FORM FOLLOWS FENG SHUI

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ABSTRACT

Feng Shui originated in China 2,000-3,000 years ago. Its content is mainly site selection for Chinese dwelling, housing, ancestor's cemetery, and actions that relate to nature and the environment. The aim of this study is to investigate influential factors which generate Chinese Feng Shui. My method is a comparison between Feng Shui and the ancient Thai constructional notions. The results present influential factors such as the environment, human, and building technology. Therefore, these factors determine the building configuration through Feng Shui.

Keywords: *Feng Shui / environment / building configuration / Chinese philosophy / architectural elements*

1. INTRODUCTION

Around 2,000-3,000 years ago, Feng Shui originated in China. Its main content is about site selection for Chinese dwelling, housing, ancestor's cemetery, and environment-related action. The influential doctrines are Confucianism and Daoism. Confucianism is concerned about human social behavior such as gratitude and gentleness. While Daoism instructs people about the way to live with nature in solitude and simplicity. At the present time, Chinese Feng Shui is favorable in many countries due to the fact that people believe in effectiveness. It can be related to many construction aspects, such as:

- Site and building selection
- Landscape and site design
- Building form selection
- Room and area positioning
- Interior and furniture design elements.

Figure 1: The well-known symbol from Daoism, Yin-Yang implies the philosophy of change and balance between two opposite poles, such as light and dark, damp and dry, hot and cold, and etc.

Figure 2: The Feng Shui master is searching for the auspicious area in order to determine the suitable direction and position of the ancestor's cemetery.*(Adopted from the Civilization of China.)*

2. DEFINITIONS OF FENG SHUI

In Chinese meaning, 'Feng' is wind or moving air and 'Shui' is water. However, the results of a previous anthropological study concluded that the ancient Chinese people always use an analogy and broad meaning. Thus, we are studying Feng-Shui is notion in various meanings such as:

- The study in natural, environment, and site location. (Praparsarnond 2005)
- Feng Shui is the Chinese knowledge that realizes on nature and environment especially wind and water. (Yiamwattana 2005)
- The knowledge is about wind and water. (Chokemankalachaichana 2003)
- The knowledge to live in harmony with the environment. (Thongtaab 2001)
- The art and science of living in harmony with your living space. Especially, Feng Shui seek to harness nature's positive force and correct the negative ones with the intention of promoting better health, wealth, and relationship. (Moran 2002)
- The knowledge of the Chinese Environmental Science. (Hale 2002)
- Feng Shui is an art of living with nature. (Porter 1995)

All definitions have various meanings. We can use the universal meaning, which covers all definitions:"Feng Shui is an eco-social science that enhances human well-being and prosperity".

3. AIM OF FENG SHUI

In the past, Chinese people frequently faced danger from natural disasters, wars, robbers, and strong climate. Thus, the aim of Feng Shui fulfilled the basic physical and security needs. At present, the aims of Feng Shui response to both physical and psychological needs, which can be presented by the theory of five needs, see figure 3.

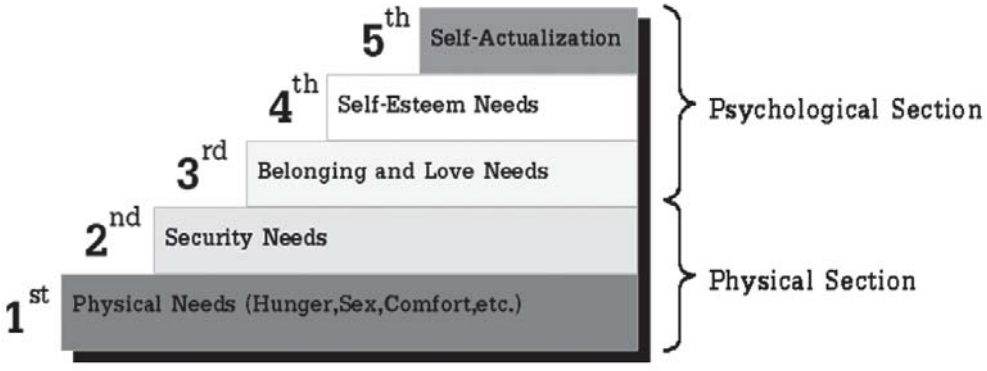


Figure 3: The Theory of Five Needs by Abraham S. Maslow.
(*Adopted from Forty Studies That Changed Psychology)*

The physical section consists of physical and security needs. While the psychological one is contains belonging, self-esteem, and self-actualization needs. The psychological will not emerge

unless the physical one is fulfilled. In other words, the physical section is the basic need for people to survive. Thus, the ancient Chinese Feng Shui notion is the 'key' to guard against harm and other people threats.

4. METHOD

The Feng Shui and Building Configuration

Feng Shui contains many instructions. The interesting part is about building configuration. For example:

- The square-shaped plan house can provide its dwellers with well being.
- The residential building has been built with the rectangular shape plan, an auspicious shape. The building should be placed for the right direction, the longer side facing south.
- The auspicious shape for the building floor plan is a perfect square or rectangle, which is not indented at corners or sides.
- The auspicious direction for the entrance of the house is the south and southeast direction.

From above, the details are quite different because they originated in distinct areas. The details can be analyzed via the configuration of vernacular architecture in the next step.

The comparison between Feng Shui and other notions

A former anthropological study in building configuration shows that the rectangular floor houses are found in the south of China around Nanchang, Wuhan and Nanjin precinct (Area 3), while square-shaped floor houses are found in the middle of China around Beijing and Tianjin precinct (Area 4). By comparing these Chinese Feng Shui with two ancient Thai construction notions via vernacular architecture, we can find the factors that determine the building configuration. The selected areas have a unique notion that determines particular building configurations. These area locations are presented in the map (Figure 4) and the detail in the table 1.

Table 1: The data of 4 selected areas in locations, latitudes, altitudes, and climate types.

area	location	latitude	altitude	climate
Area 1	The middle region of Thailand	11-16 North latitude	0-20 m. above sea level	Tropical moist climates
Area 2	The northern region of Thailand	18-23 North latitude	500-1000 m. above sea level	Tropical moist climates (with high altitude)
Area 3	The southern region of China	27-32 North latitude	1500-1800 m. above sea level	Temperate and highland climates
Area 4	The middle region of China	37-42 North latitude	30-100 m. above sea level	Humid continental and temperate climates

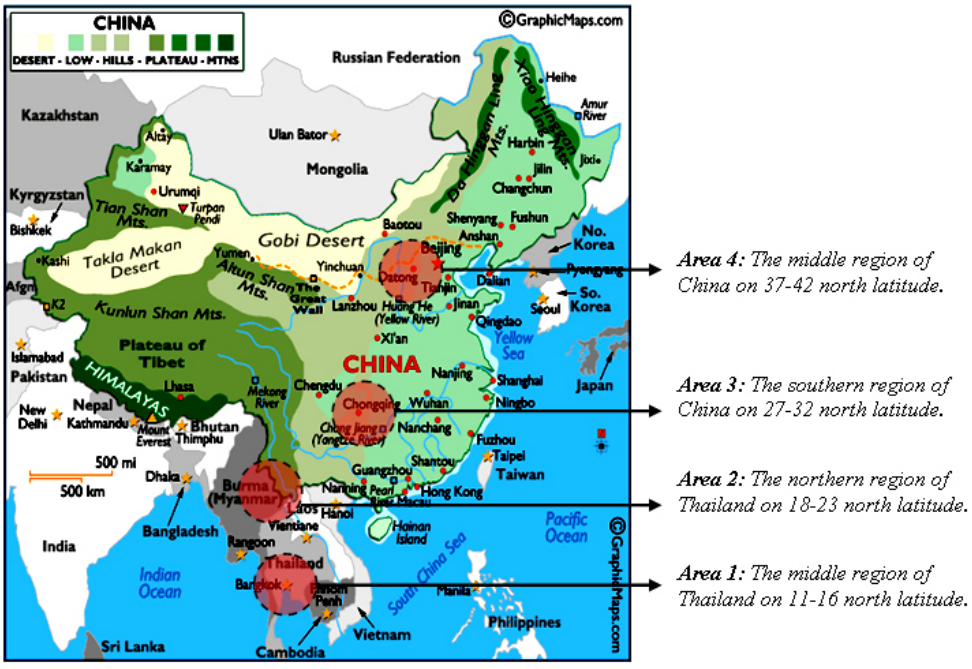


Figure 4: The 4 selected areas in China and Thailand for comparative study in building configuration factors.

In fact, higher latitude causes a lower average temperature. We selected these 4 areas because of the unique local climate caused by the difference in altitude and latitude. Furthermore, each of these areas has an interesting notion about building configuration.

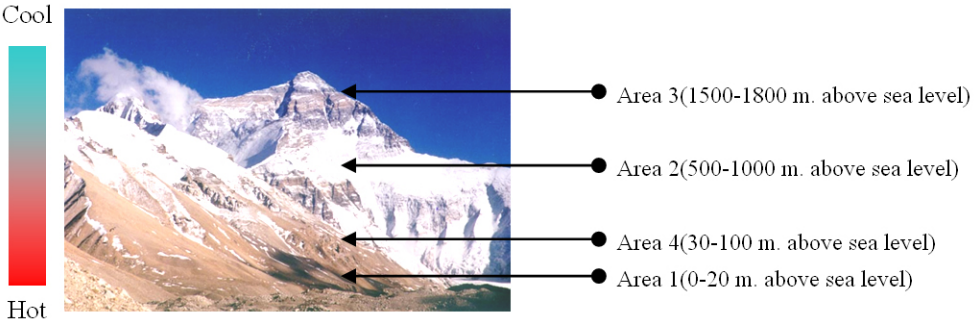


Figure 5: The relation of altitude and local average temperature.

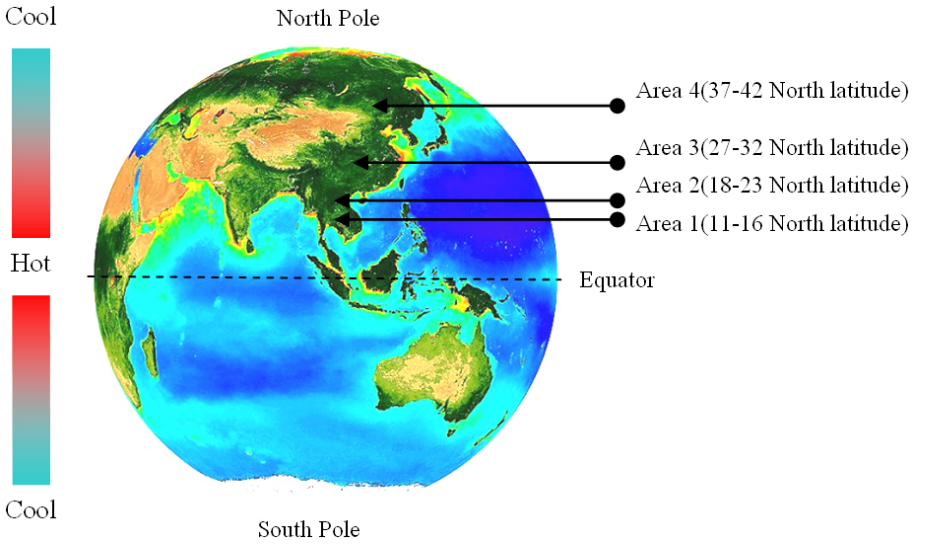


Figure 6: The relation of latitude and local average temperature.

5. RESULTS

The result shows the relation among environment, human and building technology. This relation originates a unique Feng Shui and other constructional notion in each area, such as:

Area 1: The elevated house in the middle region of Thailand on latitude 11-16 north degree.

This area is on tropical moist climates with a large amount of precipitation and maximum sunlight is coming from the west and southwest direction, while the air temperature is on average more than 18 degree Celsius. The average temperature is 35 degree Celsius in daytime and 22 degree Celsius at nighttime while the average humidity ratio is quite high, around 40-80%. An ancient Thai notion originated from this area, *"the house will be placed the longer side perpendicular to the north-south axis and it will has an elevated floor."* From data above, we can analyze,

- The house will be placed the longer side to the north-south axis in order to minimize the solar heat from the west direction.
- Because of a hot and humid climate, the wind velocity is necessary to improve thermal comfort in the building. Thus, the building has a longer side facing north-south directions that can take advantage of the south wind.
- An elevated floor is a solution for flood and ground humidity problems.
- The major building material is wood which can be found in this local area. Its qualifications, such as low density and lightweightness are suitable for this area because of less heat and moisture storage in building envelopes.

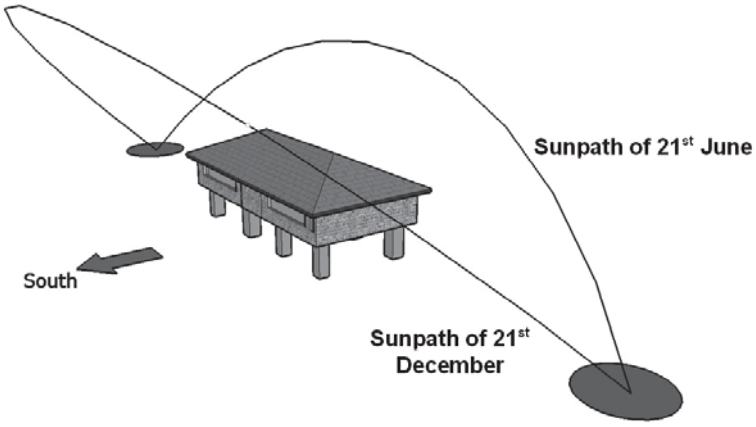


Figure 7: The rectangular-Shaped house is facing south direction with the longitudinal side in order to minimize the solar heat gain from the west direction.

Figure 8: The Middle Thai traditional house configuration.

Figure 9: The Middle Thai traditional house configuration.

Area 2: The elevated house in the northern region of Thailand on a latitude of 18-23 north degree.

This area is on tropical moist climates (high altitude) with a large amount of precipitation and maximum sunlight comes from the west direction. The average air temperature is lower than 20 degree celsius, especially in the winter because of higher latitude and altitude than area 1. The average humidity ratio is quite high around 40-80%, except in the winter. An ancient Northern Thai notion which originated from this area is *"the house will be placed the longer side perpendicular to the east-west axis and it will have an elevated floor."* From the environment and this notion we found,

- The house will be placed longer side perpendicular to the east-west axis in order to maximize the solar heat gain from the west direction in case of low temperature.
- The building with longer side facing east and west directions can take advantage from the south wind to improve the thermal comfort in the building in case of high temperature.
- An elevated floor is a solution for the flood and ground humidity problem.

- The major building material is wood that can be found in this local area. Its qualifications are suitable for this area because of low density and lightweightness which have less moisture storage in building envelopes.

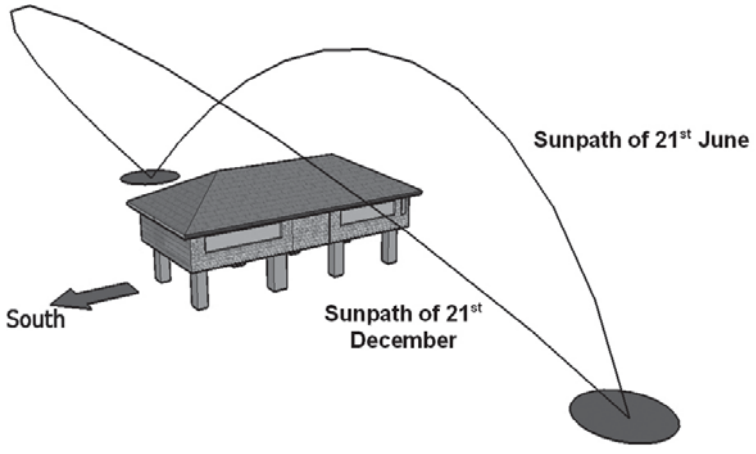


Figure 10: The rectangular-shaped house is facing west direction with the longitudinal side in order to maximize the solar heat gain from this direction.

Figure 11: The Northern Thai traditional house configuration.

Area 3: The earth-contacted house in the southern region of China on a latitude of 27-32 north degrees.

This area is temperate climate with the maximum sunlight coming from the south direction while the average air temperature ranges from 0 to 35 degree celsius. The average temperature is more than 38 degree celsius in daytime (48 degree celsius in the summer) and -5 degree celsius in the winter nighttime. The difference between daytime and nighttime temperature is much more than other climates. The relative humidity ratio is average between 30-70%. The ancient Chinese Feng Shui notion about house construction in this area is *"the house will be placed the longer side perpendicular to the north-south axis and it will contact the ground."* From the environment and this notion:

- The house will be placed the longer side perpendicular to the north-south axis in order to maximize the solar heat gain from the southern direction.
- Because of temperate climate, the building with longer side facing north and south directions can take advantage of the south wind to improve the thermal comfort in the building.
- In case of low temperature or intensely cold climate, the earth-contacted floor is a method to maximize the heat gain from the ground.
- The major building material is brick and clay that can be made in this local area. Its qualifications are suitable for this area as high density which have more heat storage than other local materials. This massive wall reduces the difference between inside and outside temperatures due to thermal time lag qualification.

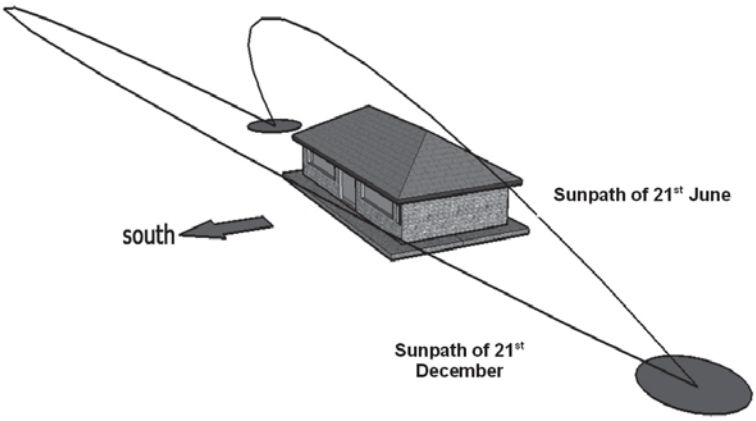


Figure 12: The rectangular-shaped house is facing south direction with the longitudinal side to maximize the solar heat gain from this direction.

Figure 13: The Southern Chinese traditional house configurations.

Area 4: The earth-contacted house in the middle region of China on a latitude of 37-42 north degrees.

This area is on a humid continental and temperate climates with the maximum sunlight is come from the south direction while the average air temperature ranges from -5 to 25 degree Celsius. The relative humidity ratio is on average lower than 50%. The ancient Chinese Feng Shui notion about house construction in this area is *"The square-shaped plan house is an auspicious dwelling and it will contact the ground."* From the environment and this notion we found:

- The house will be a square-shaped plan house in order to minimize the heat that flows out from inside because the square shape has less surface area than the rectangular one. The use of a thermal wall like Area 3 is not enough to improve thermal comfort especially in case of cloudy sky conditions.
- The square-shaped house has a lower infiltration than other shapes because of low surface area.
- Because of a cold climate, the earth-contacted floor is the way to maximize the heat gain from ground.
- From Figure 15, the floor plan of the house shows the design, which does not allow the cold wind to pass through the house because it does not have a wind outlet. Furthermore, the sunlight can shine on the Chinese solid bed that is called 'Kang' in daytime, and it can collect the heat for nighttime especially in the winter.
- The major building material is brick and clay that can be made and found in this local area, like Area 3. Its qualifications are suitable for this area such as high density which has more heat storage than other local materials. This massive wall reduces the difference between inside and outside temperatures because of thermal time lag qualifications.

Figure 14: The square-shaped house has a small surface and compact form in order to minimize the heat flow out from inside.

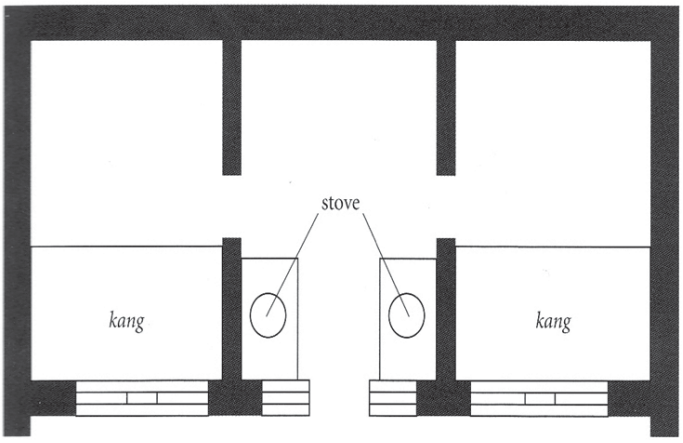
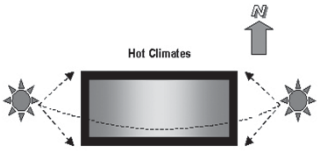
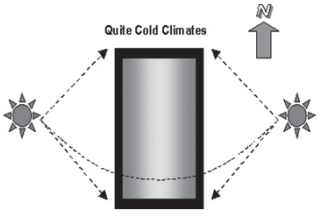
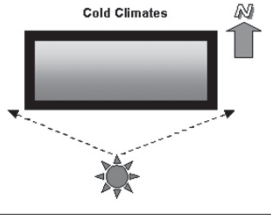
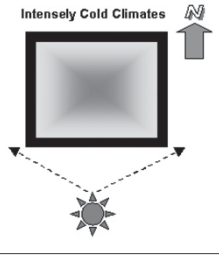


Figure 15: The ancient Chinese traditional house floor plan shows the stoves, the ancient heating and cooking instrument inside the house and 'Kang', the Chinese Ancient solid bed which retrieves the heat from stoves and southern sunlight.

From the results, we conclude for the building configurations that are determined by local climates. These building configurations are presented in the form of notions. Moreover, all of notions will reach the scientific objective, "to improve human thermal comfort" which is evaluated by the users of the buildings. The conclusion in each area is displayed in Table 2.

Table 2: The relation among building configurations, building notions, climates and techniques to improve human thermal comfort.

Areas and Locations	Climates	Building Notions	Techniques to Improve Human Comfort	Figures
Area 1: The middle region of Thailand on latitude 11-16 north degree	Tropical Moist Climates	The longer side perpendicular to the north-south axis and elevated floor are auspicious	• Minimize solar radiation and heat from outside • Minimize moisture from ground and outside • Maximize natural ventilation	
Area 2: the northern region of Thailand on latitude 18-23 north degree	Tropical Moist Climates (high altitude)	the longer side perpendicular to the east-west axis and elevated floor are auspicious	• Maximize solar radiation and heat from outside • Minimize moisture from ground and outside • Maximize natural ventilation in case of high temperature and minimize natural ventilation in case of low temperature	
Area 3: the southern region of China on latitude 27-32 north degree	Temperate and highland climates	The longer side perpendicular to the north-south axis and ground-contacted floor are auspicious	• Maximize solar radiation and heat from outside • Maximize heat gain from ground • Minimize natural ventilation	
Area 4: the middle region of China on latitude 37-42 north degree	Humid continental and temperate climates	The square-shaped plan house is auspicious and ground-contacted floor are auspicious	• Minimize the heat (from stove and man) flow out from inside to outside • Maximize heat gain from ground • Minimize natural ventilation	

From the table, we suggest that environmental factors influent the building configuration by notion referring. Moreover, we found the building technology factor that restricts and determines the design solution for humans to live with nature, such as:

- Technology of ancient building materials such as wood, brick, and clay are the factors that restrict the shape of the building. All of the cases in this study had the simple shapes (rectangular or square shape) due to the capability of the materials that had the highest efficiency if they were built in straight lines. Moreover, the simple shapes like these had more usable area than other ones (except circle shapes that are difficult to construct with such materials).
- In ancient times when the building notions originated, building materials such as glass were not yet discovered. By this reason, if the ancient people who lived

in the building wanted to get the outside view or sunlight, they would undeniably receive the wind from outside, and if they kept the window closed, they could not get everything from outside. This is the reason why the ancient notions determine the simple building configurations and less of opening especially in the cold climates.

- In the past, building systems such as air conditioning and electrical lighting were not discovered, thus the ancient buildings in all areas were built with the passive design which utilized the environmental power by the corresponding method in order to survive in nature.

Figure 16: A brickmaker is drying the raw bricks with ancient process.

Figure 17: The process of wall casting with the use of local instrument.

And then, the last factor which influents and evaluates the building configuration via notion is the human factor, such as:

- In the past, the major career of people in all areas was agricultural such as farmer or fisherman. These were outdoor careers. Thus, all of the building configurations in this study are mainly designed for after work and nighttime comfort.

- People's dress was one type of human factor. It supported human comfort and related to climate condition that was early modified by building configurations.
- The size and the wealth of the family determined the size of the building and the career of the family's leader determined the size and number of the house. In ancient times in Thailand and China, the people who were government officials mostly had larger and many more houses (cluster house).

6. CONCLUSION

From the study, we can conclude about the influential factors which determine building configuration via Chinese Feng Shui and even other notions. These factors are:

- Environment (sunlight, air temperature, relative humidity, precipitation, topography, and etc.) is the most important factor because it has the major power to determine building configuration.
- Building Technology (constructional method, material technology, building system, and etc.) is the influential factor that restricts the design construction.
- Human (life style, career, social value, family size, and etc.) is the last influential factor that can determine and evaluate the building configuration.

The relation of these factors and Feng Shui notion can be presented as this Figure18,

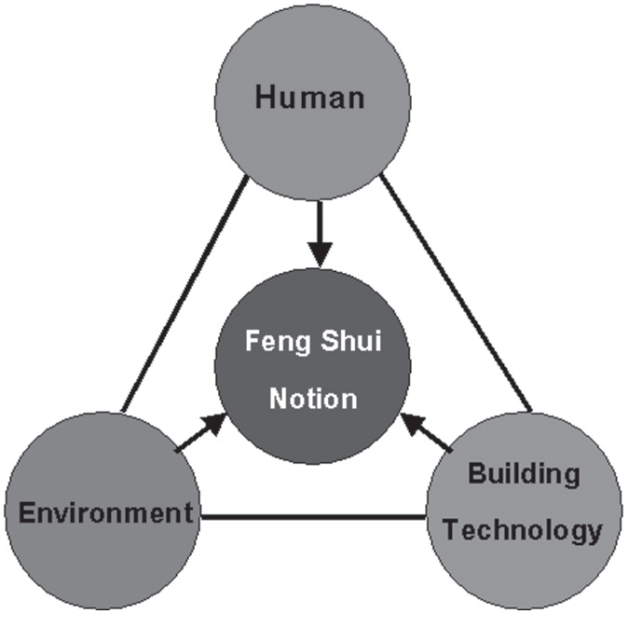


Figure 18: The diagram of the relation among human, environment and building technology as the influential factors that can determine the Feng Shui notion principles.

Consequently, Feng Shui determines the building and architectural configuration as a climatic modifier for humans to live in harmony with the environment, like Figure 19.

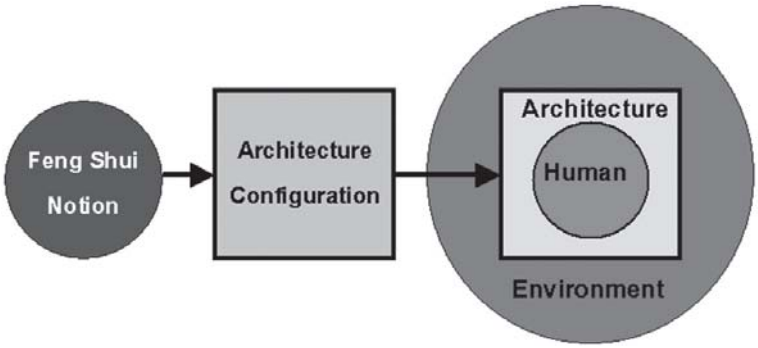


Figure 19: The Feng Shui notion determines the building configuration for human to live with environment.

In conclusion, we have a few ideas beyond this study. First, exclude horoscope, some parts of Chinese Feng Shui are scientific knowledge because they are provable and reasonable. But ancient Chinese scholars used them in a superstitious way in order to become more efficient. Second, the Chinese Feng Shui is specific for the Chinese people who determined their notion. Finally, we should consider the reason of building notion before using (especially, if we bring a notion from one area to use in another area), otherwise a negative effect maybe emerge.

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