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# Review on the Relationship between the Spatial Developments and the Change of Wooden Houses in Original Settlements in the Suburban Expansion of Bangkok

Walanrak Poomchalit<sup>1\*</sup>, Katsuhiko Suzuki<sup>1</sup> and Arno Suzuki<sup>2</sup>

1. Department of Architectural Engineering, Kyoto Institute of Technology

2. Graduate School of Science, Kyoto University

\* Corresponding Author, Email: [walanrak\\_p@rmutt.ac.th](mailto:walanrak_p@rmutt.ac.th)

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**Abstract:** This study examines the causes of the decadence of the wooden houses in trader communities settled during the period of King Chulalongkorn of Rattanakosin Capital, which represent old urban dwellings in the central region of Thailand. The conditions of remaining wooden houses and disappearing ones were compared to explore appropriate methods of reconstruction or repairs. Since modern developments started in Thailand, most of the original settlements disappeared amongst the rapid changes of urban transformation. Many of the original houses or communities have become abandoned, deteriorated or destroyed.

The results show that the speed of deterioration is related to the ability of the dweller to maintain their house. With urbanization, the economy of old communities becomes stagnant and the population ages. If the dwellers in such aging communities hope to improve their houses, a methodology to reduce the cost and the amount of labor is needed. Three things should be considered to achieve this goal: the dwellers' current construction skills, possible techniques that everyone can acquire without difficulty, and available local materials. Revitalizing such old houses will not just provide them a comfortable life but demonstrate the quality and value of early communities, and it will fortify the identity of the local area and help historical conservation.

## 1. INTRODUCTION

With urbanization, settlements often change. In cities such as the Bangkok metropolitan area that are continuously developing, traces of history, such as original early settlements, often remain in the middle of expanded urban areas along with new developments. Not only in Bangkok, but also in several places in Thailand, urbanization is continuously encroaching into early settlements. Interestingly, however, people in such old and decaying areas remain there without any interest in improving their home until they are at risk of it disappearing.

Where decadence is the deterioration of structures and their delapidation, because of decadence or abandonment early communities are often

confronted with expropriation due to new developments, occurring because their land is owned by the government. From the viewpoint of the public agencies, clearance of old and decayed areas improves the city and makes it more livable.

Expropriation causes controversy between the government and the people. Some people support the preservation of original early settlements as evidence of urbanization, history, and culture and for its value to local life, but this may conflict with public interests.

Even though the decadence may be an intangible perception or feeling, some physical elements can be used to describe it. Most visible in urban areas are architecture and landscape, such as buildings, houses, street furniture, pathways, and gardens and other greenery. However, when the government plans to improve neighborhoods, the simplest way is to remove all of the decadent urban elements and replace them with green space and beautiful landscaping; it is faster, more easily demonstrable, and less expensive than subsidizing for repairs on old houses.

The apparent decadence is a justifiable reason for clearance. If the original settlements are left untouched, old houses remain deteriorated. There are always arguments between those supporting conservation and those supporting development. If the only solution for a public improvement is to remove all of the decadent buildings, it is simply shifting the problem for homeowners; the lives of the dwellers would not improve without good economic and financial support. One solution is to improve the houses within their original setting.

The goal of this research is to find a possible solution for the recovery of the community living in decadence in the context of urbanization. Wooden houses around 80 to 100 years old are mainly focused on, as a guideline for creating a community recovery method that matches the character of most early settlements.

## **1.1 Background of research**

In 2011, the celebration project for the 84<sup>th</sup> birthday of King Bhumibol was set up under the name “The celebration project of the King to improve the quality of life for 84 villages and communities”. The objective of the project was the application of “the Sufficiency Economy Theory” - King Bhumibol’s theory on the best way to improve quality of life - 84 being the number equal to the age of the king; these communities were selected to be pilot areas for the project, which would be implemented from 2011 to 2015.

The Khlong Rangsit community recovery project was one of the pilot implementations. It was a small original settlement located at the junction of sub-canal III and Rangsit Prayoosak canal, and the aim was to improve the appearance of the area, to enhance the quality of life there, and to show the history of the settlement.

The area confronted several obstacles during the operation, such as local road constructions, flood barrier constructions and land deformation by the investors. The project continued nonetheless and improved the overall appearance of the community. Not all of the objectives, however, were accomplished. Only public spaces were renovated, excluding private houses, which account for the most visible decadence in the community; this issue was not confined to the studied community.

## 1.2 Research Objective

The appearance of original settlements was considered most significant; decadence and abandonment in a neighborhood are always the main reason for demolition.

To create appropriate methods to recover the old houses in local areas that restore the original architecture, and to improve the quality of life for the dwellers, the study had the following goals:

- 1) To define and identify the conditions of the decadence of wooden houses in earlier settlements.
- 2) To specify the causes of wooden house decadence in the context of spatial changes resulting from urbanization.

## 1.3 Target Area of Study

The expansion area is the focus of this research, especially in the suburban area where the old settlements created by the previous spatial development confront the current rapid spatial changes from urban development policies.

Micro and macro studies were conducted separately. The micro study is a case-study of the community at the junction of sub-canal III where the recovery project occurred during 2011-2015.

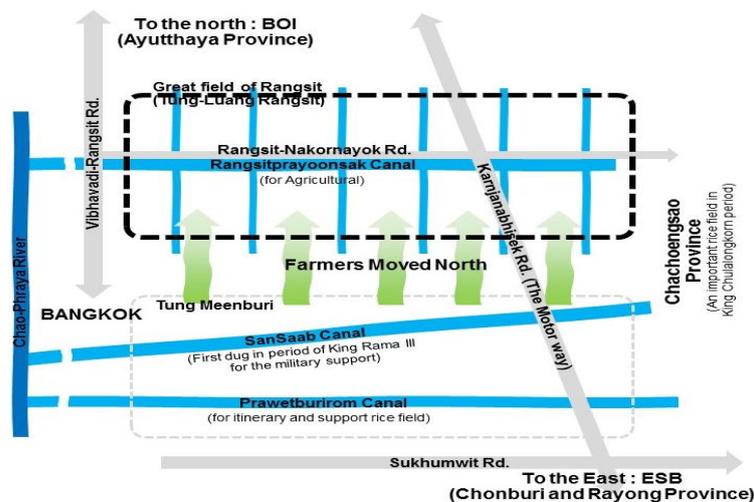


Figure 1. The location of the target area

The macro study examines the area that expands from a small community spot to the broad settlement area along Rangsit Prayoosak canal. This area was developed under old policies during the period of King Chulalongkorn; King Rama V (1868-1910) of the Rattanakosint Era ([Cheykeewong, 2007](#)).

This area is located north of Bangkok in the present Patumthani province where the urban landscape changes rapidly. It is positioned between three important industrial regions, Ayutthaya, Chonburi and Rayong Province, two international airports, of Donmuang and Suvarnabhumi, and three main mobility highways, Vibhavadi-Rangsit, Rangsit-Nakornnayok, and the main motorway; the eastern ring road rises to connect the industrial regions in the north and the seaport in the east. In this context, changes to the agricultural settlements are drastic.

Case-studies in other areas are also added for comparison.

## 2. RESEARCH METHOD

This research is a qualitative research based on observations in the studied areas, supported by previous studies.

### 2.1 Research Hypothesis

As is common in developing countries, the infrastructure in Thailand evolved under modern development theories and regulations. When Bangkok and the surrounding areas in the province were developed, the spatial changes affected the original settlements significantly. Urbanization in Thailand was a social and economic evolution, however, the development theories did not consider decadence in the communities, decreasing population, the decay of houses and the changing environment.

Decadence is the process of deterioration of a city. It is the consequence of the changes in the economy due to deindustrialisation, depopulation, abandonment, local unemployment, politics and so forth (Jackson, 1987). In an economic system, changes to significant structures in industries, transportation, and government policies result in urban decay (Andersen, 2003). In reality, these not only describe urban decay from deindustrialization, but also describe the decadence of old communities from urbanization.

In this research, the central hypothesis is organised under two criteria of decadence: where changes take place gradually or where they occur suddenly, and where the changes occur through the acceleration factors of politics or the economy. Both of these categories have seen communities disappear, but others may survive if the causes and conditions of the decadence can be specified.

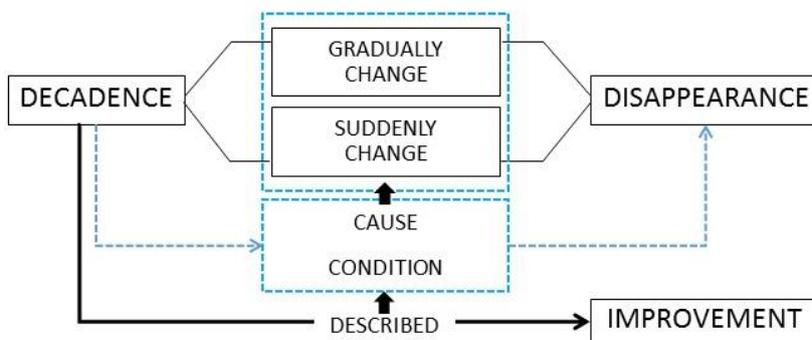


Figure 2. Research framework.

### 2.2 Research Framework

This research uses a deductive method with a case study in small communities following investigation objectives. The primary case study represents the conflict between development and conservation. Consequently, the general and specific problems were clarified by observing, surveying and interviewing.

Both decadence and development were reviewed. The deductive method makes it possible to compare reality against theories of urban planning, as

well as social and economic theories. The conclusion suggests how everyone can contribute to community recovery.

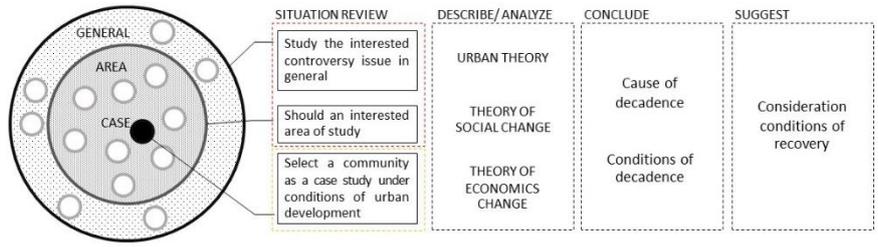


Figure 3. Research procedures

### 3. ANALYSIS OF DECADENCE

#### 3.1 General problem of communities disappearing

In Thailand, there are several communities located on government-owned land. Therefore, expropriation always occurs when the government plans to develop or expand urban infrastructure. Legally, the government can expropriate the land from people for urban utilization. Communities with decadent housing located on government land are the first to be considered.

##### 3.1.1 In urban areas

One case study is in the Pom-Mahakarn community located on the side of Ong-Ang Canal, the original moat of Krung Rattanakosin. Communities in the area have been shifted since 1959 when Bangkok had a policy for urban athleticism and traveling support (Phaithayawat, 2011). Until 1978, the Krung Rattanakosin project was operating to conserve important buildings and improve the urban environment of the capital city, following the example of European countries. The area was enhanced again under the 'Master Plan for Conservation and Development' of Krung Rattanakosin in 1994; they repaired the Mahakarn fortress with surrounding open space to distinguish it (Synchrongroup Co. Ltd, 1994).

However, this community was originally settled in the era of King Rama III (Phaithayawat, 2011). It contains wooden Thai houses in various styles, and is home to Thai musical folk drama and traditional lifestyles (Manager Online, 2016).



Figure 4. Wooden houses in the Pom-Mahakarn community (Manager Online, 2016)

Conservation became an issue for those who lived there. The community negotiated with the government, but it was inconclusive. They have since fortified non-governmental social relationships to protect themselves from disappearing. The government enforced the law in 1992 ([Government Gazette, 1992](#)) and 2004 ([Administrative Court, 2004](#)) to remove communities.

After 50 years, some conflicts are still inconclusive. The controversy over conservation and development has led to long and ongoing negotiation between government and community.

### 3.1.2 In expansion areas

The area to the east and north of Bangkok is intriguing because it was an expansion area in the past. Different situations have occurred in the area along Prawet Buri Rom Canal to the east and Rangsit Prayoosak Canal to the north.

Prawetburirom Canal was dug in the period of King Rama III for military support and was later converted for agricultural purposes during the King Rama V period. People who settled along the canal gained ownership over land dependent on their contribution to the digging of the canal ([Division of National Archives, 1910](#)).

Original settlements with wooden houses exist on both sides of the junction of the main and sub-canal. They appear decayed because the original dwellers moved out and left their homes with renters or to abandonment. The decay was likely gradual because the people moved away gradually. There is a possibility that some buildings became abandoned before renting. By observation, most renters seemed to be outlanders and also had low income.



Figure 5. The settlement of the Khlong Preng community on both sides of Prawet Buri Rom Canal.

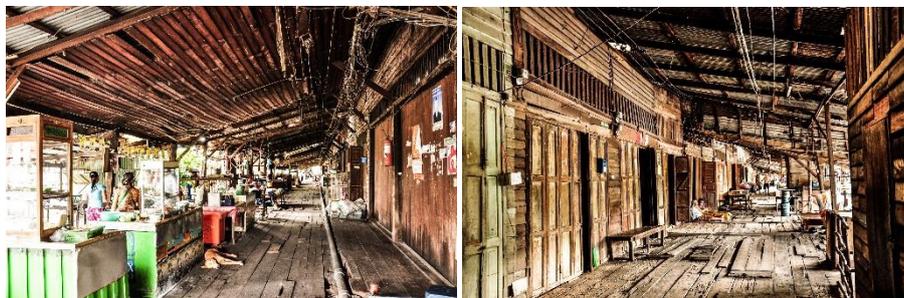


Figure 6. Decayed houses in the Khlong Preng Community along Prawet-Buri Rom Canal

The number of houses likely remained almost the same because of land ownership and the convenience of the location. The distances between each community along transportation routes are approximately 160-500 metres.

However, the settlements along Rangsit Prayoosak Canal are not the same. They are shaped by local roads that were planned along the canal-side where the original communities settled, and they are probably disappearing because the width of the local roads is almost equal to the width of the communities themselves.



Satellite imagery in 2004



Satellite imagery in 2007

Figure 7. Sub-canal 7 in 2004 and 2007; before and after road  
(Google Earth, 2016).

This means that in the urban and expansion areas in general, developments inevitably destroy the original settlement, but some development projects may force settlements to disappear more rapidly.

## 3.2 The conditions of communities in the study area

### 3.2.1 The characters of the original settlements

The first development of the study area started in the period of King Rama V. Some continued in the King Mongkut (King Rama IV) era after the United Kingdom and the Kingdom of Siam signed the agreement of the Bowring Treaty in 1855. It made a change to the economic system of Siam shifting it to a free trade system ([Cheykeewong, 2007](#)). It affected Siam's political autonomy, but positively benefited the export trade of Siamese rice ([Stiven, 1908](#)).

Table 1. Developments in the history of the study area

King Rama IV	
1855	Bowring Treaty between Siam and England changed the economic system from a monopolised to free trade system. It impacted the export of grain, teak wood and tin ( <a href="#">Cheykeewong, 2007</a> ).
King Rama V	
1874-1905	The announcement of the abolition of slavery lead to more settlement in an expansion area in the north and to the east of Bangkok.
1890	Rangsit Prayoosak Canal: digging of the first irrigation system, and labour communities settled at the junction of canals.
1895	Farmers moved from the south and settled to the east in the area around the sub-canal VII ( <a href="#">Asawai, 2002</a> ).

To maintain the success of rice exports, rice fields were expanded from the south. Farmers who initially settled in Tung Sansaab moved to the north for higher yields around 1895 ([Asawai, 2002](#)). That was the first expansion of the population in the area around Rangsit Canal, and it further increased after the announcement of the abolishment of slavery. Farmers developed their houses and the area lost its original character. Only the communities of

Chinese labourers who dug Rangsit Prayoosak Canal retained the characteristics of the previous settlement (Saetie, 2016). They settled at junctions during the canal construction of 1890.

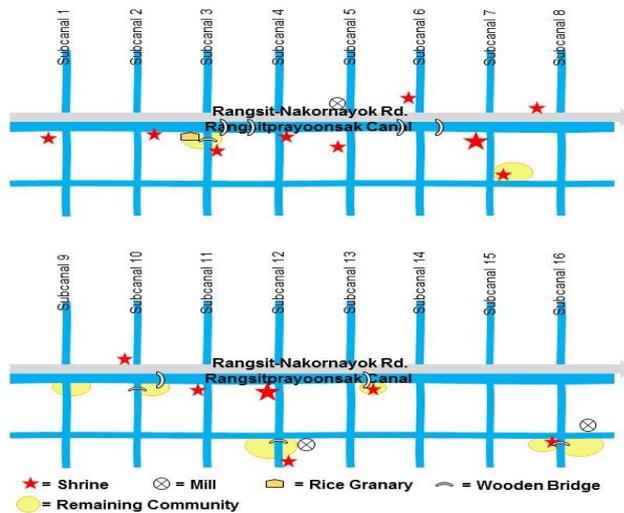


Figure 8. Characteristic of settlements along Rangsit Prayoosak Canal.

The character of Chinese settlement in this area included shrines located near junctions, wooden bridges with large structures and wooden houses. Some communities grew to fill the distances that rice travelled on its trade routes. Approximately every 8-10 kilometers, communities of rice traders settled, so that every four or five sub-canales there was another trader community. They appeared in canals 3, 7, 12 and 16 (Figure 8). For rice trading communities, there are quays or rice piers, granaries and also mills.

### 3.2.2 Change in the study area and description.

The expansion of the urban area of Bangkok under the pressure of development has changed both suburban and rural areas, especially to the north and east where new settlements have rapidly grown.

There were many factors of modern development in the study area that accelerated the change.

Table 2. Development factors of change in the study area

1914	Donmuang International airport became operational ( <a href="#">Airport of Thailand PLC, 2016</a> ).
1947	Rangsit-Nakornayok Rd. was constructed.
1961	The first National Economics and Social Development Plan was enacted, following the concept of development as improving quality of life through infrastructure investment.
Around 1976-1986	Rice begins being traded along roads. The economy changed in waterside communities along Rangsit Canal.
1982	The fifth National Economics and Social Development Plan was enacted, following the concept of decentralisation and making changes to the economic structure of the country ( <a href="#">Termpitayapaisit &amp; Pha-eam, 2009</a> ).
2006	Suvanabhumi International Airport began its operation and increased transportation.

In the beginning, the change was gradual. Around 1976-1986, when the mode of rice transportation entirely changed from water to roads, economic

life shifted away from communities resulting in unemployment and changes in social structure. Depopulation occurred in every community. With the decentralization of the fifth National Economics and Social Development Plan in 1982, settlements relocated to new residential estates between workplaces, the service area of Bangkok, and transportation hubs.

Decadence in the communities varied due to access to facilities. The multiple nuclei model shows that medium and high-class residential areas expanded and encompassed the original settlements. Unfortunately, the original settlements could not access the new infrastructure and became decadent due to their lack of development. This has been termed ‘cultural lag’ (Thavinpipatkul, 1996).

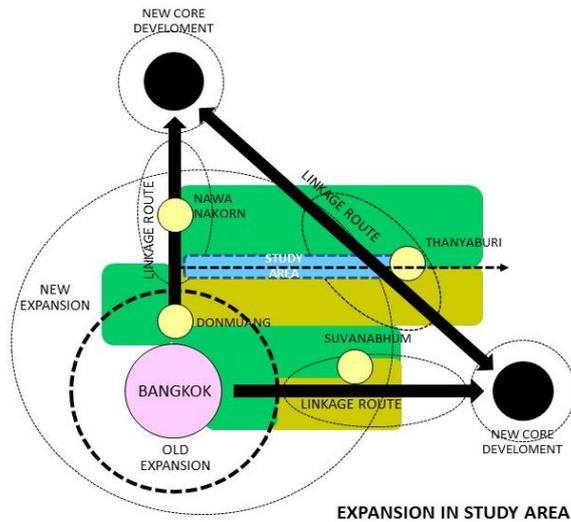


Figure 9. Influence of development policy on the study area: Analysis of expansion in study area [By author] based on Harris and Ullman's Multiple Nuclei Model (Harris & Ullman, 1945)

The government efforts to resolve this problem by removing old buildings in order to replace them with convenient facilities has led to a cultural lag, simultaneously creating development and dependency, leading to decadence and the risk of disappearing communities.

### 3.3 Analysis of recovery project and acceleration

#### 3.3.1 General decadence in the target area

From surveying and interviewing in the communities, it was found that most of the remaining people are between 45 to 80 years old, and young people are less than 15 years old (Pikulwech, 2016). With the development of modern shop-houses built nearby around 1987-1988, people have been moving away seeking more convenient housing and have left their original houses behind (Teeralapsuwan, 2016). While there are renters, many houses are abandoned which has led to deterioration.

Deterioration happens to the whole house: the walls, doors, windows, roof, and main load-bearing structures such as posts and beams. Some

houses have collapsed, while some have been rebuilt or repaired with temporary structures, but are not in a liveable condition.



Figure 10. Decadent appearance of houses at sub-canals 3, 9, 10, 12, 13 and 16

### 3.3.2 Background of the problem in the case study area

Nueng Satawat community continually confronts expropriation for urban and facilities' development as shown in Table 3.

Table 3. The developments in the study area

c, 2008	Local government reclaimed land for local road construction. Conflict between community and local government began.
2012-2014	A flood barrier was built. Most communities had left and the remaining became separated from the canal. The character of the waterside community was lost. Many cultural and architectural elements from the original settlements disappeared.
2016	The position of the local road project was specified and progress was made on its construction (Panjawittayakom, 2016). Communities without a barrier from the road remain at risk.

Since 2008, with an increasing number of residences and vehicles, traffic congestion along Rangsit-Nakornnayok Road has needed to be alleviated. The government reclaimed land alongside Rangsit Canal which put the Royal Irrigation Department in charge of local road construction (Intrawitchayanan, 2016). The road passed through the middle of communities where pedestrian pathways were located and the community was divided.

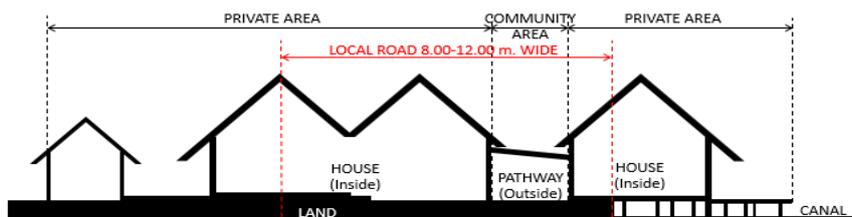


Figure 11. Community settlement and the placement of local road.



Figure 12. Road without connection at Sub-canal 3  
(Google Earth, 2016).

This development increased migration because of the instability of living in development areas. Houses were abandoned and most of the remaining people were not able to improve or maintain their houses because they had a low income.

However, after a flood crisis in 2011, the Royal Irrigation Department planned to construct a flood barrier of 165-170 metres ([Poomchalit, Sanguandsap, & Mukasirisuk, 2013](#)). The operation was completed by the end of 2014. The barrier separated the community from the canal. The Royal Irrigation Department was able to reduce the impact to communities through another solution, but the characteristic quality of the waterfront communities was lost. Many bridges, quays, and entire settlements in some cases disappeared during the construction.



Waterside image before flood barrier.



Waterside image after flood barrier.

Figure 13. The community before and after the flood barrier was constructed.

In 2016, the Royal Irrigation Department expropriated the land along the flood barrier to connect the local roads. The 8 metre-wide road was intended to pass through the community ([Maneewong, 2016](#)), however, the unclarified direction of the road is creating instability and uncertainty, and the dwellers have since abandoned the village to ruin.

### 3.3.3 The character of buildings and their decadence

In the past, there were approximately 250-300 households in this community, where the main occupation was rice trading, but now there are less than 30 households.

With the growth of the rice trade, communities became nodes along water trade routes. However, when the rice trade entirely changed to road-based transportation between 1976-1986, the community economy was significantly affected. People moved out for higher income jobs and left their elders in the original houses. At present, there are 25 families, with

approximately 50 people in this community. Most people are between 50 to 80 years old ([Poomchalit, Sanguandsap, & Mukasirisuk, 2013](#)).

As evidence of the past prosperity, there are three granaries remaining in this community, where the last quay for paddy boats can be found before the entrance into Chao-Phraya River ([Poomchalit, Sanguandsap, & Mukasirisuk, 2013](#)).

The houses have long, narrow floor plans and are connected to the walkways and terraces. In its original state, the floor of an entrance hall was made of packed soil, and there was a small wooden step before the inner hall. Between that step and inner hall was a panel door, and the same at the front of the house. This plan provided the bedroom and kitchen, located at the back of these houses, with more privacy. There were no toilets inside the original dwellings because the Chinese believed that toilets were unsanitary and needed to be separated, on the outside. The primary structure was mostly timber, but parts such as the roof were made of bamboo. The rooves used to be thatched with grass, but the modern houses are covered with metal sheets, with panels approximately 1.2 meters wide and 2.4 meters long ([Rajamangala University of Technology Thanyaburi \(RMUTT\), 2014](#)).

Concerning appearance, the decadence is obvious from the walls, roof, door, entrance, and the disposition of structures. The owners do not have the capacity for maintenance. Some houses were abandoned, while others were left to renters because the owners had moved out.



Decadence due to living activities



Decadence due to lack of maintenance

Figure 14. The decadence of houses in the community

Decadence occurred because the residents could not adapt themselves to advancements in modern technology and the changing condition of society. Old communities often have specific habits and cannot adjust easily. Consequently, when the rice trade moved to transport by road, the people who were experts at sailing became unemployed. This sudden loss of income was the prime reason they were unable to maintain their houses.

### 3.3.4 Acceleration factors of recovery

The Sufficiency Economy Philosophy project was mandated to maintain evidence of early settlements and the local history of Rangsit Canal. The whole 5-year program was set to improve the overall appearance along the canal ([Poomchalit et al., 2003](#)).

The first year was a process of value awareness motivation to community people.

The second year was a process to provoke the people to improve their community.

The third and fourth year was continued from the second year based on conservation concept.

The fifth year was promoted the community value to public.



Figure 15. 5-year program of community improvement, analysis by author.

The project, while aiming to motivate the community to work together, started with visiting the villages and sharing the aim of community improvement in order to make both an attractive tourist destination as well as creating a comfortable environment for residents. Residents were encouraged to hold a session to share their knowledge and analyse a suitable method for improvement, and to set an improvement plan. During this participation process, the opinion of older adults was influential in the entire community's decision making.

During 2012-2014, there were many activities for community improvement such as cleaning the community environment together with residents of surrounding areas, removing debris from the flood crisis of 2011. To make more space for participation, they improved unused spaces by making small gardens with wooden decks for relaxing and doing various activities. They repaired the wooden bridge, improved the community museum and added more signs and storyboards for sharing the local history. Some conflicts developed through a lack of understanding, but they were solved through the process of brainstorming together. It was a time when community engagement was improved to provide a better environment for living ([Rajamangala University of Technology Thanyaburi \(RMUTT\), 2013](#)).

During the community improvement activities shown in Figure 15, people adapted unused space in front of the middle granary to make a small park. They added more green areas and wooden decks for relaxing.

Young boys and girls joined in this activity under the direction of a man who had construction skills, he was a technician in this community. For the construction activities, such as the wooden bridge repairs, the builders were all grown men under the direction of that man. Young boys joined this activity as technician trainees. They helped with material handling and with some simple joinery. Elders acted as consultants and contributors. They gave information about the original style, function, and details of the bridge. Women prepared the materials for construction ([Rajamangala University of Technology Thanyaburi \(RMUTT\), 2013](#)).

The last activities were the community museum renovations and the fixing of furniture. For these activities the participants were mostly women, however some elders and children joined in these activities. This shows how they were able to do everything using simple techniques they had learned and basic construction tools such as hammers, saws and nails.

The last activity in this project aimed to promote the values of the community to the public and included exhibitions outside the village. Everyone loved participating in this event because participants were interested in the tales of the local history, especially those told by the elders.

In review of project reports and additional notes from observation, the conditions of participation were analysed in two parts.

The first part analysed age and gender. Most participants were women, young people and children. There were fewer men in the activities because the activities took place during the daytime and most of the men were out for work, even during the weekend.

The second part analysed construction ability. Most of the participants were able to use basic construction tools for simple work such as hammering, pulling nails, and making joinery. The elders always acted as consultants or contributors. Some people had construction skills, but the women who were home-based were only able to use basic tools and perform basic joinery.

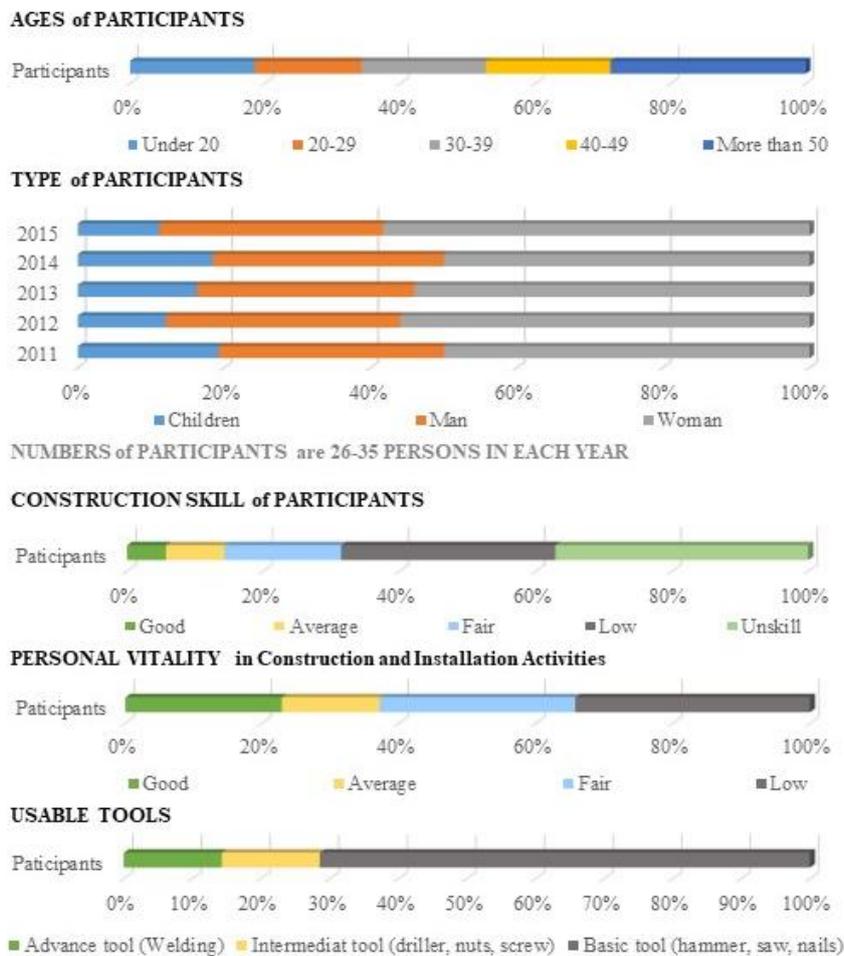


Figure 166. Analysis of construction’s activity by author.

When the plan for the local road was finalised with the community, the cohesion of the community became fragmented. This was because the project separated the people into two groups of different opinions. Some people decided to get a subsidy and move out, while others wanted to negotiate again and find the best way to improve their dwellings after the road construction. They needed a construction method that required less investment because they would have less income once the road came. Their budget and the insecurity of their habitation led many people to think that house recovery may be a waste of money.

Because of their income, they had to do house maintenance and community renovation themselves. Age, gender and vitality were significant factors in dividing tasks within the community.

## 4. CONCLUSION

### 4.1 Causes and condition of decadence

From the study of the target area, it was observed that several development policies changed the spatial character of early societies. Urban and suburban communities were transformed gradually by laws, regulations and administration, along with the occupations and the function of local people.

Where urban theories describe developments and transfigurations, urban decadence theories describe how an area changes. The government development policies altered the economy and society in the area so that unemployment and depopulation were the most significant results of the change. They always occurred at the same time.

In this research, the causes and conditions of decadence came from different levels of development. The main cause of deterioration was the change in economic and social structures, while the level of decadence depended on the community configuration. The relationship between them is as shown below in Table 4.

*Table 4. The relationship between decadence and developments in the target/case study area*

<b>Cause of decadence</b>	<b>Conditions of decadence</b>
Policies, laws and regulations	- Instability from living under the rules and regulations is mostly responsible for the disappearance of community. The threat of expropriation forces people to move out and dismantle their communities. Those who remain are disincentivised from investing in maintenance due to future uncertainty.
Spatial structure of settlement was changed	- Convenient infrastructure is always out of reach.
Change in economic structure	- People with lower incomes do not have a large enough budget for maintenance on their house. The cost of improving the appearance of the houses exceeds this budget.
Change in social structure	- Age and gender are the underlying determinators of skill and vitality, which affects the local capacity for construction.

From the table shown, the decadence of the community depends on the government's development policies that affect the change of spatial, economic and social structures. The predictability or stability of living is another critical decision factor, as well as a resident's income, age and gender.

## **4.2 Consideration conditions of the recovery method**

From this research, it was found that the primary causes of decadence are young people's migration in search of work and more convenient lifestyles. The spatial and economic changes compel them to move out. For recovery of life in the original community, repopulation with families is urgent. Houses should be improved despite difficulties in the local economy. To meet suitable standards for living, the following should be considered:

- 1) The method of repair or reconstruction must be suited to the income of people in the community. Materials that are available in the local area must be considered first.
- 2) The maintenance should require only the simplest techniques that everyone of all ages and genders can do by themselves. It should not be complicated, and it should use basic tools.
- 3) The construction method must be suitable for the construction skill level of the people. However, the new construction method must provide enough load-bearing capacity for each house and retain the character of the original dwellings.

Under such conditions, cooperation within the community is the best solution. Construction and renovation guidelines for a livable neighborhood should be provided, and appropriate techniques should be taught to all dwellers so they can maintain their houses by themselves.

However, road construction plans for the near future discourage community investment in the improvement of the appearance of old wooden houses. Therefore, the remaining wooden houses of old communities depends on negotiations between the community and the local government who are responsible for the land development. It largely looks as if communities will inevitably disappear; on the other hand, through the continuing efforts of the government to conserve early settlements as historical sites, the communities may still have a chance of remaining. If they do disappear, the characters of earlier communities and their wisdom, traditional knowledge and way of life will be lost.

While the number of residences supplied for low and middle income dwellers has increased, renovated old houses may be a better alternative in some cases.

Helping homeowners to maintain their properties will extend the lifetime of houses and thereby the good appearance of their dwellings. Determining the construction techniques and materials that are available and suitable for the dwellers' skill levels is imperative. Moreover, wood is a breathable material that regulates the temperature of buildings ([Salonvaara, Ojanen, & Simonson, 2004](#)). That makes it a suitable construction material for the climate in Thailand and wooden houses, therefore, should remain in the country as a favoured option.

The urban areas are still expanding and encroaching on the early settlements, threatening the existence of old houses. The old communities with elderly or low-income residents cannot afford to fight back against the situation, and their longevity depends on the residents' ability and willingness to maintain their houses themselves. Members of old communities should be aware of appropriate construction techniques and help each other.

## 5. REMARK AND NOTATION

From this research, there are some notations to be emphasized:

- 1) Because the details of local histories have never been recorded, the transfer of local knowledge is lacking. People always look at the decadence and evaluate communities based on their appearance; transferring knowledge and improving the public perception is imperative.
- 2) Findings in this research may be applied to future research and outcomes. Material usage, techniques, and skills of construction must be considered to plan a suitable recovery method.

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