

An Approach to Enhancing Local Assets for green area protection — a Case Study on Song Khlong, Chachoengsao Thailand

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Abstract: Green areas are continually being decreased due to urbanization although it has been controlled by city planning law. This article aims to propose strategies to maintain green areas in the Song Khlong area based on a value-added planning approach. An inventory of the existing communities' fund and green spaces was established as communities' database. Subsequently, a map of these data was created with community participation. Thereafter, strategies for either reducing the running costs or generating income were taken into consideration. It is possible to promote ecotourism in the Song Khlong areas as the major activities during weekends of people living and working around Song Khlong are shopping (48%), going to the temple (20%), going to the beach nearby such as Bang Saen beach (11%), going to the floating market (9%), and others (9%). Therefore, three projects were proposed, including (1) aesthetic improvement along the RiebKhlong road, (2) development of the WatTrisaranakom floating market, and (3) conservative tourism development in the mangrove forests of the Song Khlong village. All three projects support each other: activities on day trips can mostly be at the floating market, with going for a stroll could be at the nature-learning trails and staying for overnight at homestay. This is not just nature learning; it can simultaneously be a learning of community lifestyle with sustainably maintaining green areas

Keywords Community Assets, Urban Green Conservation

1. Introduction

Green areas are continually being replaced with concrete because of progress in urbanization. Urban expansion mostly tends to occur in hinterlands which are generally adjacent to biodiversity hotspots (Secretariat of the Convention on Biological Diversity, 2012; Seto et al., 2013). In addition, the fast pace of change and the high price of land in urban environments have posed a threat to green corridors as far as long-term protection is concerned (Dearborn D.C., 2009). At the same time, sustainable development in which green areas are retained is a challenge for both developing and developed countries (Haq2001). Consequently, urban growth now has to seriously include creation of as much large recreation zones as possible which remain natural areas (Savard et al., 2000).

It has been suggested that the attitude of the civil society is a very important factor in maintaining green areas if governments do not provide much encouragement to the land owners to keep their areas green. Therefore, it is necessary to understand clearly how green areas can provide added value to the economic growth of communities. For instance, the general satisfaction resulting from the aesthetic environment in Singapore and Kuala Lumpur, Malaysia, attracts investors and residents to these places (Sorensen et al., 1997). At the same time, it has been found that green areas are able to increase the value of community properties by around 5 percent to 15 percent (Heidt and Neef, 2008). Several literature reviews have also revealed the positive influence of green areas on land property values (Benson et al., 2000; Luttk, 2000; Wolf, 2004; Harnik and Welle, 2009). In addition, urban green areas provide the scenery of a place as favorable, and that encourages retail sales and attracts tourism (Woolley, 2003). Furthermore, urban agriculture, among the types of green area (Greenspace Designs, 2010), can decrease urban dependence on food supplies as urban areas depend food productivity heavily on hinterlands. As far as biodiversity of green areas is concerned, it provides low risk of disease transmission to humans as well as low risk of mental illness (Secretariat of the Convention on Biological Diversity, 2012; Colleen et al., 2010). Moreover, as, in recent times, the impact of climate change has become exacerbated, the green infrastructure has been proposed as a potential approach toward mitigating the risk from climate change (Forest Research, 2010). By and large, the benefit of green areas is broad. Cilliers and Timmermans (2013) categorized the value of green areas into direct and indirect benefits. With respect to direct benefits, it covers social benefits, environmental benefits, and future benefits, and all of them cannot be measured in terms of monetary value, while indirect benefits can be referred to in terms of economic value.

The lack of a consistent strategy makes it difficult to manage urban green infrastructure (Shikha, 2016); however, planning processes need to ensure that green infrastructure can be maintained as a crucial part of urban fabric (Cilliers et al., 2010). According to Cilliers and Timmermans (2013), value-added green areas need to pay attention to creation of green space inventory and suggestion of strategies to either reduce running costs or generate

income. This paper focused on creating green space inventory in the study area through the participatory process and community capitals. Following which, searching for proper guidelines in order to create strategies for generating financial returns from urban green spaces was performed with regard to an advisory community. Finally, the policy and conceptual design of green value addition was proposed to the local authority.

2. Methodology

In order to propose strategies to maintain green areas in Song Khlong, the value-added planning approach (Cilliers and Timmermans, 2013) was applied as the primarily guideline of this research process. Therefore, this research process covered two main steps: firstly, an inventory of the existing green spaces in Song Khlong was established, and, secondly, strategies for either reducing the running costs or generating income were taken into consideration (see Table 1). In the first step, there are two main objectives, including the extent of designing of green areas and the gathering of data regarding the green space. According to research objectives which mainly aim to propose strategies for generating income from existing green spaces, the green area inventory, therefore, focused only on its types and sites. Literature review and meeting with stakeholders were conducted so as to achieve the aims of the first step.

Regarding the second step, in order to achieve generating income strategies from existing green spaces, three objectives need to be achieved. First of all, pertinent information needs to be derived. This consists of community capital, activities, and lifestyles of residents and workers living around Song Khlong. In accordance with Brown et al. (1997), sustainable development highly relies on holistic analysis in which ecological, economic, and social systems are taken into account for the study. Simultaneously, the development needs to be based on self-capital so that the community would be able to see the potential, and that would lead to sustainable development in the community. This research applied the concept of community capital (Community Development Department, 2010) as information for considering the methods for the determination of generating income strategies. This concept pays attention to five categories, including natural capital, physical capital, human capital, social capital, and financial capital. The participation was determined from meeting with stakeholders including mayor, deputy mayors, village heads, other local officials, and local people so that the information regarding the community capital could be demonstrated as a capital map. Meanwhile, information on the activities and the community lifestyles were obtained by ways of questionnaire analysis. Furthermore, all attributed data acquired from the previous step was going to be synthesized and transformed into imaginary information by groups of architecture students. Moreover, imaginary projects for generating income were proposed to stakeholders through the meeting in which the strategies were delivered to the stakeholders and the local authority.

Table 1 Summary of Research Operation

Working steps	Process	
	Objectives	Methods
1. Create a list of green inventory	1.1 design extent of green areas	reviewing literature
	1.2 gather data of green space (type and site)	meeting with stakeholders for making them understand the importance of green space, and establishing a community green area map
2. Design strategies	2.1 gather information for generating income strategies - information needed is composed of the following: 2.1.1 community capital	meeting with stakeholders for the following purposes: (1) making them understand the meaning of community capital (2) designing community capital in Song Khlong (3) expressing their attitudes on desirable green areas
	2.1.2 investigate activities and patterns of lifestyle of residents and workers who live around the Song Khlong area	questionnaire analysis
	2.2 synthesize and transform attributable information into imaginary information	groups of students studying in the last year of an architecture program gather and work with all the information, combining social data with field survey to create projects which generate income for the community based on their green spaces
	2.3 propose strategies for generating income for communities and local authority	meeting with stakeholders to propose strategies with potential projects

2.1 Study area

Song Khlong sub-district, Bang Prakong district, Chachoengsao province, Thailand, was properly chosen as the area for study because of its physical characteristics and geographical location. The area of Song Khlong covers 29.374 km², and it includes 10 communities. One-third of this area is covered by mangrove forests; therefore, the occupation of the majority of the people there has been coastal fishery and aquaculture. There are only a few factories in this area, and the rest of the area is predominantly residential. According to a ministerial regulation of applying a comprehensive plan for Bang Prakong city, the type of land use in Song Khlong is such that it is designated as a green zone.

Although the geographical area of Song Khlong shows its location as Bang Prakong's estuary which encompasses developed industrial zones, it has become a green area though it is in the center of developed industrial areas. The Bang Prakong Industrial Zone is in the east while the Welco industrial estate is in the north, and the Bang Plee and KlongDaan Industrial Zones are in the west; only the south is connected to the Gulf of Thailand (see Figure 1). The ministerial regulation to applicable comprehensive plan is the only key factor contributing to the remaining of the majority of the aquaculture areas presently in Song Khlong. But this is not an actual requirement of a majority of citizens, and particularly the local authority, as what they require are more opportunities for development. This is because there is not enough financial returns from aquaculture for supporting a good infrastructure for them, and, crucially, their land price has been lower than that of the surrounding developed zones.



Figure 1. The Song Khlong boundary and its adjacent areas.

3. Results

Based on both objectives — green inventory and design strategies — the results of green inventory are included the community's green space map, the list of community capital, and the activities and the patterns during weekends of people living around Song Khlong. These data would lead to achieving designs that take into consideration recommendations of projects that generate income for the community and support for the conservation of green areas.

3.1 Extent of green areas: Types and sites of green spaces in Song Khlong

To explain the potential of the community through learning about the community assets and to create harmonious views of the value of green areas to the community, the first meeting with the mayor, deputy mayors, eight community leaders, other local authority officials, and Song Khlong community's members took place. The participants had worked together to find out the community capital, to create a handmade map of green spaces, and to design green spaces in Song Khlong (see Figure 2). Based on the meeting results, it can be summarized that green spaces in Song Khlong rely on aquaculture areas. These comprise fish ponds, shrimp ponds, cockle culture areas, salt fields, agricultural areas, canal networks, mangrove forests, and seaside areas.

3.2 Community assets of Song Khlong

Based on the category of community assets of Community Development Department (2010), the community assets of Song Khlong was determined through the meeting process. Local authority officers and relevant stakeholders had the opportunity to spend a period of time working together to design the capital based on the kinds of capital the places have been. The result can be presented as follows (Figure 3):

- 1) Natural capital refers to general natural resources and environment: from these aspects, seaside areas, mangrove forests, canal networks, and fishery resources can be provided in Song Khlong.
- 2) Physical capital refers to man-made constructions which support human lifestyles: these can be counted as including the Hong Tong temple, the Trisaranakom temple, the Samekhao temple, the mandapa of the Buddhist master (Pan), shrines, mosques, markets, and schools.

3) Human capital refers to distinguishing of skills or local wisdom of local people; human assets in the Song Khlong community include Thai traditional dramatic performances, Thai classical masked ballets, instrument builders, aquaculture trap builders, boatbuilding, and a development center of sufficient economic.

4) Social capital refers to social interaction in a given society which is presented as a public organization, a civil society, community cooperation, or community traditions. Song Khlong has retained several traditions such as the ceremony of pouring water onto a Buddha image, the water-pouring ceremony that seeks blessings from respected elders, and religious ceremonies at the central areas of communities.

5) Financial capital refers to monetary characteristics which include monetary bodies and the potential or opportunity to access fund resources. There are several funds that belong to Song Khlong, and some of these are the community fund, supporting career fund, agricultural fund, fishery fund, permanent house fund, etc.

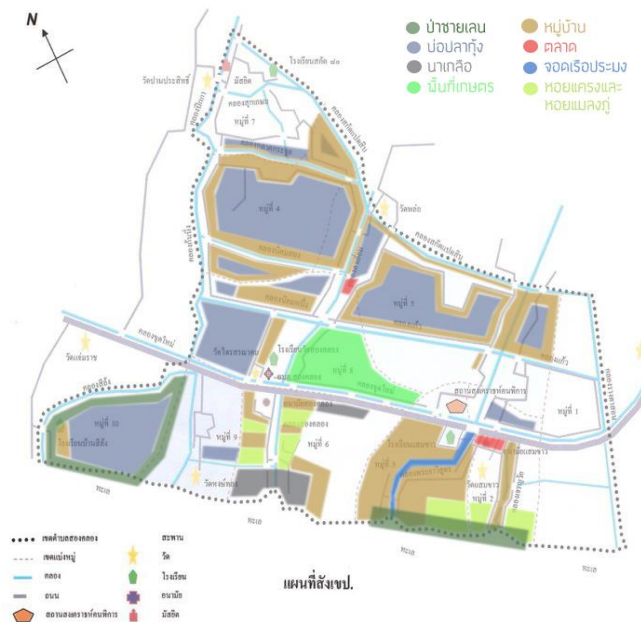


Figure 2. Distribution of green space in Song Khlong.

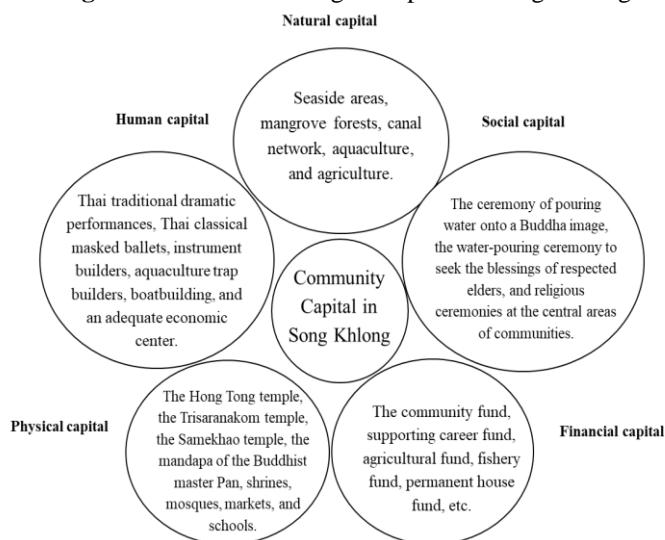


Figure 3. Summary of community capital in Song Khlong.

3.3 Activities and patterns of lifestyles during weekends

It can be summarized that the Song Khlong community has several assets. The community participation majorly proposed ecotourism to add value to their community. The location of the Song Khlong community itself can attract tourists to live or work in the surrounding areas. The design of ecotourism must respond to weekend lifestyle of residents and workers living around the Song Khlong district. Therefore, a total of 324 cases of questionnaires were distributed by conducting interviews face to face with residents and workers in order to investigate the activities and the patterns of recreation of those people. (The information is detailed in Table 2.) The results of the investigation could be summarized thus: the major activity during weekends of people who live around Song Khlong has been “shopping,” with 48%, while the second major activity, with 20%, has been “going to the temple.” The third activity is “visits to the beach,” with 11%, and the fourth, with 9%, has been “going to the floating market.” The last activity, with 9%, was “eating at the seaside.”

Table 2 General Information from Questionnaires

Issue of respondents	Information regarding respondents	
Age of respondents (work-force age)	20–50 years	Average age: 33 years
Occupation	Factory worker	96%
	Others	4%
Members of the household	3–4 persons	
Income (average)	16,500 baht/person/month	36,800 baht/household/month
Expense (average)	8,000 baht/person/month	21,000 baht/household/month
Expense for weekend recreation (average)	1,395 baht/person	3,690 baht/household

In accordance with patterns of lifestyles, these can be discussed in terms of frequency. It was found that about 10% of respondents had gone for recreation every Sunday, while the majority of respondents, 60%, had gone for vacation about 1 to 2 times per month. As for the rest, it was found that they went for vacation less than once per month. If the details are considered thoroughly, it can be found that the group of respondents who go for weekend vacations at least once per month preferred to go to floating markets and temples, while the group that goes for weekend vacations less than once per month mostly went to the beach or ate at the seaside.

The activities and patterns of lifestyles of people living around Song Khlong will play an important role in designing and deciding whether green areas in Song Khlong should be developed in order to generate income to the community with demand of the consort.

Based on the community capital which presents that the Song Khlong lifestyle is dependent on the canal network as their major occupation are aquaculture while the physical areas are in the coastal zone with a large area of the mangrove forests, and with regard to information about the attitudes relevant to the activities and the patterns of residents around Song Khlong, the floating market is the most popular hub of activity on weekends for the group of respondents that go out at least once a month. Therefore, three projects were proposed for the local authority and the Song Khlong people, and they include the following: (1) Aesthetic improvement along the RiebKhlong road, (2) development of the WatTrisaranakom floating market, and (3) ecotourism development in the mangrove forests of the Song Khlong village.

3.4 Aesthetic improvement along RiebKhlong road

These project areas cover the right of way to Sukhumvit road, the starting point of which is at the community on the east and the finishing point is at the west community (Figure 4). The concept is that of providing an identity to the area with arched entrance on both sides and plants along the road. The arched entrance will become a recognizable landmark. With plants along the road, a separate concept is presented that the south edge of the road will provide a large pedestrian stretch with the shade of plants, and the north edge of the road will provide a bicycle lane with periodic resting points (Figure 5).

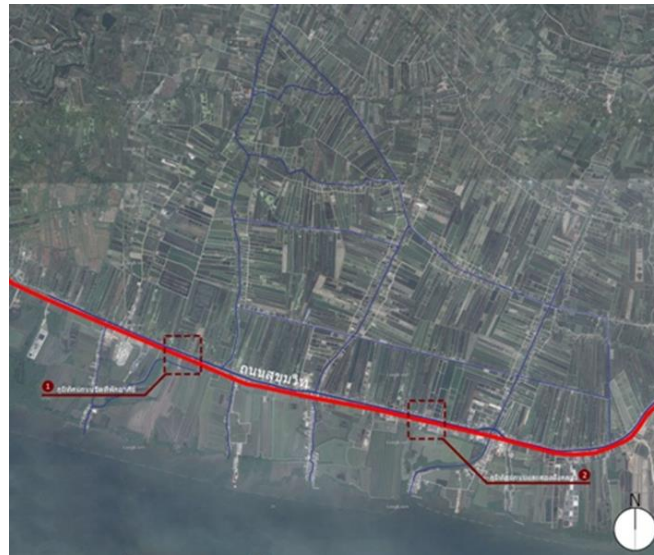


Figure 4. Areas for applying aesthetic improvement along Sukhumvit road.

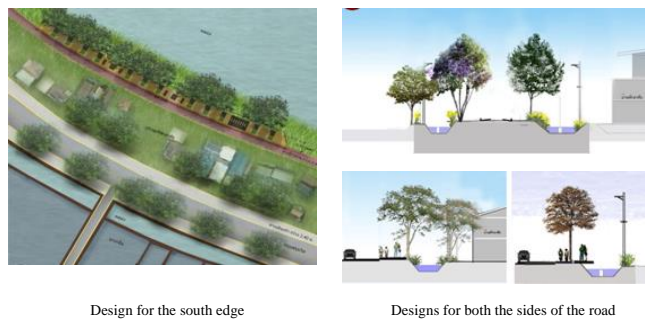


Figure 5 The conceptual design for the south and the north edges of Sukhumvit road.

3.5 Development of Wat Trisaranakom floating market

Development of the floating market is mainly aimed to provide opportunities for generating income to the villager, and, as a result, support the financial system of the local government through fees acquired from merchants in the floating market. This market will cover areas both on the land and in the water. The concept design will be providing trading zones which mainly support local community products. A utility zone will be prepared at the edge of the canal to serve as the recreation area. This market will also provide an outdoor activity zone which will support the conducting of traditional festivals during intervals. With regard to the floating part of the market, it is designed as a raft connecting to the land part, while the sellers will be on their boats (Figure 6). This project is now included in the three-year development plan of Subdistrict Administrative Organization.



Figure 6 The conceptual design of the floating market.

3.6 Conservative tourism development at mangrove forest of Song Khlong village

This project covers three components which consist of a nature-learning trail, nature-sailing tourism, and homestay. With regard to the nature-learning trail, this could be enjoyed with coastal community lifestyles, simultaneously learning coastal ecological system. This trail will be shaded and provided with resting points. In some parts of the trail, it is possible to try to traditionally collect cockle by the mud sled. Another activity, sailing trail, is a longer natural trail than the nature-learning trail. The sailing trail may be provided with several resting points with community products. The last component is homestay, and this will provide an opportunity for visitors to stay at Song Khlong longer, and they can witness community lifestyles and visit several distinguished areas such as temples or local markets (Figures 7–10).



Figure 7 The nature-learning trail network in Song Khlong village

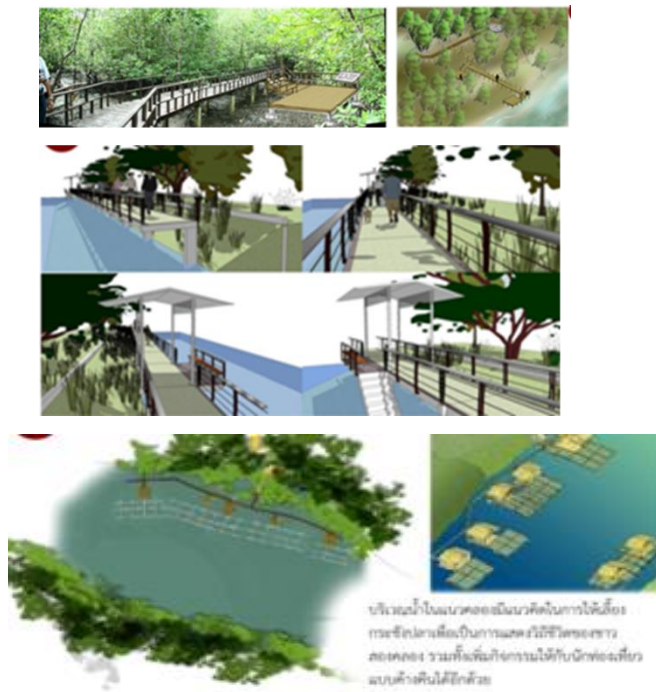


Figure 9 The homestay pattern.

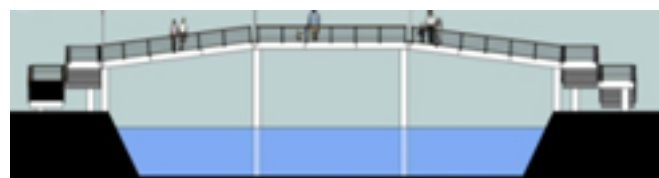


Figure 10 The linkage bridge design

5. Discussion

The results presented show that the projects contributed the most toward adding value and conserving green areas with regard to the community capital and the recreational lifestyles of the workers and residents of the neighborhood. The guideline of the projects for adding value relied on the canal network (Figure 2); the physical areas are in coastal zone with a large area being taken up by the mangrove forest. These community capitals are considered with reference to the attitudes relevant to activities and the patterns of relaxation of the residents around Song Khlong. The floating market is the most popular hub of activity on weekends for the group of respondents that go out at least once a month. Most of the respondents preferred to have their weekend recreation in green areas because they can relax their mind and body, while the community can gain financially from the tourists. This result is in line with the findings of the studies on building community capacity by appraisal capital assets for application in tourism development (Bennett et al., 2012). According to Wooley (2003), urban green areas provide favorable scenery of a place, and that encourages retail sales and attracts tourism. These value-added green areas of the Song Khlong community pay attention to keeping the green space inventory based on their assets (Cilliers and Timmermans, 2013), and pays heed to suggestions of strategies to generate income from the floating market, which is in line with Cilliers and Timmermans (2013).

All the three proposed projects are feasible for implementation since their conceptual design is from the community capital and the needs of the tourists of the neighboring area. The floating market project is now included in the three-year development plan (2017–2020) of the Song Khlong municipality. Therefore, these participatory planning processes go a long way in ensuring that green areas can be retained as a vital part of urban fabric, as established by Cilliers et al. (2010), and have been clearly determined to be the future target of development plans (Rubin and Rubin, 1992). However, the green-value added projects which were proposed for the Song Khlong sub-district could be properly adjusted for socioeconomic situations since the insight details of project administration such as phase of operation, undertaker, and budget all rely on the vision of the leaders and the cooperation of all the stakeholders. The community leader must think and act on the lines of keeping the green areas; in addition, participation from the community is very important, which can reflect the changing needs and aspirations of the participant communities (O'Brien and Natakun, 2016). These two have been considered as the key factors for success in leading the community toward sustainable development in which the members of the community can properly maintain their lifestyle. The alteration has to be on the basis of sustainable development, in which the benefits from the development result in better quality of life of the community.

However, the influence of industrial expansion around the community may influence the decision of land owners and make them more inclined toward selling. This is especially true in the case of people living in villages named Baan KhlongTaruaw and Baan Charoenwai; as the locations of these villages are next to the Bangprakong industrial estate, the land owners prefer to tentatively change their land use from green area to industrial area. Some respondents gave reasons such as being able to earn a large sum of money from selling their lands; others supported their decision that they can gain higher benefits from their lands by developing their lands from being agricultural to any other types such as industrial, residential, or commercial land uses. Similar to other findings, it was revealed that the major drivers for agricultural land conversions were the significant investments for the industrial and the residential expansion (Dadi et al., 2016; Pauleit and Duhme, 2000; Gill et al., 2007), and the spreading out of transportation network (Lanchanon, 2013). The quick-paced step of change and the high price of land in urban environments have posed a threat to green corridors as regards long-term protection (Dearborn, 2009). To curb this expansion, the Song Khlong sub-district is determined to remain as agricultural and conservation land use in the comprehensive plan which is enforced on the people by law. However, the urban comprehensive plan only considers the significance of controlling the green area by law without taking into consideration how to attract the cooperation of the community by giving them an incentive for keeping their land green. This reason makes the local people in the Song Khlong sub-district choose to change their land use. Value addition in green areas is necessary and can build the capacity of communities for supervising their green areas for sustaining the environment. As Heidt and Neef (2008) found out, green areas increase the value of community properties by 5–15 percent. Therefore, added value, community capacity, and community assets are significant factors for sustainable green area protection.

6. Conclusions

In summary, activities in three projects were designed, which were based on the community capital and the recreational preferences of the residents and the workers around the study area. All the projects support each other; for instance, activities of the day trip can be carried out by mostly spending time at the floating market, and work can be conducted in the nature-learning trail. If anybody has more time to stay longer, even by a day, homestay can be considered, and they can carry out the sales in the evening or learn about nature from the nature-learning

trail. This is not just nature learning: simultaneously, it can be learning about the community lifestyle (Figure 11). The Song Khlong capital showed that it is capable of being not just the nature and physical capital; it can also overwhelm with human and social capital as well as financial capital. These observations point to the potential in ensuring value addition to green areas. If communities can attract visitors, they will be able to market themselves. Once communities have their own markets, they can produce a wide variety of their own products. These varieties of products ensure a sustainable economy, and that leads to more opportunities and sureties of green spaces remaining green in Song Khlong.

Figure 11 Activities for supporting the process of green value addition.

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