THE CREATION OF MASTER PLAN FOR FIRE PROTECTION MEASURES IN TOURISM WATERFRONT COMMUNITY: A CASE STUDY OF KLONG SUAN MARKET COMMUNITY 100 YEAR

Kunyaphat Thanakunwutthirot 1, Morakot Worachairungreung 2, Wullop Yaiying 3, Supawadee Nusin 4

1Program of Computer Technology Application in Architecture, Faculty of industrial Technology, Suan Sunandha Rajabhat University, Bangkok, Thailand
2Program of Geography and Geoinformatics Department, Faculty of humanities and social sciences, Suan Sunandha Rajabhat University, Bangkok, Thailand
3Managing Director, Human Resource Development Institute Co., Ltd., Thailand
4Assistant Director/Environmental Consultant, Environment and Energy Consultant Co., Ltd., Thailand
1kunyaphat.th@ssru.ac.th, 2morakot.wo@ssru.ac.th, 3hrdi.huahin@gmail.com, 4supawadee-nusin@hotmail.com

The safety of life and property in the community is very important to every resident in the community. If any community is safe People in the community will have welfare for life. Able to fully engage in activities or perform their duties. At present, the problem of fire with the old community in particular, the area that has an old market often occurs. Which these places all have history with architectural style values Valuable to link the minds of people in the neighborhood for a long time. The fire problem in many times caused damage that could not be appraised. Khlong Suan Market is an old market since the reign of King Rama V in the past. Khlong Suan Market is the community center and exchange point and the most convenient and convenient transportation route with the way of life of Khlong Suan people, including Thai, Chinese, Muslims. Which can be seen from the building, such as the Jena temple, the mosque is located nearby The overall physical characteristics are at risk of fire. Because the building material is a flammable type and the wooden row houses are lined together. With activities that use cooking gas and products that are vulnerable to spreading easily in the event of a fire Installation of building modifications Wiring that is vulnerable to fire, so dealing with fire risks. As well as repetitive accidents that may occur after a fire Need to study and find ways to prevent. This research will use morphology to study the autonomous travel network to find the infiltration potential of Khlong Suan community. By applying the city planning measures and physical details To find ways to reduce the risk of fire in the community Both to life and property. This research The objective is to analyze the potential of accessing emergency services in Klong Suan Market Community 100 year. By applying an independent traffic network To find potential for access to public services And prepare fire protection guidelines By applying the city planning measures and physical details. The results from this research will help strengthen the knowledge of spatial understanding for the construction of fire protection measures in the waterfront tourism community, a case study of Klong Suan Market Community 100 year. Which is mostly physical, is a row of houses that are crowded and quite crowded Which is a local architectural style with architectural values Historical And have the mental significance of the people in the area. There is a discovery from a research. This is found that there is an important line in a minor community level in Klong Suan Market Community 100 year or there is a local integration. There is a thoroughfare which will have a trend to be the most important line of a minor community that is a rural road of Chachoengsao 3001. By this route will have a row road horizontally with Thepparach municipality road which can connect to each other when both of this two routes have joined with Rattanakosin 200 year road and there is Subdistrict Administrative Organization Thepparach 8. Besides, there is a connection with a main route that is Bang Pakong – Chachoengsao for going to nearby provinces. By there is the nearest fire station that is a fire department of Chachoengsao municipality. This has spent a travelling time approximately for 35-45 minutes.
I. INTRODUCTION

Fire is one of the major problems that can cause fatality, property damage, as well as the loss of the overall national economy. According to the fire statistics from 1989-2011, there were 50,413 fires reported in Thailand with the estimated total damage for over 30,000 million baht (Disaster Prevention and Mitigation Center, 2011).

Currently, a problem of creating a fire with a former community especially for an area which will have that former market and this will be happened oftenly. For all those places but this will have a history. There is a value in a form of an architecture. There is a value which will tie a mind of a person who lives nearby that place for a long time. By fire problems in many times, this will create a damage which mayn’t be evaluated or appraised. For example, on May 20, 2014, there was a fire event in an area of a former Bangplee ancient market 150 years, Bangplee District, Samut Prakarn Province. For a point that has an event, there is a stick footpath that is far away from Tho venerable monk approximately for 100 metres that is a center point of a market. By a fire has spread since a center point of an ancient market that is a long blocking bridge continuously for both of shops and houses of the people approximately for 50 households which is built closely and those places are fired in a broaden area approximately of 5 Rais until this has been burnt down and there is a strong wind which will make to let a flame to be burnt on shops continuously for many households. Villagers must hurry to run to flee from a point which will have an event chaotically. This will use a time approximately for 1 hour and a fraction and this will be able to intercept a fire to be in a scope. Besides, during of having an event, a volunteer rescuing car of Sumpakong base has come to extinguish on a market which will create a duplicated accident. For a front car condition, there is completely demolished. Front tires and rear left tires are broken, injured persons are dispersed on a road and they are stuck in their fire engines. Extinguishing equipments and a rescuing team are dispersed on a road (Komchadluek, 2014).

After that from a fire of a former Bangplee market, this has left a trace of a lost that is an appeal which will remind to let a community of other old wooden rooms to be panic to protect themselves from a fire. There is a preparation of a readiness to support a fire all the time. Klong Suan market. There is a rehearsal for extinguishing within a community as always including there is a water dispenser to pull a water from a canal for protecting a fire in a point that can be accessed. But from an area condition of a community that is a wooden building. There is a narrow footpath. This will give an effect to let an emergency public hazard service car to access an area with a difficulty including a market is an important area in a history. Moreover, this place is in a supervision of 2 Municipal Office. This will be needed to have a rehearsal to cope to protect a fire systematically for protecting a confusion and a duplicated accident that may be happened after a creation of fire.

Klong Suan market Community 100 year is located at an edge of a Buriram Prawet canal in an area of 2 provinces that are Thepparach Sub-District, Ban Pho District, Chachoengsao and Klong Suan Sub-District, Bangbor District, Samut Prakarn Province. By that Klong Suan market is a former market since an area of King Rama 5. If this has backwarded to the past time, a travelling by a boat is convenient and fastest. When this was back to the past time, Klong Suan market was a point to take a rest and there was a focus of a community. There was a point to exchange products and there was an important transportation route and there is the most convenience which will have a lifestyle of the Klong Suan people for both Thai-Chinese people, Thai Buddhist people and Thai Muslim people. This will mix a culture a daily living. This can be seen from the construction such as; Vegetarian house, temple, mosque which will be located in a nearby area. An overall physical aspect will have a risk on creating of a fire due to a building material will be a category to be highly flammable and a form of a wooden house that is arranged stick together. By this will have an activity which will use a cooking gas and a product that has a risk on an easy spread when there is a fire event. There is an installment of an air-conditioner. There is an electric wiring which will has a risk on creating a fire event.

In order that, there is using of a regulation of a master plan and a physical detail (Form-Based Codes) in a detail of a development of that area. This will help to let to plan to develop an area and setting of a master plan system to have a clearness more. By in this research, a researcher will focus on designing a master plan to protect a fire with a regulation of a master plan and a physical detail which will be able to bring to practice to use with an area really and concretely. By this will analyze a network of a natural movement which is in a science of a study and an analysis of a shape and a form of other things or this is called that, “Morphology”. Especially in a morphology that will focus on a research study of a building and a city in a physical form or a spatial study. Especially, an important aim is required to understand a form of a morphology of a city and a building clearly. Before this will enhance to an analysis accompanied with other factors such as; History, Sociology and Psychology etc.
II. RESEARCH OBJECTIVES

1. There is an analysis of a capacity in accessing to an emergency public hazard service, Klong Suan Market Community 100 year. By there is applying to use a network of a natural movement for finding a capacity in accessing to an emergency public hazard service before and after preparing a master plan to protect a fire.

2. There is a guideline in preparing a master plan to protect a fire with an applying to use a regulation of a master plan and a physical detail of Klong Suan Market Community 100 year for reducing a risk from a public hazard for both a life and a property.

RESEARCH METHODOLOGY

There is a guideline to design a master plan to protect a fire with an applying to use a regulation of a master plan and a physical detail. There is a case study of Klong Suan Market Community 100 year. In this time, a researcher has determined a research methodology according to following details;

A sample
Due to this research is a spatial research for building a master plan to protect a fire in a touring community of an edge of a river. A case study of Klong Suan Market Community 100 year. By this will focus on a physical area of Klong Suan Market Community 100 year. A sample will be a physical area of Klong Suan Market Community 100 year and a surrounding context in a time period of a researcher which is determined already.

Tools for answering a research question; this will be as follows;

1) For a physical spatial survey, there is gathering of an information.

2) ArcGIS10 Program, Microsoft Access, Microsoft Excel and Illustrator for analyzing and presenting an overall picture of a physical condition, a physical description and a building mass in Klong Suan Market Community 100 year.

3) A questionnaire and a question in a depth interview which is a question that will reflect to see that a questioner has considered about a word which is used and there is a method to set a question quite well already for this hasn’t given a respondent to have a confusion (Pholisita, 2009).

4) There is a ArcGIS10 Program to analyze a morphology of a city with a network of a natural movement (Space Syntax) from a relationship of a morphology of a city and an infiltration. In a sense, it is the science of architecture’s and city planning’s morphology that focuses on physical and spatial studies (Paksukcharern, 2005)

Gathering of an information
There is contacting to coordinate with a responsible agency. There is a community president and the people in Klong Suan Market Community 100 year and there is gathering of an information from observing from a physical environment which will give an effect to a creation of a fire within a community.

An information analysis
In an information analysis of this research, there is using of ArcGIS10 program, Microsoft Access, Microsoft Excel and Illustrator for analyzing and presenting an overall picture of a physical condition, a morphology and a building mass and this can access an area from a service to help in a public hazard in Klong Suan Market Community 100 year. By there is bringing to analyze together with a regulation of a master plan and a physical detail for bringing to design a master plan to protect a fire of Klong Suan Market Community 100 year.

A searching of a spatial form
1) There is analyzing of a physical description, Klong Suan Market Community 100 year.
2) There is analyzing of a building mass of Klong Suan Market Community 100 year.
3) There is analyzing of accessing to an area of Klong Suan Market Community 100 year.
4) There is an analysis of a risk on creating a fire from a physical environment of a community with a physical factor of a community.
5) There is an analysis of a regulation of a master plan and a physical detail with a physical aspect of Klong Suan Market Community 100 year for bringing to design a master plan to protect a fire.
6) There is designing of a master plan to protect a fire with an applying to use a regulation of a master plan and a physical detail.
7) There is a public relation to let the people in Klong Suan Market Community 100 year and a related agency with a safety There is an agency to protect a fire to receive a public information and this has notified to know about a project detail.
8) There is a public consultation for receiving an opinion and inspecting additional information.
9) There is setting a meeting of an expert group within a local area (Technical Hearing) for 4 times.
10) There is evaluating and analyzing a question before this will conclude a result. By this will show a comparison for seeing a clear picture more.
11) There is a public hearing to receive an opinion from a stakeholder before this will enhance to a person who will take a responsibility.
12) There is a manual to use a master plan to protect a fire in a touring community at the edge of a river with an applying to use a regulation of a master plan and a physical detail.

A result of an information analysis
This has gathered an information by contacting, coordinating with Klong Suan Market Community 100 year by this will have a field survey and gathering from an observation from a physical environment. A travelling may give an effect on creating a fire.

From a research objective
1st is an analysis of a capacity in accessing to an emergency public hazard service of Klong Suan Market Community 100 year. By there is applying to use a network of a natural movement for searching a capacity of accessing to a public hazard service.

2nd is setting a master plan to protect a fire by applying to use a regulation of a master plan and a physical detail, Klong Suan Market Community 100 year for reducing a risk from a public hazard for both of a life and a property.

1) There is setting of a meeting to explain an operation for planning and gathering an information.
2) There is a field survey with a community.
3) There is writing an Axail line on ArcGIS10 Program as shown in Picture 1.
4) There is an analysis of a network of a natural movement (Space Syntax) as shown in Picture 2.

By there is writing of an Axial line on a map of a study area with Arc GIS Program and there is bringing to analyze a network of travelling with Plug-in Program under the name of Axwoman. Theory of natural movement (Hillier, 1993) studied a set of computer theories and techniques that can demonstrate the relationship between "Space Syntax" and "the nature and level of popularity of space usage".

There is a determination of an order in Axwoman Program for analyzing a relationship of each road line as follows;

**Total Depth** : There is a measurement of a value with an order of Total Depth that is measuring of a value of a relationship of a line that one line will connect with other lines in a next sequence that what is the number of each line.

**Connectivity** : There is a measurement of a value with an order of Connectivity. There is using to measure a relationship of a line that one line will have other lines to connect directly in what number.

**Local Integration** : There is a measurement with an order of Local Integration. There is using to measure that one line will connect with other lines that is attached to oneself directly (One-step) and there is a next line that will connect (Two-step). For any of more or less in an average for knowing that what road line that will have a trend to be an important line of a minor area.
Global Integration: There is a measurement of a value with an order of Global Integration that will measure that one line will connect with all other rest lines in an average system that is more or less in any number. This will make to see a route or a position which will do a duty as a center of that system.

Picture 1, There is writing of Axail line according to a network of a travelling, Klong Suan Market Community 100 Year with ArcGIS 10 Program
There is an analysis result of a network of a natural movement (Space Syntax), Klong Suan Market Community 100 year

There is a science of an architecture of a master plan in a morphology. This will focus on a research study of a building and a city in a physical form or a spatial form (Paksukcharern, 2005). By there is an analysis of a network of a natural movement (Space Syntax). There is a relationship line that is calculated. And this will show a value as a figure and a color of a line. If one line has a relationship with other lines more. A value will be more and this will be appeared as a color line according to an Axial line that is written. By this will substitute a figure value with a sequence of an intensity of a color (Graduated Color) with a color Temperature set on ArcGIS Program. By this will have more value and this will be a color that is in a hot complexion. There is the most value which will be a red color. A line will have a relationship with other lines less until this will be an orange color, a yellow color and this will be reduced into a cool complexion color since from a green color until to a line which will have the least relationship with a blue color and a sky blue color respectively according to a color shade.

In this research, this will analyze with a specific relationship (Local Integration). One line will connect with other lines that is attached to oneself directly (One-step) and there is a next line to connect (Two-step). There is more or less in an average. This will show to see that a line or any road line will have a trend to be an important line of a minor area (Chaichana, n.d.)
III. A RESEARCH RESULT

From a 1st objective, there is an analysis of a capacity in accessing to an emergency public hazard service of Klong Suan Market Community 100 year. By this will apply to use a network of a natural movement. For a result of an information analysis, a network of a natural movement (Space Syntax), Klong Suan Market Community 100 year. This is found that an important line in a minor area level in Klong Suan Market Community 100 year or this will have a specific relationship (Local Integration).

There is the most travelling route which will have a trend to be an important line of a minor area that is a rural highway of Chachoengsao 3001. By this road will pave parallel with Thepparach municipality road. By this can connect together when this 2 roads has come together at Rattanakosin Road 200 year and Subdistrict Administrative Organization Thepparach 8. Besides, this will connect with a main road, Bangpakong-Chachoengsao Road for going to nearby provinces. By this will have the nearest fire station that is Chachoengsao Municipality Fire Department. This will use a travelling time approximately for 35-45 minutes.

From 2nd objective, this will prepare a master plan to protect a fire by applying to use a regulation of a master plan and a physical detail of Klong Suan Market Community 100 year for reducing a risk from a public hazard for both a life and a property when this has considered about a travelling route for accessing to Klong Suan Market Community 100 year which will have a physical aspect as an area at the edge of a river and there is a rural highway Chachoengsao 3001 as a main road in accessing to an area including most of a building condition is a wooden house and there is using of a benefit of a building heavily. In an aspect of using a benefit from various buildings such as; A person has lived, traded, cooked a food for consuming and trading including being a storing place for a commerce. This will be needed to have to bring a regulation of a master plan and a physical detail and a principle to operate for contributing to protect a fire to use in adjusting an area for reducing a risk from a public hazard in a fire category as follows;

1) A community shall have to prepare a plan to specify a connection between an area of Klong Suan Market Community 100 year with an agency or an outside community organization that is related to a safety in a life and a property such as; Fire station, Nursing home, Police station etc. This will include a telephone number of that agency in a center area of a community. This will let a tourist and a person in a community to be able to observe clearly. When this has a case to create a fire or an emergency public hazard in that area. This can contact to a related agency. By an agency in relieving a public hazard and a related agency related a protection of a hazard. This can access to an area and a plan in a risk management suitably and immediately when this has created an emergency public hazard.

2) There is a system to guard against a hazard of a community, this will lead to evaluate a size of a problem that is a cause of a problem in a physical aspect, an environment of a community and a network system of a road. By this will bring a map of an analysis result of a network of a natural movement (Space Syntax), Klong Suan Market Community 100 year to design and prepare a regulation in a community of a travelling of a pedestrian, a travelling of a small car and a travelling of a big car to have a system and a rule.

3) A community shall have a system of preparing of a readiness in receiving an emergency event that may be happened in a community, such as; a rehearsal of a basic extinguishing by oneself. There is a warning if this can’t restrain a fire. There is an emigration to move the people in a community and there is a notification of an event to a community president, a community leader and a fire marshal in accessing to an area for extinguishing. Moreover, ther is checking of the number of the people in a community for searching the lost people or the people who are obliged from an aforementioned event for notifying to a fire marshal to enter to help immediately.

4) There is a determination of a detail of a location of a public area for being a rendezvous point and a directing point which will have a design of a physical aspect of a public place to be a central area that will do a duty as a center of the people. There is a beauty and there is a form that is a special place (The great places) of a community.

5) A standard of a master plan and a physical detail. Street and building types (or mix of types), build-to lines, number of floors, and percentage of built site frontage specified. (FBCI, 2021) such as; Block Standard such as; a form and a size of a land plot in a developing area. This can be classified to be each community and each plot and there is accessing in every plot. In a case of creating a fire event, a fire marshal can access to stop an
aforementioned event immediately. Building Type Standard such as; a category, a using of a benefit, a height, a retreating distance from a public line etc. for reducing a congestion of a community. Standard in an architecture such as; a building shape, a front shape, a view and a detail of a design that is related to a use of a benefit, a beauty and a balance in using a building and an environment for letting a building in a community to maintain a former form of an architecture form. By this can use a benefit of a building according to an era and this will respond to a requirement and a behavior of a resident. Green Building Standard such as; a guideline in determining an aspect of a building according to a LEED criteria such as; using of a building resource, a material, an energy, a therapy and an eliminating of wastes, a receiving of a light, a ventilation etc. for a life quality of a resident in a community.

6) There is a determination of a detail in a landscape architecture, there is an environment for both in an area of a land plot, a public area, an open-air area, a green area, a landscape of a road, a footpath, a bicycle path, a path of a mass transit, a road, a big tree, a resting seat, a road furniture and a public utility system including a management system in an environment.

There is a conclusion and a suggestion of a research job

There is a safety in a life and a property as the most important thing. Every resident in a community would like to let a community to have a safety. Especially for a community who have an oldness. There is a value in an architectural form of a building. Moreover, this place will be a community as a tourist attraction. There is using of a benefit of a building in various categories. This will have to consider about a design of a master plan of a community to create a safety in a life and a property. Especially, that is in a fire. Due to Klong Suan Market Community 100 year has main building materials as a wood and there is a form as a wooden house which will have a connecting way. This will make to have a risk in a fire very much.

For a discovery, this has hoped very much that this will be a benefit on an agency in planning for keeping a safety in a community. This will relieve a public hazard and will protect a fire in a community and the people in an area of Klong Suan Market Community 100 year. Tourists will enter in an area and a surrounding area in reducing a risk in a life and a property.

BIBLIOGRAPHY

1. Chaichana Sangsawang (n.d.). an analysis of a shape and a physical description structure of a city. There is a system to support for conserving and reviving a city community.