Lowland Technology International 2018; 20 (3): 331-340
International Association of Lowland Technology (IALT): ISSN 1344-9656

Research Paper

The impact of urban development on social capital in urban fringe area of Bangkok, Thailand

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ARTICLE INFORMATION

Article history:

Received: 17 March, 2018
Received in revised form: 28 August, 2018
Accepted: 01 September, 2018
Publish on: 07 December, 2018

Keywords:

Physical environment
Social capital
Urban fringe
Urban planning
Landuse planning
Social dimension

ABSTRACT

Rapid development in center core of urban area motivates people from rural migrates to urban for reaching better quality of life. However, due to the hindsight between development planning and policies, and tangible development causing negative impacts on several dimension of urban living which includes increasing social isolation, unsafe condition and auto-dependency. This situation has affect social capital on both individual and communities level. Therefore, the aims of this study are (1) to identify the set of variables that influence on social capital formation in suburban area; (2) to determine the component factors that formulate social capital value in variety context of urban development; and (3) to analyze relationship among physical factors together with nonphysical ones for examine its effects. This study selected Thakhlong Municipality as a study area to perform spatial analysis for investigating different typology of social capital value among a variety group of residents disperse in urban fringe of commuter town character. Results from this study demonstrated that the formulation of social capital values influenced by the integrating effect of both physical characteristics of building agglomeration and social perspectives which was stimulated by land use policy and planning.

1. Introduction

The variation of policy development guidelines has been transitioned over time due to the dynamic transformation of conditions and its external changes of economic development trends and public interest. These phenomena motivates people to migrate from rural area and deciding to live in urban area which consequently, shaping their behavior and lifestyle. This phenomenon has impact on the pattern of urban development and their social network. Towards the prior development policies in the last four decades, the importance of physical and infrastructure development were mainly addressed rather than strengthen social cohesion or providing good quality of public services to the urban fringe area or hinterland. Moreover, lacking consideration of social coherence, provision of public facilities, problem of accessibility and unconcern on community activities are causing social isolation among community members, especially among “the old-liver” and “the new-comer”. However, in middle and low-income residential units or living in a quarter mile near employment places, migrants had been influenced

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Note: Discussion on this paper is open until June 2019

on residential pattern due to limitation on their affordability level. Furthermore, the low affordability of urban transportation cost has consequently reduced their social benefit or gains which is lower level of collaboration, coordination or corporation to achieve their better quality of living. Thus, it could be noted that effects from urban development policies could increase the level of social agglomeration and vice versa. Moreover, in academic perspective, there are not many researches that has described or explained the relationship between physical development and social capital. Therefore, the aim of this study are to describe the set of factors that has been fostering social capital in suburban area under the three objectives as follows; (1) to identify the set of variables that influence on social capital establishment in suburban area; (2) to determine the component factors that formulates social capital value in urban area; and (3) to analyze relationships among physical factors and social factors consequence on social capital factors in suburban area. This study applied both quantitative study and qualitative techniques to explain relationship between physical characteristics, social and chances of occurrences of social capital.

2. Literature review

There are various explanations towards definitions of social capital which cannot provide exact meaning which is depend on level of study and discipline such as network of people to share norm, value and understanding that facilitate co-operation within or among groups (Dolfsma and Danneruther 2003; Foley and Edwards 1997; Claridge 2004; Brian, 2007:103; Robinson et. al., 2002; Claridge, 2004). A total of resources regardless to physical or virtual aspects, it had been collected in either individual or group by sharing on their network and relationship, which could be formal way or informal way (Bourdieu and Wacquant, 1992:119). It is mostly improved based on social relationship (persons) rather content or sources (Gauntlett, 2011). As a stock of social trust, norms and networks that people can be drawn for solving common problems or dealing with some issues (Sirianni and Friedland: 1997, Debertin and Goetz: 2013). According to Bourdieu's ideas, to formulate and improve sense of social capital, factors relevance to economic is not only one factor represented, but also cultural capital – way that people use cultural knowledge to organize social class or hierarchy is also included (Gauntlett, 2011). Social capital has become more comprehensive thought recently, which was obviously found and considered as multidisciplinary approaches. For example, Coleman (1991) combine social concepts and economic theory to explain how social capital occurs, which are important in the direction of information sharing, constructing norm and social sanction (Gauntlett, 2011) Variation of social capital was also found in literatures which Protes (1998) categorized the social capital into three groups: 1) social control, 2) family support, and 3) benefits mediated by extra family network. While Brian (2007) distinguished typology of social capital into three aspects: 1) bond: links to people based on a sense of common identity, 2) bridges: links that stretch beyond a shared sense of identity, and 3) linkage: links to people or groups further up or lower down the social ladder (Brian, 2007). Moreover, importance of social interaction has become obvious found in central of node in urban area, which is geographic conditions play an important role fostering social contact **(Table 1)**. Moreover, it plays an important role to social life and economic development, despite the potential of accessibility to the infrastructure system in developing countries reducing socioeconomic inequality which is related to factors beyond the scope of local authorities and the service delivery system (Patacchini, Picard and Zenou; 2015).

Social capital was created and developed based on social relations between humans and spatial dimension (Rutten, Westlund and Boekema; 2010). The multidisciplinary approach becomes necessaries to explore and conceptualize social capital in present which includes theoretical knowledge in behavioral services, education, public health, political sciences, economic, infrastructure planning and demography characteristics (Raimi et al., 2017). Furthermore, when the consideration was made on disaster aspects, mitigation, response and recovery which has become significant, especially appropriate of basic condition of living to meet the standard (Dynes: 2002, Aldrich: 2012, Sanyal and Routray: 2016). Also, some areas stimulate migrants with different type of activities and daily consumptions, nevertheless the limitation transit quality and accessibility causing advert effects to some aspects not only for individual expenditure for travel, but also for accessing some services in the proximity of their neighborhood area (Iamtrakul and Raungratanaamporn, 2015: 39-51).

3. Methodology

This research applied both qualitative and quantitative research to understand the impact of urban development on social capital in urban fringe area. In qualitative research, the development plans that implemented by central government and local government were collected to depict relationship between policies guidance that affect to social development in local area.

Table 1. Classification towards social capital analyses.

Details of Examples	Unit of analysis			
	Rural community	Suburban neighborhood	City/Urban core	Nation/Region
Examples of ends to be achieved by social action	▪ Stimulate employment, and economic growth and development ▪ Preserve farmland ▪ Encourage population in-migration ▪ Improve local school	▪ Protect property value ▪ Prevent crime ▪ Avoid change of Locally Undesirable Land Use (LULU)	▪ Prevent urban decay ▪ Long-term revitalization of downtown ▪ Reduce population flight to the suburban ▪ Desegregate schools	▪ Achieve long-term economic growth ▪ Improve quality of life for all residents ▪ Eliminate racist complicity
Examples of indicators of productive social capital	▪ Church attendance, County fairs, traditional youth organizations (Youniss, McLellan and Yates, 1997)	▪ Neighborhood associations (Mesch, 1996) ▪ Residential mobility 911 Calls to police Ethnic homogeneity (Hirschfield and Bowers 1997; Ray et al. 1997)	▪ Church attendance ▪ Club membership rates ▪ Sport league (Bowling) (Putnam, 1993)	▪ Trust, norms or civic cooperation (Knack and Kiefer, 1997)
Examples of indicators of unproductive social capital	▪ Xenophobia (Debertin 1993) ▪ Bedroom communities (Flora, 1997)	▪ "Gated" communities? (Wilson 1997; also see Lang and Danielson, 1997)	▪ Gentrification (Flora, 1997) ▪ Street Gangs (James C., Howell and John P., Moore, 2010)	▪ Rent seeking, criminal behavior (Acemoglu 1995; Rubio, 1997)

Source: Debertin and Goetz (2001)

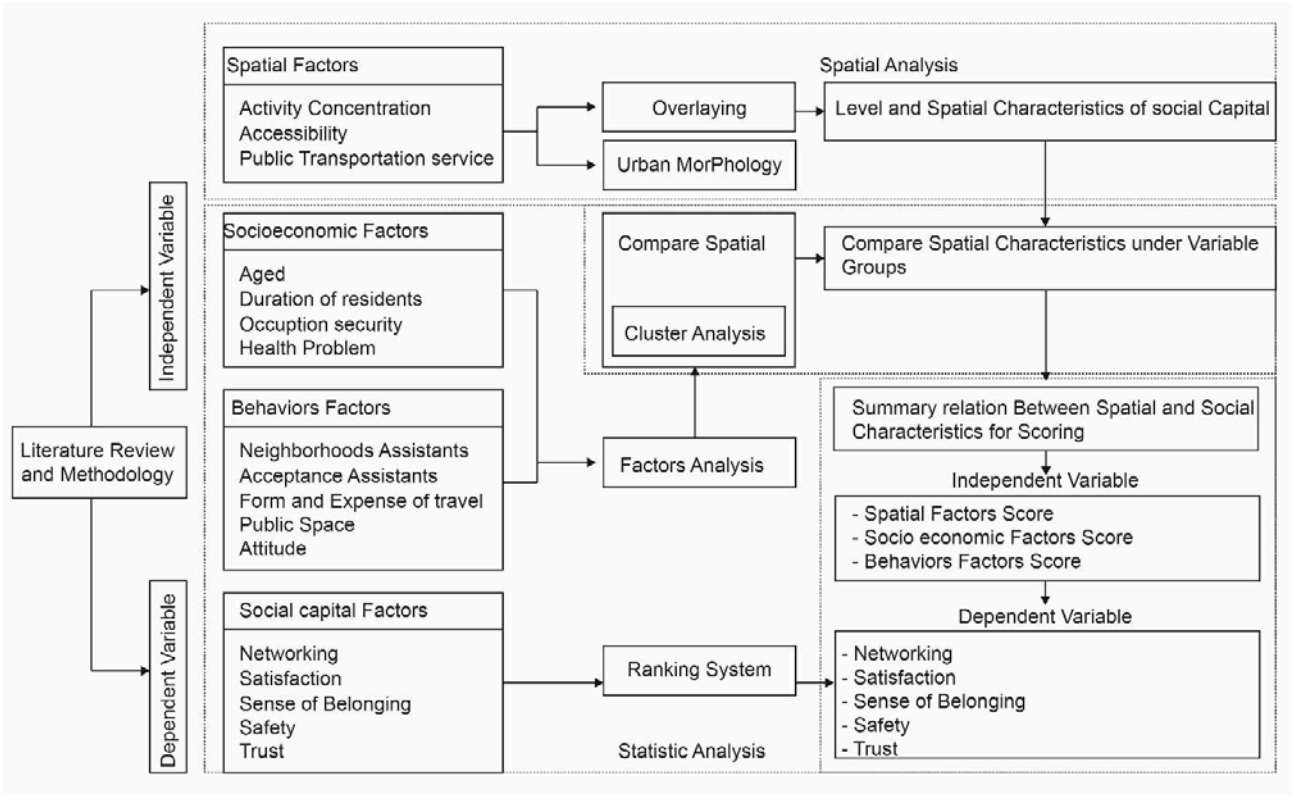

Fig. 1. Variables in study process.

In quantitative research, questionnaire survey was distributed into the study area of Tha Khlong Municipality, Pathumthani. The 400 set of questionnaire survey were distributed corresponding to the urban density in different survey grid which was designed to cover over the study area. Questions regards to social aspects, living conditions, and social capital issues were assessed in the process described in **Fig. 1**. After questionnaire survey was derived, spatial-statistical analysis was applied afterward to identify the relationship among physical characteristic, social and interaction behaviors, as well as social capital index (SCI); (i.e., SCI1: competency of social network, SCI2: neighborhood trust, SCI3: satisfaction and happiness, SCI4: sense of belonging,

SCI5 : safety and security, and SCI6: trust on community leaders). A systematic sampling technique was employed to sample the set of 400 questionnaire survey which were distributed in grid survey (1,000m.*1,000m.) in accordance to the number of building in each grid. There are four aspects in the questionnaire survey which were asked response from the participants (i.e., living conditions, community participation, urban interaction and space usage, and living expectation). This study employed the statistical analyses to assess the association between tangible and intangible aspects resulted on dissimilar level of the social capital which comprises of the integration approach of descriptive analysis, factor analysis, and cluster analysis. Thus, overcoming inequity in urban development could be recommended from evidence based on measurement of the social capital determinants and spatial dimension disturbing chances to increase residents' level of social capital in urban fringe area **(Fig. 2)**.

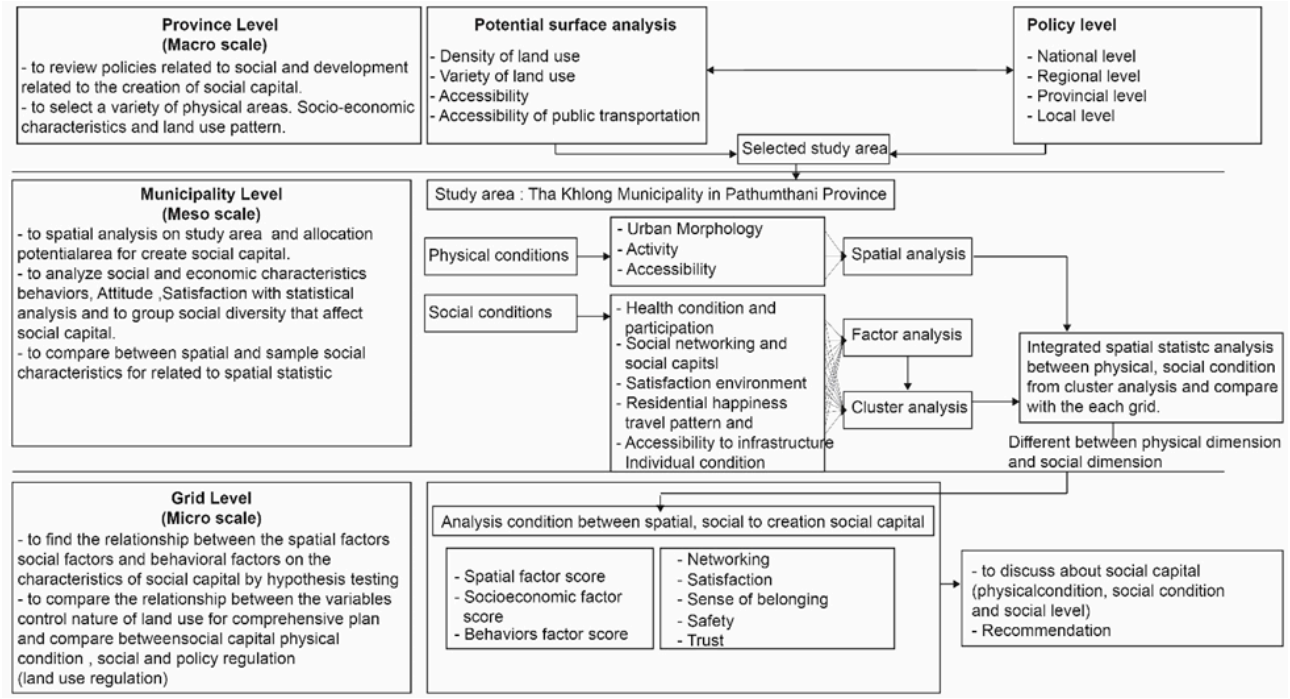

Fig. 2. Study process.

Table 2. Grouping variables in Factor analysis.

Group	Component group name	Variables
1	Trust	Trust in community leader (X_8), Sense of social inclusion (X_9), Trust in neighbors (X_7), Satisfaction in living condition (X_{10})
2	Satisfaction towards the living environment	Satisfaction towards neighbor (X_4), Sense of belonging (X_5), Satisfaction towards environmental issue in community (X_3), Satisfaction towards safety level (X_6)
3	Level of accessibility towards social capital level	Accessibility to public service area based on social capital level (X_{23}), Accessibility to community places based on social capital level (X_{21}), Accessibility to medical services based on social capital level (X_{28}), Accessibility to the area outside community based on social capital level (X_2)
4	Socioeconomic factor	Job security based on social capital level (X_{25}), Monthly income (X_{27}), Education level based on social capital level (X_{24})
5	Luxuries and commercial function inside community	Service access in community level (Clothes shops) (X_{14}), Service access in community level (Beauty salon) (X_{15})
6	Travel behavior to perform community activities	Meeting with neighbor (X_{11}), Going for exercise or doing recreation activities (X_{12}), Going for buying daily goods (food) (X_{13})
7	Luxuries and commercial function outside community	Buying goods (clothes) outside community area (X_{18}), services (beauty salon) outside community area (X_{17})
8	Attitudes towards neighborhood	Importance level of neighbor (X_1), Importance or necessaries toward helping other community members (X_2)

For the preparation of questionnaire survey, there are 28 variables regards to social capital aspects which were designed to collected and described in **Table 2**. Features of social organization could be identified on other dimension of socio-economic conditions (education, employment, income, housing quality, etc.), living and transportation environment, public infrastructure, services and facilities. Then, all variables have been gathered and input into the process of study as demonstrated in **Fig. 2**.

4. Data Collection

This study selected Tha Khlong Municipality which located in Pathumthani Province as a case study which could be depicted in **Fig. 3** and data was gathered based on grid cells as demonstrated in **Fig.4**. The grid of (1,000m.*1,000m.) was utilized to classify the analysis zone by perform questionnaire survey on each grid by considering the number of building in all different grid.

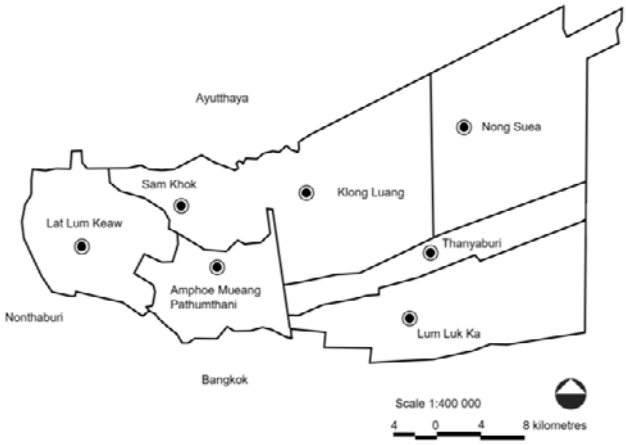

Fig. 3. Study area of Pathumthani, Thailand.

According to land use comprehensive plan enacted by Department of Town and Country Planning (DTP) since 2012, it could be classified the land use type into six types which are low-density residential zone (yellow), medium density residential zone (orange), commercial zone (red), industrial zone (purple), educational zone (olive green), and institutional zone (blue). Based on physical characteristics of land use in the study area, it can be realized the Pros and Cons of land use idea as explained in **Table 3** of suburban area from Bangkok Metropolitan Area (BMA). The approximate area of this municipality is approximately 63 square kilometers. The previous characteristics of land use was agricultural area which is later had been changed to urbanized area. There are six types of land classification which are low-density residential area (yellow), medium-density residential area (orange), high-density residential area and commercial area (red), industry (purple), educational area (olive green), and religion site (grey) (**Fig. 5**).

Table 3. Summarize of pros and cons of land use characteristics.

Aspects	Conditions and characteristics
Activity places	Typology of land use planning are completely separated in accordance to Urban Comprehensive Plan (2009) could be divided into residential zone, commercial zone, industry, education zone, commercial zone, and religion zone.
Communities characteristics	The agglomeration of communities had been located along arterials and major roads. Some communities located nearby employment places such as market or industry estate.
Facilities and services	In present, the approximate distance of service area (DPT standards) in each basic facilities or services (e.g., hospital, schools, or healthcare services) are covered all of the area of municipality.
Accessibility and reach condition	Although the road network in study area could be able to be considered as a grid system, but the convenient of accessibility in some part quite poor, especially along Paholyothin Road in both east and west direction.

Based on data from Department of Public Administration (DOPA), Ministry of Interior indicated that number of population in the study area has been gradually increasing due to the urban expansion and rapid of land use changes. The sample size of 23,768 households was gathered in the 63 square kilometers of the study area. Sampling was gathered based on a randomly chosen point in all grid cells which systematically collected through each of the 68 grids of neighborhoods. This method ensured that all households in all grids were targeted with an equal chance of inclusion.

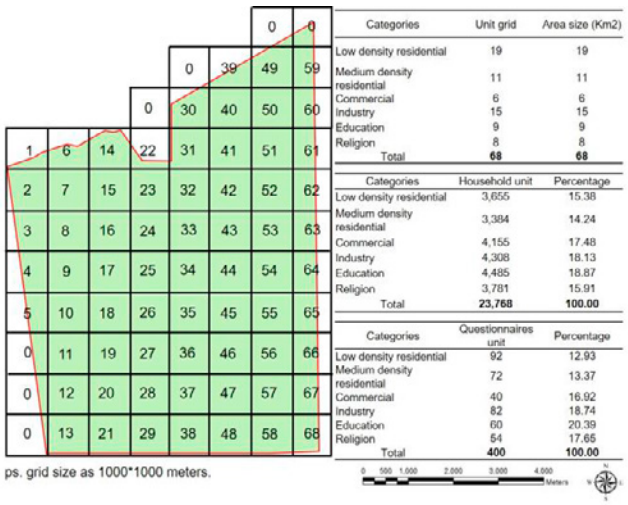

Fig. 4. Data collection based on grid cells.

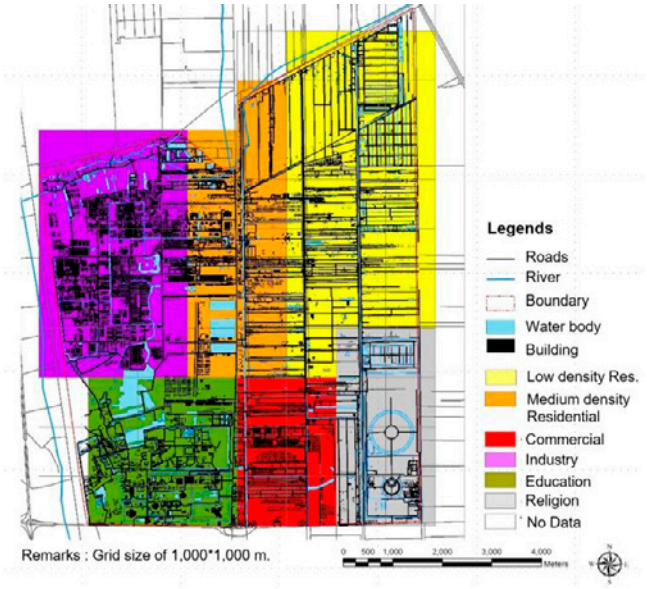

Fig. 5. Land use characteristics of the study area.

During the data gathering, most of the sampling could be considered as "new-comer" group which represented the period of stay less than ten years as depicted in **Fig. 6**. There are about 32.82% who are living in the study area less than 5 years. The second major group is the group of sample of 20.87% who are living in between six-to-ten years. Follow by the third group, it is the group of sample who are living in between 16 to 20 years of 13.74%. The number of sampling who are living in long period tend to reduce which could be noted that the major group is new-comers group (i.e., university students, academic officers, or migrants in industrial estates) rather than old-livers such as traditional people, old residents.

Towards monthly expenditure of respondents, the average monthly travel cost is equal to 1,247.48 THB per month (SD= 1098.13) which means that some of respondents must spend high cost for transport while others may not (**Fig. 7**).

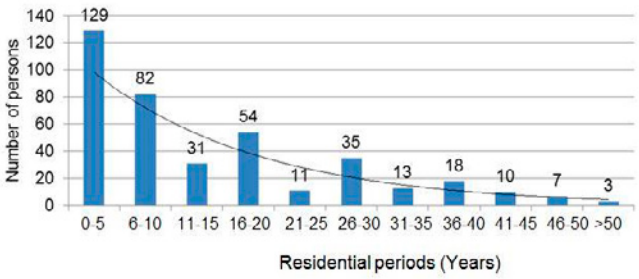

Fig. 6. Residential period of stay (years).

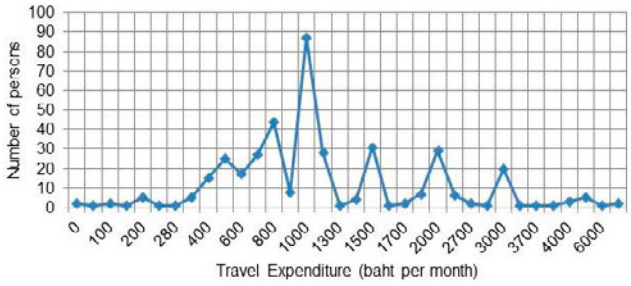

Fig. 7. Average travel expenditure per month (Thai baht).

5. Results of Analysis

Respondents were then asked by face to face interview in each targeted household of grid cell. Results from survey showed that there are eight dominant groups of cluster analysis. The different grid cell (1,000 m.*1,000 m.) could be clustering by some certain character of the similarity perspectives. Towards this analysis, the three types of cluster and spatial analysis could be defined into three types; Dominant (D) – A survey grid contain a major cluster significantly; Sub-dominant (S) - A survey grid contain a major cluster but insignificantly; and Multi-cluster (MC) – More than one dominant cluster consisting in a single grid. According to the analysis, it demonstrated that some majority of social behavior are correlated in a land use or land classification, especially in a single-land use characteristic as described in **Fig. 8**.

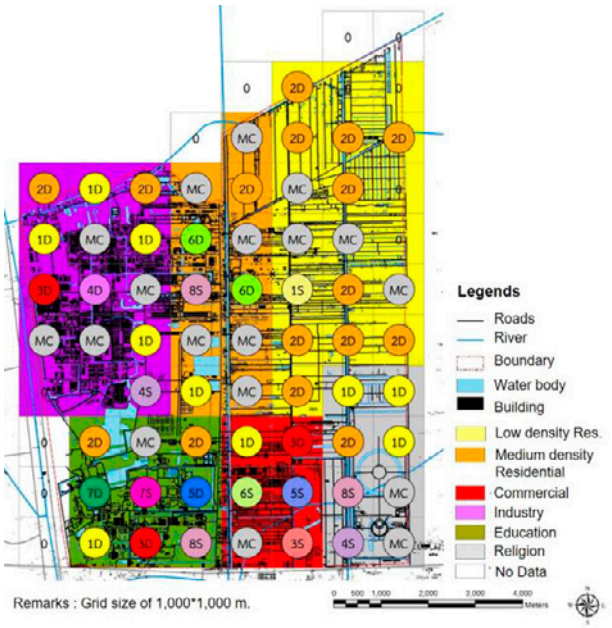

Fig. 8. Dominant cluster group, Sub-dominant cluster group and multi-cluster group.

Figure 9 illustrated classification of urban peripheral area based on land use classification and urban density. This study introduces for the unconventional classification of a variety of social dimension in association of social capital in urban fringe areas with regard to the composition of land use in their built-up areas. A hierarchical cluster analysis was employed to define groups of different area classified by grid with similar land-use patterns.

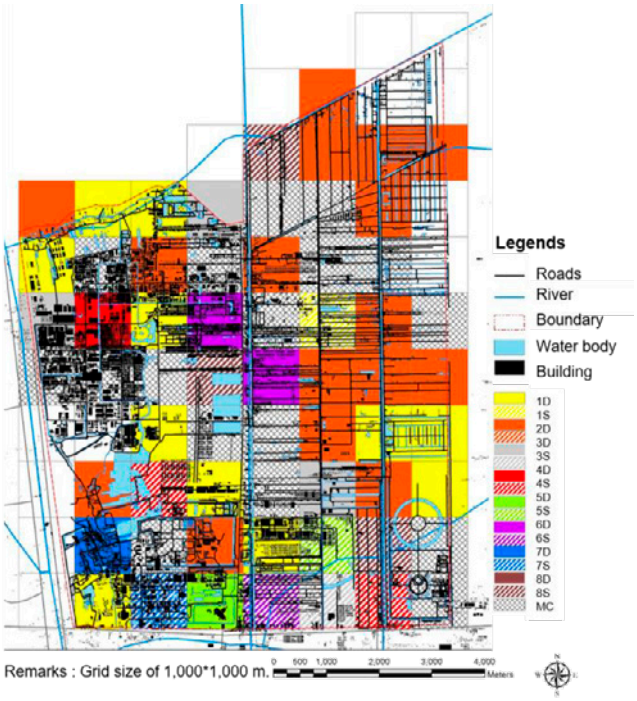

Fig. 9. Distribution of different cluster group.

A cluster solution and the statistically significant differences among the clusters could be useful to categorize different typology of the study area which derived from the multi-dimensional characteristics of the sample of population residing in these cities. Rather, it relates to the location of the study area and the function that the city fulfills in their proximity zone.

Then, the analysis of cluster analysis was performed to classify the group of people (**Table 4**). The research can demonstrated the different group of social capital variables in mixed land uses. There are a number of physical factors that help to increase social capital such as: walking/jogging areas, green area, open areas which lead to the increase in social relations. The increase in nonphysical factors also influences on social capital dimension which is also considered as an important resource of sustainable development. Furthermore, based on the fact that the mixed land uses allow performing diverse activity in shorter distance of access could increase social capital, consequently it leads to sustainability.

When the considerations have been put into the cluster group of different social characteristics, the data in **Table 5** demonstrated that the allocation of appropriate urban land use planning should focus beyond physical characteristics of the site. This study attempted to classify the different policy variable into different cluster group to demonstrate its dissimilar effect.

Table 4. Results from cluster analysis.

Factors	No. of cases	Cluster groups							
		1	2	3	4	5	6	7	8
Neighbors trust	83		1.831	2.258	2.628	3.090	2.237	2.631	2.723
Satisfactions towards living environment and living conditions	116	1.831		2.381	2.516	3.001	2.536	2.633	2.316
Spatial accessibility based on social capital level	42	2.258	2.381		2.743	3.381	2.737	2.817	2.345
Trips to do community activities	38	2.628	2.516	2.743		3.158	2.668	2.976	2.933
Socioeconomic factors	22	3.090	3.001	3.381	3.158		3.511	3.560	3.562
Importance and attitudes towards neighbor	36	2.237	2.536	2.737	2.668	3.511		2.977	2.770
Access to luxury commercial goods inside community	28	2.631	2.633	2.817	2.976	3.560	2.977		3.084
Access to luxury commercial goods outside community	35	2.723	2.316	2.345	2.933	3.562	2.770	3.084	

Remarks:

- Cluster 1: Respondents who think that importance of neighbor and travel demand are rated in low level (83 samples, 20.75%)
- Cluster 2: Respondents who are living in communities with high level of travelling across area (116 samples, 29.00%)
- Cluster 3: The group of respondents who interact with other groups and having transportation cost in low level (42 samples, 10.50%)
- Cluster 4: The group of respondents who are living in central area which is easily to access to public services (38 samples, 9.50%)
- Cluster 5: Group of respondents who believe in their neighborhood of community members (22 samples, 5.50%)
- Cluster 6: Group of respondents who are using much time accessing to facilities or services (36 samples, 9.00%)
- Cluster 7: Group of respondents who use facilities outside the community area (28 samples, 7.00%)
- Cluster 8: Group of respondents who are living in study area in short period (New-comers) (35 samples, 8.75%)

Table 5. The classification of groups cluster based on social characteristic.

Characteristic	Average score cluster group							
	1	2	3	4	5	6	7	8
Time spent to hospital (Minute)	16.60	16.90	20.24	24.87	16.36	18.31	19.29	17.86
Travel cost to hospital (THB)	62.29	64.05	57.17	112.89	92.50	75.00	70.18	73.51
Number of community participation time	1.09	1.35	1.38	1.84	0.54	1.41	1.46	1.10
Average travel cost per month	1262.65	1094.83	961.43	1988.16	1800.00	969.72	1200.00	1268.57
Level of neighborhood meeting	3.24	2.70	1.86	3.24	2.86	2.56	3.68	2.51
Travel time to meet their neighbor (min)	7.87	8.18	7.33	7.53	10.68	8.00	8.75	7.29
Frequency towards meeting neighbor (week)	1.81	1.83	1.58	2.74	2.19	2.17	2.54	2.16
Level of travelling for do exercise and leisure	3.13	2.49	1.79	2.79	2.55	2.56	3.64	2.46
Travel time to do exercise and leisure (min)	8.73	8.58	10.45	10.45	10.68	13.03	9.82	11.03
Frequency towards exercise and leisure (week)	1.80	1.93	1.82	2.66	2.28	1.98	2.43	1.59
Level of buying daily goods	3.25	3.14	3.02	3.32	3.45	2.47	3.32	3.00
Travel time to marketplace (min)	8.80	8.78	10.45	9.68	14.32	12.53	10.00	10.34
Frequency to go marketplace (week)	2.81	2.59	2.73	3.28	3.27	1.87	2.79	2.52
Level of buying food	3.99	3.83	3.55	3.84	4.05	2.78	3.71	3.83
Travel time to market or convenient store (min)	8.65	8.66	9.55	10.05	9.64	12.83	10.61	10.43
Frequency to go market or convenient store (week)	4.07	3.93	3.69	4.34	4.68	2.99	3.57	3.44
Level of access healthcare service	1.32	1.26	1.28	1.27	1.30	1.14	1.11	1.24
Travel time to healthcare service (min)	12.78	13.00	17.29	17.73	12.00	17.00	20.00	22.50
Frequency to go to healthcare service (week)	1.03	0.88	0.83	0.93	0.70	0.69	0.88	0.46
Level of access salon	1.76	1.63	1.30	1.52	1.25	1.39	1.50	2.10
Travel time to access salon (min)	10.83	10.30	11.50	12.57	16.11	9.85	10.00	11.53
Frequency to go to salon (week)	1.07	0.91	0.92	1.32	0.94	0.98	0.90	1.40
Average age	37.54	39.06	34.00	40.58	43.95	35.38	34.25	33.54
Average monthly income	3.84	3.12	2.53	2.70	3.64	1.75	2.50	1.91
Average period of stay	17.21	16.91	10.29	14.87	25.38	11.73	15.21	8.88

However, the nonphysical factors to form residents/commuters' behavior reflects on their daily life also play a key role to enhance strong social networks whether formal or informal. Furthermore, it helps to provide security, close monitoring in the district, and development of participation spirit which increase the realization of social capital, Results of spatial analysis shown that the area located nearby area are convenient to access; e.g., local road, arterial, or major roads, are motivates people to gather and coordination. Results from analysis reveals the most area that encourage people to gather which consequently improving their social capital which are likely near the major roads, commercial buildings, or industry estates while the agglomeration of buildings nearby the university area. Density calculation based on Kernel density showed that spatial agglomeration in Tha Khlong Municipality is located near Paholyothin Road, commercial district and industrial estate, which is depicted in warm color while

the area symbolized in cool tone represents there are low level of spatial agglomeration **(Fig. 10)**.

Fig. 10. Spatial Agglomeration in Tha Khlong Municipality

6. Conclusions and Recommendation

Rapid urbanization has influenced on changing land use characteristic, creating social variation and agglomeration. This phenomenon also stimulates people to migrate from remote area to developed area, seeking better in quality of life, chance of living, and expecting a good condition to their ancestors. In urban fringe area, various kinds of social groups (old-livers and new-comers) are founded in this study. Different types of social capital are significantly varied based on land use characteristic along with other physical characteristic.

The comparison of factors (physical characteristics, and social characteristic) to review the interaction on level of social capitals showed that personal capital (e.g., average income, level of education, occupations and ages) are affecting to the enhancement of social capital rather the social behavior in either positive or negative perspectives. Social interaction factors are highly affecting to the opportunities of social capital improvement rather the physical characteristic. However, for each characteristic of physical and social interactions may increase level of social capital and vice versa. Moreover, results from this analysis shown that, to increase level of social capital in one aspect, it may loss other social capital in another aspect as a “trade-off effect” in both spatial aspects and social aspects. Further study to be more precise, decision of people towards establishment of social capital based on “trade-off” effects are necessary to fulfill this study (both spatial issues and non-spatial issues).The result of study indicated that each types of social capital are significantly different based on spatial location or land use characteristics. Thus, it could be note that different types of social capital in urban area are different based on land use policy which must be carefully considered on allocation to sustain the quality of life of community people.

Acknowledgements

The authors would like to give appreciation to Thailand Research Fund (TRF) for providing funds to this research (MRG5380). The authors would like to express their gratitude to Faculty of Architecture and Planning (APTU), Thammasat University for supporting research facility and valuable consultation.

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