria, 2011).

A.3 Nurturing Harumanis plant

As the weather in Perlis is quite hot than other states in Malaysia, local farmers concluded that making a hollow surrounding the tree enables the mango tree to absorb water faster. However, a Harumanis mango tree does not require much water, unlike other trees; thus, creating the hollow can cause the tree cells to be hypotonic and can rupture the tree composition.

The technique of pruning the stem of Harumanis mango needs to be correctly done. This will ensure equal distributions of nutrients to the fruits for high-quality output and to allow maximum exposure towards sunlight for photosynthesis purposes (Anem, 2017).

Local planters also believe that spraying pesticides directly to the fruits can produce a flawless, beautiful Harumanis mango, not knowing that it will also increase the acidity of the mango itself, causing the sweetness to disappear. By spraying pesticides directly onto the fruits, it may also cause problems to children like autism and attention deficit hyperactivity disorder.

Every tree needs fertilizer to grow healthily. Locals believed that fertilizing using the right hand will bring luck such as rapid growth of trees, or more fruit production. However, if the fertilizer is poured using the left hand, it is said to be unlucky. The tree growth may be stunted and can lead to death. Rather than processed fertilizers, organic fertilizers like onion extracts are believed to support the growth of the Harumanis tree (Ien, 2016).

It is also said that if the tree is unable to grow, there are spirits lingering around the tree, taking all the necessary energy needed by the tree to grow. It is best for the tree to be disposed and the spot should not be used again for a few months to ensure the area is cleansed.

A.4 Harvesting Harumanis fruit

Harumanis is quite tricky to be harvested. As to aid in the plucking process, the planters often recite Bismillahirrahmanirahim, a verse from Quran which means “In the name of Allah most Gracious most Compassionate” before plucking the fruits. It is said the fruit will be blessed and the taste will be great. After plucking, Harumanis is often not ready to be consumed. It needs to be ripened in a warm condition for 3 to 5 days (Anuar, 1970).

Scientifically, carbide, a metal combined with carbon chemical, is used after plucking mature Harumanis mango to expedite the ripening of Harumanis mango. However, it is said that the method is not suitable as it degrades the sweetness of the mango and diminishes the sweet scent of Harumanis itself. It is also said that using carbide may also endanger consumer’s health leading to cancer, retardation of the neurological system or at least, stomach upset (Kamalasanan, 2016).

To collect Harumanis mango, planters are advised to cut the stem around 0.3 cm away from the fruit rather than pick by hand roughly. This is to avoid the rubber milk to flow from the tree’s bark and damage the Harumanis mango quality especially when the milk dries on the fruit directly (AMN, 2019).

V. Conclusion and Recommendation

Based on the data collected, it is proven that local wisdom plays a significant role in human wellness. In this context, the local wisdom applied in the cultivation of Harumanis has impacted the quality of the fruits, thus increasing the economic growth of the population of Perlis. In order to sustain the output of this unique fruit, some actions need to be taken. It is recommended a proper education on local wisdom needs to be passed from one generation to another. For example, a book on the technique to grow Harumanis consisting of local wisdom can be published as guides to all farmers. The compilation of the local wisdom can be used as guides for future generation as well. This will lead to an increase in the supply of Harumanis and maintain the quality of all the production. In order to further increase the production of Harumanis mango, it is recommended that Harumanis cultivation should be promoted among the locals and training or courses which include both contemporary scientific information and local wisdom should be disseminated to them. This can perhaps increase the output of Harumanis production. On

that basis, local wisdom is an important element for the wellness of the people and the country. In the context of this paper, local wisdom in the cultivation of harumanis mango is necessary for the wellness of the people of Perlis.

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Community-based Tourism towards Thailand Sustainable Wellness Development

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Abstract

This study is a research on Thailand's community-based tourism which is the type of the alternative tourism which involves local citizens into the business with the philosophy of "locals for locals", concerning the strategies from the people within the community for their own community development as Thailand is one of the countries relying heavily on the profit from the tourism industry. This paper provides information about the tourism industry in general, alternative tourism, mass tourism and community-based tourism with their strengths and weaknesses, the characteristics of community-based tourism. Furthermore, case studies of two successful community-based tourism in Thailand, namely the Amphawa floating market and Ban Kokekrai, local tourism groups are presented. Based on the study, it can be concluded that community-based tourism can be a key strategy for Thailand's local tourism development as it serves the purpose of business which aims to build economic growth while also plays a part of the conservation of community's natural resources and culture.

Keywords: community-based tourism; sustainable tourism; economic growth; development; local; benefit

The tourism industry is one of the most economically important industries which help nations gaining incomes. According to Taleb Rifai, UNWTO secretary-general, international tourism is a progressively important factor which increases financial development and job opportunities and exportations. The sector, while is ranked fourth after fuels, chemicals, and food worldwide, is the one which generates the most income in many developing countries (Runckel & Associates, Inc, 2015).

Thailand, one of the most progressive markets of tourism in Asia and the Pacific, is renowned as the country with beautiful eco-tourist attractions, diverse culture and ethnics, good infrastructure and hospitality, a wide variety of food and accommodation, and friendly local citizens. Although political instability in Thailand caused the reduction in international tourist arrivals, Thailand was still in the position of the Top 10 International Tourism Receipts list in 2014 (Runckel & Associates, Inc, 2015) which accounted of 24.84 million tourists (Association of Thai Travel Agents, 2019). In fact, Bangkok, the capital of Thailand, was revealed as the first place in the 2018 Top 10 Tourist Cities as stated in MasterCard's Global Destination Cities Index.

Mass tourism refers to a travelling planned by professional organizations for mass amount of travelers (Sezgin & Yolal, 2012, p. 73). This term was created after the World War II by western countries matching with the emergence of the potential consumers, the middle to upper classes. Mass tourism concentrates on travelling in one place which causes the downgrade and the loss of appeal ability due to the massification growth of the visitors (Theng, Qiong & Tatar, 2015). This kind of tourism supports economic growth as the huge amount of

arrivals provides efficient numbers of businesses in the local communities, increases job opportunities for local people and local businesspeople, generates more income, encourages the investments in infrastructure such as roads, local educational and medical facilities, stimulates the incentive of natural resource reservation and promotes local communities to the eyes of the world. However, there are also disadvantages regarding of mass tourism such as the risks of environmental problems including pollution, the loss of natural habitats, permanent damages on such natural tourist attractions, the lack of respect for local culture, the imbalance of income between tourism areas and other areas, and the poaching of international businesses towards local businesses (Goodman, 2019).

Due to the mentioned drawbacks of mass tourism, the search for other tourism models with better relationships with host environment aspects, societies, and economics have been being explored to develop more sustainable and supportive tourism models (Theng, Qiong & Tatar, 2015). The process is used to construct new ways of tourisms which include the mass tourism model and creates alternative types of more favorable towards the local communities with suitable philosophy tourisms. (De Kadt, 1990). In order to seek for desirable types of tourisms, alternative tourism then was founded.

Alternative tourism involves different variations of tourism methods where reduction of commanding mass tourism are allowed to proceed. The developing alternative tourism must take economic fronts, social and cultural fronts, environment fronts, and local participation into consideration into developing sustainable and financial-friendly tourism plans (Duterme, 2007). There are some different terms referring to alternative tourism: motivated tourism, sustainable tourism, ecotourism, and participative tourism. Table 1 provides the varieties of forms referred to alternative tourism and their significance.

Table 1. Various forms of alternative tourism (Buckley, 2009)

Name	Significance
Green tourism	An old name is associated with ecotourism, but never well defined.
Alternative tourism	A term used in the official tourist literature to nominate an alternative to mass tourism or main tourism; Indeed, it is well to distinguish any form of tourism centered on a small market or any product that may not be distributed or relayed by traditional travel agencies.
Endemic tourism	This name is very little used, whose biological vocabulary is meant to designate any type of tourism that would move from one attraction attached to a particular geographic location.
Geotourism	It is tourism whose basic attraction is a geological feature, this term rarely used. This name is taken over by National Geographic. It is close to ecotourism, but its meaning is rather blurred.
Responsible tourism	This term is little used, certainly from an analogy with "responsible care" from the pharmaceutical industry; mainly tied to social considerations.
Sustainable tourism	This term is widely used but poorly defined, and refers to a tourism that is in line with the concerns of sustainable development. It is related more to the main environmental concern of tourism, without being restricted to Ecotourism; adopted in UNWTO, Tour Operators Initiative for Sustainable Tourism.

The community-based tourism model refers to one of the alternative tourism models which focuses on the involvement of local societies in tourism development management for adopting the tourism model with more sustainability (Blackstock, 2005) which can be more positively beneficial for the host communities in terms of the economic, environment, and socio-cultural aspects. While sustainable tourism as a whole concentrates on the authorities to make decisions and plan the model, community-based tourism model concerns the management of the host communities “guided by collective decision-making, responsibility, access, ownership and benefits” (COMMEC Coordination Office, n.d.). Figure 1 is presented to give a clearer picture of models of tourism.



Figure 1. (left) sustainable tourism model (right) community-based tourism model

According to COMMEC Coordination Office (n.d.), there are several characteristic factors determining whether the strategy is a community-based tourism, including “Who” characteristics and “What” characteristics:

1. “Who” characteristics are the factors which verify whether the tourism plan is a community-based tourism based on the local people, such as:

- 1.1 Remote
- 1.2 Rural
- 1.3 Impoverished
- 1.4 Marginalized
- 1.5 Economically depressed
- 1.6 Undeveloped
- 1.7 Poor
- 1.8 Indigenous
- 1.9 Ethnic minority
- 1.10 People in small towns

2. “What” characteristics are the factors which demonstrate on what the living of the locals look like and the activities offered to the tourists which include, but not limited to:

- 2.1 Existing knowledge systems
- 2.2 Community capital, skills, cultural and environmental assets
- 2.3 Non-Westernized cultures and environments
- 2.4 The local life style, folklore/culture, materials and the natural surroundings
- 2.5 Local elements that are novel, exotic, pleasant and enriching
- 2.6 Genuine enthusiasm, warmth, and hospitality
- 2.7 Unique social space for cross-cultural exchange

Table 2. Examples of activities provided for tourists issued by COMMEC Coordination Office (n.d.) which can be considered as the characteristics of community-based tourism

Daily chores/productions	Tours/ Classes/ Events	Outdoor activities	Significant sites
drumming	village tours	bird watching	hot springs
dance	agriculture tours	medicinal use of plants	falls
hair braiding	history tours	herbal tea collection	rainforest
craft work	guided walks	trophy hunting	lakes
handicraft production	school visits	campsite management	rivers
cookery	language classes	traditional fishing	ancient sites
meal sharing	cooking classes	safaris	mountains
natural dying			

Furthermore, COMMEC Coordination Office (n.d.) also proposed the benefits brought by community-based tourism which cover all of the human wellness aspects, namely economic aspects, socio-cultural aspects, and environmental aspects. Moreover, additional benefits considered as “most important” are also stated:

1. Economic benefits
 - 1.1 Boosted local income
 - 1.2 Reduction in poverty
 - 1.3 Financial restoration
 - 1.4 Better infrastructure
 - 1.5 Improved existing sustainable economic activities
 - 1.6 All-around development among different sectors
 - 1.7 Market expansion for products
 - 1.8 Contribution to fair and equalized development
 - 1.9 Upgraded flow of resources towards local development initiatives
2. Socio-cultural benefits
 - 2.1 Strengthened human capital
 - 2.2 Strengthened social capital
 - 2.3 Development in local societies
 - 2.4 Improvement local quality of life
 - 2.5 Conservation and maintenance the local culture, historical heritage and natural resources
 - 2.6 Developed inter and intra-cultural relations
3. Environmental benefits
 - 3.1 Sustainable use and advancement of sensitive natural capital environments
 - 3.2 Preservation of local natural habitats and resources
 - 3.3 Use of variety of resources dividedly
 - 3.4 Promoting non-consumptive use of resources
 - 3.5 Progressive environmental awareness
4. Most important benefits
 - 4.1 Change in vision of life and future
 - 4.2 More future opportunities for the host
 - 4.3 Offers hope and inspires involvement to the local
 - 4.4 Supports development
 - 4.5 Motivates local people to outcome problems and threats
 - 4.6 Empowers self-confidence and self-respect
 - 4.7 Equity, community cohesion, and peace
 - 4.8 Associate with the UN’s Millennium Development Goals

Nevertheless, negative side effects of community-based tourism are also presented (COMMEC Coordination Office, n.d.), including:

1. Discomfort and problems caused by tourists
2. Damaging costs to host inhabitants’ self-confidence, pride, respect and hospitable attitude
3. Possibility for cultural conflict
4. Avoiding negative consequences requires the main premise of community-based tourism - All-inclusive participation with a bottom-up approach

Although Thailand is the nation where tourism has been an important factor for financial development for decades with increasing numbers of international tourists and rising income from export, transaction, and emerging establishments, the country has been encountered with the maintenance of profits for the business sectors at the same as looking after natural resources. Thailand has been adopting the mass tourism model so long that it is now playing the great obstacles which directly and indirectly affect the local communities negatively in terms of socio-culture, economic, and environment. There are various problems currently occurred, namely: the uncertainty of tourists visiting attractions, the differences in income between favorable and unfavorable groups of employees in the tourism industry, and local people were hired as employees with low-income, not-skill-required jobs in temporary positions in non-native businesses. Therefore, many

communities in different parts of Thailand have adapted the community-based tourism into action for improvement of the host society tourism industry which could lead to the locals' wellness. The case studies include:

1. Case study 1: Thailand's Amphawa Floating Market

Based on the case studied that have been conducted by T. Vajirakachorn and S.K. Nepal focusing on the central Thailand, it is revealed that the floating market is the primary incomes for the local community. However, the development done by the government of Thailand had caused the decrease of the canals for transportations. This is the reason why floating markets were moved to inland location. Moreover, recently the Thai government agencies such as TAT takes initiative to revive the ancient ways of life along the canal for tourism development (TAT, 2017). Samut Songkhram is the highest floating market promoting province according to the TAT (2009). Figure 2 shows the location of Samut Songkhram Province.

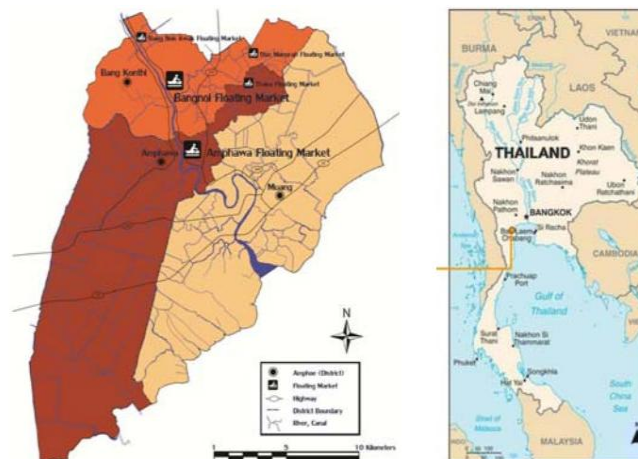


Figure 2. Samut Songkhram Province map

The market opens for business, starting from Friday to Sunday at 3.00 PM until 9.00 PM. Traditional Thailand food and desserts is the most attractive products in the floating market. The area is the size of about 2.5 km² and homes about 6,400 residents living in 1,547 households which shows in the figure 3.



Figure 3. Samut Songkhram Floating Market map

Water transportation was the major transportation around six decades ago. However, the floating market was not quite popular due to the development of roads and in-land market around thirty to forty years ago. But in 2004, the mayor who won the election brought the floating market back to the local community. At first the communities were hesitant and wondered how it could become an attraction for the tourists. The success can be

achieved since the local community is ready to do anything in order to improve the livelihood with the help of the mayor's vision. In August 2004, the floating market of Amphawa is successfully established with the effect of promoting through mass media communication such as TV shows, magazines, and newspapers. The floating market became well known within a year.

The mayor of Amphawa Municipality is the main decision-maker in Amphawa. Based on several news and informants, the Amphawa Floating Market (AFM) would not be well-known and successful without the mayor's leadership. In addition, the local community praises the mayor since he has the ability to find the fund such as the Government Housing Bank which it will provide the basic infrastructure for the floating market.

A club known as the Amphawa Stall Seller Club plays an important role. The club is responsible for recruiting the sellers and determining and designating where each seller could locate their stalls. In the beginning, sellers on the boats received B300, as an incentive, each day for coming to sell in the canal. However, the cash incentive is stopped as soon as the AFM became well-known. Since the floating market grew dramatically, it led to some problems such as the permissions over the selling space. These problems caused the arguments between sellers, municipal officials and local residents. In order to overcome the problems, some meetings have been held to solve individual problems or specific issues than community-wide concerns. In addition, other landlords saw opportunities to remodel their houses and turn those into homestays or shops. The average rent increased from 700 baht to 3,000 baht per month (1 USD = 30 THB), which the local residents (tenants who had lived there for 60 or more years) could not afford. Therefore, they were forced to move out. As a result, no residents were living in those houses during the weekdays. To summarize, the level of community participation in Amphawa was high during the initial stage of tourism development, that is, when economic improvement was the main emphasis. As the floating market developed fully, local resident involvement in tourism was limited to selling at the market during the weekends.

Tourism is creating more job opportunities for the local community or outsider such as selling goods, driving boats and owning the homestays or resorts. The better financial conditions will result in improving the social well-being of the local community. In addition, it also helps to improve the local community in education. Besides, the Amphawa Municipality receives revenues from business in the area mostly from signboard tax and local development tax. Other tourist attractions and local businesses located in the nearby areas also benefitted from the growth of the AFM. In the beginning, it was easy for local people to reserve space to sell products. Community leaders and the stall sellers club could arrange the spots for those who wanted to sell at the market.

2. Case study 2: Ban Kokekrai, Phang Nga Province

Pongsakornrangsinsin's research (2014) examined the group of local community-based tourism which is an OTOP-community working towards sustainable tourism industry. The main reason the research chose this community due to the fact that it is a Muslim community with simple and uncomplicated lifestyle. The members of the community were not in favor of the management industry or tourism industry where the visitors could potentially affect their way of life negatively. On the other hand, the group has adopted the tourism plan which profits the reservation of their traditional culture and natural resources which can be widely benefited for the understanding of sustainable tourism. Figure 4 presents the tourism route of the community.



Figure 4. Ban Kokekrai community-based tourism map

The research was conducted by interviewing with an in-depth questionnaire with the leader of the community. In addition, participant and non-participant observations during the activities done within the tourism of the community-based tourism group were organized.

The results revealed that Ban Kokekrai community-based tourism is organized by the local group who provides tourism service for visitors from Thailand and foreigners. The service includes one-of-a-kind activities, namely hot mud and sand spa, watching crab, picking Enamel Venus shell, and kayaking. The group has joined the local network or community-based tourism in Phang Nga which emphasizes on promoting and supporting the sustainable development of the community-based tourism community service. The potentials the community hold can be divided into 4 elements: resource of tourism, experience in service and tourism, tourism organizing, and participation of the local citizens.

Ban Kokekrai community-based tourism group makes use of tourism as a means for natural resources and environment and cultural maintenance. The group of community-based tourism, furthermore, encourages the community members to take parts in the business of their own society, both directly and indirectly which is important for the community sustainable development and local wellness.

In conclusion, while mass tourism may bring more economically profitable to the countries, it might slowly destroy any other aspects of human wellness, particularly socio-cultural aspects and environmental aspects, or even economic aspects itself. For example, the money spent in the mass tourist destinations does not always support the local community, but the foreign owners instead (Newman, 2019). On the other hand, in term of economic growth, sustainable tourism in general and community-based tourism might not be financially beneficial towards the country as a whole, but the community which is the organizer of the business certainly is advantageous since the income from visitors circulates within the communities and the citizen within the communities. In spite of the lack of development in economy, community-based tourism is a tourism strategy with more sustainability for Thailand to adopt into practice for improvement in sustainable human well development.

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Reuse of Waste Electrical and Electronic Equipment (WEEE) Using Hydrometallurgical and Pyrometallurgical Process: A Review

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Abstract

A broad range of goods and appliances are classified as EEE, including large and small household appliances, IT equipment, lighting, radio & audio equipment and electrical tools and telecommunication equipment. A simpler definition of EEE is it is the equipment that uses electricity or where electricity flows and which contains an electronic circuit such as a circuit with active and passive components. Thus, it was assumed that the WEEE would have undergone some degree of pre-treatment to remove bulk metal, plastic and glass components and that the electronic components such as printed circuits boards and wires are to be recycled. The largest sources of scrap of printed circuit board (PCB) are from mobile phone, computers, stereos, and televisions. The location and quantity of metals in electronic components will vary depending on the design, application, and type of function. The increased use of electronics and technology in society brings the challenge of protecting human health and the environment from potentially harmful effects due to improper handling and disposal of these products. Of this 50 ktonnes per annum of estimated PCB scrap, it is estimated that only 15 % is subjected to any form of recycling, while the remainder is consigned to landfill. Most e-waste contains precious metals (such as gold, silver, platinum and palladium), iron, copper, aluminium and plastics that can be extracted and sold. For PCBs alone, it was reported that 50 ktonnes per annum of PCB scrap is generated within the UK, of which an estimated 40 ktonnes per annum comprises populated boards. Approximately 60 % of the estimated landfill demand of 43 ktonnes per annum is believed to be consigned within the total redundant equipment package. Approximately 90% of the intrinsic value of scrap PCBs lies in the PM content, and as the basic charges levied by commercial smelters are between £500-1000, processing of low-grade electronic waste by smelting is not economic. In order to tackle this global issue, implementation of emerging legislation such as the WEEE and RoHs Directive will necessitate the increasing recovery and recycling of materials found in scrap PCBs.

I. Introduction

The production of electrical and electronic equipment (EEE) is known as one of the fastest growing businesses in the world (Babu, 2007). New applications of EEE are increasing significantly at the same time as the average replacement process is accelerating. This rapid development has resulted in an increase of end-of-life or waste electric and electronic equipment (WEEE), which can be a valuable source of secondary raw materials if treated appropriately (Ongondoa, 2011).

The uncontrolled disposal of WEEE can be harmful to human health and the environment because e-waste contains toxic substances and heavy metals. However, if the waste is properly managed, it can become a business opportunity. This is because they are able to convert wastes from an economic liability to a saleable

resource, which results in the production of little or no waste, and simultaneously protects the environment. The recyclable WEEE produces high returns because it contains valuable materials, such as gold, silver, platinum, and palladium the government of Malaysia wants to ensure the safe, effective, and economically beneficial management of e-waste in Malaysia.

Technologies that are able to combine metal removal with metal recovery are becoming increasingly important. Current recycling processes are mainly pyrometallurgical method where WEEE are being smelted at high temperatures which consists of the thermal treatment of minerals and metallurgical ores and concentrates to bring about physical and chemical transformations in the materials to enable recovery of valuable metals (Ongondoa, 2011). The cost effectiveness of pyrolytic recycling for WEEE, apart from those with relatively high precious metal content, coupled with increasing ecological concerns has cast doubt over the long-term viability of this methodology and has provided impetus for the development of more sustainable approaches embracing mechanical and hydrometallurgical technologies. Although the majority of metals can be recovered by pyrometallurgical processes, the organic yields are combusted and subsequently produce noxious gases that are harmful to the environment (Pilone, 2006). Hydrometallurgical processes allow a more environmentally benign and energy efficient route which requires two stages of process to metal reclamation from shredded WEEE; metal dissolutions into an aqueous media and followed by recovery of metal ions (Encyclopedia Britannica, 2002).

The non-selective dissolution obviates the need for expensive and waste streams of multiple dissolution steps. The process could be important in terms of meeting targets set by the WEEE Directive because not only does it remove precious metals, but also all hazardous metals from the WEEE. Conversely, selective recovery or further processing of the metals is required to obtain the most value from electronic scrap.

Several techniques, which may compete or complement each other, have been developed for the removal of metal ions from solution including electrodeposition, adsorption, ion exchange, extraction, precipitation, membrane separation, and biochemical treatment. Each of these technologies has found industrial applications. The selection criterion includes but is not limited to discharge standards, waste volume, contaminant concentration and composition, capital and operating costs but also take in the consideration of maturity and reliability of the technology. At times, a combination of the technologies may yield the best results (Jackson, 1986).

Precipitation of metals is the most used and studied method for metal removal from, for example, industrial wastewaters. This usually consists of precipitating them with lime in the form of hydroxides, although carbonates or sulphides are also possible. Precipitation for the removal of metals from solution is inexpensive, but little selectivity for individual metals. Waste streams that require further treatment are also generated (DTI, 2007). Ion exchange is well known for its ability to maintain the outlet stream quality, especially for low concentration heavy metal effluent. Regeneration of the resin and treatment of effluents generated (concentrated metal solutions) is also expensive.

Reverse osmosis, other than the high operating pressure, requires pre-treatment of the wastewater such as iron and oxidant removal, pH control, carbon filtration and biocide addition in order to avoid plugging or damage to the membrane (DTI, 2007). This will make the method complicated as well as costly, especially for small facilities.

The metallurgical industry has used solvent extraction for many years for a broad range of separations including the removal of soluble metals such as Cadmium, Chromium, Cobalt, Copper, Nickel, Molybdenum, Uranium, Vanadium and Zinc from solution (DTI, 2011). Separation is carried out in contact with an immiscible organic phase, such as carboxylic acids, amines, and phenols, to form salts or complex compounds that give a favorable solubility distribution between the aqueous and organic phases. Although liquid extraction may concentrate the metals, its recovery from the solvent stream demands additional costs.

The use of electrochemical techniques for the recovery of metal ions from solution has a number of advantages which could possibly solve the problem raised in several techniques highlighted here. Firstly, electrolytic recovery units can operate continuously and yield a very high purity product in a metallic form that is suitable for re-use or resale. In addition, electrodeposition does not generally require a supply of chemical

reagents and hence does not generate large numbers of additional waste streams with disposal problems which may cut the operational cost. However, there are a few major hurdles too. The equipment used in this process has a relatively high capital cost, and, depending on the cathode efficiency, may have a high energy cost (Pletcher, 1990). Apart from these, the high purity product that can be obtained, without the generation of numerous waste streams, make electrodeposition a promising option for the recovery of metals from the leachates of WEEE. Taking all aspects into consideration, electrodeposition technique is chosen as the best option as this route produces an efficient, environmentally friendly process involving theoretically no waste products/residual products/residue.

WEEE scrap comes mainly from the printed circuit boards. Samples from several sources of end-of-life printed circuit boards, mother boards and also graphic cards had been leached by electrogenerated chlorine in acidic aqueous solutions of high chloride ion activity thus producing a multi metal leach solution, containing nearly all of the available metal in the scrap.

The motivation to provide effective recycling of electronic scrap for retrieval of the many different constituent metals is not only regulatory but also financial. The metal content in the electronic scrap represents a significant cost of raw materials for the manufacturer of the unit. The possibility of recovering even a fraction of this investment represents a saving for the company involved. Appropriate operating conditions for metals electrodeposition must be determined by electrochemical kinetic measurements and batch electrowinning experiments, supported by thermodynamic predictions and reactor modelling to achieve high charge yield and selective metal electrodeposition. Hence, this research project aimed to produce detailed information about the electrochemical separation and purification of metals, to enable future development of closed loop processes for recovery of dissolved metals from solutions resulting from leaching WEEE.

To date, 18 full recovery facilities and 128 partial recovery facilities that use various available technologies have been designated for the segregation, dismantling, and treatment of WEEE in Malaysia. However, there are issues faced by the recovery facilities in achieving the goal of converting e-waste into a source material. The issues include the e-waste supply, the importation of e-waste derived products and coding, and finally the need to develop the criteria for e-waste processing technologies to ensure the safety and the sustainability of the facilities.

II. Electrical and Electronic Equipment (EEE)

A. Definition of EEE

EEE is defined by the WEEE Directive as 'equipment which is dependent on electric currents or electromagnetic fields in order to function properly and equipment for the generation, transfer and measurement of such currents and fields' (European Parliament, 2003). In addition, an upper voltage limit of 1000V/1500V for alternating and direct current is used to ensure that large industrial equipment is not covered by the legislation. In their interim report for the Environment Protection Agency (EPA), Wilkinson et al. in 2001 gave a simpler definition of EEE as equipment that uses electricity or through which electricity flows, or which contains an electronic circuit, example a circuit with active and passive components.

A broad range of goods and appliances are classified as EEE, including large and small household appliances, IT equipment, lighting, radio & audio equipment, electrical tools and telecommunication equipment. When such products reach the end of their useful life, they become WEEE (Department of Trade & Industry (DTI), Sustainable Development Group, 2007)

B. Characterization of WEEE

In order to enable development of a suitable physical or chemical process of metal recovery from WEEE, it is essential to understand three major factors:

- 1) the materials that are present in WEEE

- 2) their location
- 3) the concentration in which they are present.

As previously defined, WEEE includes a variety of equipment that are disparate in both function and composition (Table 1); and their generalized material composition has been summarized by a number of studies (Kim S., 2001).

Table 1. Material composition (by weight) of six different categories of equipment (Industry Council for Electronic Equipment Recycling (ICER), 2000)

Equipment category	Ferrous metals /%	Non-ferrous metals /%	Glass /%	Plastics /%	Other /%
Large household appliances	61	7	3	9	21
Small household appliances	19	1	0	48	32
It equipment	43	0	4	30	20
Telecommunication	13	7	0	74	6
Television, Radio etc	11	2	35	31	22
Gas discharge lamps	2	2	89	3	3

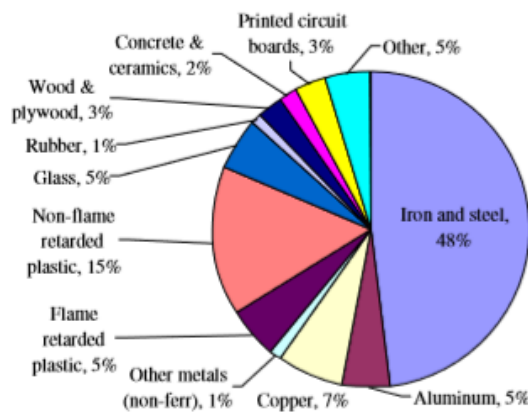


Figure 1. Material composition of WEEE (Goosy, 2003)

The cost and efficiency of WEEE recycling will depend on the amount and number of different materials present, as well as the complexity of their arrangements. It is likely that the principal application of chemical recycling will be in the treatment of electronic components such as populated circuit boards, examples of which are shown in Figure 3. In order to optimise the efficiency of such a process, it is important that the electronic scrap and printed circuit boards (PCBs) are separated from WEEE as a whole. For the purpose of this project, it was assumed that the WEEE would have undergone some degree of pre-treatment to remove bulk metal, plastic and glass components and that the electronic components such as printed circuits boards and wires are to be recycled.

According to Duan, the largest sources of scrap PCBs are from mobile phone (21.30%), computers (18.76%), stereos (11.2%) and televisions (7.04%). The location and quantity of metals in electronic components will vary depending on the design, application, and type of function required. Hence any system for chemical recycling of WEEE should be able to process a range of materials. Consequently, it will be useful to gain an understanding of the typical composition of such units.

PCBs are typically constructed from base layers of reinforced polymers, which range from glass fibre reinforced epoxy resins to chemically stable polymers, such as polytetrafluoroethylene (PTFE). Copper metal is usually deposited between the polymer layers and etched onto the polymer surface, while interconnector holes drilled through the board are filled with copper and palladium to join the metal layers. Other metals including

Pb, Sn, Ni, Au, Ag, and Pd may be deposited onto the copper layers to create a solderable finish. Metallic containing components are then attached to the unpopulated board with lead tin and silver solder. The electronic components added to bare PCBs contain an even wider mix of materials. Aluminium is present in cooling parts of the active semiconductor elements and capacitors, while iron is found in cabinets, heat sinks, transformers and electromechanical components. Gold is used as connector wires and pins, whereas resistors contain mixed metal oxides. Small quantities of tantalum, gallium, indium, titanium, silicon, germanium, antimony, tellurium, and a large proportion of the periodic table may also be present (Goosey, 2004). A schematic of a section through typical PCBs is shown in Figure 3.



Figure 2. Printed Circuit Boards (PCBs)

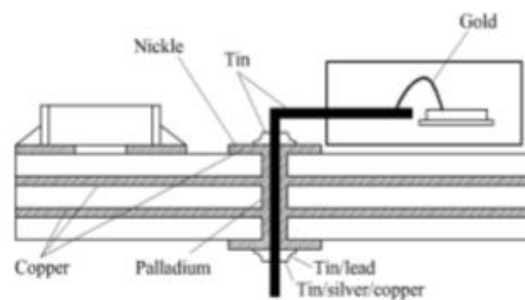


Figure 3. PCB (Goosey, 2004)

Several studies have analysed the general metal content in PCBs (Figure 4) while Brandon et al. in 2002 reported the typical content after the use of eddy current and magnetic separations during the pre-concentration process (Table 2).

Table 2. Metal content of PCBs (Duan et al., 2011)

Weight % of Metals in Electronic Scrap / PCBs						
Cu	7.20	19.19	23.47	10.00	16.00	14.20
Fe	2.29	3.56	1.22	-	5.00	8.18
Ni	0.26	1.65	2.35	0.85	2.00	0.52
Sn	1.63	2.03	1.54	-	4.00	1.99
Pb	2.35	1.01	0.99	1.20	2.00	1.03
Al	5.80	7.06	1.33	7.00	5.00	3.64
Zn	0.21	0.73	1.51	1.60	1.00	1.11
Au	-	0.07	0.05	0.03	0.01	0.01
Ag	0.07	0.10	0.30	0.01	0.05	0.08
Pd	-	-	0.02	-	0.01	0.02

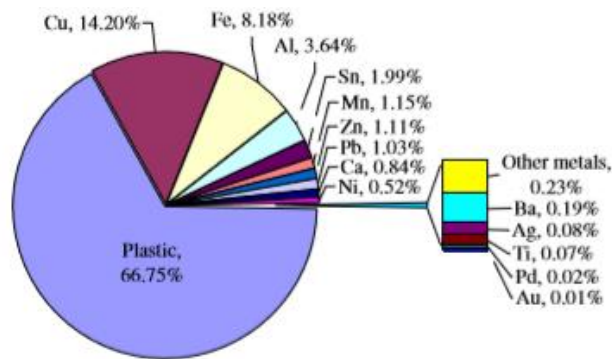


Figure 4. Composition of Metals in Electronic Scrap of PCBs (Brandon, 2002)

III. Overview on Current Situation

The increased use of electronics and technology in society brings the challenge of protecting human health and the environment from potentially harmful effects due to improper handling and disposal of these products. Every year, an estimated one million tonnes of WEEE are discarded by householders and commercial groups in the UK (Waste Online, 2010). Of these, 43 % is sent directly to landfill and more than 90 % is landfilled, incinerated or recovered with no pretreatment (AEA Technology, 2004). Hence, considerable quantities of valuable material are wasted and hazardous material released into the earth from landfill or into the air from smelters.

For PCBs alone, it was reported that 50 ktonnes per annum of PCB scrap is generated within the UK, of which an estimated 40 ktonnes per annum comprises populated boards. The remaining 10 ktonnes is either composed of unpopulated boards or associated board manufacturing scrap such as off-cuts. Of this 50 ktonnes per annum of estimated PCB scrap, it is further estimated that only 15 % is subjected to any form of recycling, while the remainder is consigned to landfill. Approximately 60 % of the estimated landfill demand of 43 ktonnes per annum is believed to be consigned within the total redundant equipment package (Goosy, 2003).

The majority of PCB scrap that enters the recycling route involves recovery of the metals and PMs by smelting. There are few smelters in the world and the costs involved are such that only boards with a high PMs content are recycled. Approximately 90 % of the intrinsic value of scrap PCBs lies in the PM content, and as the basic charges levied by commercial smelters are between £500-1000, processing of low-grade electronic waste by smelting is not economic (Goosy, 2003).

The rapid escalation of WEEE is also a global concern. The growth of WEEE in Europe is about three times higher than the growth of the average municipal waste. In the EU, 6 million tonnes of WEEE were generated in 1998 and with the volume of WEEE increasing by at least 3 to 5 % per annum, it is estimated to reach 24 million tonnes by 2020 (AEA Technology, 2004). In 2007, it was reported that 2.25 million tonnes of WEEE were generated in the USA, about 18 % of which was collected for recycling and the remainder largely sent to landfills (Wilkinson, 2001). In terms of PCBs, only 29 ktonnes of metal were recovered and the remainder was sent to foreign smelters for extraction of copper and other PMs (Kang, 2005). In Asia, especially China, it was reported that the total amount of PCBs that will be discarded in the near future may reach 526 ktonnes every year, which will account for almost 5 % of the total hazardous waste generation in China (Duan et al., 2011). This number is in an order of magnitude higher compared to waste generated in the UK. In order to tackle this global issue, implementation of emerging legislation such as the WEEE and RoHs Directive will necessitate the increasing recovery and recycling of materials found in scrap PCBs.

A. Legislative Issue for WEEE

The awareness of the danger caused by WEEE to life and the environment is reflected in environmental legislation and regulations. Considering the current waste management and the rapid growth and the hazardous content of EEE in particular, the European Commission adopted two draft directives in June 2000 on WEEE and on the Restriction of the use of certain hazardous substances in EEE (RoHS (European Parliament, 2003).

B. Waste Electrical and Electronic Equipment (WEEE) Directive

The UK regulations implementing the WEEE Directive were laid before Parliament on 12 December 2006 and were enforced on 2 January 2007 (Department of Trade & Industry (DTI), Sustainable Development Group (SDG), 2007). The objective of the WEEE directive is to prevent the generation of WEEE, increase reuse, recycling and to reduce the environmental burden associated with end-of-life management of these waste streams (Department of Trade & Industry (DTI), Sustainable Development Group (SDG), 2007). The directive states that member countries shall encourage the design and production of EEE which takes into account and facilitates the dismantling, recovery, and in particular the reuse and recycling, of WEEE, their components and materials. Producers are then required to increase the use of common components and material coding standards.

On the other hand, member states must set up separate WEEE collection facilities (to achieve a minimum of 4 kg per person per year) to minimise the disposal of WEEE as unsorted waste. New equipment put onto the market are obliged to be marked with the symbol indicating separate collection for EEE (a crossed-out wheeled bin). Producers need to set up and finance systems to provide necessary treatment of the separately collected WEEE using the best available treatment, recovery and recycling techniques. The minimum requirements for the treatment of WEEE are disassembly, fluid removal, and selective treatment of components containing printed circuit boards, batteries, mercury, chlorofluorocarbons, brominated flame retardants, cathode ray tubes, asbestos, and polychlorinated by phenols (Department of Trade & Industry (DTI), Sustainable Development Group (SDG), 2007).

C. Restriction on Hazardous Substances (RoHS) Directive

Certain materials that are frequently present in EEE are hazardous in nature, and considered to pose risks to human health and the environment. Taking into account current technical and economic feasibility, substitution of hazardous materials in EEE by a safer material, is the most effective way of ensuring significant reductions of risks to health and the environment. The RoHS Directive has banned the placing on the EU market of new EEE containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, and polybrominated biphenyl (PBB) or polybrominated diphenyl ether (PBDE) flame retardants since 1 July 2006 (Department of Trade & Industry (DTI), Sustainable Development Group (SDG), 2007).

Mercury is mainly used in fluorescent tubes as well as in batteries, switches, sensors, and relays. In fact, 22 % of the world consumption of mercury is in EEE. Goosy, M. and Kellner, R., 2003 Mercury and its compounds are highly toxic and long-term exposure may be fatal; they produce biological transformations in the environment and living organisms (Department of Trade & Industry (DTI), Sustainable Development Group (SDG), 2007). Cadmium is highly toxic and many of its compounds are carcinogenic. Cadmium is mostly found in batteries, but is also used as a pigment and stabilizer in plastics and as a fluorescent (Wilkinson, 2001). Currently consumer electronics contribute 9 % of the cadmium present in municipal waste streams (Department of Trade & Industry (DTI), Sustainable Development Group (SDG), 2007). Lead is found in solder, cathode ray tubes (CRT) in television and computer screens and batteries (40 % of lead is present in the municipal waste stream because of EEE). Lead and lead compounds are bio-accumulative, carcinogenic, teratogenic, has negative effects on the human nervous system, blood and kidneys. Hexavalent chromium is highly toxic and is used as corrosion protector coating. Brominated flame retardants (BFR) are used for flammability protection of PCBs. However, they accumulate in the environment, and may produce dangerous dioxins and furans upon heating during recycling processes (Cui, 2003). It should be noted that while these hazardous chemicals have been banned in new EEE from 2006 by the RoHS directive, the WEEE chain will continue to contain them for some years to come, and so any recycling process should be designed accordingly.

D. Review on Industrial Metal Recovery

In order to comply with the current legislation on WEEE which emphasizes recycling, current industrial metal recovery was reviewed. In recent years, separate collection systems for the recycling of WEEE have been established in several countries. The recycling systems are setup so that the WEEE is collected and transported

to dismantling facilities, where manual separation of the waste into different fractions occurs, in most cases, to remove hazardous substances before other materials can be recycled or treated in a safe and suitable way. The fractions containing PCBs, low and high-grade fractions, are thereafter sold to copper smelters, which feed the material into their process to recover predominantly precious metals (PMs) and copper.

Copper smelters process electronic scrap especially from PCBs to recover Cu, Au, Ag, Pt and Pd (Goosy, 2003). From an economic viewpoint, PCB waste is seen as a PM source, which is the reason that the smelters receive and process this type of waste. Copper, in itself, is normally seen as a usable by-product that comes along with the PMs. Although, there are more than 160 copper smelters in the world, of which some process copper scrap, these treat mainly waste products with high percentages of pure copper such as electrical cables, copper rods and tubes. However, some smaller copper smelters in Asia, mainly in Japan, China and India, might also process PCBs, but these smelters normally do not stay on the market for very long (Kindesjö, 2002)

IV. Economic Perspectives

The drive to provide effective recycling of electronic scrap for retrieval of the many different constituent metals has not only political and regulatory consequences, but also financial. The metal content in the electronic scrap represents a significant cost of raw materials for the manufacturer of the unit. The possibility of recovering even a fraction of this investment represents a saving for the company involved. For the purpose of this report 10 metals, 6 bases and 4 precious, were analyzed as shown in Table 3, based on weight % scrap (Brandon, 2002) shows recent trading prices (London Metal Exchange, 2011) of these metals in the global markets.

Table 3. Price of base and PMs traded on the global market place (London Metal Exchange, 2011)

Element	Weight % scrap	Price	
		£/tonne	£/tonne
Cu	14.19	6,140	871.00
Pb	1.03	1,518	15.60
Ni	0.52	131,95	68.61
Sn	1.99	5,022	99.94
Zn	1.11	1,550	17.05
Au	0.013	33,3m	4329.00
Ag	0.076	875,000	665.00
Pd	0.016	19.1m	3056.00
Fe	8.18	756	61.84
Pt	0.005	39.7m	1985.00

The cost effectiveness of pyrolytic recycling for scrap board assemblies, apart from those with relatively high PMs content, coupled with increasing ecological concerns, has cast doubt over the long-term viability of this methodology. Subsequently this has provided impetus for the development of more sustainable approaches embracing mechanical and hydrometallurgical technologies. To significantly elevate the levels of recycling being undertaken, it is clear that any approaches must embrace a cost-effective manner and be environmentally benign.

Hydrometallurgical approaches do offer a treatment alternative to smelting and the possibility of realizing higher metal recovery yields. This latter point is of great significance when dealing with high value scrap. Two stages are generally involved in hydrometallurgical approaches to metal reclamation from shredded electronic systems where metal dissolution into an aqueous media is followed by recovery of the metal ions. The dissolution consists of a series of selective and/or non-selective acid and/or caustic leaches of finely divided solid material. The solutions are then subjected to separation procedures such as electrodeposition, solvent extraction, precipitation, cementation, ion exchange, filtration, and distillation to isolate and concentrate the metals of interest (Burkin, 2001).

V. Electrochemical Reactor Design

Ideally, a reactor for industrial deployment should be designed to deplete the dissolved metal in the effluent to the target concentration for discharge to sewer and such that it could be operated continuously, Scott (1993) and Walsh (2001) have written excellent reviews on some of the specifications of reactor design, which ensure energy efficient reactor operation including:

1. High charge yield
2. High mass transport rates (km)
3. High current density
4. Low potential drop (ϕ), over electrodes and membranes
5. High surface area (A) electrodes per unit reactor volume
6. Uniform potential distribution
7. Acceptable operating cost, lifetime and practicality

Janssen and Koene in their review paper in 2002 explained that the main parameters for an electrolysis reaction in the removal of impurities were the current density, charge and spacetime yield. However, for dilute solutions the effectiveness of the reactor was strongly determined by the mass transfer of the reacting species, the effective surface area of the electrode and the occurrence of side reactions.

According to Juttner (2000), improved mass transport can be achieved by setting the electrodes in motion or by applying turbulence promoters. Increased mass transport rates enable increased current densities for transport-controlled conditions. However, as the current density increases, the cell voltage increases and therefore corresponding so do the operating costs. As reported by Scott in 1993, to suppress this effect, the inter-electrode gap can be decreased and conductive electrodes should be used.

Due to the sheer volume of reactor designs, the literature review presented here will focus on selected designs of reactors available in the Electrochemical Engineering Group, of Imperial College London that are suitable for depleting ca 500 mol m⁻³ of copper, the predominant species in the WEEE leachate, to analytically undetectable concentrations.

VI. Conclusion

E-Waste management can become a business opportunity that produces high returns because e-waste also contains valuable material, such as gold, silver and other. According to The Global E-Waste Monitor 2017 Report by the United Nations University, Malaysia generated 8.8kg of e-waste per person in 2016, totalling 280 kilotonnes. That year, the world produced 44.7 million tonnes of e-waste – or 6.1kg per person – which is equivalent to the weight of 4,500 Eiffel Towers Management approaches have included law enforcement and regulation and the promotion of WEEE recovery activities. WEEE of no commercial value must be disposed of at sites/premises licensed by the Department of Environment (DOE), Malaysia. Hence, the government of Malaysia must be ensuring that safe, effective and economically beneficial of e-waste in Malaysia. Electronics recycling is important for our health and our planet. Old unwanted appliances in your home and work environment still have a lot of value. Most of the parts can be broken down and reused to make newer structures.

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Empowerment of Local Wisdom in Sustainable Development of a Green City

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Abstract

Empowerment of local wisdom is a substitutional aspect in generating the ideas of human wellness in general. This local wisdom awareness would bring an eco-dynamic lifestyle, where it emphasizes the green city and the eco-development of it that has widely applied in most aspects of daily life. The development of the green city is in line with the demand of the community to be more aware of that concept of life. Building an extensive knowledge requires many approaches in terms of engagement from the government, the Non-Government Organization (NGO) and the local community in order to address the issue of obtaining the human wellness by way of sustainability of a city. The sustainability of the development of a city begins with the motivation to develop a new concept in preserving local wisdom. This paper will offer an initial insight into the environment and sustainability awareness in order to encourage and preserve local wisdom among the local community. As such, it discusses the role of the local community's responsibilities and participation in accommodating the changes that correspond to human wellness based on the Sustainable Development Goals.

Keywords: green city; local wisdom; human wellness; Malaysia; Sustainable Development Goals

I. Introduction

Local wisdom is a part of the culture of local knowledge that is formed through a process of learning by way of observation. In other words, local knowledge is the knowledge that already exists in the local community or people. There is no limitation in improving the existence of local knowledge, as it can change over time, and the process is adaptable in the community. In general, local wisdom emerges through an internal process within the community. Thus, it passed to a future generation, as a result of the interaction between humans and their environment. Therefore, when we look at the scope of empowerment of local wisdom to create an ideal concept of human wellness, we must look at the process and the effect of the empowerment as well. This encouragement will instill a strong determination to achieve the Sustainable Development Goals specifically for Sustainable Development of Cities.

1.1. How Empowerment of Local Wisdom Will Affect Sustainability of City

The sustainability of the development of a city begins with the motivation to develop a new concept while preserving local wisdom. The role of local wisdom is significant to overcome and to create a sustainable city as it will create an eco-friendly neighborhood. A sustainable city can introduce greenery into the urban environment, to reduce carbon oxide emissions and to improve the quality of its air, and promoted renewable energies to conserve and protect natural resources.

According to the Sustainable Development Goal no. 11, the United Nation has "make cities and human settlements inclusive, safe, resilient and sustainable" and this has been adopted by Malaysia in its own goal in carrying out the sustainable development (Unit, 2017). For the year of 2020, Malaysia has set to substantially increase the number of cities and human settlements, that adopt and implement integrated policies and plans to promote inclusion, efficient use of resources, mitigation of climate change and adaptation to it.

It can also be interpreted as eco-friendly development, which prioritizes in the conservation of natural and cultural assets. It is necessary, because if local development cannot be managed, then there would be environmental damage, which threatens all lives on earth. Therefore, eco-friendly development also aims to save the environment from destruction.

II. Measures Taken to Sustainability

Sustainability is one of the vital connections between the earth and the human being. Therefore, Malaysia had committed in sustainable development goals, especially in sustainable cities and communities. Thus, the derivation from a sustainable development goal, which is the urban green space or green city as one of the proactive action taken by Malaysia.

Malaysia's target is to implement the green city trough out Malaysia within the year 2020 (Idrus, 2016). Currently, there are only of them, namely Melaka, Kuala Lumpur, and Johor Bharu. Furthermore, Malaysia has recognized some other cities that are capable of developing into a green city, namely Ipoh, Bandar Sunway, and Kuching.

The Ministry of Water, Land and Natural Resources, is a ministry of the Malaysian government which shows encouragement to achieve the green city. Hence, this Ministry provides guideline such as characteristics for buildings, usage of the solar system, recycling mechanism, and many more. Among developing green cities in Malaysia, we chose to discuss only three of them, namely Melaka, Kuala Lumpur, and Forest City, Johor Bahru. Elements of discussion will focus on the projects and activities run within the cities.

A. Melaka

Melaka is one Malaysian effort to achieve the green city which is supported by government policies, private sectors, and by the local community. One of the main changes in Malacca is the Melaka River, which was once polluted but has turned to be one of the main tourist attraction. (Sulaiman, 2018).

Other than that, Melaka was able to become the green city after receiving the technical assistance of the Asian Development Bank (ADB) including bankable projects such as solar energy program and street lighting. Besides, the projects include setting up a database to track green indicators in the environment and economic growth and conducting training in urban development, environmental planning, and knowledge sharing.

Melaka development projects were the first to be implemented under the Green Cities Initiative of the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). The city planning was to make sure that the city became greener than before. Therefore, it was relevant for the towns to plan towards developing into green cities as it will benefit the people.

B. Kuala Lumpur

Kuala Lumpur became the second green city. The population in Kuala Lumpur is estimated at 7.5 million and will reach 7.9 million by 2020. Nevertheless, the vast difference in population percentage in the actual plan bring challenges to Kuala Lumpur in sustaining the city and develop it into a green one. However, there were few measures (?) that had been taken to ensure a successful plan. According to Dewan Bandar Raya Kuala Lumpur (DBKL), the Greater City's program was launched in Kuala Lumpur with a target to plant 100,000 trees by 2020. Hence, DBKL shall plant at least 30,000 trees each year.

Other than that, DBKL had launched the "Adopt A Park" or also known as Pocket Park to encourage the private sector in order to make Kuala Lumpur greener. The private sector will handle this program, and once the agreement expires, the park will be given to DBKL. Five private sectors joined this program, namely i) Kumpulan Veritas Design, ii) Think City, iii) Tesco (M) Sdn. Bhd, iv) Naza TTDI Sdn. Bhd. and v) Dynamic Property Management.

There are around 12 Pocket Parks in Kuala Lumpur. Other than that, DBKL made compulsory for development an area of more than 4 acres to provide 10 percent for the green area. However, if the land is limited, the developer may choose to plant vertically within the building. DBKL with the cooperation of Forest Research Institute Malaysia is ready to provide the specialists and consultations to the developer in order to make the concept of green city successful.

Another measure that has been taken consideration is to preserve the forest in the middle of the Kuala Lumpur city. Bukit Nanas is one of the efforts that has been undertaken and called "Green Lung." Furthermore, the Ministry of Wilayah Persekutuan stated that the use of the plastic bag is banned in the Kuala Lumpur city.

C. Forest City Iskandar, Johor

The Forest City is human-made islands which are 3,425 acres, off Iskandar City in Johor Bharu and will be completed by the year 2033. The Forest City is one of the efforts by the Johor royal family with the partnership of Country Garden Pacific View (CGPV). The main criteria for the Forest City lie onto the environmentally friendly and sustainable development.

The developer for the Forest City is working with international ecological consultants in order to achieve the standard of a green city. The way it was designed has numerous purposes, such as energy-saving, absorbing dirty polluted air, and releasing clean purified air, noise-absorbing and the transport system is eco-friendly.

III. Awareness of Green City

We have surveyed awareness on Green City which pertaining to sustainability and local wisdom among Universiti Utara Malaysia's students. The survey was done online via university media social. One hundred twenty-one respondents consisted of residents throughout Malaysia. Explanation about the respondent's background involving gender, race, age, states, and type of residence are shown below.

3.1 Analysis of Awareness Among the Students as Part of Local Community

A. Gender

From 121 respondents that have participated in the survey, 81% of them were females and 19 % males. Based on this, we can assume that, female are more attracted to the Green City idea. Gender distribution of respondents is shown in Diagram 1.

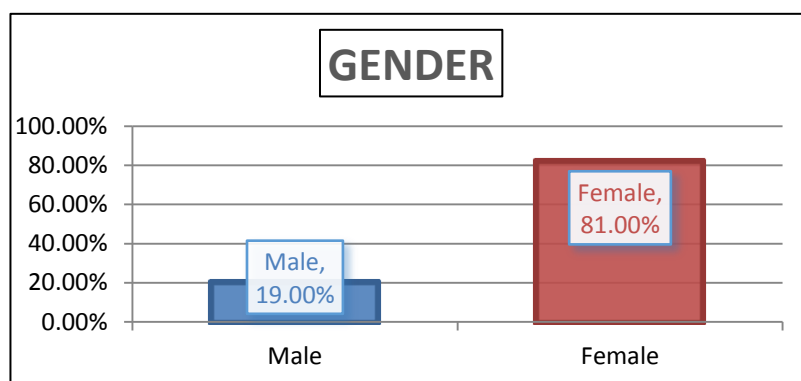


Diagram 1: Distribution of Respondents by Gender

B. Race

In this survey, 79.3% of the total respondents were Malay, 7.4% were Indians and others, and 5.8% were Chinese. The race distribution of the respondent is shown in Diagram 2.

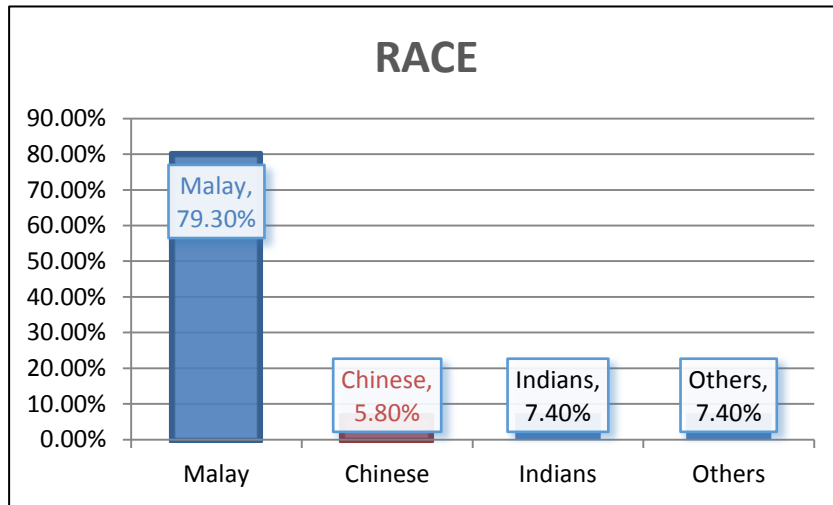


Diagram 2: Distribution of Respondents by Race

C. Age

Based on these 121 respondents, 77% of respondents between the age of 21-23, 10% within the age of 24 to 26 and 18 to 20 and 1% in the age of 27-29 and 30-33. The age distribution of respondents is shown in Diagram 3.

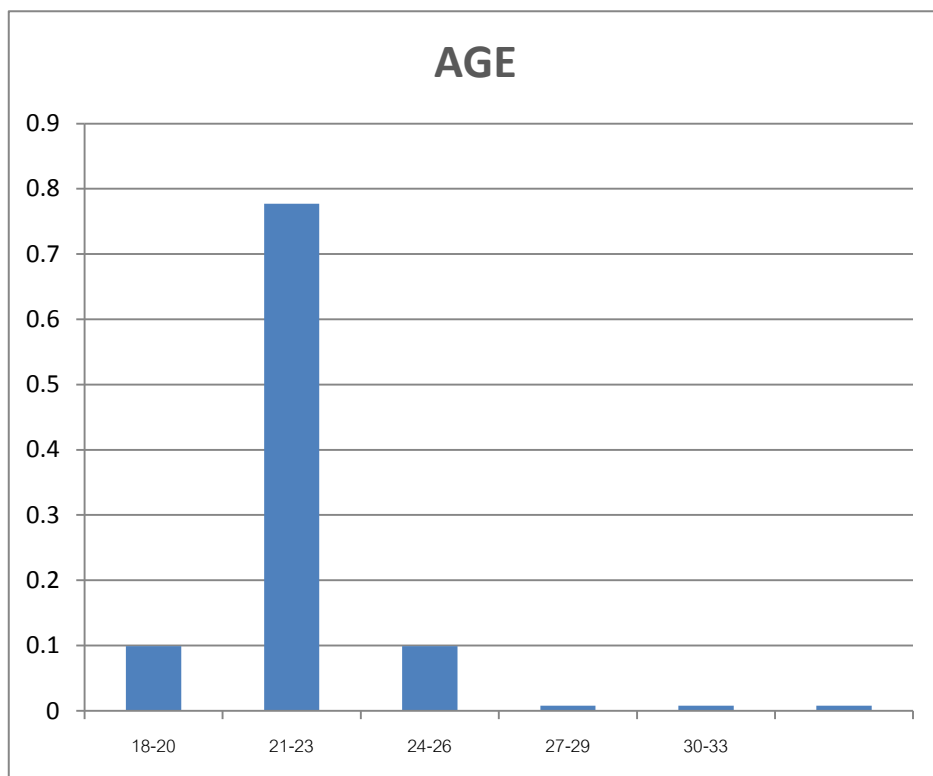


Diagram 3: Distribution of Respondents by Age

D. States

Most of the respondents were from Kedah state, which made up to 21.5% from the total respondents, then followed by Kelantan (15.7%) and Selangor (13.2%). Other states are shown in Diagram 4 below.

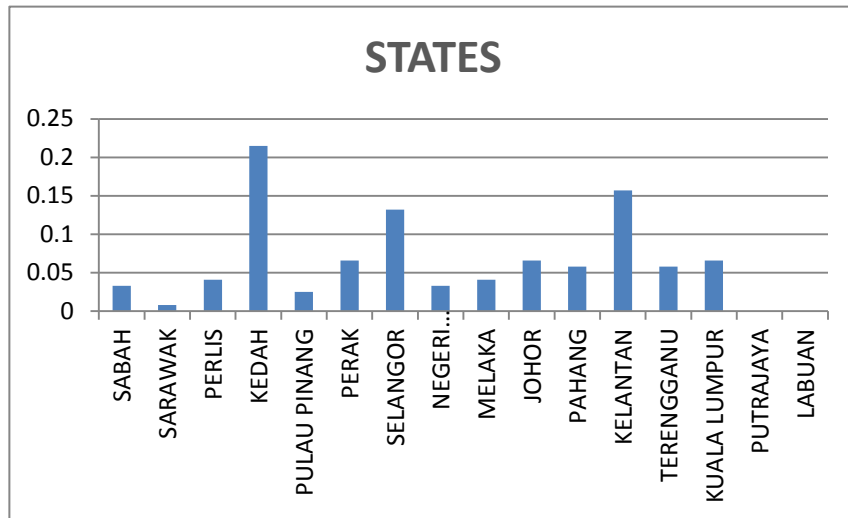


Diagram 4: Distribution of Respondents by States

E. Type of Residence

The majority of the respondents lived in the urban area (58.7%) and the remaining respondents in rural areas (41.3%). The distribution of respondents by type of residence is shown in Diagram 5.

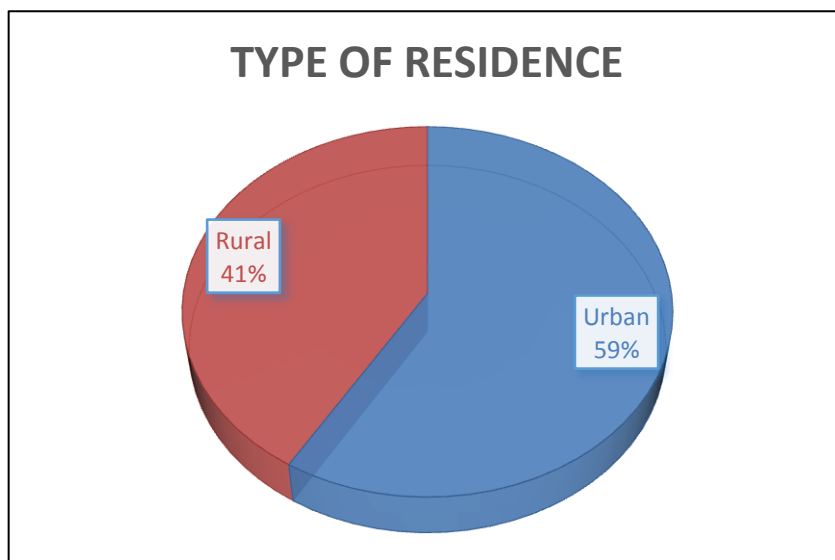


Diagram 5: Distribution of Respondents by Residency

IV. Discussion

The discussion will focus on the awareness of respondents in regards of the environmental issues, their knowledge on both concepts of the 'green city,' sustainability, and also their willingness to be part of the green city projects.

4.1 Awareness of respondents on Environmental Issues.

From the data received, we found that 98.3% of the respondents were aware of environmental issues. Only 1.7% of the respondents were not aware.

4.2 Knowledge on Green City

We also found that 95.9% of the respondents have heard about Green City. 75.2% of them heard about the Green City concept from various social media such as Facebook and Twitter. 53.7% of them heard about Green City from educational institutions such as teachers and lecturers. Moreover, 50.4% of them obtain knowledge from television. However, only 8.3% take the initiative to make their research on this subject. Besides that only 41.3% of them have attended a programme about Green City.

4.3 Knowledge of the Concept of Sustainability

From the data obtained, we found that 86% of the respondents know the concept of sustainability. Interestingly, the majority of them (57.9%) obtained knowledge on this concept from the educational institution. Besides that, 53.7% of them are aware of the concept of sustainability from various social medias available nowadays. Lastly, 48.8% of them heard about it from television, and 14% of them did their research.

4.4 Willingness to be part of the Empowerment of Green City

From the data obtained, we found that 96.7% of the respondents are willing to be part of the empowerment of Green City.

V. Effect of Sustainability in Human Wellness

Human wellness is the combination of being in good physical and mental condition. Wellness is a conscious, deliberate process that requires being aware of and making choices for a more satisfying lifestyle. There are eight dimensions of wellness, which are physical, spiritual, social, emotional, intellectual, occupational, environmental, and financial (Swarbick, 2006). However, in this paper, we chose three types of wellness to focus on the effect of building a sustainable city.

A. Emotional Wellness

There is a mutual relationship between human emotional wellness and sustainable development. According to Colfer and et al. (1998), shaping the neighbourhood for sustainability might lead to an improvement in residents' emotional wellness. Besides that, according to the UK's Deputy Prime Minister Office, the policies pursued by the local government affects everyone's daily life and directly contribute to their sense of well-being. Hence, in order to achieve emotional wellness, sustainable development policies contained in the Green City Concept such as encouraging cycling and walking as alternatives to car travels for short journeys as they can improve air quality and reduce the risk of serious illness such as heart disease and enhance mental health and self-esteem. Besides, this will also produce a positive spill-over effect where the overall society will benefit from the reduction in air pollution caused by traffic. Moreover, the provision of green spaces in megacities also contributed to emotional wellness. This is because according to Kua (Kua E.H, 2017), dense-populated megacities with inadequate provision of green spaces could affect the mental health of its residents. The exposure to green spaces can improve mental health, reducing blood pressure and stress level, and encouraging physical activity. (Kua E.H, 2017)

B. Environmental Wellness

The definition of environmental wellness is the livability of our surroundings. The local community awareness to recognise and detect the problem they faced in their neighbourhood will then help in creating an eco-development city. The empowerment of local wisdom in detecting the problem, and improvising the sustainability of the cities they live in can empower the environmental wellbeing.

Thus, it will provide excellent health by developing pleasant, stimulating environments that support well-being. Environmental wellness is now often being referred to as an indicator of progress for sustainable cities. By creating a sustainable city, it will then promote the growth of environmental wellness.

In environmental wellness, the critical part is by leading a lifestyle that is both benefiting the environment and minimizes harm. The most significant environmental threats include air pollution, ultraviolet radiation in the sunlight, chemicals, noise, water pollution, and second-hand smoke. (Swarbick, 2006)

C. Physical Wellness

The existence of a green city will contribute to physical wellness. Some of the apparent contributions could be the reduction of cardiovascular and respiratory illness. A research conducted in green space located in the United Kingdom, which highlighted that cardiovascular risk was significantly lower among the non-user living there (Tamosiunas A, 2014).

Moreover, the other study in the United States found that cardiovascular and lower respiratory-tract conditions increased due to the high amount of tree loss. (G.H Donovan, 2013) Other than that, the research found that when the green environment increases, it will boost the exercise frequency. (S.M Hug, 2009) Plus, exercising in a green space has a positive impact, rather than doing it in non-green space. Thus, in conclusion, the green city does give benefit to physical wellness to people.

VI. Roles of Community

6.1 Government

The roles of a community start from the government in preserving safety and reliability for this encouragement to work. In other words, the government must play its role by having a support group within the community to encourage the involvement of the local community in taking part of preserving and building a sustainable city or known as a green city.

Other than that, the idea of the government to sit and have a board to monitor the development of a sustainable city should be highlighted as the primary point to make it work. For example, The Environmental Quality Monitoring Programme (EQMP) aimed at improving the existing environmental quality monitoring system has been implied to monitor purpose of air, river, and marine. (Bernama, 2016) By having this kind of monitoring board, the development of the sustainable city can succeed.

However, the participation of youth in the government sector is much needed nowadays as they can provide an insightful insight into what might benefit from future development. As the sustainable development goal requires a new mind in developing the ideas and thus, the participation of youth will be useful to encourage these ideas to work. The task of preparing and distributing ideas in policymaking with the experts might be useful for the government if the youth willingly contribute themselves to the process of achieving this goal.

6.2 Non-Government Organization

Non-Government Organization later abbreviated as NGO, is one of the parts of the local community that contribute to Malaysia's target in sustaining the development goal. The existence of NGO is to assist the

government's effort to develop the wisdom of the local community. Other than that, to ensure the local community becomes proactive to achieve the sustained developmental goals of a green city.

A. The improvement of Media Coverage

The Asia-Pacific Institute for the Development of Broadcasting (AIBD), which is headquartered in Kuala Lumpur, Malaysia worked together with other national NGOs to produce the documentaries regarding the environmental issue, including the green city especially with Television Trust for the Environment (TTE), which was located in Colombo, Sri Lanka. (Pacific)

B. Monitoring and Reporting

The campaigns regarding sustainable development goals are based on research. Therefore, at the local community level, NGOs can receive information that is valuable to complete their mission and to work, cooperate with government institutions and law enforcement authorities.

C. The Advisory for Government

The government shall accept the ideas from the NGOs in order to improve the campaigns. The NGOs had their academia, for example, The Sustainable Transport Action Network for Asia and the Pacific (SUSTRANS), which is based in Penang, is dedicated to promote transport policies. This way, it allows for the sharing of information about current transport plans and eco-friendly mobility. Thus, the NGOs may become an informal advisory for the government.

D. The Role of Youth in Achieving the Green City Goal.

Youth contributions in Malaysia on Green City are significant because youth are active, energetic, and enthusiastic, which make them more comfortable to share their ideas and communicate with others. The youth is indeed, the support system in NGOs and able to spread awareness on Green City more effectively because they can organise Green City programs through their schools, universities or other community groups.

6.3 Consultation with Local Community

A democratic community would appreciate sustainable development, as it requires collective action (Kamariah D, 2006). In Malaysia, via the amended Town and Country Planning Act (Act 1129) 2003, public participation is mandatory during the formulation stage of any development plan and after the draft plan is approved. According to the Act, the local community is given the right to be involved in the preparation of Structural Plan and Local Plan. However, when planning is concerned, previous reports showed that there is low public participation. According to the Department of Town and Country Planning (2001), there was only 1% to 12% of the local community that attended the Draft Local Exhibition (Kamariah Dola, 2006). If this trend continues, it will hamper the sustainable development programme. This trend happened because the majority of the public have limited awareness and knowledge of their rights in planning. They feel that participation is not necessary as they believed the government will always satisfy them. Hence, in order to increase the participation rate, the government and the private sector should play their roles.

For the part of the government, they should outline clear roles and responsibilities to the public to ensure that opinions from all levels of community are taken into consideration. Besides that, they should use the new platform such as the internet to make participation more available to the public. They should also use a simple language and interactive medium to explain the planning content so the public can understand it easily.

For the private sector, they must work hand-in-hand with the government to serve the public, such as alleviating the participation process. Besides, incentives should be given to the businesses who allocate their resources to improve the participation of the local community in their development planning.

6.4 Youth Involvement

It is an undeniable fact that the role of youth in society will have a high impact on building society as they have a significant role to play. In this topic, the youth involvement will be significantly good if they can be involved in the planning and organizing appropriate youth and community programme to create awareness of the environment.

Youth involvement can be made by establishing new youth services for encouraging sustainable cities and undertaking detached 'outreach' youth work. By partaking this role, the growth of local wisdom for sustainable cities will be achieved as youth is an essential part of creating a society.

Last but not least, the energy of youth with experience of old can do wonders in a society. Encouragement of the authorities that run together with youth involvement will cause this empowerment of local wisdom in the sustainable development of a city can succeed.

VII. Conclusion

The discussion and findings above stated that, Empowerment of Local Wisdom in Sustainable Development of City is attainable and has relevance to be applied in order to achieve the Sustainable Development Goals through Green City. This idea in developing a sustainable city has a significant effect on human wellness as it promotes emotional, physical, and environmental wellness. It also discusses the role of the local community's responsibilities and participation in accommodating the changes that correspond to human wellness, based on Sustainable Development Goals. We then examine the central part of bodies to take part in executing the plan based on local wisdom. First, it targeted the broader community that holds a position as the government, secondly by the participation of Non-Government Organisation (NGO) and thirdly by the engagement of the local community in consultation when developing policies.

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Empowering Thai Massage towards Human Wellness: Revisit Thai Massage

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Abstract

The paper aimed at studying the problems and how to empowering Thai massage. The data were collected via interviewing a folk masseur and some Thai people who often use Thai massage service. The paper revealed that Thai massage in the rural areas is not sustained sufficiently by the government because of the progress of modern medicine. Therefore, Thai people seem to overlook Thai massage and prefer the modern medicine. In contrast, Thai massage in big cities is very famous. However, the problem of secret prostitution in Thai massage shops can be damaging to the image of Thai massage in general. Therefore, based on the interview with the masseurs and related sections, it was also recommended that the government should empower it by creating a reliability and save the image of Thai massage.

Keywords: Massage; Local Wisdom; Empower; Conserve; Well-being

I. Introduction

Thai massage, which is a valuable local wisdom of Thailand, is very well-known for tourists and people all over the world. Thai massage can be categorized into different types: facial massage, body massage, foot massage, oil massage, Thai herbal massage, and etc (Gold, 2007). Generally, the purposes of Thai massage are mostly for relaxing, relieving the stress and pain, and treating the health conditions. Unfortunately, it seems that the government does not sufficiently support Thai massage in the rural areas, while, the modern medicine is progressing. This can lead to Thai people to overlook it and prefer modern medicine than traditional medicine. Moreover, Thai massage in big cities is popular among tourists, but there is a rising problem in this service especially prostitution, the image of Thai massage has changed in the wrong way. For this reason, foreigners or even Thai people misunderstand the objectives and benefits of Thai massage. This effect is in accordance with Upathambhakul and Agmapisarn (2018) studying about sex stereotypes of female traditional Thai masseuse. The researchers found that prostitution and stereotypes of the word “masseuse” create a misunderstanding about the female traditional Thai masseuse.

To restate, Thai massage should be empowered and revisited the image of Thai massage in the rural areas and in big cities by government because Thai massage is effective to treat health conditions and can be a valuable choice for Thai people apart from modern medicine.

II. Background of Thai Massage

Thai massage is an ancient therapy and has long history. In fact, the origin of Thai massage can be traced to India. It is believed that Thai massage was invented more than 2,500 years ago by Jivaka Kumar Bhaccha (Shivago Kompara), who was a physician to the Buddha, and had tremendous knowledge of medicine.

Thai massage is available in 2 types: Chaleisak massage (folk massage), and Rachasamnak massage (court massage). Ms. Kanchanawat who is a masseur of Thai Traditional Medicine Health Promotion Centre which is part of the government agency, the Institute of Thai Traditional Medicine (ITTM), explained that Chaleisak massage or folk massage begins with massaging from feet to head, then massaging the back and the front. Some masseurs also end by twisting torso to the left and right. On the other hands, Rachasamnak massage or court massage is used only hands and fingers. The masseurs must not use their knees, elbows nor feet for massaging. (Kanchanawat, 2011)



Figure 1 Chaleisak massage

Source: <https://www.thailand-trip.org/th/massazh/>



Figure 2 Rachasamnak massage

Source: <http://www.studio-academy.com/c3/6/หลักสูตรรวมวไลยราชสำนัก>

Nowadays, Thai massage can offer to different parts of body; for example, face, body, foot, and etc. The masseurs rely on the same principles. That is physical and mental health are the benefits of Thai massage such as relaxation, relieving the stress and pain, and improving circulation throughout the body.

III. The difference between traditional Thai massage and modern Thai massage

Thai massage is available in the rural areas and big cities. Different problems are occurring in these contexts which will be presented in the following section.

1. Traditional Thai massage in the rural area

In the past, traditional Thai massage used to be needed all over Thailand. Thai people in the rural areas usually used traditional medicine especially Thai massage to treat some health conditions such as stiffness, and relieving the stress and pain, so they could ask for folk masseur to massage them. Moreover, the folk masseurs and local people were intimate; therefore, they could feel relaxing both body and mind.

However, it is not the popular choice for people nowadays. People more rely on modern medication rather than massage to cure the syndromes; furthermore, the medical fee is not expensive because of government's policy, which is well-known as Universal Health Coverage or UHC. For these reasons, Thai massage seems to be overlooked and faded among Thai people, and the government may not sustain as expected.

In fact, Mrs. U-rai Wijarnpreecha, with 60 years old, and Mr. Somrit Boonterm, with 71 years old, who could not walk because of Herniated Disc disease, and then chose traditional Thai massage to treat their health conditions said that after using traditional Thai massage, the health conditions are better obviously. Moreover,

traditional Thai massage becomes another choice to treat people who have Herniated Disc disease and paralysis. (Wijarnpreecha and Boonterm, 2019)



Figure 3 Traditional medicine

Source: <https://www.thaipost.net/main/detail/1481>



Figure 4 Modern medicine

Source: <http://ishii-lifesupport.com/th/>

Another currently existing problem for Thai massage in the rural areas is having paid attention very little to promote Thai massage in the rural areas. Mr. Prajuab Phetpokha, who feels that more support should be given by the government said that Thai massage should be empowered by creating a reliability and saving the image of Thai massage. In fact, Thai massage is for treating health conditions, neither for business nor prostitution. More than that, the government may not support Thai massage as expected; for this reason, Thai people use Universal Health Coverage which uses the modern medicine to treat health conditions, and it may cause kidney and liver disease. (Phetpokha, 2019)

2. Modern Thai massage in big cities

The modern Thai massage is similar in what aspects to Thai traditional massage, but its purpose is for relaxing. In current, the modern Thai massage is very popular and easy to find in city center. The massage shops can be found everywhere in Thailand such as around the hotels, inside the alley, or nearby the tourist attractions. There are many reasons why the modern Thai massage can be found easily.

First, the modern Thai massage has more choice of massages; for example, foot massage, hand massage, body massage, and oil massage. Second, its service is more interesting. When customers enter the massage shops, the masseurs will give customers a warm welcome, and try to make them feel more comfortable. Currently, many massage shops have an air conditioner which customers can feel more relaxed and not too hot while using the service. Finally, there is another service, prostitution, secretly offered in massage shops. This is true that the prostitution can be found in the modern Thai massage. Only a few massage shops do not have a prostitution inside the shops. There are two reasons that the prostitution can be found in the modern Thai massage shops. The first is the masseurs can earn more money. The second is customers come to the massage shops with the desire for prostitution. Most masseurs in the modern Thai massage are women, and they also wear a uniform which attract the men. That is the main reason why the prostitution is requested by the customer.

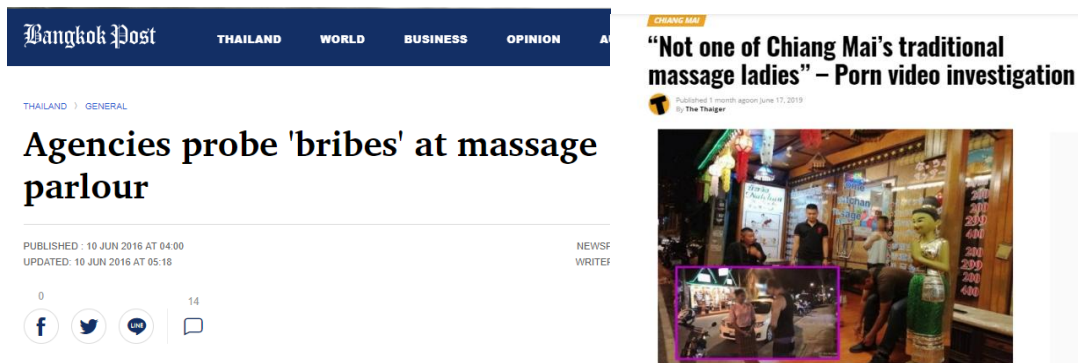


Figure 5 Thai massage news in big cities

Source: <https://www.bangkokpost.com/thailand/general/1006161/agencies-probe-bribes-at-massage-parlour>

Source: <https://thethaiger.com/news/chiang-mai/not-one-of-chiang-mais-traditional-massage-ladies-porn-video-investigation>

Nowadays, most of Thai massage shops in big cities has the prostitution secretly as it can be found in the news, and some people may think that modern Thai massage with secrete prostitution is normal. The interview towards accessing of the modern Thai massage revealed certain interesting points. Mr. Surat, the interviewee 1, said that the prostitution is not very difficult to find currently. The customers can ask the masseurs about the prostitution after using Thai massage. On the other hands, Mr. Rachanon, the interviewee 2, said that the service is sometimes offered to the customers without asking. The easy way to stay away from the prostitution in the modern Thai massage is keeping looking like a poor guy because the masseurs want more money sometimes. The masseurs will try to do everything to get more money.

Additionally, there are some useful suggestions to notice the massage shops that is good quality, and not offer the secret service of prostitution. Firstly, the environment of the shop must be clear and open. Secondly, the permitted license from the government must be displayed. Lastly, the masseur's uniform must be polite. Considering these suggestions, customers can get a good experience of massage from the modern Thai massage. Mr. Surat and Mr. Rachanon gave some suggestions that before the customers enter the modern Thai massage shops, try to check its area for more safely from losing the money. (Wijitjinda and Sukontewa, 2019)

VI. Empowering Thai massage

Thai Massage should be empowered, revisited, particularly created good image for several reasons. First of all, Thai Massage can create opportunity for certain disabled people, such as the disabled, blinds and prisoners to earn income. These groups of people can earn money and improve life quality of the people. Importantly, this is not too difficult for the government in the government power to do it. The opportunities offered to the needy people can be seen in the following news.

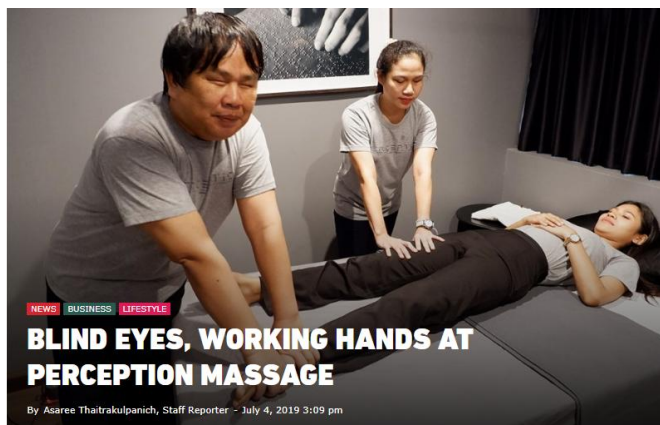


Figure 6 Thai massage news on the possible ability of disabled people

Source: https://www.thailandee.com/blog/en/index.php/2710-chiang-mai-massages-restaurant-women-prisoners?fbclid=IwAR1fCd3rkW767_xkFk-_S3ZWfKWPkzvdmNWT_FigsBJomQ1R9V1nFu5hU

Source: <https://www.bangkokpost.com/business/1403874/empowering-the-sightless>

Some people may think that disabled people cannot work to get money, but these are some examples of creating opportunity for disabled people to earn income like a normal people. Mr. Mike Thailandee, the famous documentary maker, and blogger, posted on his blog that the women prisoners have to follow 300 hours of massage classes in prison and then the 150 hours class to obtain the masseuse certificate mandatory to practice this profession in Thailand. In addition, the women prisoners who have successfully completed all the stages work here for 2 to 3 months and receive 50% of the money they generate, which corresponds on average wage between 14,000 and 17,000 THB monthly. This money will help them start a new life after prison. (Thailandee, 2017)

Apart from this, the blinds also get an opportunity to work as a masseur to earn income. Mr. Suwatt Pathompakawan who is a co-founder of Perception Blind Massage said that underprivileged people can be empowered by offering Thai massage worldwide. Moreover, it is found that massages from the blind were more deliberate compared with those who have vision because they can't see anything, so they try to touch the customer's body carefully. (Pathompakawan, 2018)

Additionally, Thai Massage can attract the foreigners to travel in Thailand. Therefore, the economics in Thailand will be increase. Doctor Somchai Pinyophornpanit said that when the foreigners travelling in Thailand, 3 interesting things they should try are going to the beautiful tourist attractions, Thai foods, and especially Thai massage. Now, Thai massage and spas logo are being discussed with the Department of International Trade Promotion. (Pinyophornpanit, 2011)

Finally, since Thai Massage can improve well-being of Thai people, the government should empower it to be another choice for Thai people apart from modern medicine. Chantraket, Sonksakda, and Metranon (2016) found that Thai massage therapy is the most popular in working-age people at 27.3%, 33.4%, 31.1% from the 2009, 2011, 2013, respectively. Thus, such service should be further developed and promoted through the integration with the use of herbal remedies and other TTM services.

V. Conclusion

Thai massage in the present is facing 2 major problems. Thai massage in the rural areas does not be sufficiently supported. Since the modern medicine is progressing dramatically, Thai people seem to overlook Thai massage, which is the local wisdom of Thailand. In addition, the government may not sustain Thai massage to be another way to treat the health conditions. So, it is lightly faded among Thai people.

On the other hands, Thai massage in big cities is very famous among tourists, but there are a lot of illegal Thai massage shops where most of them have a prostitution secretly. Therefore, this kind of business is mutual benefit; the masseurs can get more money, and the customers can get extra service. For these reasons, its image is changed and unreliable.

The government should empower Thai massage by creating a reliability and saving the image of Thai massage. For example, the masseurs should follow massage classes which is determined by the government to obtain the masseuse certificate, Thai massage in big cities should not have a prostitution, and the government should support Thai massage in rural areas to be another way to treat the health conditions. Finally, if Thai massage can be sustained and empowered sufficiently, it will be the valuable local wisdom towards human wellness and international expansion.

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Thai Medicinal Plants as Food in Thai Culture; from the Thai Traditional Uses to the Table

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Abstract

Thai curry is a common Thai food which contains Thai medicinal plants. The selection of ingredients follow by the Thai wisdoms. *Curcuma longa* (Zingiberaceae) or turmeric, *Allium sativum* (Amaryllidaceae) or garlic, *Allium ascalonicum* (Amaryllidaceae) or shallot, and *Capsicum frutescens* (Solanaceae) or Chili are the common ingredients in southern style Thai curry (Nakhon Si Thammarat, Thailand). For the treatment of diseases and health promotion, the Thai folk doctors are not only give them a traditional medicine, but also giving the advisory to the patients and care givers. They concerned about food what should have and should not have during the treatment. It indicated that food is important for health, especially during the treatment. Recently, the research reports about effect of phytochemicals and crude extracts from the Thai medicinal plants on hepatic-metabolizing enzymes (Cytochrome p450) were discovered. The selection of food for the patients need to concern about drug-herbs interaction with health benefits.

Keywords: Type your keywords here

I. Introduction

To living as Thai people, we need to learn and do about Thai cultures which are related to the nature and Thai wisdoms. On the over there, Thai medicinal plants are involved in many Thai cultures in our life. For example, the Thai rice (*Oryza sativa*; Gramineae) is the famous rice in the world which we have proudly to present. The Thai rice appears in many Thai cultures, starting from cultivation, harvest, and other events that reflected to the respect of Thai people on the Thai rice. The good meaning of the name of Thai plants are also concerned for selection on usages instead of indication, taste, shape and appearance of plants. For example, the jack fruit (*Artocarpus heterophyllus*; Moraceae) or Ka-Noon has meaning of the Thai name as supported by the people. The fruit meat contains high nutrition and calories that can be used as food. The wood contains morin that able to be used as coloring agent. The star gooseberry (*Phyllanthus acidus*; Euphorbiaceae) or Ma-Yom has meaning as famous people or popular. Thai people usually cultivate this plant around their home as the meaning of its name. The star gooseberry contains high vitamin C or ascorbic acid which is good for health. On the other hand, the Thai medicinal plants have been used for treatment of the diseases such as infection, fever, inflammation, and also cancers. The Thai medicinal plants are not only use as medicine, but also used as cosmetics, food and other purposes which related to the health issues. In Nakhon Si Thammarat, Thailand, the high biodiversity made this area enriched with Thai medicinal plants. The local wisdoms were found from the traditional books that we called Bud-Kao and Bud-Dam. We also found and learn about the local wisdoms from the Thai folk doctors. In this area, Thai folk doctors have roles in health system parallel with the modern

medicine. The Thai medicinal plants have been used and applied in many purposes. We found them in the recipes of the local food in this area. It made the good taste and also giving the health benefits. However, the selection of Thai medicinal plants in food need to monitor and concern about drug-food interaction and contraindication. The suitable usages of Thai medicinal plants follow by the Thai wisdoms made good health for the people. In this study, we focused on the Thai wisdoms about Thai medicinal plants in the local food recipe. We had review the traditional usages of the local people in Nakhon Si Thammarat about Thai medicinal plants as food for the health benefits.

II. Methods and results

We conducted the descriptive research with activities in the classes of School of Pharmacy, Walailak University. We visited the Thai folk doctors and local people in Nakhon Si Thammarat during January 2018 – April 2019. The targets were Thai medicinal plants, the Thai wisdom on health issues, and interview Thai folk doctor about their roles in health system. We observed the local people focusing on Thai traditional medicine usage in daily life, especially food. The Thai medicinal plants in the case of food was found and described in the detail. We also have gained the knowledge about Thai medicinal plants from Thai folk doctors. The data were analyzed and compared with the scientific data. The supporting data of the Thai medicinal plants usages was concluded. These results can be used for selection of Thai medicinal plants in the health promotion. In the Doctor of Pharmacy program of School of Pharmacy, we have PHD-241 (Fundamental of Pharmaceutical Botany and Pharmacognosy), PHD-341 (Pharmacognosy), and PHD-342 (Traditional medicine in primary health care) which are done on the Thai medicinal plants. The pharmacy students can be learn about Thai medicinal plants in the real nature around Walailak University on excursion. The active ingredients in Thai medicinal plants were discovered on PHD-341. To using CBL in the village on the Thai medicinal plants related to health issues was done in PHD-342. The special project about visiting the Thai folk doctor was done and recorded. In this time, all data were analyzed and concluded focusing on Thai wisdom about Thai medicinal plants as food.

Walailak University located in Nakhon Si Thammarat, Thailand where high biodiversity of the natural resources has been found. This area is attached to the Thai gulf and has a lot of mountains, such as Kao-Luang national park. Because of these advantages, we can found a lot of Thai medicinal plants. For wellbeing and healing the health problems, Thai wisdom on traditional medicine was applied by using the Thai medicinal plants. We visited 10 Thai folk doctors in The Plant Genetic Conservation Project under the Royal Initiation of Her Royal Highness Princess Maha Chakri Sirindhorn (RSPG), in 2018. 5 Thai folk doctors are doctors' herbal medicine who prepared the Thai traditional medicine for their patients after do the diagnosis. They follow by the Thai wisdom what adopted from their ancients. They also extended their study in Thai traditional medicine from schools and temples. All activities related to the treatment were recorded and applied in the related cases. We met 2 Thai folk doctors who treat the patients with snake bite. They need to know about the kind of snake and decided the treatment for the patients. They also do the treatment and healing the dead tissue by using many Thai medicinal plants. They have own wisdom to prepare and treat the patients with the inherit spell. *Curcuma amarissima* (Zingiberaceae) or Ka-Min-Kom has been used for treat the snake bite. The crude extract showed alpha-glucosidase enzyme inhibition, anticancer (breast cancer), anti-inflammation, relief fatigue, and flatulence. The aim of use in this case may be stimulate the nerve on the site of snake bite. *Davallia denticulata* (Polypodiaceae) is one kind of fern has been used for treat snake bite and insect bite. We met 2 Thai folk doctors who treat the patients with bone and joint diseases. They help the patients who suffered from broken bone and joint injury. Almost of the traditional recipes contain Thai medicinal plants what belonging to Zingiberaceae. They prepared the massage oils and orally recipe from them. *Syzygium aromaticum* (Myrtaceae) and *Acmella oleracea* (Compositae) were applied for relief pain as local anesthetic agents. We met 1 traditionally midwife. Now she stop to do her role in the community as the modern medicine comes and also as her personal reasons. But she still treat and giving health care for postpartum women. *Curcuma comosa* (Zingiberaceae) is the common Thai medicinal plant in her recipe. She also recommended some Thai medicinal plants for lactation, such as young flowers of *Musa sapientum* (Musaceae), rhizome of *Zingiber officinalis* (Zingiberaceae), seed or fruit of *Piper nigrum* (Piperaceae), and leaf of *Ocimum africanum* (Labiatae). The

common recipe of food for lactating women made from these kinds of Thai medicinal plant, called Kaeng-Liang. For the treatment of diseases and health promotion, the Thai folk doctors are not only give them a traditional medicine, but also giving the advisory to the patients and care givers. They concerned about food what should have and should not have during the treatment. It indicated that food is important for health, especially during the treatment. That why we interested in Thai medicinal plants in case of food. From the poem said “we should have food as medicine, but we should not have medicine as food”, it means we can select food for promoting our health and avoid to have diseases. From these data, we prepared the activities for pharmacy students to learn about Thai medicinal plants which can be used as food for promoting the health in the communities.

The common recipe in Thailand is curry. This recipe contains many kinds of Thai medicinal plant. From reviewing the literatures, there are several kinds of curry available in Thailand with similar ingredients as shown in the table 1.

Table 1: Thai curry and common ingredients

Ingredients	Kaeng Liang	Yellow curry	Roasted curry	Red curry	Green curry	Panang curry	Indian-style curry	Mussaman curry
Capsicum annuum (Solanaceae) – dried fruit		●	●	●	●	●	●	●
Allium sativum (Amaryllidaceae) – clove of garlic		●	●	●	●	●	●	●
Allium ascalonicum (Amaryllidaceae) – challot (bulb of challot)	●	●	●	●	●	●	●	●
Alpinia galanga (Zingiberaceae) – rhizome (Galanga root)		●	●	●	●	●	●	●
Cymbopogon citratus (Gramineae) – stem and leaf (Lemongrass)			●	●	●	●	●	●
Shrimp paste	●	●	●	●	●	●	●	●
Sea salt		●	●	●	●	●	●	●
Cuminum cyminum (Apiaceae) – dried fruit (Caraway)				●	●	●	●	●
Piper nigrum (Piperaceae) – seed or dried fruit	●			●	●	●		●
Coriandrum sativum (Apiaceae) – dried fruit				●	●	●	●	●
Coriandrum sativum (Apiaceae) – root				●	●	●		●
Citrus hystrix (Rutaceae) – skin of fruit				●	●	●	●	●
Syzygium aromaticum (Myrtaceae) – cloves								●
Myristica fragrans (Myristigaceae) – Nutmeg								●

In history of Thai curry, the real Thai curry mainly used fish meat. But after another country cultures such as Indian culture and Arabic culture come to Thailand. They applied their wisdom in Thai curry. Mostly they have been used pork, beef and chicken meat in the curry. Add more spices in the Thai curry is need such as clove and nutmeg for covering the smell of them. The Thai curry which represented the south of Thailand as well is yellow curry and also roasted curry. We visited the local people at Thasala, Nakhon Si Thammarat and gained the knowledge on paste for these 2 kinds of curry. The list of ingredients were shown in the table 2.

Table 2: Thai curry of Nakhon Si Thammarat and its ingredients

Roasted curry*		Yellow curry*	
Ingredients	Amount	Ingredients	Amount
Curcuma longa (Zingiberaceae) – rhizome (Turmeric)	1.2 kg	Curcuma longa (Zingiberaceae) – rhizome (Turmeric)	1.2 kg
Allium sativum (Amaryllidaceae) – clove of garlic	1.0 kg	Allium sativum (Amaryllidaceae) – clove of garlic	1.0 kg
Allium ascalonicum (Amaryllidaceae) – challot (bulb of challot)	0.5 kg	Allium ascalonicum (Amaryllidaceae) – challot (bulb of challot)	0.5 kg
Capsicum frutescens (Solanaceae) – fresh fruit	1.0 kg	Capsicum frutescens (Solanaceae) – fresh fruit	1.0 kg
Cymbopogon citratus (Gramineae) – stem and leaf (Lemongrass)	1.0 kg	Cymbopogon citratus (Gramineae) – stem and leaf (Lemongrass)	-
Piper nigrum (Piperaceae) – seed or dried fruit	1.0 kg	Piper nigrum (Piperaceae) – seed or dried fruit	-
Citrus hystrix (Rutaceae) – skin of fruit	2 – 3 fruits	Citrus hystrix (Rutaceae) – skin of fruit	-
Alpinia galanga (Zingiberaceae) – rhizome (Galanga root)	0.2 kg	Alpinia galanga (Zingiberaceae) – rhizome (Galanga root)	-

* These 2 kinds of Thai curry need to mix with spice powder which contains dried fruit and root of *Coriandrum sativum* (Apiaceae) and dried fruit of *Illicium verum* (Illiciaceae). We called Thai masala or Kreung-Ra.

The local Thai curry in Nakhon Si Thammarat contains Thai medicinal plants with biological activities as shown in the table 3.

Table 3: The common Thai medicinal plants in Thai curry (Nakhon Si Thammarat, Thailand) and their health-related data

Thai medicinal plants	Constituents	Health benefits / Activities	Interaction with hepatic drug-metabolizing enzyme	References
Curcuma longa (Zingiberaceae)	Curcumin, monodesmethoxycurcumin, bisdesmethoxycurcumin, Turmerone, Zingiberene, Borneol, Camphene, Ciniol, Sabinene, Phellandrene	Antioxidation, Anti-inflammatory, Anti-cancer, Neuro-protection, Anti-depression, Carminative, Cyclooxygenase-2 (COX-2) inhibition, H ₂ -receptor blocker, Antimicrobial, Anti-flatulence	CYP2C19, CYP2B6, CYP2C9, CYP3A4	Volak, L. P., et al (2008)
Allium sativum (Amaryllidaceae)	Allicin, Ajoene, Methylajoene, Dimethylajoene, Allisatin, Diallyl sulfide, Methylallyl thiosulfonate, Quercetin, Isoquercitrin, Astragalin	Hepatoprotection, Anti-inflammatory, Antibacterial, Antioxidation, Antifungal, Antiviral, Anti-parasitic, Cyclooxygenase-2 (COX-2) inhibition, Anti-flatulence, Immunomodulation, Hypotensive	CYP2C9, CYP2C9, CYP2C19, CYP3A4, CYP3A5, CYP3A7	Markowitz, J.S., et al (2003)
Allium ascalonicum (Amaryllidaceae)	Coumarins, Diallyl disulphide, Propyl disulfide, Allicin, Quercetin	Antimicrobial, Antifungal, Antiviral, Anti-parasitic, Hepatoprotection, Nephroprotection, Anti-flatulence	CYP2A6, CYP2C9, CYP2C19, CYP2D6, CYP2E1, CYP3A1	Zhou, S., et al (2003)
Thai medicinal plants	Constituents	Health benefit / Activities	Interaction with hepatic drug-metabolizing enzyme	References
Capsicum frutescens (Solanaceae)	Capsaicin, Dihydrocapsaicin, Nordihydrocapsaicin, Homodihydrocapsaicin, Homocapsaicin, Chlorogenic acid, Ferulic acid, Capxanthine	Pain relief, Cancer prevention, Weight loss, Alleviate pain in arthritis, postoperative neuralgia, diabetic neuropathy, and psoriasis, Prevention and healing of gastric ulcers, Antioxidation, Anti-inflammatory, Anti-flatulence	CYP3A4, CYP1A2, CYP2C9	Babbar, S., et al (2010)
Cymbopogon citratus (Gramineae)	Menthol, Cineole, Camphor, Linalool, Citral, Citronellol, Geraneol	Smooth muscle relaxation, Antibacterial, Anti-flatulence, Antifungal, Pain relief, Diuretic	CYP3A4, CYP2D6	Tang, H., et al (2018)
Piper nigrum (Piperaceae)	Caryophyllene, Limonene, beta-	Increase blood flow, Pain relief, Anti-	CYP3A4, CYP1A2,	Shamsi, S., et al

Thai medicinal plants	Constituents	Health benefits / Activities	Interaction with hepatic drug-metabolizing enzyme	References
	Pinene, alpha-Pinene, Terpinolene, alpha-Humulene, delta-Cadinene, Camphene, Piperine, Piperettine, Chavicine	inflammatory, Anti-flatulence, Anticonvulsant, Anti-parasitic	CYP2D6	(2017)
Thai medicinal plants	Constituents	Health benefit / Activities	Interaction with hepatic drug-metabolizing enzyme	References
Citrus hystrix (Rutaceae)	beta-Pinene, Limonene, beta-Phellandrene, Citronellal, Linalool, Borneol, Camphor, Sabinene, Umbelliferone, bergamottin, oxypeucedanin, psoralen, Citric acid	Cardio protective, Vascular protective, Antibacterial, Antifungal, Anti-flatulence, Anti-tumor	CYP2C9, CPC9, CYP2C, CYP2C10, CYP2C9, CYP3A4	Zhou, L., et al (2018)
Alpinia galanga (Zingiberaceae)	Cineole , α -Pinene, trans-Caryophyllene, Terpinen-4-ol, Chavicol	Antiamphetamine, Antibacterial, Antifungal, Anti-inflammatory, Antiperistaltic, Antipyretic, Antiseptic, Antispasmodic, Antiulcer	CYP1A2, CYP2D6, CYP3A4	Subehan, et al (2006)

III. Conclusion

From these data indicated that Thai medicinal plants in Thai curry have health benefits follow by the usages in Thai wisdom. *Curcuma longa* (Zingiberaceae) or turmeric, *Allium sativum* (Amaryllidaceae) or garlic, *Allium ascalonicum* (Amaryllidaceae) or shallot, and *Capsicum frutescens* (Solanaceae) or Chili are the common ingredients in southern style Thai curry (Nakhon Si Thammarat, Thailand). *C. longa* contains curcuminoids and volatile oils with biological activities, such as antioxidation, anti-inflammatory, anti-cancer, neuro-protection, anti-depression, cyclooxygenase-2 (COX-2) inhibition, H₂-receptor blocker, antimicrobial, and anti-flatulence. But the crude extract of *C. longa* showed potent hepatic-metabolizing enzyme (CYP3A4) inhibition. The common drugs which related to CYP3A4 are clarithromycin, diltiazem, erythromycin, itraconazole, ketoconazole, ritonavir, verapamil, simvastatin, and prednisolone. In case of *C. longa* - simvastatin, we need to monitor myopathy or rhabdomyolysis as the level of simvastatin was increased. And also *C. longa* – prednisolone, we also need to monitor immunosuppression caused by increased prednisolone levels.

The Thai medicinal plants have been used in Thai traditional medicine for treatment of diseases and health promotion. The local people in Thailand applied these Thai wisdoms in food by selected the edible Thai medicinal plants as ingredients. The Thai curry is a most common Thai food which contains many kinds of Thai medicinal plant. Recently, the scientific data about drug-herbs interactions were discovered and concerned. The selection of suitable food for the patients to avoid drug-herbs interaction is required with high health benefits from Thai medicinal plant usages,

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APPENDIXES

SEMINAR ACTIVITY SCHEDULE

Day/Date	Time	Program/Activity	Venue
1 Friday 23 August 2019	Arrival and Registration of Delegates		AD Building
	20.00-21.00	Team Managers Meeting	AD 1207
2 Saturday 24 August 2019	08.00-08.30	Student Registration and Arrival of Guests	WU Co-Working Space
	08.30-09.00	Arrival of VIPs / Ice Breaking	
	09.00-09.30	Welcoming Address by Assoc. Prof. Dr. Charun Bunyakan Vice President for Academic Affairs	
	09.30-10.00	Seminar Opening Ceremony by Prof. Madya Dr. Hendrik bin Lamsali President of IMT-GT Varsity Council	
	10.00-10.15	Photo Session	
	10.15-10.30	Refreshment	
	10.30-11.30	Keynote Address by Asst. Prof. Dr. Penchan Pradubmook- Sherer Professor in Health and Social Welfare, Mahidol University	
	11.30-12.00	Ice Breaking	
	12.00-13.00	Lunch	
	13.00-13.30	Prayer	
	13.30-15.00	University Group Presentation 1-3 1. Universitas Syiah Kuala (UNSYIAH) 2. Universiti Malaysia Perlis (UniMAP) 3. Rajamangala University of Technology Srivijaya (RUTS)	
	15.00-15.15	Refreshment	
	15.15-16.45	University Group Presentation 4-6 4. Universitas Negeri Medan (UNIMED) 5. University Utara Malaysia (UUM) 6. Walailak University (WU)	
	18.00-21.00	IMT-GT Varsity Carnival 2019 Opening Ceremony & Welcoming Dinner	Thaiburi Hall
3 Sunday 25 August 2019	08.00-08.30	Student Registration	WU Co-Working Space
	08.30-08.45	Ice Breaking	
	08.45-10.15	University Group Presentation 7-9 7. Institut Teknologi Medan (ITM) 8. Universiti Sains Malaysia (USM) 9. Prince of Songkhla University (PSU)	
	10.15-10.30	Refreshment	
	10.30-12.00	University Group Presentation 10-12 10. Universitas Sumatera Utara (USU) 11. Universiti Teknologi MARA (UiTM) 12. Thaksin University (TSU)	
	12.00-13.00	Lunch	
	13.00-13.30	Prayer	
	13.30-15.00	Mixed Group Activity: Brainstorming	
	15.00-15.15	Refreshment	
	15.15-16.30	Mixed Group Activity: Planning	
	16.30-21.00	City Sightseeing and Joining Cultural Performance	Nakhon City

Day/Date	Time	Program/Activity	Venue
4 Monday 26 August 2019	08.30-09.00	Student Registration	Innovative and Technology Building
	09.00-09.30	Departure for Botanical Garden	
	09.30-10.30	Building Shelter	Botanical Garden
	10.30-10.45	Refreshment	
	10.45-11.45	Mixed Group Presentation (Group 1-2)	
	11.45-12.45	Lunch	
	12.45-13.15	Prayer	
	13.15-14.15	Mixed Group Presentation (Group 3-4)	
	14.45-15.00	Refreshment	
	15.00-15.15	Preparation for Master Chef & Creative Arts	
	15.15-17.00	Master Chef & Creative Arts	
	17.00-20.00	Dinner and Traditional Dance	
5 Tuesday 27 August 2019	04.30	Morning Call	Baan Laem Homestay
	05.30-12.00	Excursion to Baan Laem Homestay	
	12.00-12.30	Seminar Closing Ceremony by Prof. Madya Dr. Hendrik bin Lamsali President of IMT-GT Varsity Council	
	12.30-13.30	Lunch	
	18.00-21.00	IMT-GT Varsity Carnival 2019 Closing Ceremony	
6 Wednesday 28 August 2019	Departure of Delegates		

LIST OF PARTICIPANTS

No.	Name	University Team	Mixed-group Team
1	Mr.Nobel Kristian Tripanoyo Tampubolon	USU	The Garlic
2	Mr.Ray Vivaldi Panjaitan	USU	The Shallot
3	Ms.Siti Hafifah	USU	The Lemongrass
4	Mr.Ilham Rahmadi	ITM	The Garlic
5	Ms.Mutia Khairunnisa	ITM	The Shallot
6	Ms.Siti Ayu Hastari	ITM	The Coconut
7	Mr.Fajar Fadli	UNIMED	The Garlic
8	Mr.Muhammad Irfan Novaldi	UNIMED	The Shallot
9	Ms.Titania Ayu Dwisari	UNIMED	The Lemongrass
10	Mr.Aulia Persada Bin Gunawan	UNSYIAH	The Garlic
11	Ms.Raisha Fathima	UNSYIAH	The Coconut
12	Ms.Nadiatul Azizah	UNSYIAH	The Lemongrass
13	Mr.Aiman Harris Ahmad Shukri	UiTM (Arau)	The Shallot
14	Ms.Noordalila Ramli	UiTM (Arau)	The Coconut
15	Ms.Nurul Zafirah Hamka	UiTM (Arau)	The Lemongrass
16	Ms.Ainaa Safiah Binti Azhar	UniMAP	The Garlic
17	Mr.Muhamad Zikry Bin Mohd Zulkaflee	UniMAP	The Coconut
18	Ms.Nur 'Aini Syafiqah Binti Bohari	UniMAP	The Lemongrass
19	Mr.Muhammad Zairulfikri Zailani	UUM	The Shallot
20	Ms.Nurul Aqilah Hashim	UUM	The Coconut
21	Ms.Shahirah Md Shuhaimi	UUM	The Lemongrass
22	Ms.Nur Damia Binti Supian	USM	The Garlic
23	Ms.Nurul Hanis Binti Mohd Rashidi	USM	The Coconut
24	Ms.Siti Aisyah Binti Mohd Razif	USM	The Lemongrass
25	Mr.Firadaos Chawae	PSU	The Garlic
26	Ms.Papitchaya Areewattana	PSU	The Shallot
27	Mr.Sittikorn Sukkaew	PSU	The Coconut
28	Ms.Chanidapa Suttigul	TSU	The Garlic
29	Ms.Natcha Rittichai	TSU	The Shallot
30	Ms.Waranya Rattanapan	TSU	The Lemongrass
31	Ms.Kusumaiyah Dunkhade	RUTS	The Garlic
32	Ms.Peeraya Saraviroj	RUTS	The Shallot

No.	Name	University Team	Mixed-group Team
33	Mr.Wachirawit Wannatem	RUTS	The Coconut
34	Ms.Hanafarah Salaemae	WU	The Shallot
35	Ms.Janyaporn Wungpanya	WU	The Coconut
36	Ms.Thanutcha Suwanchatre	WU	The Lemongrass

WELCOMING SPEECH

Delivered by Assoc.Prof.Charun Bunyakan, Ph.D.
Vice-President of Academic Affairs, Walailak University

Distinguished guests,

The IMT-GT collaboration has once again brought us all together, as they have in previous years. But for this year, Walailak University is honored and proud to host the event.

I would like to express my warm welcome to all delegates from the three countries: Indonesia, Malaysia, and Thailand, and express my appreciation to those young ones with energetic spirits who join the Varsity Carnival 2019 in the theme Empowering Local Wisdom towards Human Wellness and its Sub-theme: Economy, Society (Health and Politics), Environment and Technology.

I believe that our 4-day seminar will widen the eyes of both students and academia in the region. Especially for us here in Tha Sala, I hope the seminar program will also broaden the vision of local people. Some of us may have already familiarized ourselves with the surrounding area; otherwise, you will soon be introduced to interesting places for an excursion, and to get in touch with the locals.

Our seminar will take place in four venues: Science and Technology Park Building (WU Co-Working Space), WU Botanical Garden, Ban Leam Homestay, and Nakhon Si Thammarat City.

Our team at Walailak has designed various academic activities during the carnival, namely, University Group Presentation, Mixed Group Presentation, Cooking Competition, Camping, and Excursion. I personally hope that the learners of the 21st century, like you all, will enjoy interacting, moving around, discussing, sharing, and even inventing creative menus! I should also say that I am looking forward to tasting the food from this international community 😊

And, not to forget the serious tone of the carnival, our academic team, upon agreement from all members, has designed the awards in 3 categories. Best Paper Award, Mixed-group Presentation Award, and Best Presentation Award.

I am also delighted that Walailak has initiated an overnight camping activity to strengthen the bond and friendship among participants, as they say ‘the right kind of stress can bond your team together’. We believe that the assigned task during the camp will challenge you to excel your performance.

Let me now give you a warm welcome once again. I thank you all for making your way here to Walailak University, and I wish you achievement and fulfillment in your academic ventures.

OPENING SPEECH

Delivered by Prof. Madya Hendrik Bin Lamsali, Ph.D.
President of IMT-GT Varsity Carnival

Distinguished Committee Members of the IMT-GT Network
Distinguished participants;
Ladies and Gentlemen:

It's my great pleasure to extend a very warm greeting to you here on Walailak University, the largest campus in SEA region!

As we all know, IMT-GT is a network among universities within the geographical triangular area connecting Indonesia, Malaysia, and southern Thailand. The collaboration has been widely recognized, and joint activities have been successfully conducted in various forms for over 20 years. I personally would state that our IMT-GT network stands as one of the strongest and longest relationship in higher education in South East Asia.

And for us here, at the Varsity Carnival, the connection has embraced the young spirits who pursue the dreams for academic excellence. Throughout these years, we have observed innovative ideas, creative studies, and enthusiastic teams which leave behind them deeper impacts and bigger influences than we would have thought.

I am particularly pleased that during this seminar, both students and scholars from the networked universities will present their invaluable research from multi-disciplined subjects. We will learn issues in Humanities, Science, Social Science, and Health Science. This will afford us the opportunity to learn from each other and share our respective expertise in order to strengthen the academic community.

Apart from the seminar and talk, one of the excitements everyone is looking forward to is the local fieldtrip and outdoor activities. Our host, Walailak University, seems to have taken an initiative in getting into the true meaning of 'field trip'. As feelings are inter-culturally shared, the youthful spirits gathering at the carnival will cherish the outdoor camping and soaking in the mud. I trust that the hands-on experience will encourage the learners of the 21st century to learn the culture by taking part in the local one.

I appreciate the mutual collaboration from all of the active partners, four universities from Indonesia, four from Malaysia, and four from Thailand. My wish is that strong bonds and friendship among us all will grow and more creative ideas stem out from our academic ventures during these four days of activities.

Ladies and gentlemen,
I now declare the seminar open. Thank you.

CLOSING SPEECH

Delivered by Prof. Madya Hendrik bin Lamsali, Ph.D.
President of IMT-GT Varsity Carnival

Distinguished Committee Members of the IMT-GT Network

All participants – the young ones with great spirits of learners of the 21st century:

It has been my memorable experience to witness IMT-GT Varsity Carnival 2019 at Walailak University. Years ago, the region called Tha Sala might have been unknown to most of us, but after the event during the past week, I'm sure most, if not all, of us have imprinted a long-lasting memory. Such memory, if I may say, does not come merely from the place itself, but from the people, their beautiful minds, and the collaboration we have been part of over those challenging hours.

To me, the intervarsity network cannot be successful without the devotion of all parties – the hosts and the guests. Here, may I ask everyone to give a big round of applause to yourselves. Looking back, the host can see how much effort you have made in order to organize platforms for academic challenges. And the guests, you can see your strong determination to join the carnival. You travelled a long way to present your top form of academic excellence and to discover your hidden talents.

It's true that the path ahead of you is still a long way, but at least by now you would have realized that if you keep walking confidently and with high ethics, you will find the path worth taking. I would give an analogy of the experience walking in the maze at Walailak University garden. Our destination is to reach the fountain, and the exit. We tried this and that turn, some encountered a dead end, but we all kept trying. And we have to admit that the fun part might not be the point of reaching the destination, but it was the journey itself.

After the four-day activities here, I believe that everyone here has been through a unique journey, and we are all grateful to have the opportunity to be part of the event. This has coloured your youth, and strengthened your individual development now that our 21st carnival has come to an end.

I am grateful that our IMT-GT network has been standing strong and cherishing the collaboration for another year. We have once again delightedly observed innovative ideas, creative studies, and enthusiastic teams from diverse disciplines.

I would like to take this time to officially thank the host, Walailak University, for the warm hospitality and the wonderful arrangements. And I thank all participating institutions, students, and staff for your contributions. Before I declare the seminar closed, I wish you all success and achievements in study and in life, and may you all have a pleasant journey back home.

I now declare the seminar closed. Thank you.

AWARDS, CRITERION and WINNERS

AWARDS	CRITERION
Best Paper Award	Creativity, 30 Relevance of Topic, 20 Organization, 20 Conceptualization, 20 Content, 10 (See also Writing Framework Description on page 97.)
Best Presentation Award	Delivery, 15 <ul style="list-style-type: none"> - Voice projection - Eye contact /Facial expression - Confidence Verbal skills, 30 <ul style="list-style-type: none"> - Clear pronunciation / language clarity - Articulation / fluency / preparation - Pace of presentation/ rhythm/ pause Content, 25 <ul style="list-style-type: none"> - Background / aims - Methodology - Results - Discussion & Conclusion - Organization / Proportion Visual aids, 15 <ul style="list-style-type: none"> - Adequate / good quantity / Enough supports - Quality: Colour/ font size/ readability/ figure/ tone Dealing with questions, 5 <ul style="list-style-type: none"> - Clear answer/ relevant/ useful Time management, 5 <ul style="list-style-type: none"> - Time well spent

AWARDS	CRITERION
Best Mixed-group Presentation	Teamwork, 30 <ul style="list-style-type: none"> - Planning process and individual contribution - Group interaction - Task management Presentation, 40 <ul style="list-style-type: none"> - Clear concept - Interesting content/ inter-connectivity - Well-organized presentation - Clear delivery - Creativity and entertainment Master Chef Competition, 30 <ul style="list-style-type: none"> - Culinary work - Food presentation - Taste/ use of ingredients/ serving portion - Brief description

AWARDS	WINNERS
University Team	
Best Paper Award	Universiti Teknologi MARA (UiTM, Arau)
Best Presentation Award	Universitas Negeri Medan (UNIMED)
Mixed-group Team	
Best Mixed-group Presentation Award The Winner	The Shallot
The First Runner-up	The Garlic
The Second Runner-up	The Coconut
The Honorable Mention	The Lemongrass

WRITING FRAMEWORK DESCRIPTION

Relevance of Topic

The ideas are relevant, fully extended and well supported. The position is fully developed while addressing relevant ideas necessary to answer the research questions.

Organization

Text is well organized and coherent. The piece of writing is logical and ordered with links between ideas clearly presented by the use of a variety of cohesive devices and organizational patterns to good effect. Ideas and information are sequenced through appropriate and sufficient paragraphs.

Content

The article shows substantial, logical, and concrete development of ideas. Details are relevant, original, and convincingly interpreted. Sources are used to support, extend, and inform, but not substitute writer's own development of idea (or with overuse of citations).

Conceptualization

Thesis statement is clearly stated and is thought-provoking. The paper is developed through essential research questions, with interesting/ crucial problems of the study. It shows the conceptual framework that helps develop an understanding of the study's main idea as well as includes the dimensions of frameworks for conceptualizing the idea.

Creativity

Original ideas are interestingly presented. The paper shows fresh insight that challenges the reader's thinking. The researcher is able to see the problem or challenge in a wider context, able to apply prior context to new context and arrive at solution. The writing reflects logical and critical thinking for problem solving, explains conclusion, evaluates, supports or critiques the thinking of others.

PHOTO GALLERY

Opening Ceremony



Keynote Address



University Team Presentation



Mixed-group Presentation



Building Shelter



Master Chef Competition





Excursion



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The 21st IMT-GT
Varsity Carnival 2019

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