



The Application of Circular Economy Concept in the Context of Canal Community Development

Pawinee Iamtrakul^{1*} and Sararad Chayphong¹

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ABSTRACT

At present, the government has attempted to promote a redevelopment project along the Lat Phrao Canal. This is due to the realization of the importance of the housing inequality problem based on initiative in the housing improvement projects in various ways. This study focuses on an analysis of the potential of the low-income community development in three level which are: individual, community, and district scale. Based on community-based benefit sharing of the case study of Lat Phrao communities, the research methodology was designed by using a qualitative research technique from interview process which comprise of 4 components of: (1) human resources and community development capital, (2) group and corporate resource capital and (3) physical resource of the community and (4) the possibility of the community development approach under a circular economy concept. The results found that the low-income community along pilot canal has the potential to develop based on a circular economy model due to the availability of local economic activities existed in the area. However, in order to promote community tourism, it is necessary to improve the current infrastructure system, additionally a partnership model for providing knowledge-based support from relevant agencies must be involved towards sustainable development approach.

1. INTRODUCTION

The city population is now growing and expanding with more than half of the population living in the city and expected to grow 70% by 2050 [1]. As the expansion of the city with a significant driving force for urban development, it has become a place for exchanging ideas and socializing among people of different gender, race, age, class, status, culture, and different attitudes. However, as the city grows ahead, the consequences of its actions cultivate more inequality and exclusion within the city. Thailand's inequality was ranked the third in the world (2016) after Russia and India [2]. The gap between the rich and the poor is increasing rapidly. This can be reflected in the evidence of large-scale of real estate development model. The concentration of buildings is quite high due to the population density together with land restrictions. As a result, urbanism engulfs more vulnerable communities which the problem of slum communities is therefore difficult to avoid. Currently, Thailand has amount proximately 5,500 communities across the country which has continued a growing trend of its settlement. In many areas, it was found that housing problems and dismantling is a major problem today in many areas [3]. This is a

consequence of land expropriated for development which generates more land value than affordability of low-income communities. In addition, the government has realized the importance of the housing inequality problem by trying to develop and improve condition of informal settlement in various ways to fill the gap of inequality and unaffordability of housing problems. Improved housing would directly low-income group while indirectly helping boost local economic growth, reducing their environmental impact and lower social inequality; however, to cope with this problem, it must be consistence with the needs of the community. However, the main mechanism for sustainable development should be focused on self-reliance that can create social opportunities and economy at the same time. This is not just an opportunity for the benefit of affordable housing; an improvement of their lives through incremental upgrading of their homes must be considered while enhancing social capital of the community as well. Instead, it should focus on housing as represented the identity of the community in order to increase the bargaining power of accessing the rights and opportunities that arise from being a vulnerable community to strengthen their power and sustainable community development. Hence the need to

¹Center of Excellence in Urban Mobility Research and Innovation, Faculty of Architecture and Planning, Thammasat University, Pathumthani 12121, Thailand.

*Corresponding author: Pawinee Iamtrakul; Phone: +66-2-986-9605; Email: iamtrakul@gmail.com.

build a city with the participation of everyone can be performed by allowing everyone to harvest produce from city resources together with proper management and planning.

In fast-growing cities, it is a must to build the capacity of Lat Phrao communities to create opportunities for a better quality of life for all groups of people. This project considers the study area to be a pilot model of community-based project. At present, the government has developed a project of some communities along the Lat Phrao Canal, to be the prototype area along the canal. By constructing a concrete dam to prevent flooding in Bangkok with a total distance of 45 kilometers in the Lat Phrao Canal, it includes the demolish and relocate houses that were built, encroaching canals and dam construction lines to construct new houses and communities of totaling 50 communities of 7,069 households. The area is located in a community area located along the site of study area which is considered the most efficient canal for the development of water transportation system. This is confirmed by the analysis results from the potential of physical characteristics of the study area [4],[5]. This is part of the projects of Hybrid Canals-Rail Connectivity: Linking Bangkok's Canals Networks to Mass Rapid Transit Lines 2014 - 2015 and the Development of Community-Owned Canal Transit System, Boat Piers and Vicinity 2016 – 2017 under Thammasat University and supported by the Rockefeller foundation [6],[7]. By analyzing the linkages between the canal network together with the rail network, it can be used to prepare for recommendation of better connectivity for daily life with expansion of the rail network to cover more public travel choices. This finding revealed the potential of these communities' allocation with the easy access to several job options with economy choice of commuting each day for work. With the idea that Bangkok has a potential waterway, it can be recommendation for a network of navigating route. Together with a number of intersections in conjunction with rail networks, therefore, it should create an alternative travel connection for the Bangkokians with an appropriate Water transit-oriented development (WTOD) [8] planning and strategy for the development of the area. The analysis of the possibility of investments to collective ownership schemes is not only to ensure well-located land, but also the providing of better local economic development must be part of the solution by allowing communities to own the business themselves. This will help to make the fares cheaper and more comfortable with the situation of community problems along the canal.

From previous research, it can help build up community capacity to promote the business model process by leveraging the existing network to meet the needs of the community and by allowing the community to own the business. In order to create more concrete connections to the local economy, the existing potential needs to be movement to drive the project. To recognize the rights of

considered whether it is a canal for flood mitigation or a canal with economic activity. Then, the participation process should be adopted to create a connection through the utilization and development of existing resources that lead community tourism to meet economic needs. Based on current social activities among communities, it can remain a community identity in the scope of resources within the community. It must be pointed out how stakeholder groups in the social system are involved and participate in the implementation of an innovative integration of water transportation with the circular economy for tourism. A guideline to promote community economic development for helping more income distribution should focus on the preservation of natural resources, local life and culture within the scope of limited resources. This must be carried out within the capacity and limitations of the community and society for sustainability. And ultimately, the suggested business plan can be applied to all levels of community and district planning to strengthen local businesses and achieve more accessibility. Therefore, this study focuses on analysis of the potential of the community development on the basis of community capital. The key element to identify the suitable development approach in this study was considered and classified into 3 components which are human resource and community development capital, group and corporate resource capital, and physical capital. With the integration of data gathering and analysis from the local group as target users of the community, the findings would lead for the recommendations towards community development based on the potential for sustainable development.

2. LITERATURE REVIEW

2.1. Concept of Community Development

The city's growth has been causing congestion, and environmental degradation. When considering on the case of developing world, a more serious problem has been found in area of informal settlements, invading communities scattered in different cities which has been remained and continued reflect social inequality as part of the history of most cities. In particular, this type of settlement has been existed as a result of urbanization and industrialization as populations boomed in Bangkok and its suburbs together with the lack of proper land management to accommodate the residents, especially for the lower level. Therefore, the government allocates a policy to solve the problem of low-income housing in cities and intruding communities to ensure affordable and accessible housing to the poor in cities. The establishment of the "Ban mankhong" project is to develop sufficiently responsive for living in slum communities which started operation since 2003 [9]. It is supported by the government by assigning the community organization development institute (public organization) together with the community organization the urban poor and incorporate them into social housing

program, the organization emphasizes on the participation of community and local organizations which leads to cooperation in solving problems of urban service to accommodate urbanization together. The approach to community development can therefore have a variety of action approaches whose efficiency depends on the community's context and environment conditions. However, process of development needs to take into account for the needs of the community or local users of the service. The consideration should be based on three assumptions as follows [10]; (1) A person is a creature that has needs and desires influence or motivation behavior. Case of only unmet needs are the motive and the needs that have been met are no longer motivating. (2) The needs of individuals are hierarchical and sorted by importance from basic to complex needs. (3) When the needs are low, and receive a good response, then the person will continue to move towards a higher order requirement.

2.2. Sustainable Local Economic Development

Development of local economy is the implementation of various economic activities or choices for local people including agricultures, service industry, production, consumption and distribution. By allowing people in the community to participate in solving the fundamental economic problems of the community, it requires a process of participation in thinking, co-thinking, taking part, and benefiting. It is based on the foundation of existing capabilities from "Community Capital" [11]. The process of economic development and community capital is consisting of a production system, a management system, a marketing system by using community capital which is an important tool to go through the process of analyzing the economic system and community capital of each area. Then, development plan can be drawn with clear goals and indicators with more efficient activities. However, it should be considered in building an understanding from the question which comprises of "what are resolutions, what to do with whom, what to do, why and what to do?" [12]. In conclusion, the community economy is characterized by each household as a productive unit. The labor of family members is the most important factor which is a critical component for the job prospects of each family, sufficiency and self-reliance according to the local economy concept. The community must be self-contained, dynamic and able to survive on its own.

The recommendation can be in line with the development of capitalism [13-14]. It is interesting to monitor the simple economic characteristic aspects of the community in term of local job with diversify sources of income by using local resources and be less vulnerable to economic downturns for local people [15]. Especially, all these activities should not be carried out as single or isolated activities, but put together like a puzzle to shape an integrated local action plan to re-establish local economic cycles [16]. The driving factor of the

community economy to be considered includes; (1) Human resource development: consists of the pattern of development among 3 groups of people: local economic leaders, local member within the community and relevant officials. They must develop their skills and knowledge based on economic development within the community, (2) Organization development: by focusing on building capacity of groups or communities and emphasizing on supporting each other to promote participation in joint action, (3) Development of physical foundations: by recognizing the availability and service condition of facility and infrastructure to support local economic activities, especially, the utilities and basic municipal services related to consumption and production such as water supply, waste management, electricity, etc.

2.3. Circular Economy Concept

The circular economy is adopted to replace the traditional economy (linear economy) based on the use of Resource - Production - Discard (Take-Make-Dispose) concept to a circular economy model. It brings back utilizing the resources with the concept of reproducing and reusing in solving the emerging resource shortage crisis and contributing to sustainable growth [17]. The principles of the circular economy cover three main principles which are: 1) design products and services that focus on the cost of natural resources, 2) increase the efficiency of resource utilization for maximum benefit through the rotation of raw materials and goods, and 3) reduce the occurrence of waste and negative externalities on the environment as much as possible. Those three principles make it come across a traditional production system or a linear economy that concerns disposable production (make-use-dispose) and focus more on profit as a set.

However, when the focus was shifted to a circular production system, it considers an approach of reusing raw materials from used products (make-use-return) [18]. It is evolved into the adoption of clean energy concept while reducing the negative impact and increasing the positive impact on the economic aspects. In short, a circular economy is an economy idea where the value of raw materials, resources and products are preserved as long as possible and waste generation is lowest. It is about the recycling of used resources and reusing them in the future by using innovation and technology to help in the new production process for the most efficient use of resources. This circular economy principle is not just a concept to preserve the environment and society, but can also bring economic benefits as well.

3. METHOD AND STUDY AREA

This project considers the Lat Phrao community as a study area by considering 3 communities of samplings among 50 communities. The study area covers the communities along the Lat Phrao Canal which is considered as the most potential canal for promoting water transportation system connectivity with mass transit connecting as depicted in Fig 1. The

interview process was designed for 30-40 minutes intervals per person with a total of 45 people by selecting from communities along the study area. The target group is

classified by the social status and the characteristics of the community's membership which are: 1) community leaders and 2) local people within the community.

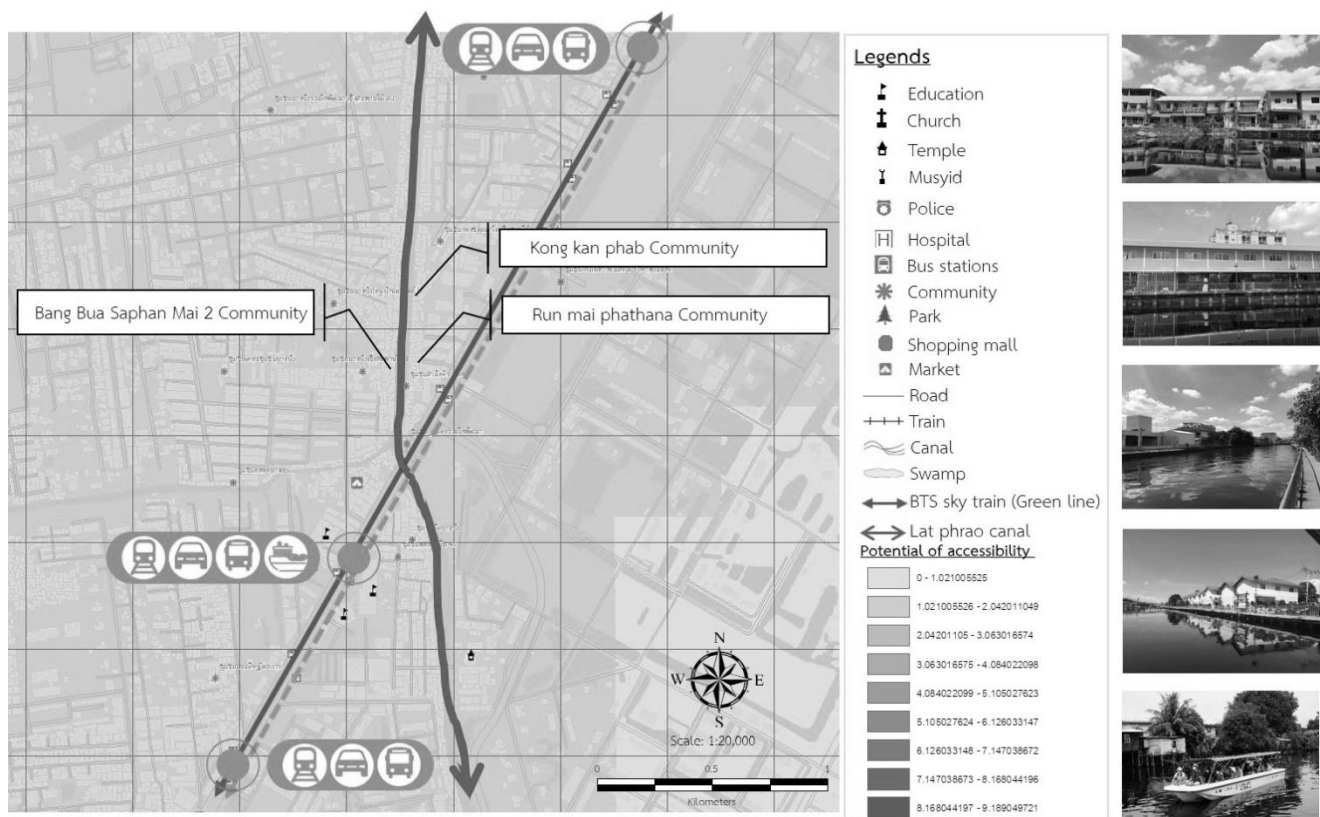


Fig.1. Study area and current living conditions.

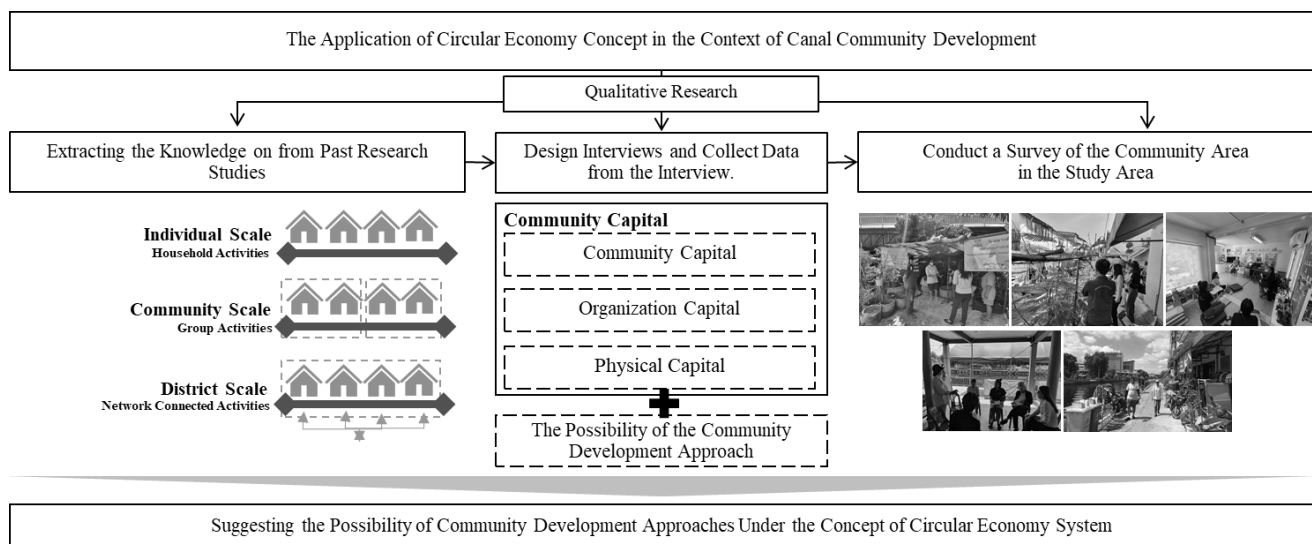


Fig.2. Framework of study.

The research methodology was designed by using a qualitative approach which can be explained as follows (Fig. 2);

1. Extraction knowledge based and finding issues from previous research studies of “Hybrid Canals-Rail Connectivity Project: Linking Bangkok's Canals Network

to Mass Rapid Transit Lines (2014-2015)” and “The Development of Community-Owned Canal Transit System, Boat Piers and Vicinity (2016–2017)” conducted by Thammasat University and supported from the Rockefeller foundation [19].

2. Conduct a site survey by gathering data from the communities in the study area to understand the needs within the community sampling that was located along Lat Phrao canal and housing improving under low-income housing project.

3. Interview survey and data collection from the focus group was performed based on participatory approach among community leaders and members. The components of the interview were divided into 4 parts which are;

1) *Human resource and community development capital*: It is the process of realizing the rights of slum dweller on their capacity to engage actively with other stakeholders. It can be varying depend on different level of cooperation among member within the community, the readiness and potential of the local people to cooperate, the responsibilities in driving the community development of community leaders, the level of participation and strength of networks among other stakeholders; government, communities and local agencies that drive community development at present.

2) *Group and corporate resource capital*: It is expected to support the confidence of community in the future. This is due to ensure people safe from eviction with a sense of long-term stability with local economy movement. It is consisted of financial support, personnel/experts, training, and equipment/ infrastructures.

3) *Physical capital*: It is important component to ensure the available urban services to the poor with sufficient level. The facilities and utilities must cover basic urban services in responsive to the view of the reality on the ground. The existence of local physical structures must be evaluated and apply the planning tools to evaluate the sufficient of infrastructure services.

4) *The possibility of the community development approach under a circular economy concept*: Regarding limitation on job opportunities and housing choice, upward social mobility must be considered within the communities constrains. Thus, with restrictive social or cultural realities, the offering of an alternative lifestyle and reskill for job opportunities must be introduced with an option of waste management, farming and household gardening.

4. RESULTS OF ANALYSIS

4.1. Knowledge Expansion and Community Development Approach

Based on the results of a research study under Hybrid Canals-Rail Connectivity: Linking Bangkok's Canals Networks to Mass Rapid Transit Lines (2014-2015), the potential development of water transportation system of the Lat Phrao Canal was recommended. It indicated the potential of canal connectively and current demand of utilization to link the inner of Bangkok area. This leads to an extension of the further research under "The Development of Community-Owned Canal Transit System,

Boat Piers and Vicinity Project (2016 – 2017)". The result of analysis demonstrated the potential linkage of the canal network together with the rail network to allow commuters to be able to travel in their daily life and to promote tourism in the community. The potential of the community to start a social enterprise was also recommended to help promote the process of community involvement in a business model by leveraging the existing networks to meet the needs and potential of the community. The results of the study can be summarized the potential business model guidelines as follows;

1) *Individual Scale*: Connecting the micro-activity system to the voyage while increasing accessibility through a smart boat with very high potential to become a business after the canal's development, e.g., activities such as small business activities such as laundry shops, beauty salons.

2) *Community Scale*: This business level can generate income opportunities for the community, e.g., research trip, solar energy power and OTOP.

3) *District Scale*: It provides an option for linking economic activities within the entire community, e.g., smart boat and coop boat.

From such a model of economic activity within the community, it can be seen the potential of water transport by boat which can become a business after the canal's development. Consequently, it would result in large numbers of people boarding and alighting all day. This can bring that potential as a core for linking other levels of business activities within the community, e.g., shops, laundries, restaurants and other services to be essential in the area. As well as an additional suggestion of economic activity models is about to create alternative actions for the community improvement.

4.2. Human Resource and Community Development Capital

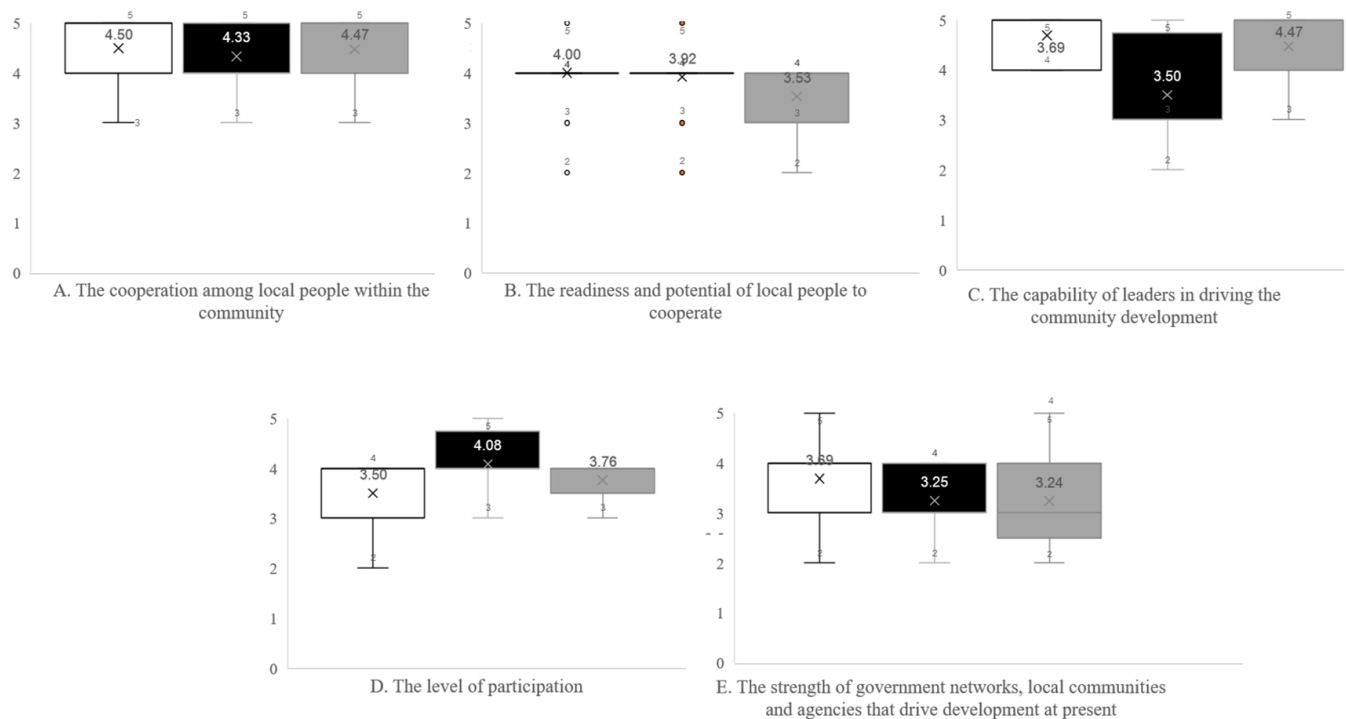
Lat Phrao community is considered as a model of housing development along the canal because the dwellers are involved in working and earn additional income. Starting from the community survey, determination of mutual agreement, co-housing development planning and guidance, all household of total of 229 houses have same possibility to join the project. The model of low-income housing development in the Lat Phrao community focuses on building houses and communities along canal with serviceable and affordable land for the slum settlements in consistence with level of environmental health and basic living conditions. The landscape along canal would be improved with better aesthetic view and greenery scenes. The current of concrete walkway along the canal must be reconstructed with sufficient spaces for walkability and support daily active commuters. Furthermore, the living spaces and public spaces must be improved and provide recreation choices for the communities as well as various service management systems must be well organized. Such

development requires the cooperation from many groups of stakeholders with multi aspects, e.g., savings, welfare, cremation. Since the realizing the housing improvement of slum settlements depends on their capacity to engage actively with the concerned authority. It requires a process to allow an engagement in a dialogue about upgrading their communities.

However, it must be considered together with the cost of human resources and community development organizations; there are five factors which should be focused and explained as follows;

- 1) The cooperation among local people within the community (X_1),
- 2) The readiness and potential of local people to cooperate (X_2),
- 3) The capability of leaders in driving the community development (X_3),
- 4) The level of participation (X_4), and
- 5) The strength of government networks, local communities and agencies that drive development at present (X_5).

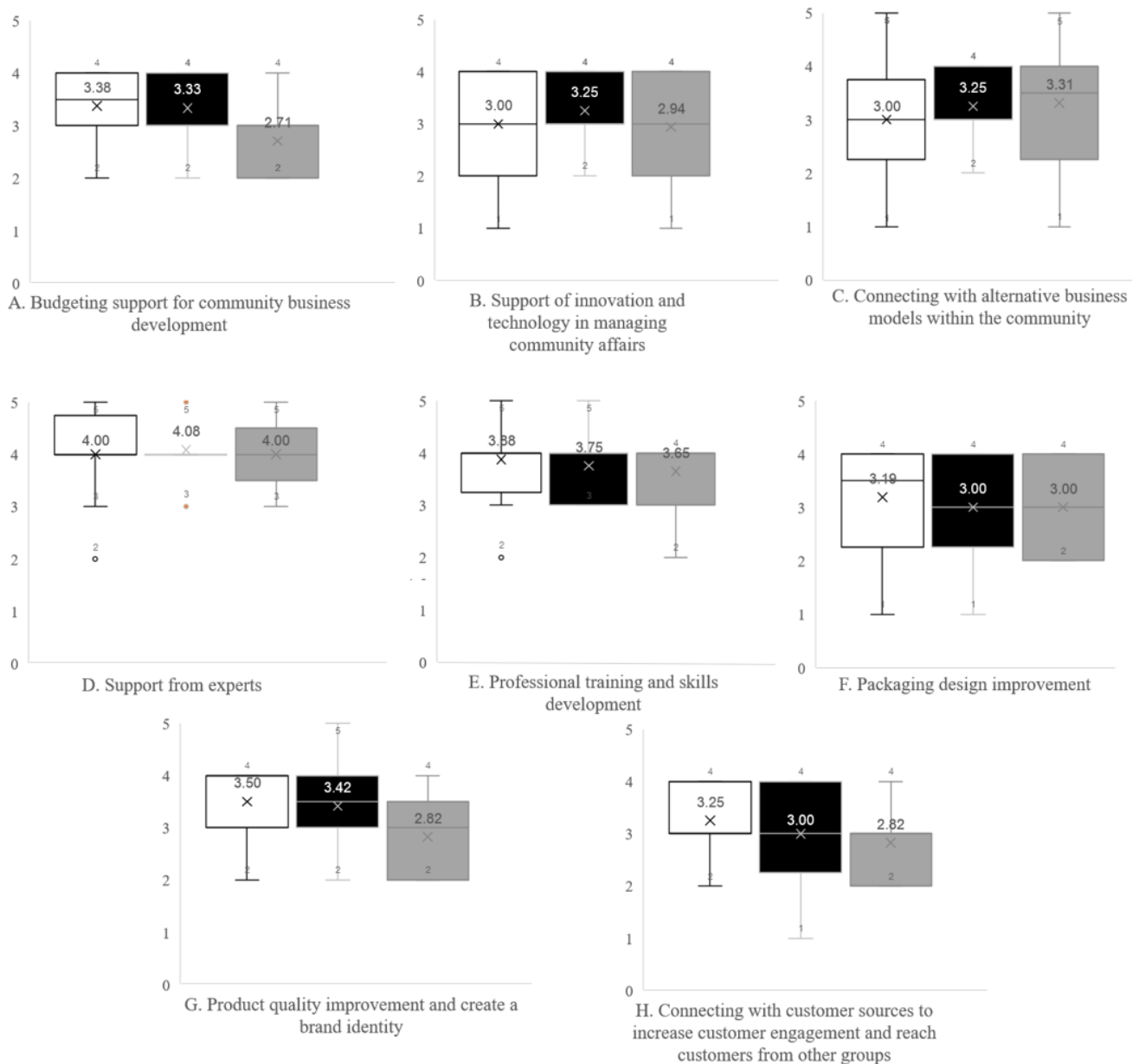
As a result of the data analysis, it was found that the current potential social and organizational capital factors according to the respondents' attitude were the level of cooperation among local people within the community ($X_1=4.43$), followed by the capability of leaders to drive of community development ($X_3=4.22$), readiness and capacity among local people to cooperate ($X_2=3.82$), level of participation in community development among local people ($X_4=3.78$), strength of the entire government network, local communities and agencies that currently drive development ($X_5=3.39$) as demonstrated in Fig 3. The above result of analysis indicates the opportunities for community economic development due to the potential of the cooperation among local people within the community. It can be considered as an important factor in conducting activities which cannot be carried out by only one group of community for each activity. Rather, it should work together within the community to create a connected economy, both in the form of activities within and between closed communities to balance benefit-sharing.



Remark: score = 1 (Low) – 5 (High)

□ Bang Bua Saphan Mai 2 Community ■ Kong kan phab Community ▒ Run mai phathana Community

Fig.3. Human resource and community development capital (social aspect).



Remark: score = 1 (Low) – 5 (High)

□ Bang Bua Saphan Mai 2 Community ■ Kong kan phab Community ■ Run mai phathana Community

Fig.4. Human resource and community development capital (economic aspect).

More findings can be revealed as shown in Fig. 4 which demonstrated the possibility of cooperation among local community people to alleviate their social and economic problems and improve the current situation. This study employed 8 factors for the assessment which consisted of; 1) budgeting support for community business development (X_1), 2) support of innovation and technology in managing community affairs (X_2), 3) connecting with alternative business models within the community (X_3), 4) support from experts (X_4), 5) professional training and skills development (X_5), 6) packaging design improvement (X_6), 7) product quality improvement and create a brand identity (X_7), and 8) connecting with customer sources to increase

customer engagement and reach customers from other groups (X_8). The results of the study showed that the most likely factor according to the target group's attitude is the support from experts or personnel to help business model development ($X_4=4.03$) follow by, professional training and skills development ($X_5=3.76$), product quality improvement and create a brand identity ($X_7=3.25$), budget support for business development ($X_1=3.14$), linking businesses with other business models within the community ($X_3=3.12$), packaging improvement ($X_6=3.06$), support of innovation and technology in the management

of community affairs ($X_2=3.06$), and readiness and potential of local people to operate and execute their business ($X_8=3.02$).

4.3. Group and Corporate Resource Capital

The community area along the Lat Phrao Canal is considered as the most potential canal for urban connectivity while reflects the strength of the community in co-development with other sectors to improve their quality of life and solve the quality of living. Along with economic development within the community, the proximity area of the communities that located in our study area represents a high density of living, resulting in a large group of commuters and users. The community along the Lat Phrao Canal has existing potential cooperation with nearby and outside academic groups, community developers as well as the private organizations which has always been involved in developing and solving problems within the community. This is due to the fact that it is a key area for residential development that is considered quite successful in community rehabilitation due to the high level of participation among group of people in the community, academic network, private agencies and government agencies. The ultimate goal of housing improvement project is to provide people with affordable housing with a good living conditions and environment. The relevant agencies can cooperate and help to support and promote the quality of life of the people of the community, e.g., promoting job opportunities, waste management, wastewater treatment, promote activities for children, youth, women, the elderly and the disabled as wells.

Based on the consideration of the past cooperation and community development mechanism, the agency that has been involved in activities within the community comprise of many sectors. It was found that there are three main sectors which are government agencies (85%), private firms (3%) and education sector (12%) (Fig. 5). When considering the model of support from different agency, it was found that the mechanism for supporting and implementing activities within the community was divided into 4 key resource which comprise of: 1) financial support, 2) personnel/experts involve, 3) training and workshop, and 4) equipment/ infrastructures. However, it was noticed that the main support for low-income group was in term of materials and infrastructure due to an urgency of government contributions and incorporate activities. Currently, many areas in the study area are under construction and completed the construction of the flood controlling and retaining wall. However, in some communities where the improvement of housing development project was completed, more social and economic development would begin to create a better living and environment for people within the community.

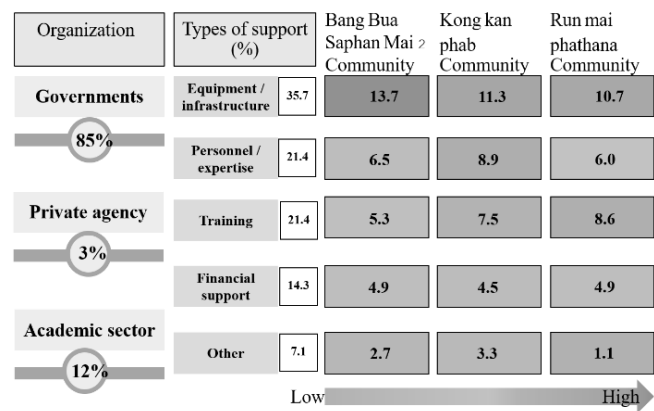


Fig.5. Group and corporate resource capital.

4.4. Physical Capital

Lat Phrao Canal is a strategic point that cuts through Bangkok's with the most congested area in the east of Bangkok. The great potential for residential and commercial development is due to the allocation of intersection point between Bang Sue and Saen Saeb canals which connect to the Chao Phraya River. Interestingly, the Saen Saeb Canal is only a waterway that connects Eastern Bangkok with the city center. The potential of the allocation of Lat Phrao Canal community can be noticed with the geographical of its urban area with high density of activities and residential buildings which make the area with a variety of activities and amenities as depicted in Fig. 6.

4.5. The Possibility of the Community Development Approach under Circular Economy Concept

The result of analysis from the focus group among community people revealed that there are different possibilities for future development. By considering the capacity of the current economic activities within the community, the consideration for recommendation was comprised of 3 forms of suggested activities based on the body of knowledge to contribute towards a circular economy system development. According to the data analysis, it was found the interesting points of potential activities to be recommended in the communities as presented in Table 1.

1) *Waste management*; it can be seen that the nature of the current problem is to collect, dispose in trash and wait for collection by government agencies. Some have sorted waste to sell for some specific type of salable waste. Screening of waste or waste management is for partial group of plastic waste or separated garbage that can only be sold. However, organic waste generated from the communities are only disposed and follow waste management from local authority. For potential actionable development guidance, it was found that if such actions were recommended, it is expected to be a method that can be applied within the community. There are four options of

waste management (X_W) which are separating waste ($X_{W1}=3.73$), organic waste, composting ($X_{W2}=3.13$), creating new products from waste ($X_{W3}=2.53$), and reuse ($X_{W4}=2.36$).

2) *Farming and household gardening*; it can be seen that most of the current characteristics are self-cultivation in the household level. This is due to the problem of space constraints with less available space for gardening. Therefore, when inquiring about actionable development advice, it was found that there are four possible actions expected to be a method that can be applied within the community. The household farming and gardening options (X_F) consist of; gardening within family ($X_{F1}=3.82$), family gardening and sharing within the community ($X_{F2}=3.49$),

gardening own food and selling within the community ($X_{F3}=2.33$), and self-grown and selling outside the community ($X_{F4}=1.89$).

3) *Economic activities within the community*; it can be seen that the nature of the current economic situation in the community consisted of 5 options. The potential economic activity in the study area (X_E) comprise of five options which are; local producing and community commerce among people in the study area ($X_{E1}=1.16$), followed by sharing goods and commerce within the community ($X_{E2}=1.00$), sharing goods and commerce for people outside the community ($X_{E3}=0.76$), online commerce ($X_{E4}=0.71$), and commerce with other communities ($X_{E5}=0.69$).

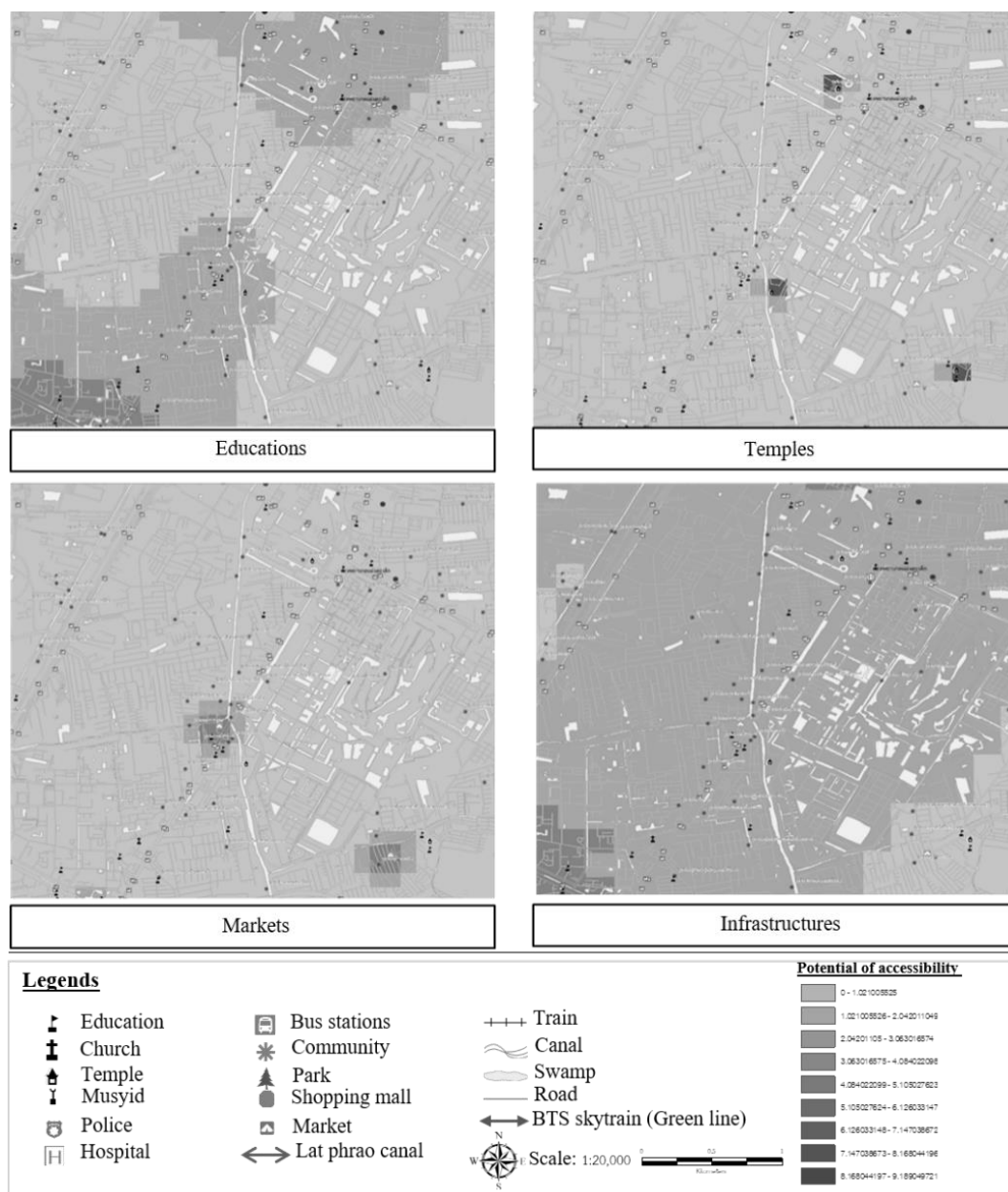


Fig.6. Physical capital.

From the above-mentioned data collection, it was found that the most potential economic activities were about the business carried out within the community both producing and commerce and a direct and non-circular form of economic activity. This business should be transformed to the circulation of activities for benefits sharing within the community.

5. CONCLUSIONS AND RECOMMENDATIONS

This study focuses on analysis of the potential of the community development by focusing on the social and economic activities within Lat Phrao canal communities towards circular economic development approach. Based on result of analysis from data gathering among different stakeholders, a recommendation for low-income community improvement models should consider different level of an integration of business development model. By considering community-based benefit sharing, the case study of Lat Phrao communities was targeted on the basis of a qualitative research. The interview form was applied and designed to focus on 4 components of analysis which are; (1) human resources and community development capital, (2) group and corporate resource capital, (3) physical resources of the community, and (4) the possibility of the community development approach. Under the concept of a circular economy system, this study applied the concept to the economic development to assess the needs and capacity of low-income group within the study area by face-to-face interview among 45 community people. The community leaders play an important role to create the power of communication and knowledge sharing, however, the regular activities set up for strengthening local people collaboration and mutual understanding within the community.

Although, the built environment of canal community represents the poor conditions, circular economy strategies could then be applied to link the low-income group with the opportunity for an inclusive transition of their informal jobs to the mechanism of new business options. Due to their existing potential of socio-economic activities and networking in the area, the circular economy model can be adapted with low cost of diversify options for their alternative sources of income. This is to maximize benefit through the rotation of goods and services, e.g., organic waste, green energy from solar rooftop, etc. This concept can help in reducing the negative impact and increasing the positive impact on both social and economic dimensions in the communities. Besides, employing innovation and technology in the new production process for the most efficient use of existing resources must be realized for community-based initiatives. The transformation among their current network with inclusive approach can help and encourage them to adopt safer techniques and to gain socioeconomic benefits to earn a living from trading and processing products within their community.

Table 1. The possibility of the community development approach under a circular economy concept

Variables		Mean	Std. Deviation	<i>t</i>	Sig.
Waste management (X_w)	Separating waste (X_{w1})	3.73	1.321	18.956	.000
	Organic waste (X_{w2})	3.13	1.471	14.290	.000
	Creating new products from waste (X_{w3})	2.53	1.325	12.830	.000
	Reuse (X_{w4})	2.36	1.131	13.968	.000
Farming and household gardening (X_F)	Family gardening (X_{F1})	3.82	1.683	2.432	.019
	Family gardening and sharing in the community (X_{F2})	3.49	1.740	15.238	.000
	Gardening own food and selling within the community (X_{F3})	2.33	1.552	13.449	.000
	Self-grown and selling outside the community (X_{F4})	1.89	1.335	10.085	.000
Economic activities within the community (X_E)	Producing and trading for people within the community (X_{E1})	1.16	1.906	9.490	.000
	Sharing goods and trading for people within the community (X_{E2})	1.00	1.698	4.066	.000
	Sharing goods and trading for people outside the community (X_{E3})	0.76	1.228	3.906	.000
	Online commercial (X_{E4})	0.71	1.180	4.129	.000
	Commercial with other community (X_{E5})	0.69	1.240	4.043	.000

All stakeholders must be responsible for better quality environmental health and basic living conditions for current low-income group towards an enhancing equity, economic productivity, and environmental sustainability. However, in order to achieve the ultimate goal of economic productivity, community tourism is a key option to create more business activities for ensuring jobs opportunities for all income levels, however it is necessary to improve the current infrastructure system and built environment. Finally, the creative partnerships and collaboration among all levels of government, civil society organizations and citizens, and the private agency are essential to achieving a holistic strategy in ensuring vital services while allow

communities in a role in co-creating solutions that work for all.

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