

# Neighborhood relationship measurement between newcomer and former inhabitants in sprawl areas of Bangkok Metropolitan Region: the case of Nonthaburi and Pathumthani province, Thailand

(Gated Housing Development impacts on neighbourhood relationship in sprawl area)

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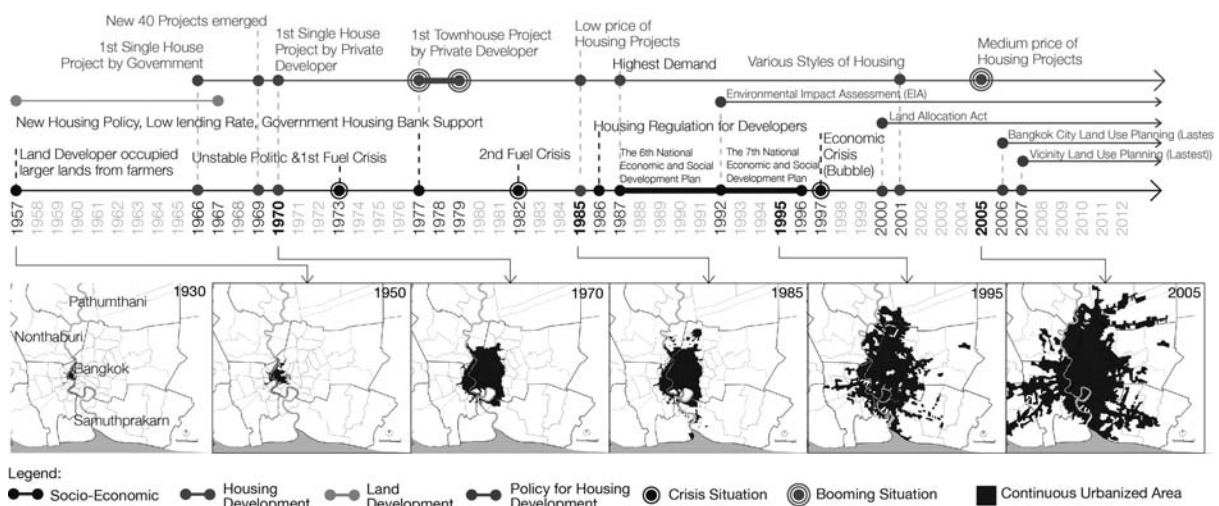
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Bangkok Metropolitan Region (BMR) faced impact of sprawl situation spreading in large scale, and land use has rapidly transformed, changing from agriculture to urbanization and dose of new residential projects. This transformation conduces to livelihood problems between newcomer and former villagers. The study has conducted with site survey and questionnaire distribution. After empirical study and review literature in study area in Nonthaburi and Pathumthani was investigated, the positive and negative impact of different land use transformation was revealed. The results can propose idea to improve new housing project in the future.

## 1. Introduction

### 1.1 Research background and objective

Bangkok city has been coped with high economic activities and migration of rural population because of rapid urbanization. In order to reduce impact of speedy population growth and distribute urban development from city center, the 6<sup>th</sup> and 7<sup>th</sup> National Economic and Social Development Plans<sup>1) 2)</sup> are established and became effective. Consequently, greater areas of Bangkok city are included as target area, called Bangkok Metropolitan Region (BMR)<sup>(1)</sup>. Five vicinity areas, where are target area, obtained extreme infrastructure network. New urbanized area has been developed along the road network, as known ribbon development (Figure 1). Furthermore, this situation motivates developers to construct residential projects flowing in this area to support high housing demand. The projects have been disorderly overlapped on many paddy fields. The significant impact from land use transformation, changing from agriculture to urbanization and dose of new residential projects (called Gated Housing Project (GHP)) in a few decades. Consequently, sprawl emerged borderless around the city and spread in large scale, and then land use has rapidly



changed.

*Figure 1: Urbanization Area Diffusion in Bangkok and greater area and its background (1930 – 2005)*

The sprawl impact is investigated in various dimensions. Demolition of neighborhood relationship is an effect of sprawl that has little empirical evidence exists to support this notion<sup>14)</sup>. For example, characteristic associated with sprawl that can reduce the potential for spontaneous interaction is the privatization of open space. The low densities associated with the typical sprawling development provide ample room for gardens, patios and lawns. Thus, the need to make use of public parks or other public open space is reduced<sup>14)</sup>. Therefore, sprawl situation in BMR relates to neighborhood relationship problem that caused by new housing development (GHP), because of rapid migration and land use transformation. This transformation conduces to livelihood problems between newcomer and former villagers because of unplanned location of new residential development. For example, some former villages are enclosed by new housing projects with high fence; consequently, they might confront an accessibility problem. Moreover, contrast housing unit and project boundary design can impact on social segregation. Therefore, this study aims 1) to examine impact of different land use transformation caused by overwhelming migration, and 2) to compare neighborhood relationship between newcomer and former villagers through questionnaires in different case studies. The prospect outcome is suggestion for new housing development in sprawl area.

## 1.2 High movement of population and Land use transformation

Table 1. Population growth in BMR

Province in BMR	Area** (km <sup>2</sup> )	Population** (pp)		Density** (pp/km <sup>2</sup> )	Population Growth	Ratio* (1998) Agricultural/total area
		2004	2012			
Bagkok	1,568.737	5,6341,132	5,673,560	3,616.64	+0.7%	0.14
Nakhonpathom	2,168.327	789,016	874,616	403.36	+9.6%	0.51
Nonthaburi	622.303	942,292	1,141,673	1,834.59	+21.2%	0.22
Pathumthani	1,525.856	769,998	1,033,837	677.55	+34.3%	0.46
Samuthprakarn	1,004.092	1,049,416	1,223,302	1,218.32	+16.7%	0.09
Samuthsakhon	872.347	442,687	508,812	583.27	+14.9%	0.26
Total	7,761.662	9,636,541	10,455,800	1,347.11	+8.5%	

Source: \*\*[http://stat.dopa.go.th/xstat/pop55\\_1.html](http://stat.dopa.go.th/xstat/pop55_1.html) , \*Ministry of Agriculture and Cooperation, 1998

Among six provinces of BMR, population growth rate in Pathumthani and Nonthaburi is significant different from others by 34.3% and 21.2%, respectively since 2004 (Table 1). Although both provinces have high movement of population, there is also large scale of agricultural area as shown 0.46 and 0.22 ratios. Those huge numbers of population is highly possible to replace agricultural area by residential area where support high demand of housing. The differences of land use transformation in Pathumthani and Nonthaburi bases on geographic and land composition in that area. This also impacts on distinct formation of new development such as housing projects (GHP) and another built-up area. As a consequence, the relationship between former villagers and newcomer is necessary to pay consideration and investigated because inhabitants will be directly troubled by disorder land use transformation. Hence Pathumthani and Nonthaburi were selected to clarify district that also faces high migration, population growth in Khlongluang and Bangyai district is 8.87% and 9.10%, respectively, higher than other districts.

## 2. Research methodology

Structure of this paper has conducted with two parts; first, we study background of sprawl development in BMR. Then we found that GHP development related to neighborhood relationship in Pathumthani and Nonthaburi need to be examined in term of background of physical land composition. Second, characteristic of inhabitants and neighborhood

relationship inside and outside gated housing project was clarified and assessed. We thoroughly observed physical and distributed questionnaires by face-to-face acquirement, which rely on literature review. Additionally, we also inquired non-structural interview to residents during observation that can support result from statistic. Summary, all results will be analyzed neighborhood assessment between inside and outside communities, especially, affect from gated housing development on newcomer and former villagers.

**2.1 Measuring neighborhood relationship**

According to many sprawl researches mentioned about adverse common impacts of sprawl is loss of sense of place and community<sup>8)</sup>. Some American gated community study revealed that gated communities reflect to varying degree four social values (sense of community, exclusion, privatization, and stability) in positive social value for the residents inside. In addition, the notion of social problems in sprawl area in section 1.1 also supports importance of neighborhood relationship investigation. Sense of community is a dimension in neighborhood relationship that applies to communities in both the geographic and relational sense, and should be considered distinct from individual characteristics<sup>9)</sup>. McMillan and Chavis (1986) discuss four key elements inside community: (1) membership, which involves the sense of belonging and emotional safety it provides; (2) influence, reflecting the ability to affect change in each other; (3) integration, which refers to the feeling or perception that needs are met through the cooperative behaviors of the group; and (4) shared emotional connection, which individual member’s commitment and shared life experiences or history of time and place. Moreover, relationship between physical aspect of community and social relation is also mentioned in many researches. Buckner (1988) revealed the physical attractiveness of the neighborhood also has been found to strength social cohesion. A well-defined boundary contributes to the connection to a particular place and the sense of community therein. The ultimate boundary of gated communities are often promoted as increasing sense of community, on the other hand, there is conflict on this discovery. Wilson-Doenges (2000) found that gated communities do not increase sense of community, and may actually decrease it, and give either a false sense of security or not sense of security at all. These findings focused inside community assessment, however, social problems in BMR also influence on people outside community. Therefore, inside and outside neighborhood relationship should be assessed in the same time.

**2.2 Sampling and tools**

Research population was calculated with Taro Yamane’s formula or table as follow;

Where n = Sample size

N = Population size

e = Sampling error (usually .10, .05 and .01 acceptable error)

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

Table 2. Neighborhood assessment

Statement	Point Scale				
	1	2	3	4	5
Inside Community: Community Value					
(1) Environment Satisfaction	very dissatisfied	dissatisfied	neutral	satisfied	very satisfied
(2) Feel good when someone help to improve your community	strongly disagree	disagree	not sure	agree	strongly agree
Inside Community: Neighbor Interaction					
(3) Degree of trust in neighbor	very mistrustful	mistrustful	neutral	trustful	very trustful
(4) Number of acquaintance (persons)	0-5	6-10	11-15	Over 15	
(5) Number of friend (persons)	0-5	6-10	11-15	Over 15	
(6) Frequency of neighbor visiting	never	once a month	once a week	twice a week	almost everyday
(7) Frequency of talking to neighbor	never	once a month	once a week	twice a week	almost everyday
Outside Community					
(8) Perception to surrounding community	Feel bad	Neutral	Feel good		
(9) Number of using outside service in district (activities)	0	1-2	3-4	5-6	7

According to the formula, the sample size is 400 people when sampling error is 0.05 and population is 239,172 people in Khlongluang district and 126,562 people in Bangyai district. According to literature review mentioned above, neighborhood assessment in this paper consisted of; (1) inside relationship evaluation, which combined neighbor interaction and community value factors, and (2) outside relationship, evaluating by perception to surround community and number of using service outside community but in district. Respondents were asked to indicated their satisfaction, perception, frequency, and number of activity participation with nine statements referring to “your own neighborhood, community, and surrounding community”. Each statement was rated on point scale as shown in Table 2.

### 3. Characteristics of community and background of case study areas

#### 3.1 Case 1: Khlongluang district, Pathumthani province

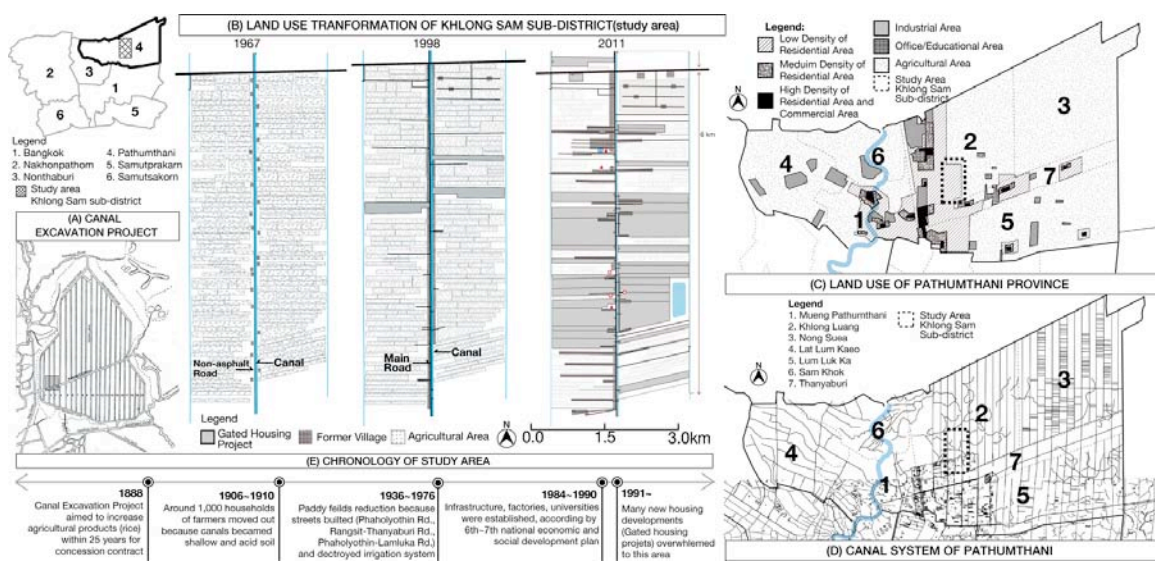


Figure 2: Land use and canal system of Pathumthani province

Beside Pathumthani is the high population growth; agricultural area is replaced by residential area (Fig.2-B). According to history of area, the study area was a part of drilling canal project and was used as agricultural area since King Rama V era (1868 – 1910), who bestowed on land of the north of Bangkok city as rice trading center of the region. The drilling canal project aimed to increase agricultural products (rice) within 25 years for concession contract. They ran the project from 1888 to 1913, which covered area around 1,350 km<sup>2</sup> (Fig.2-A). Farmers from many places moved in to settle down since 1895 with scatter settlement and temporary shelter to rent small paddy. During 1906 – 1910, around 1,000 households moved out because canal became shallow since 1906 and acid soil. Consequently, paddy fields declined around 60% of whole project area in 1936, and 1976 destroyed irrigation system<sup>7)</sup> (Fig.2-E). Therefore, area in Khlong Luang, Lum Luk Ka, and Thanyaburi district regards as kinds of land readjustment<sup>5)</sup> area especially in physical meaning condition. The road network was located to be parallel to grid canal system. Land configuration, which is geometric form such as rectangular, polygon and narrow shape, based on man-made water features (Fig.2-D). However, the highest number of house is in the third canal sub-district (Khlong Sam sub-district) by 128,859 units <sup>(4)</sup>. In addition, its land use has been rapidly transformed from agricultural to residential, which contains GHP concentrated area that replaced many paddy fields (Fig.3-B). Hence, we selected Khlong Sam sub-district to examine relationship between residents inside and outside of new and former communities.



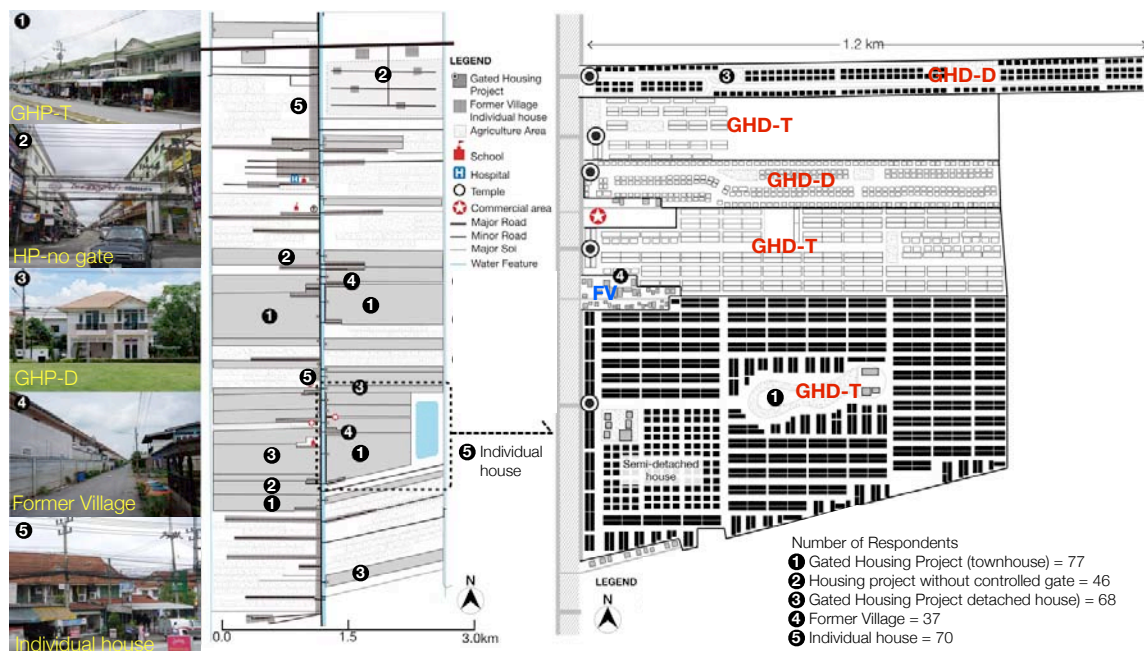


Figure 3: Characteristic of Gated Housing Project in Pathumthani

During site observation, GHP-T contain commercial business area inside the project, it makes community livelier. GHP-D tend to be inside environment with many aesthetic architecture and features but lacks of shops. On the other hand, former village does not have their own or nearby amenity. (Fig.3). It usually found gated housing projects located along main road in the west and along canal in the east. Because there is only one main 4 lanes road next to canal in the west side, people who live the opposite side have to connect by their own bridge, while, former village located in small alley on both sides of canal. We found that the road network conforms to canal system; it was constructed parallel and along with one side of the canals. All projects and communities face to main road with only one access, so they cause traffic conjunction during rush hours and supposed to be inconvenient to go to use public facility outside community. GHP-T plot is geometric form in huge scale (around 1 km. length); they contain over 1,000 households in one project, while GHP-D and former village is narrow. In addition, its master plan inside GHP-T is similar to GHP-D in grid pattern; (1) a main corridor connects from the gate to alley of housing units, and (2) a common space located in the middle of project. GHP appearance is significant symbol; one decorative gate at the front of project, and high fences (Fig.3). This ultimate boundary also implicitly enclosed outside community where is behind that fence. Hence appearances of different community in study area are obviously distinct in terms of size, plot shape, dwelling unit density in project, and architectural elements. Regarding these empirical evidences and literature review in section 2.1, the different physical appearance in study area possibly influence on neighborhood relationship both inside and outside community.

### 3.2 Case 2: Bangyai district, Nonthaburi province

Because geography of land is plain and contains many natural canals and connects to Chao Phraya River, this potential is suitable for agricultural activity. Original local people were from Ayutthaya who immigrated during Ayutthaya Era (14<sup>th</sup>-18<sup>th</sup> Century) as farmers who operated paddy fields and orchards<sup>14)</sup>. Many traditional local communities and local markets settle down as the waterfront. Agriculture business has been success; currently there were a huge agricultural product market center for western side of Chao Phraya River as shown in Fig.4. Since, urbanization is spread from the city by public facility and modern transportation such as outer ring road, the pattern of city has been changed. New housing

project development (GHP) occupied land and directly connected to the main road network without canal connection. On the other hand, local communities still located at the original settlement along to canals and access to small local road. GHP also replaces patchy paddy fields and orchards with free-form shape as follow fields' form, while some area is still doing agricultural business. Therefore, current land use of Bangyai district is hybrid between agricultural and residential area. The consequences of rapid transformation possibly impact on environmental and social aspect of newcomer and former villagers.

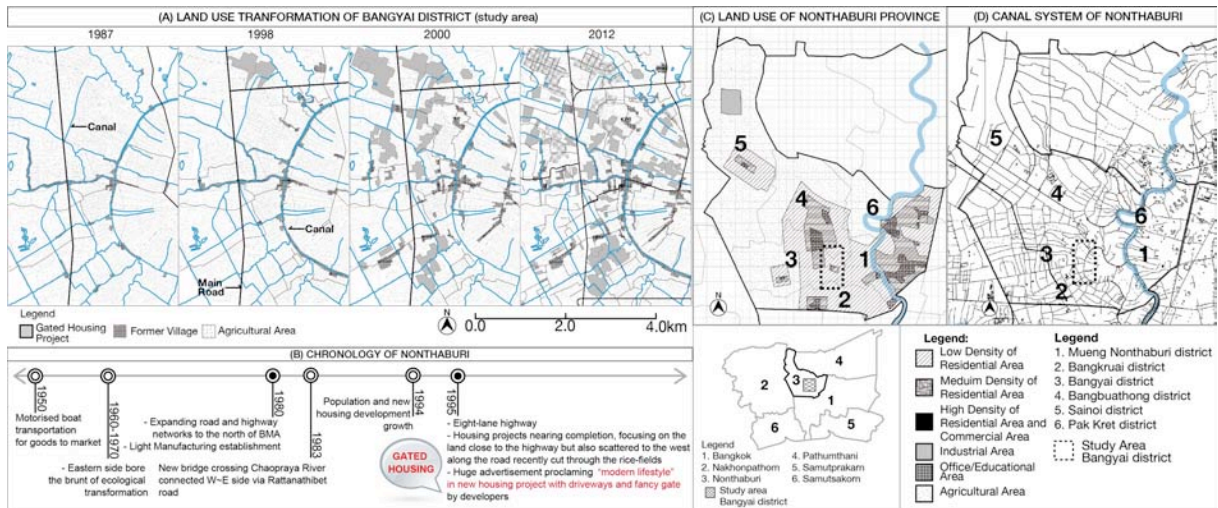


Figure 4: Land use and canal system of Nonthaburi province

Figure 5 shows the gate of GHP directly connected to main road and was back onto canal routes, in the same time former villagers settle down in waterfront area. The ultimate boundary of GHP enclosed community behind and closed involuntarily their accessibility. In this area, we also found some housing projects that were constructed since 2000 eliminated gate but kept fence and connected internal corridor of project to be public road. The number of dwelling unit in project is around 200-500 units that are smaller GHP in Pathumthani.

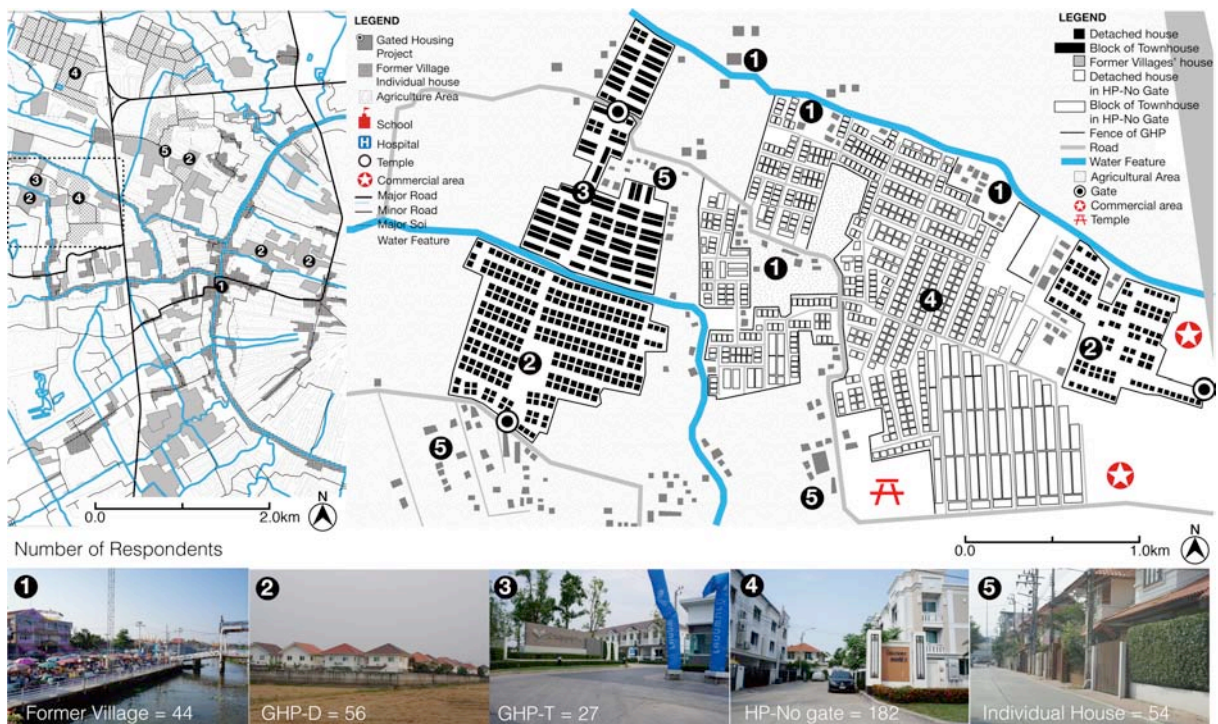


Figure 5: Land use and canal system of Nonthaburi province



## 4. Results

Regarding the site observation as mentioned in chapter 3, both case studies contained five typical types of community, namely, former village (FV), gated housing townhouse project (GHP-T), gated housing detached house project (GHP-D), housing project without gate (HP-No gate), and individual house (Ind). Although 400 questionnaires were distributed in those five types of community, but respondents are 300 and 363 copies, respectively. The first part of questionnaire aims to understand characteristic of inhabitants in different type of community that will be explained in section 4.1. Second part proposed to assess inside and outside neighborhood relationship among different those communities that will be presented results in section 4.2.

### 4.1 Characteristic of respondents in case study areas

Table 3. Demographic of respondent comparison between study areas

Item	Community type in Pathumthani					Community type in Nonthaburi					
	FV.	GHP-D	GHP-T	HP	Ind.	FV.	GHP-D	GHP-T	HP	Ind.	
Number of Respondent	37	69	77	46	65	44	27	56	182	54	
Mean	Age <sup>(b)</sup> (yrs)										
	Min	19	21	18	19	20	13	19	17	14	22
	Max	56	66	65	58	77	86	68	58	73	59
	Mean	41.30	40.19	37.59	38.73	37.841	48.71	40.25	35.45	38.88	35.31
	Std.	8.784	12.090	11.161	9.859	0.082	15.865	10.251	10.600	13.739	8.085
	Travel time to work <sup>(b)</sup> (mins)										
	Mean	46.50	53.63	45.86	45.33	41.94	31.82	39.34	36.92	33.04	19.45
	Std.	35.600	37.627	24.019	24.529	24.037	32.655	22.636	18.989	23.061	17.813
	Household member <sup>(a)(b)</sup> (pp)										
	Mean	3.50	4.00	3.66	3.93	4.67	4.35	3.72	4.11	3.93	5.18
	Std.	1.366	1.686	1.479	1.307	1.629	1.932	1.161	1.761	1.602	2.579
	Period of dwelling <sup>(a)(b)</sup> (yrs)										
	Mean	18.46	6.58	6.49	8.79	6.71	30.53	5.68	10.00	9.14	19.00
	Std.	11.061	4.261	4.740	5.800	8.271	19.921	9.131	18.921	7.506	12.944
	Household Income <sup>(a)(b)</sup> (THB)										
	Mean	2.08	2.12	1.96	1.95	2.23	2.23	3.54	2.35	2.47	2.18
	Std.	0.493	0.636	0.471	0.384	0.726	1.180	1.313	0.714	1.085	0.972
	Frequency	Occupation (%)									
• Government officer		37.8%	22.1%	23.1%	19.5%	17.1%	20.5%	42.6%	30.4%	12.8%	40.0%
• Company officer		13.5%	36.8%	33.3%	48.8%	38.6%	0.0%	13.0%	26.1%	16.8%	14.0%
• Business owner		24.3%	1.5%	5.1%	4.9%	1.4%	2.6%	33.3%	21.7%	17.3%	6.0%
• Shopkeeper		8.1%	17.6%	20.5%	14.6%	21.4%	46.2%	3.7%	13.0%	21.8%	20.0%
• Freelance		8.1%	22.1%	10.3%	12.2%	21.4%	2.6%	3.7%	8.7%	18.4%	4.0%
• Unemployed		8.1%	0.0%	7.7%	0.0%	0.0%	28.2%	3.7%	0.0%	12.8%	16.0%
Household Income (%)											
• 0 – 10,000 THB.		8.1%	10.3%	11.7%	9.8%	10.0%	28.2%	3.7%	4.3%	13.6%	20.4%
• 10,001-30,000 THB.		75.5%	70.6%	81.8%	85.4%	64.3%	43.6%	24.1%	65.2%	50.0%	55.1%
• 30,001–50,000 THB.		16.2%	17.6%	5.2%	4.9%	18.6%	12.8%	24.1%	21.7%	19.9%	14.3%
• 50,001-70,000 THB.		0.0%	0.0%	1.3%	0.0%	7.1%	7.7%	11.1%	8.7%	8.5%	6.1%
• Over 70,001 THB.		0.0%	0.0%	0.0%	0.0%	0.0%	7.7%	37.0%	0.0%	8.0%	4.1%
Workplace (%)											
• Bangkok city		21.6%	20.9%	20.5%	12.2%	30.4%	13.2%	40.7%	52.2%	22.2%	16.0%
• In this province		48.6%	32.8%	43.6%	70.7%	33.3%	23.7%	48.1%	39.1%	26.9%	74.0%
• At home		27.0%	46.3%	29.5%	17.1%	36.2%	52.6%	7.4%	4.3%	39.2%	8.0%
• Unemployed		2.7%	0.0%	6.4%	0.0%	0.0%	10.5%	3.7%	4.3%	11.7%	2.0%

Source: By researcher; Questionnaires' Results, 2013

Legend:

FV = Former Village  
 GHP-D = Gated Housing Project (Detached house)  
 GHP-T = Gated Housing Project (Townhouse)  
 HP = Housing project without gate  
 Ind. = Individual house (not by developer)  
 (a) = Variable that Sig. <0.05 in Pathumthani  
 (b) = Variable that Sig. <0.05 in Nonthaburi

Mean of Household Income:  
 1.00-1.49 = 0 – 10,000 THB  
 1.50-2.49 = 10,001 – 30,000 THB  
 2.50-3.49 = 30,001 – 50,000 THB  
 3.50-4.49 = 50,001 – 70,000 THB  
 4.50-5.00 = Over 70,001 THB

The similar characteristics of respondents in five types of community in Pathumthani are occupation and workplace. Most of respondents are private company officers that work in Khlongluang district or at home. The indicators that related with different type of community and can clearly indicate distinct characteristic of five communities are; (1) Age of respondents, which FV is oldest, (2) household member, which illustrates density of people

in dwelling unit, (3) household income, which GHP-D and IND has highest average income in Nonthaburi and Pathumthani, respectively, and (4) period of dwelling, which FV live longest period as local people.

#### 4.2 Neighborhood measurement between inside and outside relationship

Table 4. Relationship between characteristic of community and neighborhood relationship in Pathumthani

Variable		Inside Relationship							Outside Relationship	
		Community Value		Neighborhood Interaction						
		ES	UNI	DT	NA	NF	NV	TN	PSC	NOSU
Ind.	Age	0.011	0.061	0.187**	0.153**	0.117*	-0.010	-0.099	-0.008	0.006
	Fam.	-0.010	0.014	0.011	0.107	-0.089	-0.140	0.020	0.053	-0.105
	Inc.	0.025	-0.082	-0.056	0.016	-0.073	0.109	0.124*	0.011	0.035
	Pe.	-0.038	0.140*	0.0173**	0.240**	0.093	0.082	0.223**	0.015	0.240**
Dep.	ES			0.323**	0.166**	-0.088	0.045	-0.053	0.069	0.024
	UNI			0.455**	0.177**	-0.070	0.159**	0.062	0.134*	0.167**
	DT								0.050	0.063
	NA								0.194**	0.063
	NF								0.035	-0.026
	NV								0.046	0.258**
	TN								-0.164**	0.264**
PSC										
NOSU										

Legend:

ES = Environment Satisfaction  
 UNI = Unification  
 DT = Degree of Trust in Neighbor  
 NA = Number of Acquaintances  
 NF = Number of Friends  
 NV = Frequency of Neighbor Visiting  
 TN = Frequency of Talking to Neighbor  
 PSC = Perception to Surrounding Community  
 NOSU = Number of Outside Service Usage

Age = Age of Respondent  
 Fam. = Family member (Density in one dwelling unit)  
 Inc. = Household Income  
 Pe. = Period of Dwelling  
 Ind. = Independent Variable  
 Dep. = Dependent Variable  
 \* p < 0.05  
 \*\* p < 0.01  
 Pearson correlation coefficient

In Pathumthani, period of living correlated with inside and outside relationship in positive correlation. People who live former has stronger neighborhood interaction and inside-community value than newcomer, in terms of number of acquaintance and frequency of talking to neighbor. The elderly have higher trust in neighbor and a lot of friend than younger because of positive correlation coefficient. Salary of respondent related with talking to neighbor. The community value inside community correlated with outside relationship in terms of number of outside services because of positive coefficient. Often neighbor communication can create high outside relationship. Trust in neighbor and number of acquaintance strongly related with community value that illustrated by high correlation coefficient (Table 4).

Table 5. Relationships between characteristic of community and neighborhood relationship in Nonthaburi

Variable		Inside Relationship							Outside Relationship	
		Community Value		Neighborhood Interaction						
		ES	UNI	DT	NA	NF	NV	TN	PSC	NOSU
Ind.	Age	0.007	0.065	0.008	0.122**	0.088	0.077	0.196**	-0.011	-0.034
	Fam.	-0.176**	-0.128*	-0.136*	0.063	0.136*	-0.103	-0.097	0.084	0.059
	Inc.	0.044	0.036	0.079	-0.087	-0.022	-0.007	-0.064	0.009	-0.041
	Pe.	-0.111*	-0.145*	-0.148**	0.267**	0.154**	-0.104	-0.011	-0.119*	0.049
Dep.	ES			0.510**	0.028	0.048	0.009	-0.051	0.025	0.117*
	UNI			0.511**	0.128*	0.089	0.142*	0.076	-0.063	0.037
	DT								-0.072	0.007
	NA								-0.002	0.049
	NF								0.036	0.046
	NV								0.003	-0.047
	TN								0.064	-0.016
PSC										
NOSU										

Legend:

ES = Environment Satisfaction  
 UNI = Unification  
 DT = Degree of Trust in Neighbor  
 NA = Number of Acquaintances  
 NF = Number of Friends  
 NV = Frequency of Neighbor Visiting  
 TN = Frequency of Talking to Neighbor  
 PSC = Perception to Surrounding Community  
 NOSU = Number of Outside Service Usage

Age = Age of Respondent  
 Fam. = Family member (Density in one dwelling unit)  
 Inc. = Household Income  
 Pe. = Period of Dwelling  
 Ind. = Independent Variable  
 Dep. = Dependent Variable  
 \* p < 0.05  
 \*\* p < 0.01  
 Pearson correlation co-efficiency



In Nonthaburi, period of dwelling and density inside dwelling unit related with inside relationship in similar way, namely, there was negative correlation coefficient in community value aspect. Former people with big family less related inside relationship in terms of environment satisfaction and trust in neighbor. Moreover, outside relationship also correlated with period of dwelling in perception to surrounding community. However, people who have high inside environment satisfaction influence on trust in neighbor and number of outside service usage.

## 5. Discussion

Regarding table 3 and 4, period of living is an indicator of characteristic of community. Therefore, inside-outside relationship of former village in Pathumthani is higher than new community such as gated housing project with townhouse or detached house. Namely, former villagers have more friends, higher trust, and more united to inside community than gated housing project people. These results can be explained with difference of physical appearance of GHP and FV as follow; (1) size of new community is much more larger than former village, (2) number of dwelling unit in new housing project, and (3) area adjustment in new project has changed such as providing temporary commercial area and opened for outsider. These can create less trust on neighbor and inside community value. High number of outside usage in former village can increase mutuality to district. Because former villagers today do not have private facility, they have to share recreation space in public. On the other hand, housing project by developer provides private facility space, that decrease outside relationship. In order to improve outside relationship, neighbor communication should be promoted.

In Nonthaburi, period of dwelling also indicate characteristic of community. According to table 5, former villagers have low inside relationship, although they have many acquaintances. While people who live in gated housing project are newcomer, they know not so many people but satisfied inside community and have high trust. Because master plan of housing project provides more privacy and high quality of common facility, and there is less difference of social class. In addition, former villagers have lower perception to outside relationship than newcomer. This can be assumed there is confliction between former and newcomer in Nonthaburi area. According to Figure 5, boundary of new housing project obstructed accessibility and lead to environmental problem to former villagers. Community value can be supported by neighborhood interaction, namely, often neighbor visiting can promote unification.

## 6. Conclusion

The study revealed physical appearance of community related with inside – outside relationship of people who live in gated housing project and local people. We conclude and suggest ideas about new housing project improvement in sprawl area as follow;

In hybrid land use (Nonthaburi province); (1) In order to promote neighborhood interaction among resident in gated housing project, site planning should be more considered such as providing common space more than one place, and (2) Quality of environment outside gate housing project should be improved or better outside perception of former villagers by local government. Moreover, location of gated housing project should be controlled to reduce inconvenient accessibility of former villagers.

In land readjustment area and high density of gated housing project (Pathumthani province); (1) Scale of gated housing project should be reduced. Zoning rearrangement in project should be clear and controlled between commercial and residential zone, and outsider access.

In further study, dimension of neighborhood assessment should be assessed in deeply dimension and included another stakeholders' opinion, in order to propose more practical implementation.

### Notes:

- (1) Bangkok Metropolitan Region (BMR), as the national plan, includes 6 administrative provinces are; 1) Bangkok: 1,568.737 km<sup>2</sup>, 5,702,595 people, 2) Nakhonpathom: 2,168.327 km<sup>2</sup>, 851,426 people, 3) Nonthaburi: 622.303 km<sup>2</sup>, 1,078,071 people, 4) Pathumthani: 1,525.856 km<sup>2</sup>, 956,376 people, 5) Samutprakarn: 1,004.092 km<sup>2</sup>, 1,164,105 people, and 6) Samutthasakorn: 872.347 km<sup>2</sup>, 484,606 people. Total BMR area is 7,761.662 km<sup>2</sup> and number of residents is 10,237,179 people. It consists of 69 districts in total. Source: <http://th.wikipedia.org/wiki/กรุงเทพมหานครและปริมณฑล>
- (2) 30 administrative districts consist of 14 districts of Bangkok city, 4 districts of Nonthaburi, 5 districts of Pathumthani, 5 districts of Samutprakarn, 2 districts of Samutthasakorn, and 1 district of Nakhonpathom.
- (3) Land Readjustment is a land management instrument by which a public authority assembles and controls conversion of land from rural to urban use according to town planning requirements. The landowners also collectively leave land for streets and other public services, build the required infrastructure wholly or partly adapt existing boundaries to the new plan.<sup>10)</sup>
- (4) Gated Community is part of the trend toward exercising physical and social means of territorial control with gates, private security guards, and barricades help control one's environment and improve quality of life.<sup>12)</sup>
- (5) Related Housing Development Regulations in BMR; 1) Principle City Plan by Department of Public Work and Town & Country Planning, 2) Land Allocation Acts by Department of Lands, 3) Building Code by Department of Public Work and Town & Country Planning, and 4) Environmental Impact Assessment (EIA) by Office of Natural Resources and Environmental Policy and Planning

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