タイにおける持続可能な低所得者層住宅計画の改善策-収益空間、自力増改築及び自力カスタマイズの寄与

Doctoral Dissertation of Philosophy

Strategies for Sustainable Low-income Housing Enhancement in Thailand: Contributions of Income Generation Space (IGS), Self-built Metamorphosis and Self-customization

September 2015

by

Nayatat Tonmitr

Interdisciplinary Intelligent Systems Engineering
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Engineering and Science, University of the Ryukyus, Japan
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CANDIDATE'S DECLARATION

This Dissertation titled: "Strategies for Sustainable Low-income Housing Enhancement in Thailand: Contributions of Income Generation Space (IGS), Self-built metamorphosis and Self-customization" is submitted to the University of the Ryukyus, Japan in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Area of Architecture under Interdisciplinary Intelligent Systems Engineering.

I declare that this dissertation is my own original work. It has not been submitted to any other university or institution of higher learning and that opinion and views expressed herein remain my sole responsibility and do not necessarily reflect those of the university.

Nayatat Tonmitr
(Doctoral Candidate)

We, the undersigned, hereby, declare that we have read this dissertation and we have attended the dissertation defense and evaluation meeting. Therefore, we certify that, to the best of our knowledge this dissertation is satisfactory to the scope and quality as a dissertation for the degree of Doctor of Philosophy in Area of Architecture under Interdisciplinary Intelligent Systems Engineering, Graduate School of Engineering and Science, University of the Ryukyus.

DISSERTATION REVIEW & EVALUATION COMMITTEE MEMBERS

Prof. Dr. Nobuyuki Ogura (Chairman)

Prof. Dr. Shimizu Hajime (Committee)

Prof. Dr. Castro Juan Jose (Committee)

ABSTRACT

This dissertation contributes and fortifies the imperative outlooks that low-income housing circumstances in the developing housing world can be enhanced, implemented, as well as strengthened both for the habitat policy distribution level and the housing design enhancement. It provides the sustainable practical strategies that reflect the necessity of present housing needs and shed light to the sustainability of future low-income housing development. It provides coherent instances on how to strengthen the housing programme and explore the sustainable implementation.

Utilizing Thailand as the study prototype, the study focuses on low-income housing, low-cost housing, squatter settlement as well as low-income settlement, majorly involves with the housing scenarios under the governmental housing programme in order to find out the sustainable concrete way of the implementation. The study clarifies the sustainability of low-income habitation that covers all the nationwide housing scenarios which contains two major housing programmes within. The first programme referred to as the Baan Eua-Arthorn Project (BEP), which is renowned as a low-cost housing project that is provided by the National Housing Authority (NHA). The second approach referred to as the Baan Mankong Program (BMP), or a secured housing programme, that is majorly facilitated by the Community Organizations Development Institute (CODI). It therefore can be seen clear outlooks that cover all the practical governmental housing practices in Thailand. Additionally, to cover insight into the enhancement processes, research sites were chosen both for the main regional city (Utilizing Khon Kaen Province Prototype), as well as the capital city of Thailand (Utilizing Bangkok Prototype) to clarify the whole housing image of the nationwide level, consequently to be a prototype of the Asian wide and International development level that could be made an adaptation from.

The study contains the critical analysis and solutions of the imperative housing enhancement outlooks from the first chapter till the last of the summary. It cannot be denied the important of historical timeline of the low-income housing scenarios that will pave the way for the future development, therefore the lessons learned of Thai housing development is initiated as for the first chapter. The imperative outlooks of the sustainable housing enhancement have been systematically organized, included the aspects as follows: Collaboration tactics and supportive key actors, sustainable community maneuver system (construction management, financial management, and habitat management), characteristics and sustainability of Thai Sahakorn-Chumchon (Thai community cooperative maneuver system), Cooperative system as the initiative of the development processes, participatory design and the housing design, alternative chosen supportive institutions, negotiation and housing design characteristics, community housing maneuver system and disaster rehabilitation, contribution of the traditional Thai house characteristics on low-income community habitation, materials for extension of low-income housing, importance of Income Generation Space (IGS) and factors impacted on IGS enhancement, IGS utilizing family in relation to technologies, self-built metamorphosis and contribution of IGS in the BEP, self-customization for IGS in the BMP, requisiteness of IGS in non-IGS family, generating income by utilizing IGS for sustainable savings management, integrating IGS into sustainable low-income housing planning outlook, covering all of the demand for sustainable low-income housing development, all of these imperative issues are clarifies respectively as a flow of the study framework to cover insight into all of the significant outlooks of the practical sustainable development.

Particularly, the IGS has played a significant role supporting the low-income dwellers' earning. The habitat itself, apart from functioning as a living habitation, it is also able to support the dwellers to generate income. This strategy is found actively and effectively works both for the BEP and the BMP scenarios by utilizing the self-built metamorphosis as well as self-customization as tools to get the IGS. As for the BEP, about 77% of houses in the research area conducted the extension. About half of dwelling units in the study area are extended for the IGS. Moreover, the spatial characteristics of IGS as a multipurpose/ flexible space can serve the desire of dwellers. It furthermore has a capability of solving the poverty issue as an essential

possibility or the core of low-income enhancement issue that is needed to be fulfilled in the near future low-income habitation strategy. The IGS has supported the dwellers' continuous occupation and could also reflect the nature of how low-income Thai people have survive through fundamental given living conditions. As for the BMP, Self-customized IGS survival strategy was explored to be utilized by the dwellers throughout their occupation period. More than one-third of the houses in the research area are self-customized for IGS. The study has further shown that, even in the non-IGS utilizing family, there is a positive trend that the IGS is demanded to support the dwellers' income generation activities. IGS has also shed light on its flexibility of usage possibilities that can be implemented in future low-income housing scenarios, as well as for a wider scale of housing enhancement, that will pave the way for a practical housing program and sustainable habitation.

It is due to the sufficiency of each person is in difference, the IGS is able to create income to each dweller, thereafter the dweller has more of the affordability, better quality of life, earn more income than it was used to be. All of these are the core aims of poverty reduction by utilizing habitat or architecture itself effectively. The IGS shows its effective potentiality according to famous nationwide self-sufficient economy philosophy. In which Thai self-sufficient economy philosophy has been derived from the present King of Thailand's thought. It is due to Thailand is a major agricultural country, therefore first intentional conceptual thought was major aiming at low-income people, but how well it was, depends on the application processes of the users. By integrating IGS and self-sufficient consideration into the architectural point of view, it shows the effective practical outcome of sustainable housing enhancement.

Two major governmental low-income housing approaches have played an important role in provision of the habitat for the country. Because there is the demand of legal land secure tenure, both for the enhancement of the upgrading projects and the tend-to-be squatter possibilities. The BEP and the BMP have a capability to cover those of the demands. It should be therefore keep both of the two running simultaneously, by implementing and strengthening with the sustainable strategies. Or if there is the near future new housing programme, it should keep two of those as the lessons learned and fulfilled it with those mentioned strategies. Habitat and planning characteristics might be participatory designed in the alternative way rather than a massive production, or if there is an obstacle according to budgetary limit or so forth, it should be at least empowered the participatory design to suit the real needs. As well as, the programme should be put the IGS insight into the consideration at both of the policy distribution, planning and housing design level in order to provide the practical sustainable habitat to settle in, securely and sustainably.

Keywords: Architectural Equational-image Philosophy, Architectural Sustainability, Asian Habitation Co-characterization, Asian Waterfront Settlements, Baan Eua-Arthorn Project (BEP), Baan Mankong Program (BMP), Baan Karn Keha, Bang Bua Community, Banpet District, Building Materials, Changchumchon (Community Skilled worker), Community Architect, Community-based Participatory, Community Housing, Community Maneuver system, Cooperative, Cooperative System, Customization, Environmentally Sustainable Habitation, Extension, Extension Materials, Fourteen Rai Community, House Planning, Housing, Housing Strategy, Hybrid Prototype, Khon Kaen-Thailand, Leadership, Lesson Learned, Local Institution, Longitudinal Study, Low-cost Housing, Low-income, Income Generation Space (IGS), Lower-middle Income, Materials, Metamorphosis, Mind Maps, Nakamura House, Negotiation, Occupation, Occupation-based Income Generation, Participatory Design, Planning, Property Maneuver, Ruan Thai (Traditional Thai House), Sahakorn-Chumchon (Thai Community Cooperative Maneuver System), Self-build, Self-community Management, Self-customization, Self-customize, Self-help Housing, Self-maneuver, Self-maneuver Community, Self-maneuver Extension, Self-organized Mechanism, Self-sufficiency, Space Conversion, Strategic Scheme, Suphanburi Ruan Thai, Sustainability, Tawanmai Community, Technology and Facility, Thailand, The 2011 Thailand Floods, Time Variation, Spatial Utilization, Spatial Organization, Urban Low-income Community, Urban Poor Housing.

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LIST OF ACRONYMS AND DEFINITIONS OF TECHNICAL TERMS

ACCA	Asian Coalition for Community Actions
ACHR	Asian Coalition for Housing Rights
BEP	Baan Eua-Arthorn Project (Low-cost Housing Project)
BMA	Bangkok Metropolitan Administration
BMP	Baan Mankong Programme (Slum Upgrading Programme)
CCC	Chang Chumchon (Community & Local Skilled Constructors)
CDC	City Development Committee
CDF	Community Development Foundation
CODI	Community Organization Development Institute
DPF	Duang Prateep Foundation
FAR	Floor Area Ratio
FRSN	Four Regions Slum Network of Thailand
IIED	International Institute for Environment and Development
ILO	International Labor Organization
LDF	Local Development Foundation
LIG	Low Income Group
LMIG	Lower-middle Income Group
MIG	Middle Income Group
NCDP	National Committee on Decentralization Policy for Provincial and Local Development
NGO	Non-Governmental Organization
NHA	National Housing Authority
NRD	National Rural Development Committee
NULICO	National Union of Low Income Community
OTTV	Overall Thermal Transfer Value
RDF	Rural Development Fund
RTTV	Roof Thermal Transfer Value
SOC	National Urban Poor Communities Development Organization
UCDO	Urban Community Development Office
UN	United Nations
UN-HABITAT	United Nations Human Settlements Programme
UNCHS	United Nations Centre for Human Settlements (Habitat), since 2002 known as the United Nations Human Settlements Programme (UN-HABITAT)
USDA	United Slum Development Association
WB	World Bank

IGS	Income Generation Space; Places where utilized as helping to generating the income, apart from the purpose of residing for Low-income.
IGA	Income Generating Activities
Self-Sufficiency Economy Philosophy	Thai Philosophy which has been distributed from the present King of Thailand to Thai people, particularly for low-income. (*Pratchya Settakit Porpiang, in Thai*)

Chapter 1
Introduction

1.1 THE DISSERTATION CONCEPTION: CONCEPTUAL RELATIONS AND PRACTICAL ENHANCEMENT OF POVERTY REDUCTION, LOW-INCOME DWELLERS, LOW-INCOME HABITAT AND SUSTAINABILITY

1.1.1 The Poverty, The Low-income and The Low-income Habitat

Low-income housing has been so far a critical topic of discourse in the developing housing world, particularly for the developing countries. Sustainable low-income housing enhancement is one of the most imperative and critical issues of the National Development Plan which covered all scenarios of country's mobilization

Over the past decade, low-income housing in Thailand, by provisions from the governmental side as a key provider[*1)] and facilitator, has majorly focused on two famous housing scenarios (Tonmitr, 2012d: Yap et al, 2010). The first approach is referred to as the *Baan Eua-Arthorn Project* (BEP), which is renowned as a low-cost housing project that is provided by the National Housing Authority (NHA). The way of thinking of its planning has been derived from the planning and design processes of the NHA's architectural team. Census survey data of Thailand was utilized at that time. After that, the average household size and density was determined in number per household. Following that, a compact livable area for household members was designated. As well as, the NHA had its own standard; therefore, drawings and specifications for residential building of the BEP were required to conform to the design standard of the NHA (NHA of Thailand, 2005).

The second scenario referred to as the *Baan Mankong Program* (BMP), or a secured housing program, is mainly facilitated by the Community Organizations Development Institute (CODI). The basic idea and concepts of the CODI are to support and empower urban and rural community organizations through financial assistance, housing development, and environmental improvement (CODI's website). In addition, the basic idea and concepts of the Baan Mankong Collective Housing Program are based on the concepts of a people-driven housing development process, utilized participatory design scheme, placing Thailand's slum communities and their community networks at the center of a long-term development process, and comprehensive solutions to land title and housing problems in Thai cities (CODI's website).

The research outlooks have been major concerned with the habitat, poverty reduction and human/ dwellers. Poverty means including quality of life. Low-income and lower-middle income combine the meaning of less opportunity in comparison to the higher class. And low-income habitation means

including low-income habitat and the surrounding context of environment. Therefore three major outlooks have a close-knit relationship that implied the way on how to conduct the sustainable implementation as shown in Fig. 1.1.

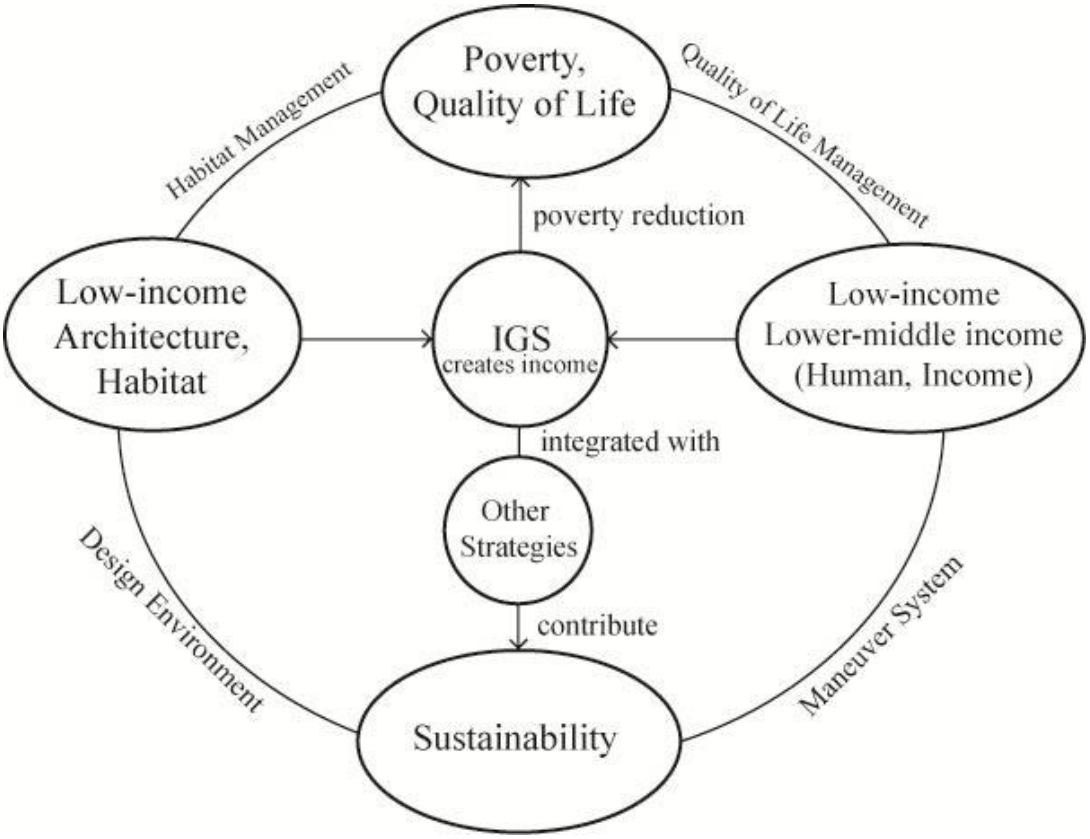

Fig. 1.1 Major Conception of Research Contributions

1.1.2 Contributed Strategies, IGS and Sustainable Low-income Housing Enhancement

In order to achieve and conquer the poverty reduction of the grassroots, the effective strategies are needed to be performed. Because of it initiates from the low-income/ lower-middle income (grassroots, poor), therefore the poverty reduction is the major aim of enhancement processes. Thereafter the habitat that can also be utilized to create income for its users is found to be the very significant strategy. Apart from utilizing the habitat as a residing purpose, dwelling unit that can be utilized to support the income generation activities, or to create income for its owner is found value added to the living property of the low-income. Space where can be used for supporting the earning activities is explored and referred as to Income Generation Space (IGS). In order to gain the IGS there are the approaches and tools that are different to be utilized in a different context. Self-built metamorphosis is found to contribute the IGS in the BEP, while self-customization is discovered to contribute the IGS in the BMP.

As for the major conception of research contributions shown in Fig. 1.1, when the low-income and the habitat are well met with the effective strategies, the IGS is found as the core contribution to create income for dwellers. By supporting the income generating activities, living habitat can be used apart from a residing purpose but also can be utilized to create income for its users, thereafter contribute to the poverty reduction. The IGS has shed light is potential, performance and played its significant role both for the BEP and the BMP. The outlook of IGS is able to make integration with other strategies which will be discussed, described, and clarified in the following chapters of the dissertation.

Illustrated in the network of Fig. 1.1, habitat management is the bridge between poverty/ quality of life and low-income habitat. Between the poverty/ quality of life and the human, the well action of quality of life management is found as the link between that of the two aspects. Human needs well maneuver system and habitat needs well design environment. If the aspects mentioned above are implemented effectively and properly with the IGS and the other strategies, sustainability of living habitation can be achieved, which will be clarified in each of the chapter of the dissertation. Additionally organization of the dissertation will be the key direction, and framework that pave the way to an insight comprehension of this dissertation.

1.1.3 Research Issue

In order to be able to see the clear image of what are the contributions of study, the Fig. 1.2 has been made utilizing the conceptual idea base on systematic thinking processes (Mind Maps integrated with Mathematics based processes). The core concept came from the idea of sustainable architecture, in which contains three major outlooks within, human, architecture, and environment. An illustration has been made as shown in the left hand side of Fig. 1.2, it contains major three of the subsets which are:

First major subset is the Human, it contains dwellers career, planners career including architects, designers, constructors. The outlook of human behavioral aspects and housing policy distribution are also included within this category.

Second major subset (the Architecture), which is the key part of the study where the human being conducts a living, an occupation, an earning, an activity inside the dwelling unit. It consists of the outlooks of residence, dwelling unit, design characteristics point of view, participatory design, for instance. All of these aims at the low-income habitation enhancement and related issues.

Third major subset is the Environment. In the real circumstances, it is hard to separate living architecture and human from the environment. In which this meaning is the context of the low-income habitation. This context includes low-cost housing, slum upgrading programme, squatter settlements, land title, secured housing aspect, and so forth. The architecture (first subset) is utilized by the human

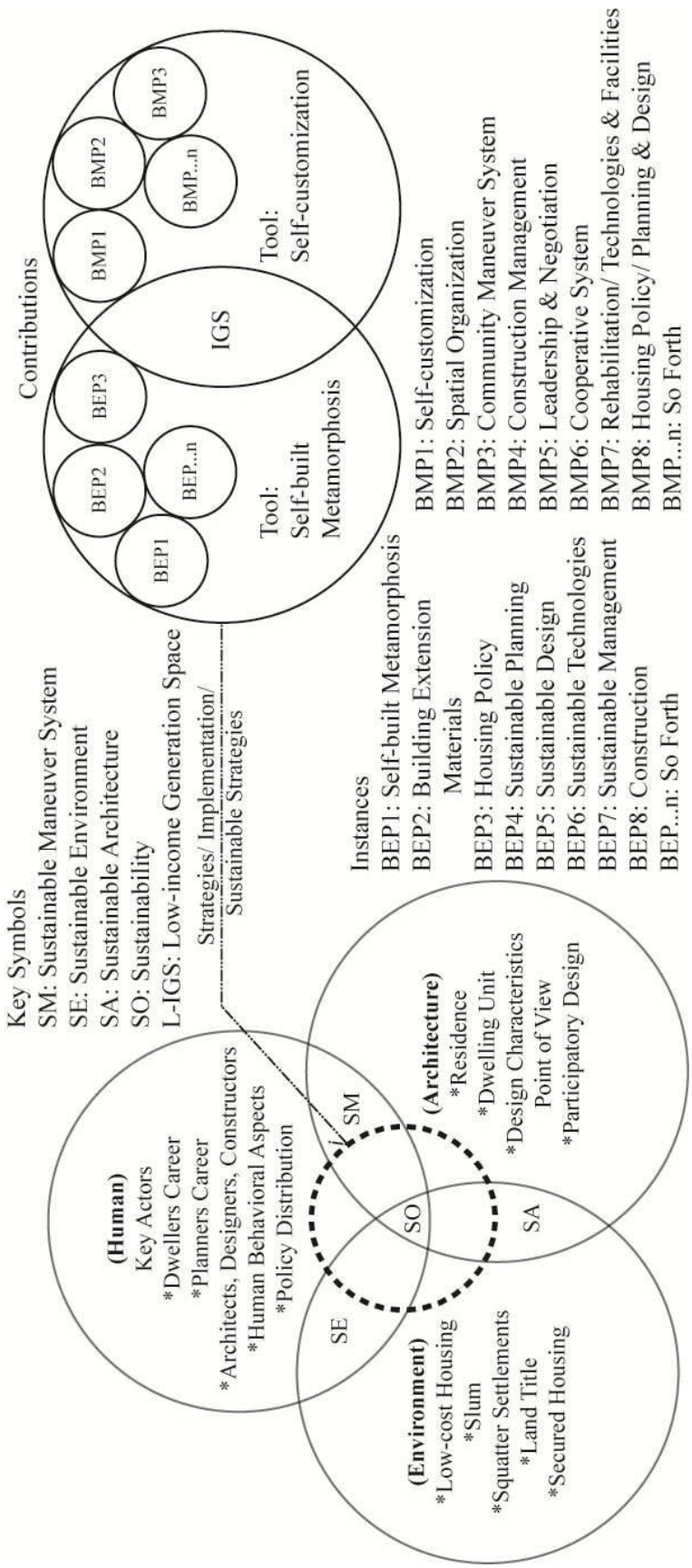

Fig. 1.2 Set and Subsets of Sustainable Strategies and Research Contributions

(second subset) in a context of the environment (third subset).

In the reality, three of those things work together. When the human is integrated with the architecture sustainably, it can be called sustainable maneuver system (SM). When the architecture is integrated with the environment suitably, it can be sustainable architecture. Additionally, when the environment is properly integrated with the human, it can be found sustainable environment. Finally, the integration of three major subsets is the sustainability (SO).

To achieve the above mentioned sustainability, the sustainable enhancement and implementation processes have been clarified. The research goes straight insight into the outlooks of practical enhancement in order to explore "What's New" or "Practical Contributions" utilizing the major two governmental housing scenarios which are the Baan Eua-Arthorn Project (BEP), low cost housing project and the Baan Mankon Program (BMP), concerns with slum upgrading issues. Therefore, the contributions contain further two more subsets, subset of the BEP and the subset of the BMP. The integrated part can be eventually found that is the Income Generation Space (IGS) oulook, as shown in Fig. 1.2 right hand side. The contributed strategies of the BEP consist of the aspects: self-built metamorphosis as a tool to gain IGS in the BEP, building extension materials, housing policy enhancement, sustainable planning, sustainable design, sustainable technologies, sustainable management, construction, and so forth. While the contributed strategies of the BMP contain the outlooks: self-customization as a tool to achieve IGS in the BMP, Spatial organization or configuration, community maneuver system, construction management, leadership and negotiation, cooperative system management related to housing sustainability, secured housing aspect, rehabilitation, technologies and facilities, housing policy, housing characteristics, planning and design, and so forth.

1.1.4 Significance of the Study

Housing for low-income in the developing housing world has been a crucial topic of discourse as one of the most imperative issue of overall country development plan. Thailand likewise, the issue of low-income housing has been so far a topic of crucial discussion. The concrete endeavour has been initiated since the country officially established the National Housing Authority (NHA) in the 1970s (Tonmitr et al, 2012c: Tonmitr et al 2012d). Up to the early of 2000 A.D. which the new major two governmental housing scenarios have been launched which are the BEP and the BMP, which can be defined as the minor change endevour from the first era in the 1970s.

The studies have been conducted in order to explore the strategies that can be practically proposed and utilized in a concrete way of enhancement. The practical solutions have been proposed in the following chapters based on the conceptual idea of the aim to achieve poverty reduction by utilizing

the dwelling effectively integrated with others contributed strategies. Eventually, the contributions of Income Generation Space (IGS), Self-built metamorphosis, and self-customization have been explored. Therefore it can be proposed made implementation processes to the national housing policy, both for housing policy distribution level, as well as housing design enhancement. Additionally, it can be a prototype of Asian wide level or international development to learn and make adaptation from. In order to suit each of the local and personal substances and context of situation.

1.1.5 Scope and Constraints

Scopes have been designated to ensure an apparent and a deep insight into the details as well as the outlooks of study subject. As probably the pioneer study of its kind on Income Generation Space (IGS) which related to self-built metamorphosis and self-customization in Thailand, particularly for the BEP and the BMP, this dissertation presents great scope for later studies in similar fields, as well as can be utilized as a practical proposal to the National Housing Authority or the organizations related to housing development programme, even is able to be used for the academic researchers to learn how to brainstorm and create the thing that is called "What's New?" from. Up to this period of time, it has been feebly documented on the journal outside its country (Thailand), or international journal that the IGS in the BEP with a focus on self-built metamorphosis and its contributions has been published as a journal, particularly English version in Japan. Even some were found as an article or in a proceeding of the conference. As for the BMP, although there are academic scholars who have studied about low-income housing in many countries, each has a different endeavor from this study. And this issue of self-customization contributes to IGS, particularly for the BMP, and a small scale of row-type housing has been given little attention. Integration of the outlook of time variation and the spatial organization is new for the study this type of housing study, also for the BMP due to the difficulty of data collections were required.

Acquaintance or familiarity needs time and techniques to spend on, to get the deep insight into the data and materials. Trust and believe are very important in order to gain the deep insight data, especially the slum study where the inner connection in the community is imperative otherwise stranger or the new comer is hard to get inside the community to receive the data. Some areas still remain dangerous to get inside without the close-knit relationship. Some are personal data of the dwellers and private space that allowance is needed from the owners before recording the data. However, as a Thai person with the skill of the Thai language, both the Middle and *Esarn* local indigenous Thai languages, and the realization of real *Thai-Esarn* customs, the author was allowed an insight into the outlook, nature and a closer engagement with respondents.

1.2 THE DISSERTATION FRAMEWORK

1.2.1 Aim and Objectives of the Research

This dissertation majorly aims at the practical contributions that are essential to put an insight into considerations of the housing enhancement programme in Thailand, as well as Asian wide level to adapted from. The studies clarify the real living conditions, habitation, survival strategies against poverty by utilizing the dwelling units (Architecture) effectively and sustainability.

In order to explore the solutions, strengthen the advantages, reducing the debility of the low-income housing project, the research originates from the point that after the housing policy has been distributed, performed, constructed the habitat unit, till the evaluation and monitoring after a long term occupancy. The dissertation contributes the imperative outlooks, the survival tools and strategies have been clarified, in order to see the reasons why, for instance self-built metamorphosis, self-customization have been utilized, how those of the tools create the space for income generating activities, purposes and categorizations of the IGS, delineate the factors impacted on IGS enhancement, and define the strategy that the IGS is operative for both of the BEP and the BMP. Additionally, the imperative outlooks of the sustainable housing enhancement have been systematically organized, included the aspects as follows: Collaboration tactics and supportive key actors, sustainable community maneuver system (construction management, financial management, and habitat management), characteristics and sustainability of Thai Sahakorn-Chumchon (Thai community cooperative maneuver system), Cooperative system as the initiative of the development processes, participatory design and the housing design, alternative chosen supportive institutions, negotiation and housing design characteristics, community housing maneuver system and disaster rehabilitation, contribution of the traditional Thai house characteristics on low-income community habitation, materials for extension of low-income housing, importance of Income Generation Space (IGS) and factors impacted on IGS enhancement, IGS utilizing family in relation to technologies, self-built metamorphosis and contribution of IGS in the BEP, self-customization for IGS in the BMP, requisiteness of IGS in non-IGS family, generating income by utilizing IGS for sustainable savings management, integrating IGS into sustainable low-income housing planning outlook, covering all of the demand for sustainable low-income housing development, all of these imperative issues are clarifies respectively as a flow of the study framework to cover insight into all of the significant outlooks of the practical sustainable development. It is hoped that the practical contributions, findings, solutions, strategies are able to strengthen the enhancement effectively and sustainably. Furthermore, the contributed strategies can be proposed to the national housing development programme both for the housing policy distribution level and the housing design point of view in order to cope with the near future low-income habitation scenarios to find the sustainability of low-income habitation.

1.2.2 Research Methodology and Techniques

There are the imperative techniques which have been utilized for this study. First of all, Mind Mapping Analysis has been utilized in the stage of the brainstorming, further more used in some of the scrutiny procedures. To clarify the characteristics for an easy comprehension of the Mind Maps, Mind maps have been widely used in many branches of study fields, renowned as an essential critical thinking process. It provides a strategy for analyzing the materials, integrating critical thinking and problem solving skills (Eden, 2004) and (Kokotovich, 2008). It has furthermore utilized in the architectural field (Buzan, 2005) as the important architectural thinking procedure. After having a scrutinized consideration tool, there is the process of conducting this research. Longitudinal Studies have been performed on this kind of housing research. Longitudinal Studies are frequently used to explore the enhancement trends of a settlement over period of time. It deals with repeated observations of same items over a certain periods of time. It is moreover allows researchers to distinguish short from long-run phenomena as further reading can be seen in (Tang and Wong, 2008). It is therefore two of these techniques have been picked up and conducted a scrutiny on this low-income habitation research.

Primary data in collaboration with secondary data have been collected and investigated. As for the primary data, the several onsite survey were conducted. Physical observations of all housing in the community were also undertaken. The integration of graphic recording techniques with recorded discussions has been utilized to collect ideas. The questionnaires to owners were employed to see the owners' intention for space usage and time sequence. In-depth face-to-face interviews with the community leader, together with semi-structured interviews with the dwellers helped to fulfill the supported outlook. Additionally, follow-up target discussions, which were held directly onsite, went straight to the dwellers' homes. Furthermore, direct interviews and discussions with key persons who were in charge of each project were completed, which included municipality officers that are responsible for the BEP and the BMP, the head of the *Esarn*[*2)] zone CODI and his officers, the NHA officers and practical dwellers who live in each of the community, as well as the persons who contribute to developing the Tawanmai community. Telecommunication processes (telephone, Skype, e-mail, etc.) were sometimes used to fulfill new finding outlooks, all aimed at gaining the data from the side of the planners, policy makers and dwellers. Moreover, the mind maps[*3)] technique was also employed while brainstorming the idea analysis. The secondary data was achieved from the *Esarn* CODI office, the NHA office, community library, community records, and Khon Kaen University library. In addition, international journals have also been reviewed in terms of related fields. Furthermore, as a Thai person with the skill of the Thai language, both the Middle Thai and *Esarn* local indigenous Thai languages, and the realization of real *Thai-Esarn* customs, the author was allowed an insight into the outlook, nature and a closer engagement with respondents. Above of all, appreciation directs to the kind cooperation of the community dwellers. The sense of place and the

nature of being a part/ a member of the community in each of the research site, allows the author to gain the significant and deep insight materials to be utilized for this dissertation.

1.2.3 Organization of the Dissertation

The contents of this dissertation are structured and created under sixteen chapters, in which all of the major content chapters (Chapter Two to Chapter Sixteen) have been published in journal papers and/ or conferences; both for the international conference and architectural research field congress.

The dissertation stream is structured as shown in Mind maps of Fig. 1.3, in which the main stream is initiated from chapter one till the contribution chapter in chapter fifteen. And it furthermore categorized into five major stages as illustrated in Fig. 1.3. Stage 1 describes about the introduction of direction for utilization of the dissertation. Followed by stage 2, the background of low-income Thai housing has been clarified which contains two chapters within. Stage 3 talks about the maneuver system, community mechanism, and the enhancement processes that contains three chapters inside. The stream continues to stage four which IGS contributions have been clarified, which consists of nine chapters therein. Finally, structure is ended up with stage 5 which concludes the contribution strategies. There are key numbers with circle provided refer to order in the author's publication list.

The study contains the critical analysis and solutions of the imperative housing enhancement outlooks from the first chapter till the last of the summary in order to explain the imperative outlook of each chapter in detail. It cannot be denied the important of housing background of the low-income housing scenarios that will pave the way for the future development, therefore the lessons learned of Thai housing development is initiated as for the second chapter. The imperative outlooks of the sustainable housing enhancement have been systematically organized, included the aspects as follows. Collaboration tactics and supportive key actors are clarified in the third chapter, sustainable community maneuver system is delineated in the fourth chapter (construction management, financial management, and habitat management). Chapter five captures characteristics and sustainability of Thai Sahakorn-Chumchon (Thai community cooperative maneuver system), also recapitulates cooperative system as the initiative of the development processes, participatory design and the housing design. Additionally, Chapter five illustrates alternative chosen supportive institutions, negotiation and housing design characteristics. Chapter six clarifies community housing maneuver system and handling for rehabilitation, also enumerates the contribution of the traditional Thai house characteristics on low-income community habitation. The seventh chapter contributes the viewpoint of materials for extension of low-income housing. Importance of Income Generation Space (IGS) and factors impacted on IGS enhancement are explored and explained in chapter eight. Additionally, chapter nine shows IGS utilizing family in relation to technologies. Self-built metamorphosis and contribution of IGS in the BEP are analyzed in the tenth chapter. Furthermore, the contribution of

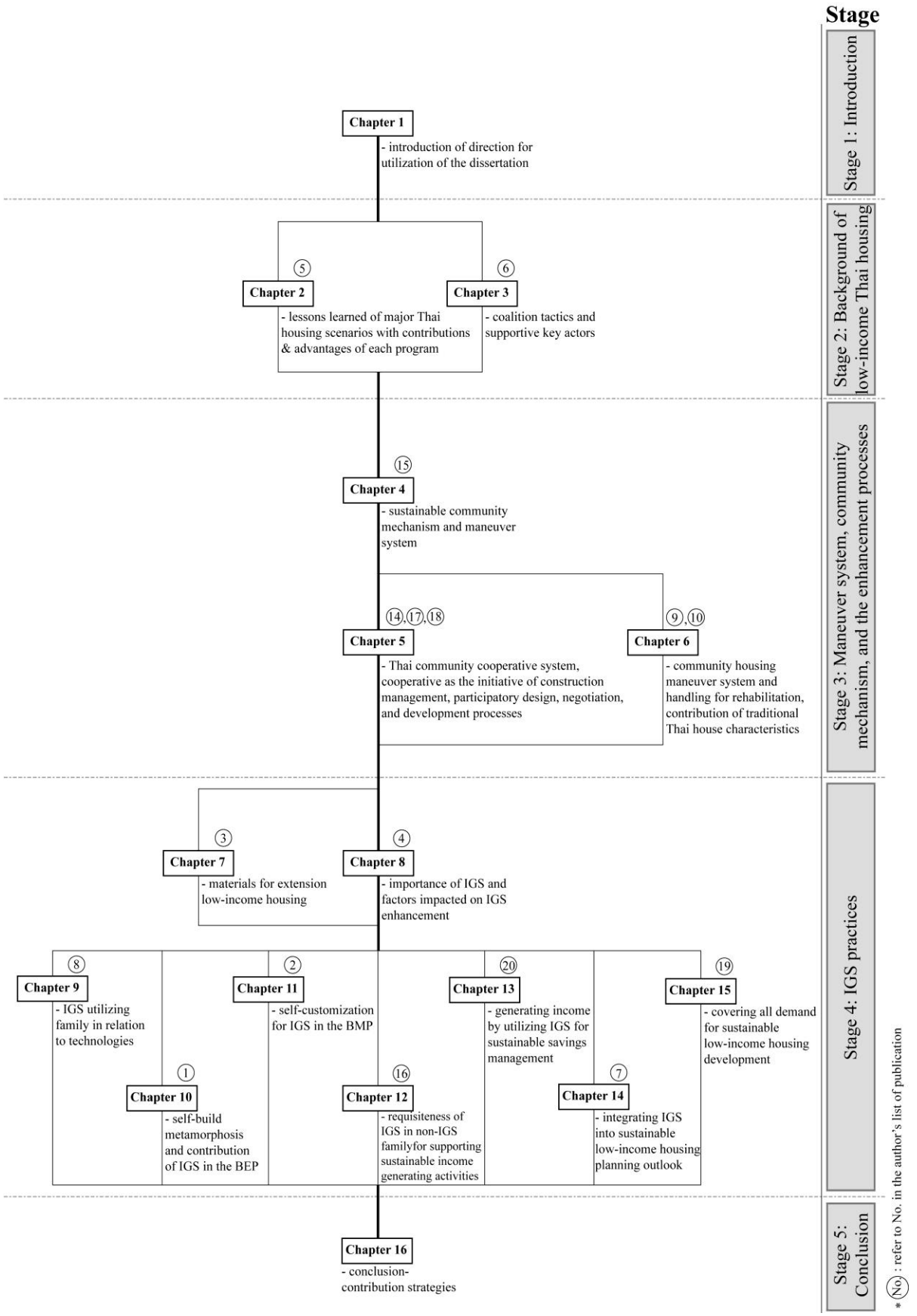

Fig. 1.3 Organization of the Dissertation/ Chapter Direction

self-customization for IGS in the BMP is clarified in the eleventh chapter. The outlook of requisiteness of IGS in non-IGS family is pinpointed in the twelfth chapter. The thirteenth chapter contributes to the imperative outlook of generating income by utilizing IGS for sustainable savings management. Chapter fourteen contributes to the view of integrating IGS into sustainable low-income housing planning outlook. The fifteenth chapter summarizes how to cover all of the demand for sustainable low-income housing development, all of these imperative issues are clarifies respectively as a flow of the study framework to cover insight into all of the significant outlooks of the practical sustainable development.

The first chapter highlights the key context direction and key point of this dissertation meanwhile the final chapter apparently summarizes all of the main important findings. Each of the chapter is designed to introduce the significance of the issue under the insightful critical discussion, and provides subjects integrated to the overall aim of the thesis. There are summarized conclusions and references provided at the end of most chapters to highlight the contributions of each chapter comprehensively, and several of the imperative appendixes are organized at the end of this dissertation.

NOTES

*1) Key providers were majorly categorized as government organizations and NGOs. The Intermediary Institution in collaboration with self community management was found to be the apparent aspect of sustainable housing issues, particularly, for low-income people. For further reading, see (Lee, 1998).

*7) *Esarn* is an indigenous local Thai language renowned as the Northeastern area of Thailand.

*8) Mind maps have been widely used in many branches of study fields, renowned as an essential critical thinking process. It provides a strategy for analyzing the materials, integrating critical thinking and problem solving skills. For additional reading, see (Eden, 2004: Kokotovich, 2008).

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Chapter 2
Sustaining the Nationwide Low-income Habitat Strategy: The Lessons Learned since the 1970s

2.1 INTRODUCTION

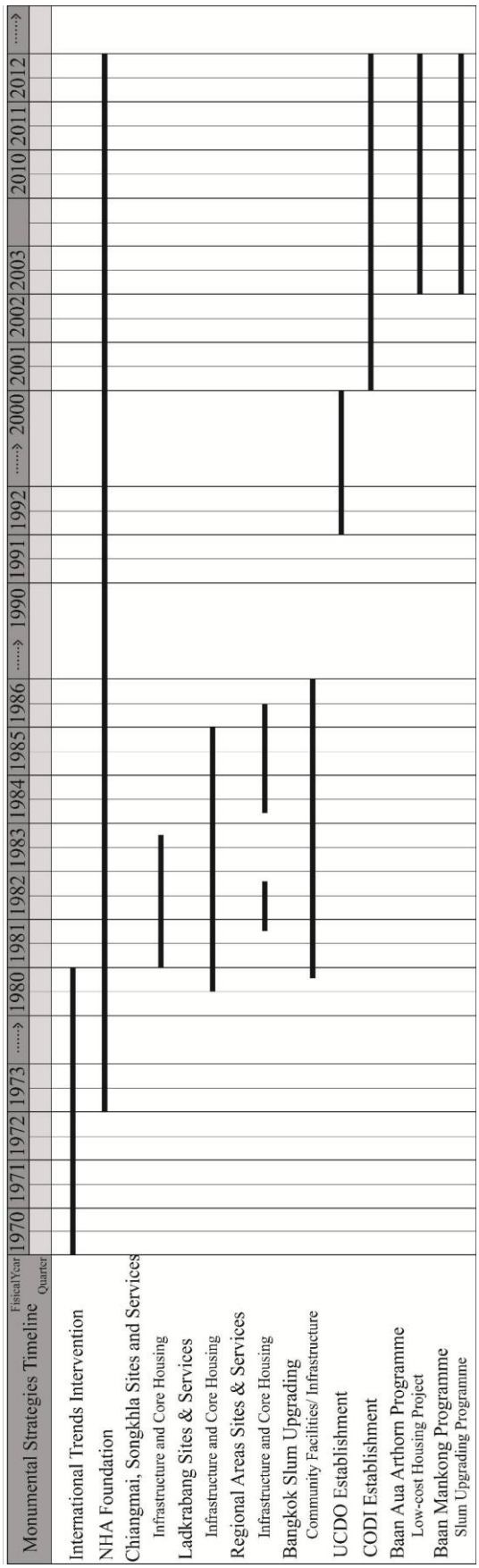
The international low-income habitat trend has apparently approached Thailand since the 1970s that was patronized by the World Bank, including strategies and schemes. It has been explored three major input schemes since then. The first trials and errors were due to the 1970s-1980s. Thereafter, by 2003, two new major strategies have been launched renowned as Baan Aua Arthorn and Baan Mankong scenarios aiming at solving the nationwide low-income habitat issues. Nonetheless, each of them has its advantages and debilities that need the implementation. Self-help properties maneuver and its acclimatization of the strategies were found to play significant role in both adoption and implementation process. The study signifies that each of the nationwide low-income habitat strategy have played simultaneously role support the overall scenarios with its practical implementation process and the way of its country acclimatization.

Living habitation has been so far one of the apparent issues that contribute to the overall successful enhancement of many developing countries. It has been increasingly focused as a topic of discourse. Specifically, Low-income housing in Asian housing world have been studied within the field of political, economic and its design characteristics, while it has been feebly documented about a clear implementation of the strategy by the practical prototype from learning about international trend and its country acclimatization, not only strategic adoption.

The mega international low-income habitation trend was found to be entered the field in the period of the 1970s that was patronized by the World Bank (World Bank, 1987). As for Thailand, it was found three major schemes since 1970. The first trials and errors time was in the 1970s-1980s which well known as Sites and Services or Core Housing that provide the housing plot and the basic facilities, later on, let the dwellers incrementally constructed the habitat. And let alone the period until 2003, the two new input strategies were made possible. The first scheme was called low-cost housing project (Baan Aua Arthorn) which seems to be the minor change endeavor of core housing scheme. In simultaneous approaches, slum upgrading programme (Baan Mankong) was launched aiming at solving nation slum issues. Nevertheless, each of the three has its advantages and errors that needed to be fulfilled.

Therefore, this paper contributes a clear understanding and the attempt is made to investigate the advantages of each strategy that needed to be strengthened also pinpointed the paralyzed issues that

Table 2.1 The Monumental Timeline



*Chiangmai is located in the Northern part of Thailand, Songkhla is located in the Sourthern part of Thailand
Ladkrabang is located in the middle part of Thailand in Bangkok, the Capital City. Sites & Services was renowned as Baan Karn Keha in Thailand

needed to be lessened. Furthermore, it seeks to find what is needed to be implemented and sustained for the future low-income habitation in its country, also to the developing housing world as a practical pilot prototype.

2.2 THE THREE MAJOR LOW-INCOME HABITATION STRATEGIC BACKGROUNDS IN THAILAND

2.2.1 How Comes the International Trends

After having learned the international low-income habitation trends before 1970, it was rare on housing strategic blueprint evolution in the third world countries until that was introduced by the World Bank in the period of 1970s (Giles, 2003). Hence, the international trends of housing field had entered into the developing world in the early 1970s and it was generally extrapolated to have ushered in the new era of housing trends (Harris and Giles, 1945-1973).

2.2.2 How is the Strategies' Acclimatization?

To Thailand, after the first trials & errors of housing strategic endeavor period had been launched in the 1970s-1980s (Yap and Wandeler, 2010). Thereafter, it was due to the change of a new political party, it is therefore the new two major housing strategic plans were kept scrutinized and established as shown in Table 1. It was something that was keep on continuing from the first trials & errors period of time and has transformed by any forms and means. For the first approach, it was maneuver by the NHA and renowned as a Low-cost housing project (Baan Aua Arthorn), as the international level, for example in the HABITAT journal called it "We care housing" but actually this word was derived from A Thai mutual patronization known as the "Sympathetic Housing". So as to the conceptual idea is begun with the well intention that would like to find the most effective housing together with the legal land title to be used as nationwide housing prototype. Furthermore it is able to make adaptation to the local and personal substances, for instance, the cultural style and the affordable materials in each of the region together with subsidy rate from the government. Additionally, if going through a deep analysis, it was found that it is found to be minor change version of the Sites and Services. Therefore, what has made it difference is the low-cost housing provide the ready-to-engage housing, on the other hand, the Sites & Services provide the plot with the basic facilities.

The second major approach from the 2003, it was known as Slum Upgrading programme (Baan Mankong) under the Community Organization Development Institute (CODI) (Boonyabancha, 2005), as being decentralized the task from the NHA, it was aiming at dwellers' maneuver system with the support of the government agents as a permeable actors. Aiming at the land secured tenure process which is the initiated core enhancement.

2.3 LET THE GOVERNMENT BEGIN, LET THE PEOPLE DO SELF-FULFILLMENT

2.3.1 Crucial Step of Enhancement with On-site Basic Facilities and Legal Land Title Plot

After establishment of the National Housing Authority in 1973, thereafter the first official policy was distributed to the field; Thai core housing as known in Baan Karn Keha (NHA's housing). The policy was decentralized to the stakeholders by the influence of international trend that was being said and was patronized by the World Bank. The policy makers' intention was to provide the site together with the basic facilities and need dwellers' incremental construction to be done later. The advantage is benefit for people who need the legal land title and have a long term occupied plan to do piecemeal construction after having incrementally gained their budget as shown in Fig. 2.1.

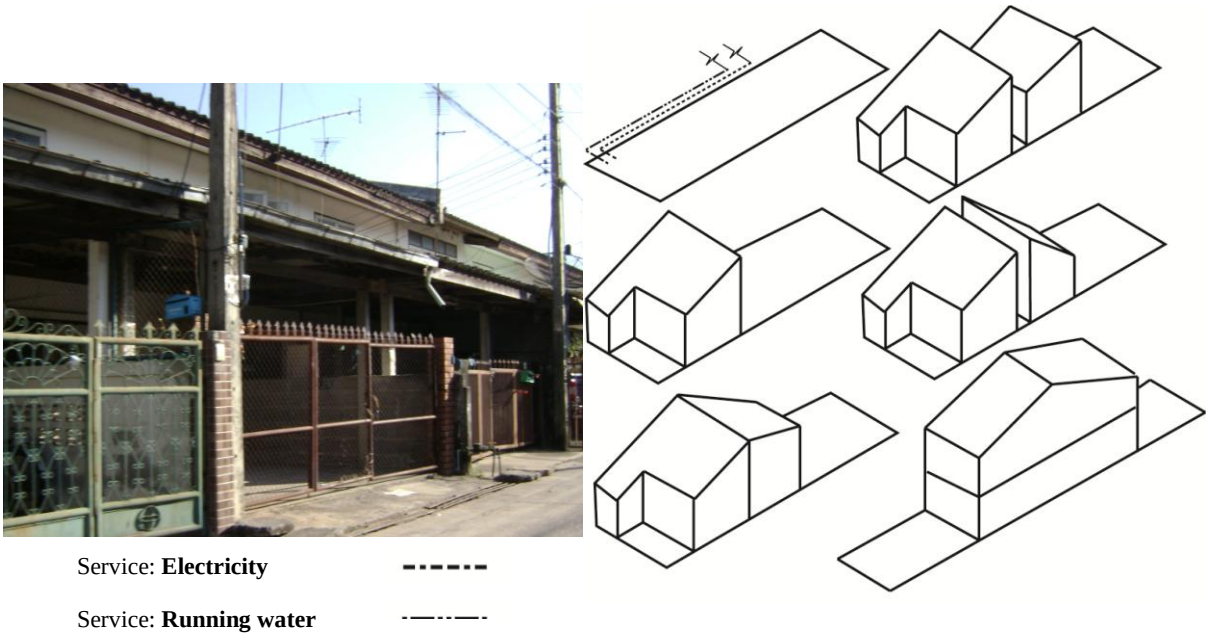


Fig. 2.1 Instance of Sites & Services Physical Characteristics (left). Incremental Construction Idea (right) (source: adapted from NHA)

2.3.2 Fulfilling the Debilitated Points

The debility is an unclear or missed understanding of the designers' sides and the real dwellers that forced to make it happen, the dwellers don't clearly understand the meaning of the overview strategic outlook that made the procedure smooth and put it into the limit. There was also the blueprint to sell in the NHA office but rarely the clear instruction or direction that is easy to the residents to follow. It is therefore should be implemented the clear definition of strategy, developer, catalytic actors and real practitioners, for instance, public hearing organized, round table, even on-site suggestion and assessment.

2.4 LET THE GOVERNMENT CREATE THE THEME, LET THE PEOPLE MAKE THE ADAPTATION

Fig. 2.2 Nationwide Low-cost Housing Project Characteristics with Its Extended Low-income Generation Space Capability

2.4.1 Past Lesson Learned and Minor Change Endeavor

Apparently, it seems like the designer had known the weak points of the previous strategy that would not be suitable for Thai people's behavior and habitation therefore it was provided the plot, services and the basic building (Tonmitr et al, 2012). The implication was whether dwellers were able to build living units; regardless, it was still adequate for first stage of occupation. The design allows occupants to construct extensions if they are able and wish to. On the other hand, the given unit is still able to live of first stay for non construction-skilled tenants. Therefore, that is become a today's nationwide low-cost housing project.

2.4.2 Intermediate Strategic Theme for the Capability of Intermediate Group- Legal Land Title Outlook

As for this strategy, it is able to act as the key dais that has capability for the low-income group, even the poorest of the poor, slum residents, or a low-income people who has no land right at the beginning, for example, are able to gain the definite land tenure after completion of the affordable requirements. Unlike the most tremendous issue of slum development in Bangkok which the land secured tenure, it is due to the possession of the Treasury Department, the point is for this kind of land tenure, the best

way that is able to maneuver is to prolong the period of tenure and get the secured tenure by the long term negotiation. Hence, how well the success was is up to the power of negotiation. It is therefore low-cost housing strategy has a capability for the intermediate low-income group who has no land title and wants to possess his own secured-tenure for a long run occupancy. Moreover after period of occupation, earning the money and upping their level from low-income group to be the lower-middle class by selling their properties and find a new place to occupy, for instance, housing development career.

2.4.3 Learning from the Dwellers' Extension and Low-income Generation Space as a Self-help Implementation

The paramount issue is due to the survived acclimation which depends on the dwellers' self-metamorphosis. Therefore, what has been learned is the strategy make should put it in scrutinized priority to this adaptation topic to be implemented. The more detailed information has been shown in Ref. 10 (Tonmitr and Ogura, 2011). Furthermore, low-income generation space was found to be the most significant of the community as acting as the space that is able to help generating income using as on-site, not only for the residential purpose. Therefore, it is able to create money by their self-properties. Additionally, its acclimatization by extensions was shown in Fig. 2.2.

2.5 LET PEOPLE PARTICIPATE THE INITIATED PROCESS, LET THE GOVERNMENT PATRONIZATION

Fig. 2.3 Instance of Baan Mankong Project: Photograph of Under Painting Process House, Unpainted House

2.5.1 Significant of Leadership and Power of Negotiation, Insight into Bottom Up Process

As for Baan Mankong Programme, before being evicted out of the community, it is unlike the slum clearance idea but to enhance and make mutual living as a part of the city. Make them feel important and feel like their home conceptual idea. Physical characteristic was shown in Fig. 2.3.

As the case of Bang Bua community in Bang Khen area in Bangkok where is the capital city of Thailand, It formed its canal network with nearby communities and choose up one network leader to have more power of negation. Before the time that their network is not so strong, they are unable to negotiation as at least what they want. But when they are become strong network, together with the help of CODI, slum dwellers are able to negotiate long term rental period and fee. That is to say, the power of leadership makes them have more power of bargain that made it fast enhancement. Detailed information about Bang Bua community are in Ref. 3, 6, 7, 11 and 12. Furthermore, the dwellers felt positive to the forming and starting process in terms of economical aspect (Archer, 2012).

2.5.2 Design Participatory Approaches and Self Properties Maneuver

It was a kind of self-managerial system; the collaborated design systematic scheme has been done through the community based management with the outside patronization. The designers from academic area, government organization, NGOs, NPOs, community architects, even voluntary support also be found, for instances. The design procedure has been done by arranging workshop by creating many small cells, discussion; revise until getting the final of each cell, then cross-checked the overall theme till the master development plan and shop drawing were drawn. It was shown that, community architects play a significant role facilitating the design process. Before starting the construction, slum members have to join the saving group (Sahakorn-Chumchon) which is tend to be the initiated strategy (Tonmitr and Ogura, 2012), then after reaching the requirements, they were allowed to start construction by given money in from of building materials. Additionally, both of Sahakorn-Chumchon and community architects help mobilizing and facilitating in the design monitoring system.

2.6 COUNTRYWIDE AND INTERNATIONAL WIDE CONTRIBUTIONS

Learning from the past has been taught the developers on how to manage the near future strategic scheme even though, whether the strategic name has been changed or continued from. Due to the tremendous numbers of low-income group, in addition, within this group were also be categorized in further level, it is therefore the nationwide scheme should cover the whole attention.

As the international contribution, it is need for learning by acclimatization of the lessons learned to the local and personal of each country’s substances to find the optimum that is able to suit for each of the developing country scheme.

2.7 CONCLUSION

This paper has gone through and pinpointed a clear analysis of international housing trend and its acclimated strategic to Thailand. Self-help properties management was found to play an important role in both initiation and sustainability of the design project. Furthermore, government patronization also still need to be fulfilled in the most practical terms and the idea should be derived from lessons learned by real dwellers' acclimation. Self-help metamorphosis is found to be an apparent strength of low-cost housing theme. Moreover, every schemes is unable to leave one alongside, but it should play simultaneously mobilize the overall low-income habitation scheme. Finally, these lessons learned are able to be scrutinized for the international developing housing world as a prototype of the acclimatization to the unique local and personal substances of the low-income architectural properties maneuver, for the near future strategic habitation plan.

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Chapter 3
Fortifying Nationwide Low-income Habitat Strategy with Hybrid Prototype Actors

3.1 INTRODUCTION

Low-income habitat settlements have been so far the topic of discourse and the demand for legal land tenure is becoming increasingly imperative. Thai government through its Community Organization Development Institute (CODI) has launched its endeavor in providing the Baan Mankong programme for the grassroots people. Meanwhile, the distribution of the housing scenarios and the practical adoption has been fulfilled. The implementation processes have been performed and it was explored that the community based participatory process helped in mobilizing the housing scheme. Moreover, hybrid patronized key actors have been found to play a significant role patronizing the design process. It is furthermore, Changchumchon is explored to be the community support key persons to help mobilizing the construction process. Also the knowledge & skill have been transferred. The paper shed light on the implementation process which has been done by the community participation process. Hybrid prototype key actors have been explored the capabilities to help sustaining the availability, practicality, design procedure of the slum dwellings.

Many developing countries have suffered from the issue of land resource management for the poor that causes the effect to the environmental and living habitation, also to Bangkok, Thailand where its population and the demand of legal land title are becoming increasingly high as being the capital metropolitan area. One of the most perceptible kinds of illegal squatter in Bangkok is slum settlement that so far caused many problems. An endeavor to solve this problem has been launched by establishing the Community Organization Development Institute (CODI) that has been separated the task from its first National Housing Authority (NHA) that principally deal with the land secured tenure. Launching the programme by promoting and making a clear understanding about what CODI does, initiating saving groups, thereafter performing the redevelopment process. Particularly for the design process, it is inadequate for such a group or an architect can perform effectively and decrease time consuming due to the tremendous number of slum settlement. Therefore community architect and Changchumchon have played a crucial role patronizing with the collaboration with community-based requirement in each of the area.

Much study emphasize on the aspect of background and the responsibility of CODI to Baan Mankong programme. Boonyabancha tries to explain about Baan Mankong programme under CODI supervision (Boonyabancha, 2005). The UN-Habitat's Slum Upgrading facility (SUF) has shown the background of the upgrading in Bang Bua (SUF, 2008). Aspect of financial has also been focused (Mitlin, 2007).

Also for the field trip report were performed to elucidate the situation (BUDD and DPU, 2011), (Kayumi et al, 2012). Additionally, the economic aspect of Baan Mankong programme was studied (Archer, 2012). Nonetheless, it has been feebly documented on the detailed design process of slum housing and how much the key patronized actors and slum dwellers do so that mobilization of the design construction process also to the design negotiation and monitoring system.

Therefore, this chapter clarifies how the design processes were being implemented and shown the task of community architects who play a crucial role mobilizing, facilitating and supporting for the affordability of slum architecture as one of the most imperative for the design aspect with the community-based participation. Also for the community architect movement and its trend were clarified. Furthermore, this paper helps to fortify the upgrading strategy particularly in terms of design participatory strategy.

3.2 PRIOR STEPS TO STARTING THE DESIGN PROCESS

Programme Distribution and Public Hearing strategy have been utilized as the initiated stage to make trial of understanding in terms of overview of the development process. Therefore, how well the core of success depends on these crucial steps also, apart from the programme distribution and application of the adopted development scenarios.

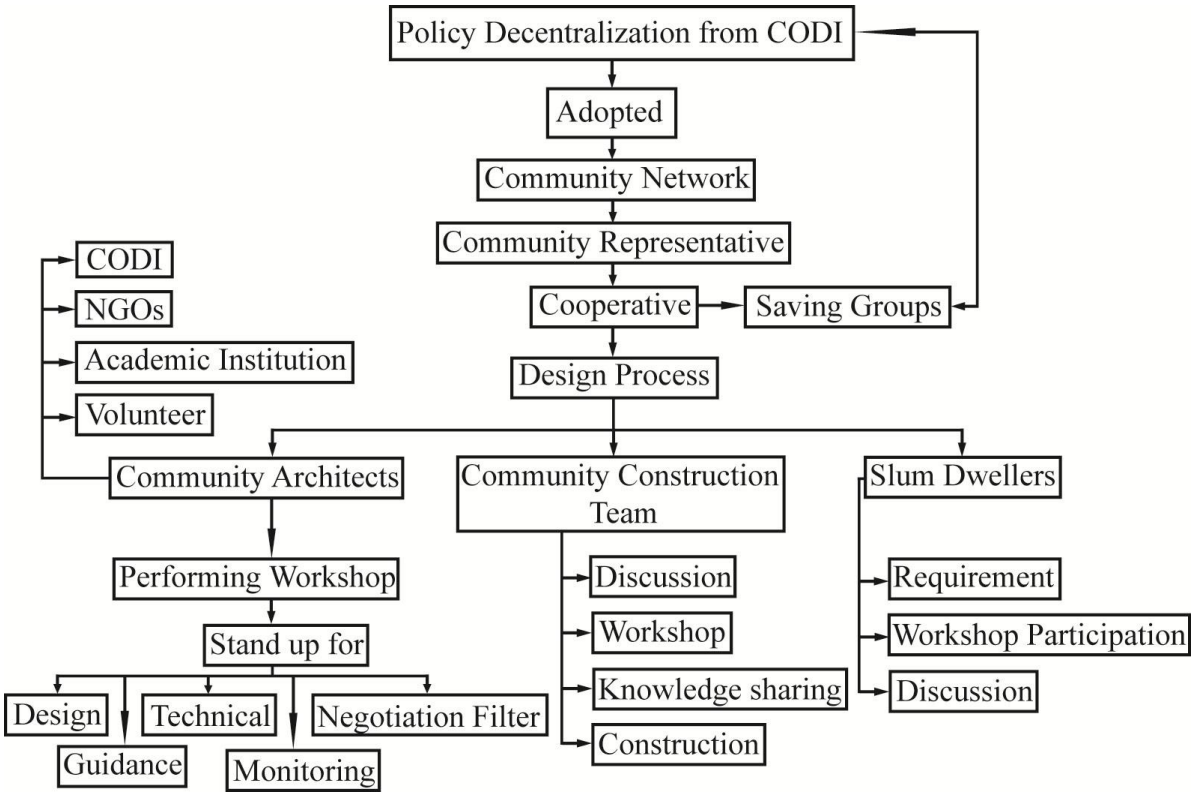

Fig. 3.1 Design Participatory Tools and Decentralized Strategies

The slum upgrading strategy has been decentralized from CODI by initiating a clear understanding about its intention to help enhancing the slum and the process of development as shown in Fig. 3.1. At the initial step, CODI try to frequently organize the public hearing to make the clear understanding with slum dwellers.

It was sometimes organized at CODI office even sometimes in the actual site whereas in slum community. The programme is the slum upgrading with the support of help negotiating the long term housing loan, and land right as making the negotiation with the Crown Property Bureau (CPB), for instance 20 years or more for long term contract. Therefore, since the negotiation was made, slum dwellers are able to have land secured tenure which is the legal land title.

3.3 INTERNAL KEY PATRONIZED ACTORS

3.3.1 Crucial Role of Leadership and Negotiation

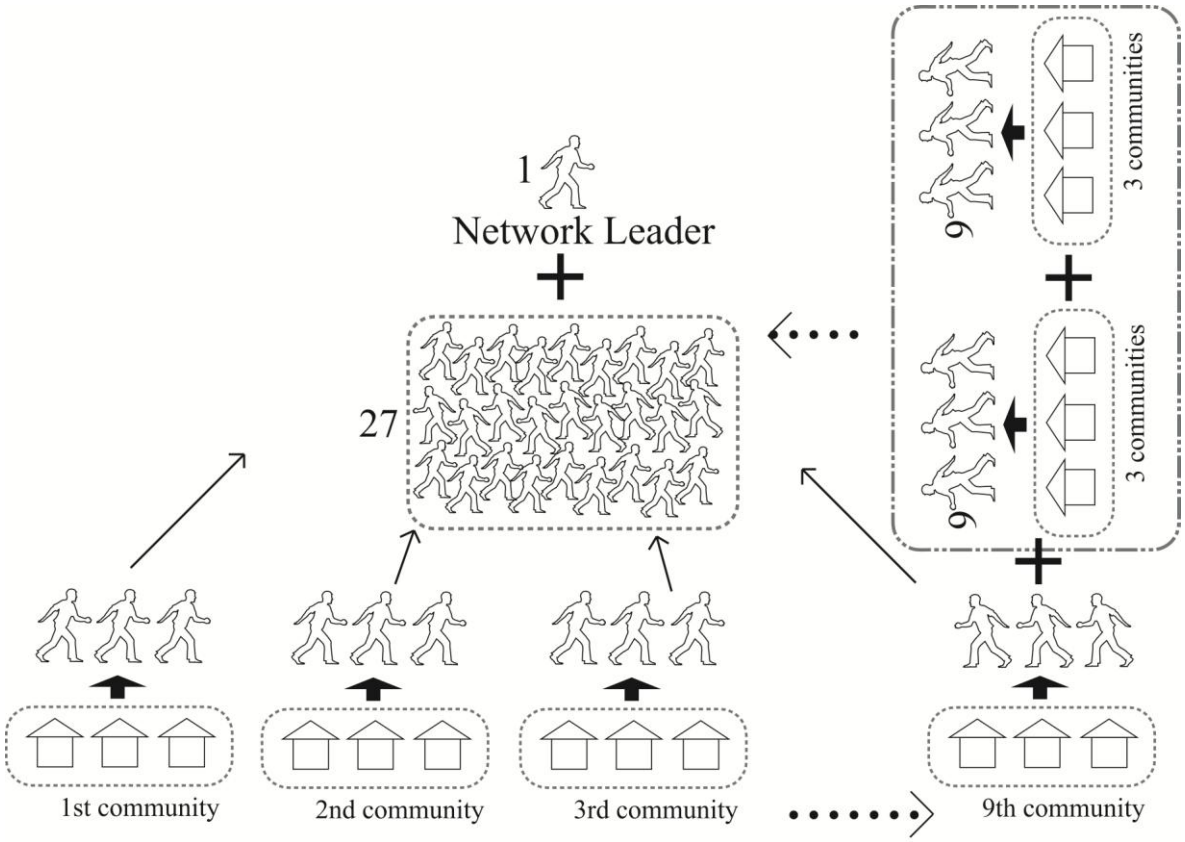

Fig. 3.2 Design Participation Process

In 1990, slum problems became apparent realization for the dwellers due to the major so far issues, for instance, drug selling, environmental and horrific connection among the dwellers. Moreover, due to the critical situation in Bang Bua community in 1993 that seems as the vertical point that the

communities along the Bang Bua canal were considered by outside world as the source of contaminated water. In addition, the public municipality has a plan to construct 6 meters wide canal alongside road, but the tenants were not willing to, due to its limit area. It is therefore that year, the canal network was formed out to strengthen community system, by choosing its representatives from each community to form the network. It was only 9 communities at the beginning, 3 representatives from each of the community, therefore totally 27 main persons plus one for the network leader (Mr. Prapas Sangpradab since then), it is therefore totally 28 people. And it is incrementally increasing to be 12 communities till now; there are 15 communities in this network. Bang Bua community has their community leader also to the other slums in Bang Khen area, therefore, it was easy to form the community network. Bang Bua community has its own representative to join in the National Union of Low Income Community Organizations (NULICO). In other words, this community has the framework in the community network and its individual level. The advantage is the efficiency to control and manage the community.

The prevailing outcomes, slum dwellers have more power of negotiation, for example, they could negotiate the width of the former plan 6 meters wide to 3 meters wide, 1 meter near the canal was municipality built and next to 2 meters was community built. Also they have more power of negotiation by the support of CODI to negotiate the 30 years long term legal land rental to the Treasury Department which was longer than it used to be also it was given the construction loan from the government under the supervision of CODI. It is therefore apparent that the powers of leadership and negotiation have strong effect to the initiate step of upgrading system as shown in Fig. 3.2.

3.3.2 Cooperative as the Saving Groups and Its Permeable Community Monitoring Procedure

After formation of community network to have more power of negotiation, the next process is to form the cooperative of the community and have the chair of the cooperative. After joining the cooperative and starting to have saving account, until the saving was reached the requirement (ten percent of real construction cost) thereafter the housing construction loan was allowed and start having design process (Tonmitr and Ogura, 2012). Cooperative is not only the form that deals with the money like the small bank, but also acts as the monitor and permeable membrane that help for the process of affordable slum housing. It was a kind of community self-management who looks after the process. For instance, loan was not given to the dwellers in terms of money but slum dwellers were given the loan in form of construction materials which is able to ensure that all of the money was paid for actual construction cost. These were shown that community cooperative is the internal start key actor for the design construction process.

3.4 EXTERNAL KEY PATRONIZED ACTORS WITH COMMUNITY ARCHITECT MECHANISM AND ITS TRENDS

Table 3.1 Example of Community Architects and Their Working Area in Terms of Design Affordability Patronization

Insti.Type	Community Architects	Area of Development
Gov.	1. CODI	All areas
Semi-Gov.	2. Chanoknart Four Regions Slum Network	Bangramard zone
Academic Institution	3. Rittirong Chutapruttikorn Bangkok University	Chonglom community and Bangramard community
	4. Panayu Chaiyarattananon King Mongkut's Institute of Technology Ladkrabang	WatInbanjong community
	5. Nattawut Usavagovitwong and Prayong Posiprasert Sripatum University	Bang Bua community
Voluntary	6. Volunteers- Architects, Designers, Others	Depending on each project

3.4.1 Institutional Design Patronization

This programme is being fulfilled for the design aspects by the architects. Without the collaboration of architects and slum dwellers, the affordability of housing design could not be made. There are supports from CODI, 4 Regions Slum Network, University or academic patronization and voluntary patronization. It is therefore there is the collaboration among governmental organization, non-governmental organization (NGOs), academic institution, voluntary that help facilitating the design process for Baan Mankong programme. It was prevailing that there is not only each institution participated in one project but also in the tremendous number of developed area, there is also the collaboration between each institution. For instance, in Watinbanjong community, it was the alliance between Sripathum University and King Mongkut's Institute of Technology (KMITL) that help mobilizing the redevelopment project.

3.4.2 Role of Community Architect and Its Responsible Community and Movement

Only for CODI and its architects are inadequate for such a tremendous area of the development, therefore after decentralizing the programme, there are the communities for team of architects to be responsible to. The given example of an outstanding development and its responsible zone in Bangkok as shown in Table 3.1.

3.5 DESIGN CONTRIBUTION PROCESS

3.5.1 Design Requirements and Community-based Participatory Strength

Housing construction depends on Changchumchon (community self workers team), they used self-help construction which the members are the owners and community members so the money has been circulated within the community. Apart from money circulation, construction skill and knowledge sharing has been taught among the people. It is therefore slum human resources have been instructed from generation to generation within their community, from non skilled worker to be skilled worker and that skilled worker is able to have self-skill after completing their house, later on helping other to build their living habitation. The gradual self-build construction process has been designated for the Bang Bua community, for the structure foundation and column are need to be prior calculated load bearing since first decision making.

Fig. 3.3 Photograph of Unpainted House and Under Painting Process House

The first step is to make the foundation and the number of storey, thereafter most of residence started to make enclosure for their living. Most of the houses initiate their enclosure from the second floor to be their bedroom and keep their costly belongings inside to prevent robbery and let the first floor vacant at the first step of occupation. After occupation period, when dwellers are able to afford the cost of construction including the construction materials, consequently, they started to enclose their first storey space. It is noticeably that, the house owner gradually gain their construction skill from building

up their house, after their houses have been completed, they have skill and knowledge that can share or supervise their neighbors who still building up the house. For the finishing colour is not so complete at once. It depends on affordability of the painting cost and let the finishing start as shown Fig. 3.3. Colour finishing is not the immense issue of their architecture.

3.5.2 Practical Design Development and Workshop Discussion

Workshop and design participatory have done in forming the small group of participation like 5-6 afterward up to 20-30 people which has been use the strategy of same interest and previous house location even friendship selection. The preliminary design of the small group has been done many times until reached the satisfaction and have to ensure that it was suited for the whole community theme. Later, the master plan was determined.

3.5.3 Shop Drawing, Starting Up Construction Process and Monitoring System

After having the master plan, the detailed plan and shop drawing were written. The detailed information of given plot size is in Ref. 5&8. Used construction parts from the house before starting up upgrading can be applied for their new house for instance, used roofing tile, used metal structure that they can re-cut, rejoin for new construction purpose, used window and door frame, used window and door even used old wood can be used for concrete construction process to be the block for cement pouring. Other necessary parts dwellers can make the requirement to the cooperative center when they wish to conduct the construction. For the widely-used roofing materials, corrugated asbestos are mostly found in the project but the colour are varies, for example, plain colour, red, orange, blue and brown. For wall plane, concrete block is mostly used for enclosure building façade. Metal roofing structure can be explored in general construction because it saves the time, easy to move and install. Additionally, the technical advice still given to the dwellers even after construction process has been finished, for instance, the integrated building system and house maintenance. The self-monitoring system was done by community cooperative, dwellers also to the community architects patronization.

3.6 CONCLUSION

This chapter has shed light on how to fortify the low-income habitation design strategy that means not only the civil management but the physical design procedure also. It was found that the hybrid prototype patronized of key actor strategy was able to cope with the actual slum design development process. By the patronization of self-internal and external key actor, it is able to mobilize the design process to become real development. Also to the leadership and power of negotiation that was the first step of the enhancement. Additionally, the collaboration among the community members, community architect, Changchumchon, and the government side should make clear understanding since the upgrading process was formed out so that to make the long term sustainability of improved slum habitation as well.

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Chapter 4
Self-organized Community Mechanism to Sustain the Governmental Low-income Housing Project

4.1 INTRODUCTION

Urban housing situation has been so far a critical topic of discourse for sustainable city development. Low-income people are a part of city dwellers who inhabit in many kinds of settlements (Tonmitr and Ogura, 2013). One of those settlements that is imperative for the development is the squatter settlement or slum. The effort to cope with slum development issue named Baan Mankong Programme (BMP), under a responsibility of the organization called Community Organizations Development Institute (CODI) that the tasks have been separated from National Housing Authority (NHA) (Tonmitr et al, 2012a: Tonmitr et al, 2012b: Boonyabancha, 2005). There is an endeavor of a previous study on the BMP about materials for low-income housing extension (Tonmitr, 2014). This paper unveils the self-organized community mechanism utilizing the case of Tawanmai community housing in Khon Kaen Province, Thailand that is under the BMP.

For the enhancement strategy, this paper aims to clarify the self-organized community mechanism through following objectives:

-Delineate the processes of community housing system for housing development action.

-Explore the role of community cooperative for housing enhancement strategy.

-Unveil the housing loan system for urban poor housing community.

-Clarify the housing type in relation to loan and payment system

Therefore, it is important to gain insight into the aspect of self-organized housing mechanism that will help to develop the urban poor housing strategy.

4.2 CONTEXT OF RESEARCH AREA

4.2.1 Site Location and Research Area

Tawanmai community housing has been utilized for this research. Site location is located in Khon Kaen Province in Thailand as shown in the community layout plan in Fig. 4.1. Whole houses of the community have been investigated. The survey covers whole houses (145 houses plus 1 community center) which have been shown in Fig. 4.1. As for the data collection, the integration of graphic recording techniques with recorded discussions has been utilized to collect the data. Also related documents have been reviewed.

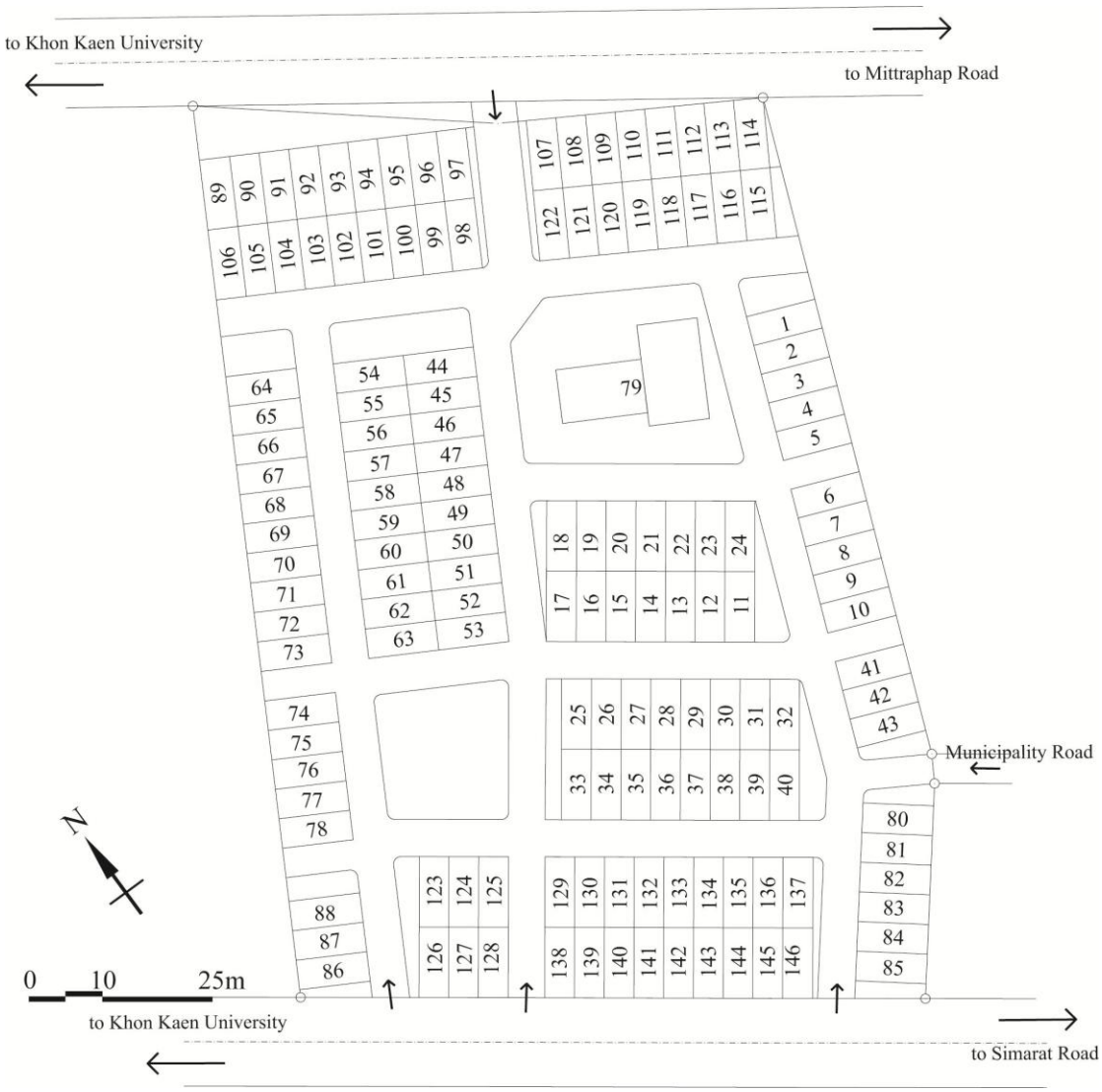

Fig. 4.1 Tawanmai Community Housing Research Area

4.2.2 Housing Characteristics

Housing design of this community is designated to be the form of a row-house type. Houses can be majorly categorized into two types which are the one and a half storey building, and the two-storey building which will be further analyzed in a study on house planning and design outlook in relation to loan and payment system in chapter 6 of this paper. Most of houses (138 houses) were two-storey housing, less amount of numbers were one and a half storey housing (7 houses).

4.3 PROCESSES OF COLLABORATION FOR HOUSING DEVELOPMENT ACTION

The processes of housing development will not be able to start without the collaboration of many stakeholders. The coalition process brought the stakeholders from many fields that formed the team both for the action and evaluation processes.

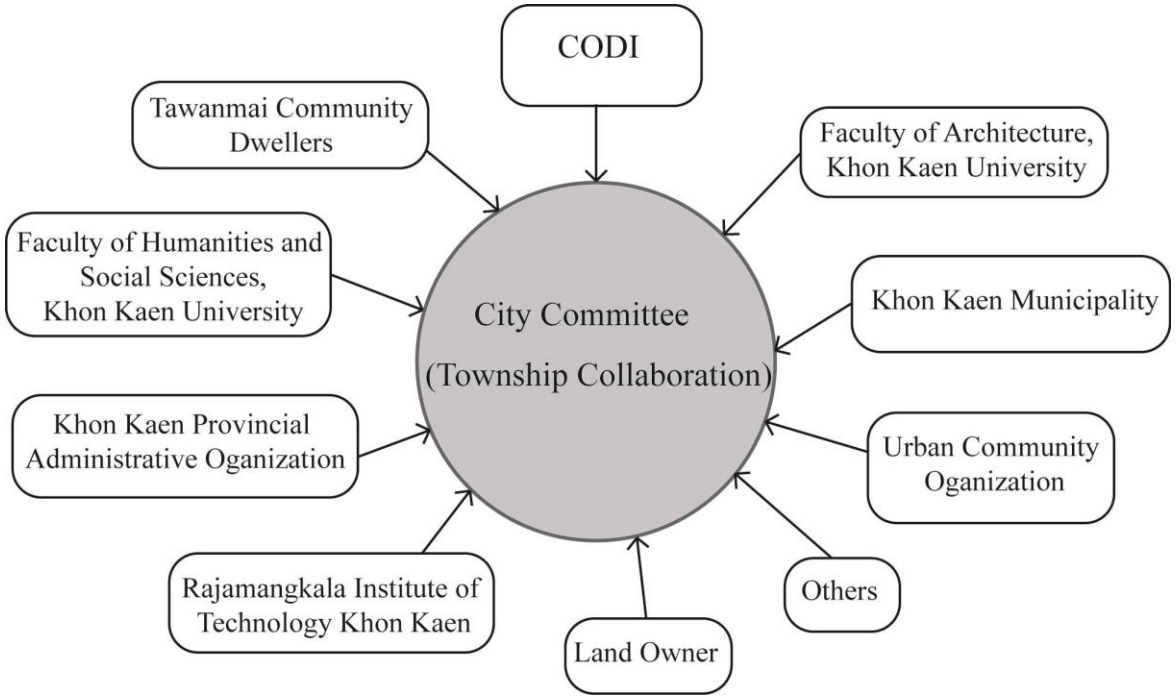

Fig. 4.2 City Collaboration for Action

There are major 9 stakeholders for the development processes as shown in Fig. 4.2. One is the CODI that helps to support the programme and brought the people all together. Three of which are the local University and Institution which include Faculty of Architecture, Khon Kaen University (KKU) that supports knowledge distribution and sharing about housing design and planning, holding the technical workshop for dwellers and people who in charge with the construction processes as well as house planning approval procedure. Faculty of Humanities and Social Sciences, KKU helps to make clear understanding about the BMP that is under the CODI, supports the community and city committee operation, helps about community observation, analysis and synthesis as well as sharing the idea for the BMP development. And Rajamangkala Institute of Technology supports house drawings and sharing the knowledge with dwellers. Two are from local administrations which are Khon Kaen Provincial administrative organization and Khon Kaen municipality. Another three are community dwellers, urban community organization and the land owner. All of the stakeholders were brought together for the housing participatory development action.

4.4 SIGNIFICANCE OF COMMUNITY COOPERATIVE

4.4.1 Forming the Team for Housing Development

Initial important step was to form saving groups, thereafter changed it to be cooperative scheme. The cooperative does not deal with only the financial system but construction process also that will be described in 4.4.2. There are 13 people which are the cooperative committee members that were chosen from all dwellers of the community members meeting as shown in Fig. 4.3. The cooperative committee meeting is held on every first Sunday of each month. And for the members' meeting is held on every second Sunday of each month. The community members have participated in land purchasing, house planning and design processes, house evaluation process, with the cooperative committees. And the representatives from construction section of the municipality have collaborated with the processes. Additionally the cooperative is able to be evaluated by all the community members.

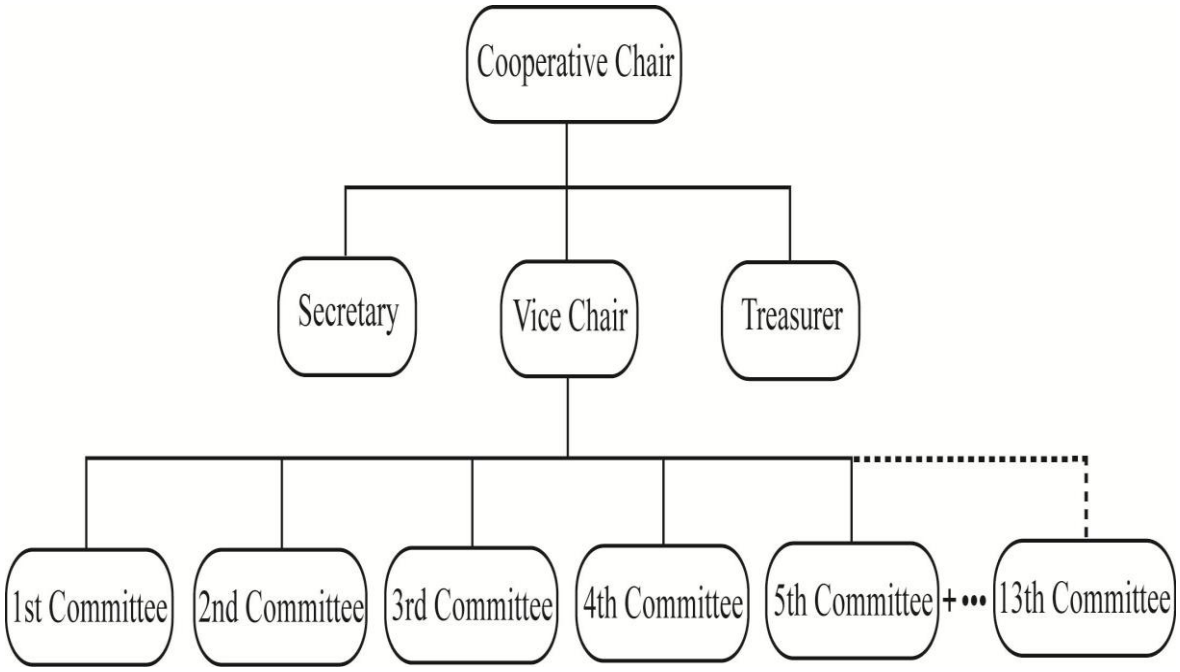

Fig. 4.3 Structure of the Cooperative Administration Team

4.4.2 Role of Community Cooperative

Construction management system was operated by the community cooperative. The community skilled constructors (Chang Chumchon) were hired. And cooperative helps to manage about purchasing construction materials. Therefore the money and construction skill have been circulated within their own community. It can be mainly categorized the cooperative into five teams for housing development action. First is purchasing section, is responsible for materials price observation,

checking, and purchasing as well as making the material purchasing documents for evaluation of every month. Second, the store section helps to check, giving the materials and make evaluation of these processes. Third is financial section, stands for paying the construction price and making the financial documents. Fourth is evaluation team, supports construction management processes with the committees, controls the construction processes. And the last one is construction phase checking team that stands for checking the quality of housing when construction is completed with the house owner and representatives from construction section of the municipality. Therefore, the construction processes are well planned so that construction processes can be run smoothly.

4.5 HOUSING LOAN SYSTEM FOR URBAN POOR COMMUNITY

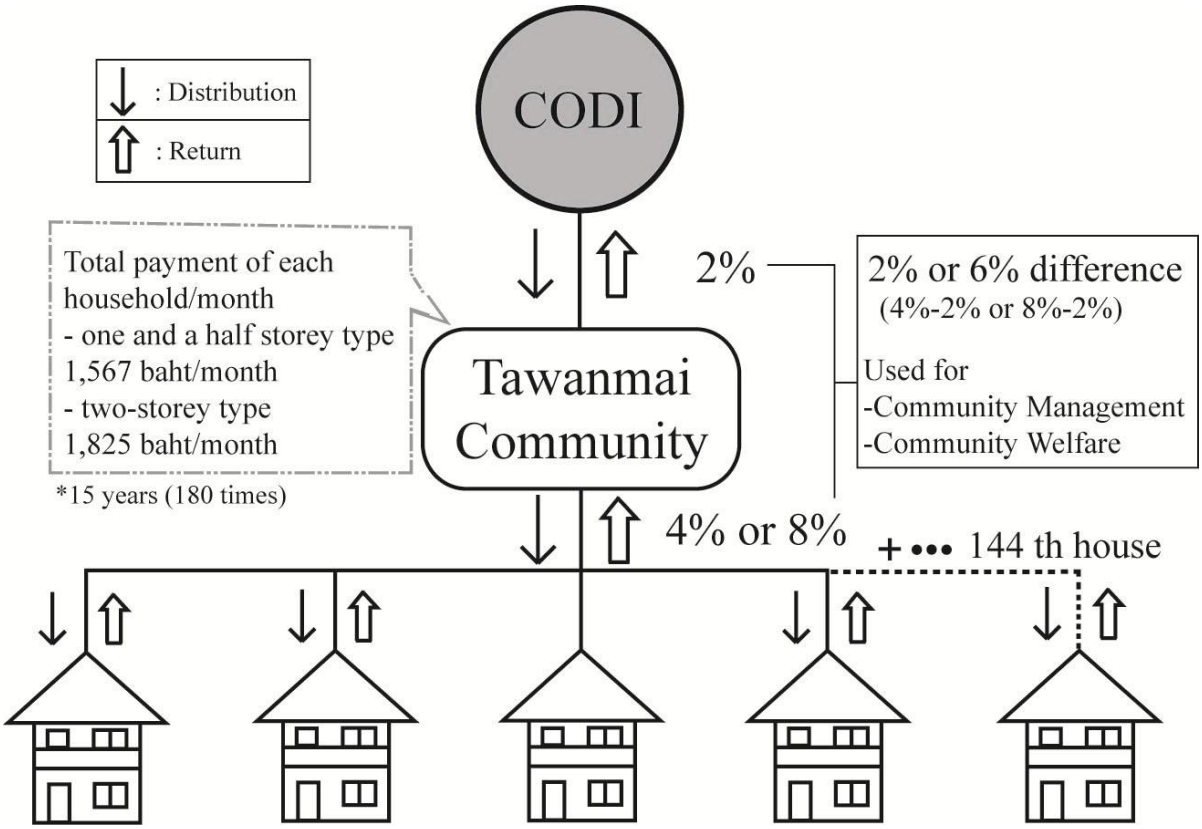

Fig. 4.4 Housing Loan Management System

This chapter analyzed the housing loan system for the urban poor community as shown in Fig. 4.4.

Tawanmai community borrowed money from CODI at the rate of 2%/year. Community members can take loan at the rate of 4%/year for housing management or housing construction. Additionally it was

calculated at the rate of 8%/year for the activities except housing issue for instance, for income generation activities for purchasing equipments or an investment. As for 2% or 6% difference, cooperative will use this amount of money for community management or community welfare. Therefore the activities of loan system can be concluded as follows:

-There is daily saving, weekly saving, and yearly saving that can be further categorized into three types.

1. Saving for living habitation (house and land price).
2. Saving for a share 100 baht/ month.
3. Saving for community welfare 30 baht/ month.

-There is a loan for income generation activities in short term (12 months), at the interest rate of 8%/year.

-There is a long term loan system for paying the house and land price (180 months), at the rate of 4%/year. Furthermore, there is a long term loan for housing construction purpose (180 months) at the rate of 4%/year.

Total payment of each household per month can be concluded. As for the one and a half storey house type, dweller has to pay 1,567 baht/month (land & house cost and share) to cooperative. As for the two-storey house type, dweller has to pay 1,825 baht/month that covers land & house cost as well as monthly share to their community cooperative. The dwellers have to pay long term loan for 15 years (180 times). If they want to sell their house, they have to sell back to their community, not to sell to outside. This system prevents the community from outside intervention that helps to preserve the sustainability of the community.

4.6 HOUSING TYPE IN RELATION TO LOAN AND PAYMENT SYSTEM

There are two types of housing that are a one and a half storey row-house type, and a two-storey row-house type. Payment can be majorly sorted into two types which are payment of land price and payment of house price.

As for the one and a half storey type, monthly payment of land price is 452 baht/month. Land price payment is 1,015 baht/month. Additionally, dweller has to pay 100 baht/month for the community management and social welfare as a share fee. Therefore, monthly total payment of this house type is 1,567 baht/month as shown in Fig. 4.5. As for the two-storey house type, monthly payment of land price is same as the previous house type that is 452 baht/month. Dweller has to pay 1,273 baht/month for house price.

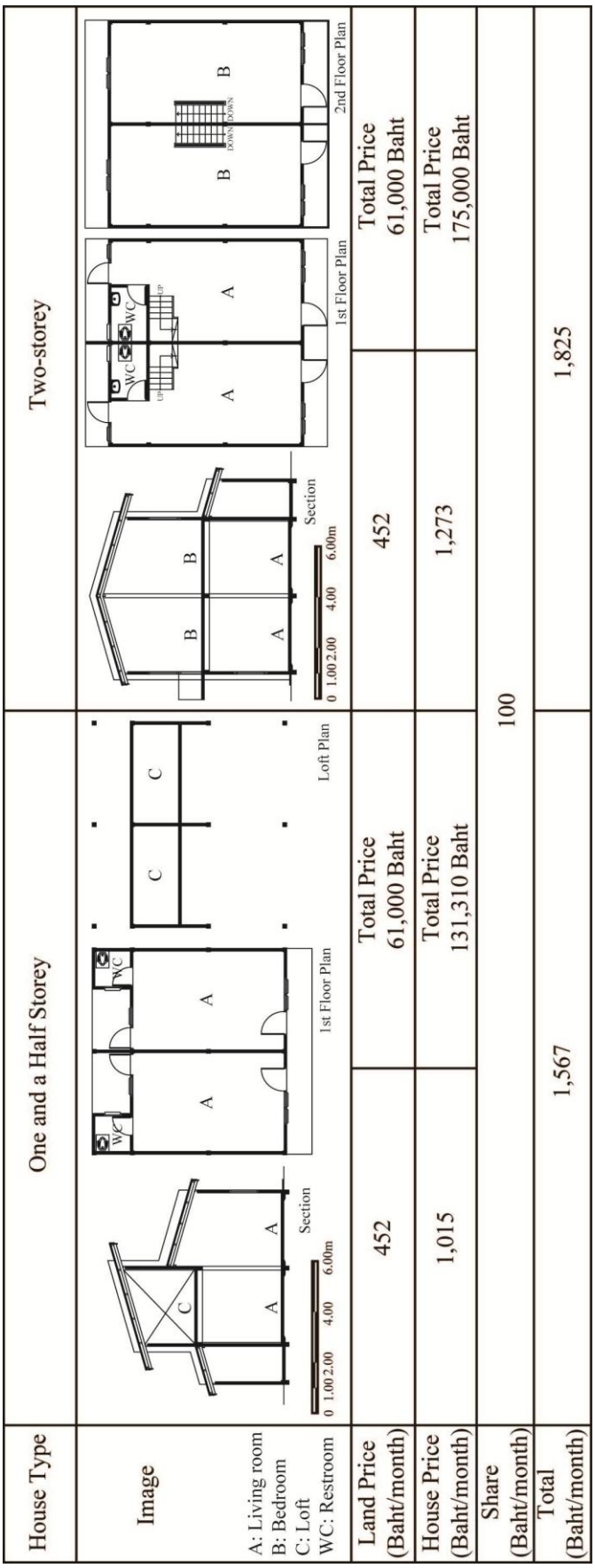

Fig. 4.5 Tawanmai Housing Type, Characteristics, Loan and Payment System

The total payment that included land and house price of each month is 1,825 baht/month including a monthly share fee that is slightly higher than the previous house type as shown in Fig. 5. Long term payment is due to 15 years that is 180 times of payment. So dwellers can afford their house by finishing the long term payment through monthly payment. Total payment of land & house price can be calculated. As for the one and a half storey row-house type, total payment of land price is 61,000 baht. The total payment for house price is 131,310 baht. So the total payment of land price and house price is 192,310 baht. As for the two-storey house type, the total payment of land price is 61,000 baht which is same as the previous row-house type. In addition, the total payment of house price is 175,000 baht. So the total payment of land & house price is 236,000 baht.

4.7 CONCLUSION

To develop community housing under the BMP, the need of practical collaboration comes into the first step. Understanding of the BMP and community participation played a significant role of the housing development. The strategy to bring community members all together by using saving group activity, thereafter changed to be community cooperative scheme showed the capability to combine financial system and construction management together. Dwellers can take part in the practical development, request their needs, share their ideas, or even evaluate the project. Additionally, long term loan system in relation to housing type helps dwellers to afford the houses together with land, and some of their money can be utilized as their welfare system. Therefore, the collaboration between many stakeholders, cooperative and the long term loan system in relation to housing type have played the imperative role for the affordability of sustainable urban poor housing.

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Chapter 5
Empowering Sustainability of Nationwide Low-income Housing Strategy with Thai Community Cooperative System (Cooperative System as the Initiative of Construction Management, Participatory Design, Housing Characteristics and Development Processes)

5.1 INTRODUCTION

As was being a metropolitan city in the developing housing world, Bangkok as well as Khon Kaen of Thailand where has suffered from the human and habitation aspects likes many developing countries and due to the tremendous number of people and the limit number of residential area, and high cost of land. Moreover, the squatter problem that has been so far the major low-income habitation discourse until the Baan Mankong programme was established which aiming at solving the slum housing situation (Boonyabancha, 2005). As acting as the slum upgrading programme, it was provided the collaboration between the government sector and community self-management system. Nevertheless, a strategy is needed to be fulfilled by the real circumstances and its dwellers adaptation. One apparent issue is about collaborated system with the role of Thai Sahakorn-Chumchon (Thai Community Cooperative), based on Thai Buddhism Society as similarity in some aspects of Islamic Waqf that has the capability to sustain the community to be upgraded well living habitation. Furthermore, this chapter clarifies how community cooperative system has helped to starting up the re-development processes which included construction and design aspects. Moreover, after the development processes have been initiated, it can be seen the design characteristics of each project.

5.2 BAAN MANKONG AS A NATIONWIDE LOW-INCOME HABITATATION STRATEGY

5.2.1 Formation of the Representative in Terms of Leadership

Due to the Bang Bua community crisis in 1990, that was considered by outside people that this community has been so far the cause of water pollution by the garbage disposal of each household. In addition, the vertical point came to this community when the public municipality needed to construct a canal side road as 6 meters wide, however, dwellers were not willing to do due to its limit area. Later on, they eventually found their way to self-manage this problem. The formation of the Bang Bua canal network consisted of communities along the river side and then chose one leader of this strategy to be the contact person of all canal side communities.

5.2.2 Group Forming and Power of Negotiation

After having the power of leadership and the Community Organization Development Institute (CODI) has entered the Baan Mankong field around that time with aiming at solving slum issues. It is therefore the initiation of collaboration. According to Bang Bua land area belongs to the Treasury Department.

Therefore, the CODI has acted as the agent to help fulfill the negotiations. Finally at that time slum tenants were able to have longer contracts of land title than it used to be.

5.3 WHAT IS THAI SAHAKORN-CHUMCHON?

5.3.1 General Sahakorn-Chumchon Background

Sahakorn-Chumchon is the custom resource maneuver system in Thailand and it has the unique point that is similar to Islamic Waqf. Waqf is regarded as a unique Islamic innovation (Hennigan, 2004). For the detailed information about Waqf is in (Khalfan and Ogura, 2012). In this term, Sahakorn-Chumchon has a capability to initiate the design upgrading process by acting as central agent that helps to collecting the slum dwellers all together to originate the process. Furthermore, it helps to sustain and mobilize the maneuver system, it is not only the finance system, human resources but also the key-connection for the slum housing design process.

5.3.2 Thai Sahakorn-Chumchon and Buddhism Influence

Although Thailand is not a country that the Islam is a Major religious, as being as Buddhism country which means major of its population are Buddhists. There is a similarity of the role of the Waqf of Islamic society and Bang Bua community's Sahakorn-Chumchon does, the characteristics of Waqf; Once a property is dedicated to waqf it remains waqf forever: Under no circumstances can the property be withdrawn from waqf except in rare cases when properties are swapped with another property of equivalent value or purpose. The similarity is, for instance if there is a land that dedicated to the Thai temple (Wat), it is unable to sell to the public sector who needs to invest on this land right. The point is, The land right in the Bang Bua community is unable to shift to outside community members which means that if someone in the community wants to get out of the community and sell, that person is not allowed to sell to the public sector, this term means that it has to be sold back to the Sahakorn-Chumchon which is safe from outside intervention that might be back to slum problem again. It is therefore the Sahakorn-Chumchon has a strong effect and capability to sustain the community management process. Sahakorn is continued from the Thai-Buddhist trust called Longkhak (Mutual patronization) and it was materialized before 1968 that the Cooperative League of Thailand which was formed first and the cooperative regulation launched.

5.4 GENERAL BACKGROUND OF COOPERATIVE SYSTEM FOR LOW-INCOME COMMUNITY

The aspect of how cooperative system help enhancing urban low-income community strategy has been clarified. And also the participatory system of the community development has been pinpointed by utilizing the cases of Bang Bua and 14 rai community in Bangkok for these issue

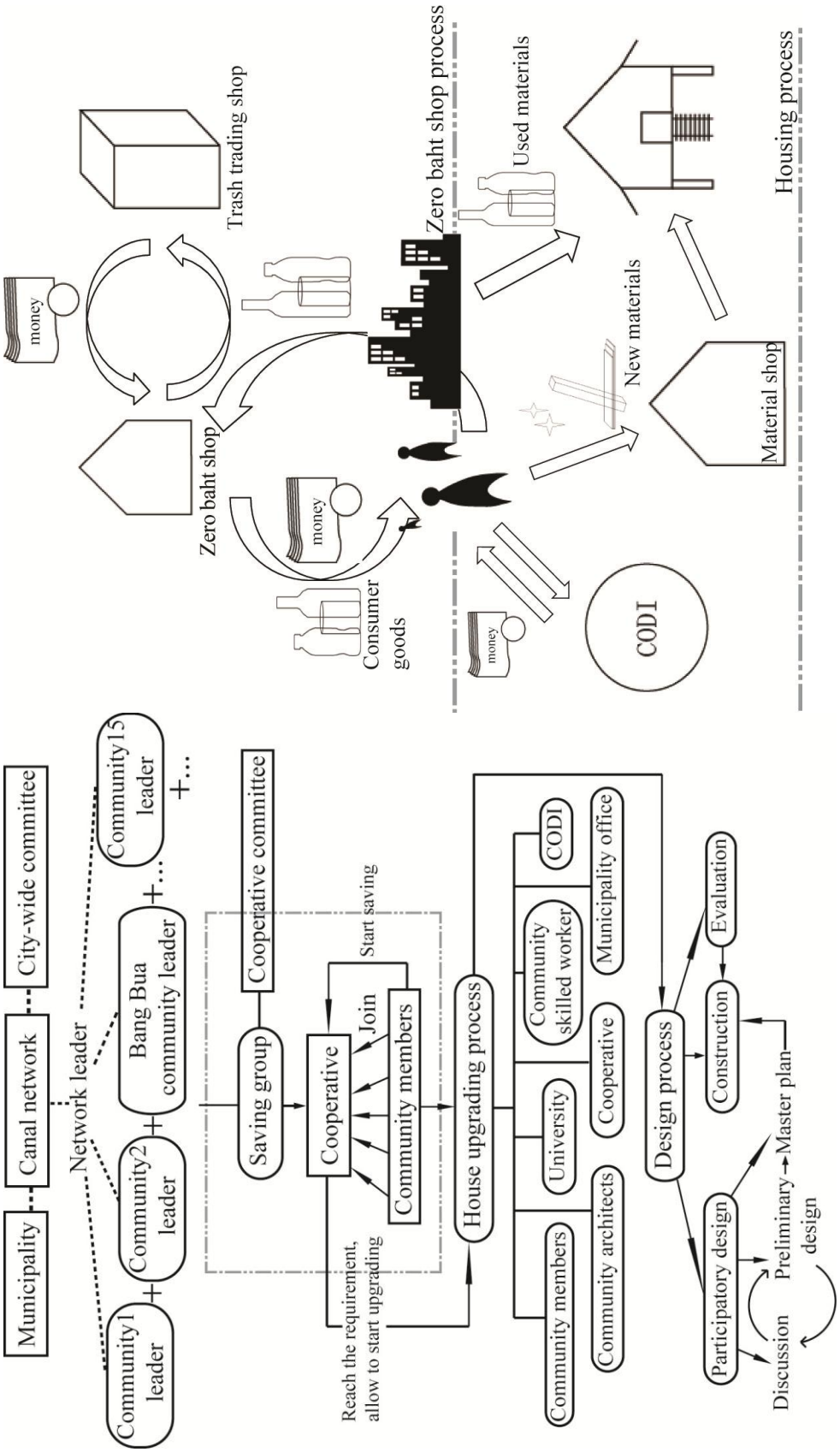

Fig. 5.1 Bang Bua Community Maneuver System (left), 14 Rai Community Maneuver System (right)

5.4.1 Starting Up the Saving Group

Initially, the cooperative system can be formed up by establishing the saving group. This advantage of strategy is to bring the members together. It is not only for the financial saving purpose only but also to make the power of negotiation and relationship among the members to become more fruitful and stronger.

5.4.2 Linking Cooperative to Community Development

The successful development needs the people to take the participatory action. Cooperative system plays an imperative role dealing with community people (Tonmitr and Ogura, 2012). The strategies vary from each community context which will be shown in the following sessions.

5.5 COOPERATIVE SYSTEM OF BANG BUA COMMUNITY

5.5.1 Using Cooperative to Initiating Re-upgrading Process

It is due to the physical characteristic of the location that is the waterfront settlements, there is the canal network for community action. So far, there are 15 communities which has each of its community leader or representative to join this network. Bang Bua community leader is also canal network leader. After having community leader and the canal network, there is more power of negotiation to collaborate with a municipality and city-wide network. Performing a saving group is the initial step of an upgrading activity as shown in Fig. 5.1 (left). Subsequently, turning in to cooperative system, cooperative committees were chosen to help taking care of the cooperative. Community members start saving activities until reach the requirement, For instance, people who wish to take loan have to have saving at least 10% of the money they want to loan. Thereafter members were allowed to start the housing upgrading process.

5.5.2 Participatory in Design Process

As illustrating in Fig. 5.1 (left), the house upgrading process is launched. The coalition among community members, community architects, academic institutions cooperative, community skilled workers, municipality, and CODI help in mobilizing the development process. As for the design process, three major steps can be categorized. Participatory design processes, including group design discussion, preliminary design have been revised until getting the final master plan. Consequently, construction processes have been conducted. Additionally, there is also monitoring process during and after the construction phase.

5.6 COOPERATIVE SYSTEM OF 14 RAI COMMUNITY

It is known that 14 rai community is low-income community. Most of the community members' background is trash collector (Tonmitr and Ogura, 2013). Therefore the strategy called zero baht shop has been selected and utilized. Having zero baht shop; the shop which members are able to bring the

garbage that they collected outside the community, turned into money or it is an optional way to choose consumer goods in the zero baht shop. On the other hand, zero baht shop acts as the intermediate actor who helps changing the garbage into money and bring back to the community for investment in zero baht shop as illustrated in Fig. 5.1 (up right). Community-based occupation background affected much on this strategy. Strategy has been fulfilled by considering the capability and keenness of its community members. For the housing process as demonstrated in Fig. 5.1 (bottom right), some of loaning process has been done through CODI. New materials and affordable materials including used materials can be utilized to build the house in this community.

It is clearly seen that cooperative system has a capability to cope with the low-income community enhancement process. Additionally, it could be one of the strategies that should be implemented for low-income community. The Bang Bua case shows the capability of cooperative to be the initial step of slum development. Moreover, it is able to combine the community members to take participatory action for the re-upgrading process. The 14 rai community case shows the capability of cooperative system that put the community-based occupation into consideration. Community people are able to use their keenness adapted to the cooperative scheme. The cooperative system plays a significant role implementing the community development strategy that is allowing the members to participate in the process.

5.7 SUSTAINABILITY BY EMPOWERING THE SELF COMMUNITY MANAGEMENT

5.7.1 Initiate the Sustainable System

After having negotiation power with the government, the Bang Bua community used a cooperative system (Sahakorn-Chumchon) to be main actor who deals with management in the slum community by selecting the trustworthy people (At present, his name is Sgyuan). Slum dwellers who wish to have their house upgraded start have to be a member of the community cooperative and then start the saving process till they reach the conditions that allow them to start borrowing a housing loan and start the design construction procedure (Tonmitr and Ogura, 2012).

5.7.2 Social and Community Sustainability, Longevity and Double Sustainability

After having a subsidy loan from the CODI, dwellers have to deal monthly payment with CODI through their cooperative. Hence, double sustainability is due to self Sahakorn-Chumchon and CODI. It is an outstanding method of giving loan, slum members are not given the loan in the form of money but they were given in form of construction materials to ensure that all the loan is actually used for housing construction, not for other purposes. The detailed information of a given plot size is in Ref. 5&13. Slum community, in addition, has their observatory team cross-check the construction materials costs, it is therefore the dwellers are able to get the most reasonable price. The manifestation of Bang Bua housing is shown in Fig. 5.2.

Fig. 5.2 Housing Characteristics in Bang Bua Community with Its Manifestation

5.8 INTERMEDIARY HOUSING STRATEGY FOR POOR COMMUNITY (Community based decision, negotiation and housing design characteristics/ Implementation to community maneuver system)

The demand of housing for low-income has been so far a topic of discourse for developing housing world, particularly for Thailand where the legal land title has been the crucial issue for the poor people. According to the circumstances, there are two major governmental organizations which provide the support for the poor; National Housing Authority (NHA), and Community Development Organization Institute (CODI) (Tonmitr et al, 2012c). The responsibility of these two organizations is in difference. NHA major deals with low-cost housing, on the other hand, CODI copes with slum situation. There is an apparent case which is 14 rai community which has been given the land from the NHA but let the CODI act only financial subsidy.

This issue explores the housing of the low-income community to unveil the survival strategies which has been utilized by the community based on low-income people background. Also help to clarify the procedure of self-fulfillment design affordability.

5.9 MAJOR SUPPORT INSTITUTIONS

In Thailand, there are two major governmental organizations that cope with housing for the poor. NHA

which was established in 1973 as the beginning point of official nationwide housing development (Tonmitr and Ogura, 2012: NHA Thailand, 2010: Chiu, 1984). CODI is responsible for nationwide slum upgrading programme. Three typical cases were selected to represent the housing strategy situation. Firstly, Banpet Low-cost housing project in Khon Kaen province was selected to be the case under the provision of NHA. Secondly, Bang Bua community in Bangkok was chosen to be the case under the supervision of CODI. Last case, 14 rai community in Bangkok was selected to show an indirect coalition between NHA and CODI. 14 rai community is the case of the intermediary strategy that integrate the NHA and CODI by dwellers' determination.

5.10 DESIGN CHARACTERISTICS

5.10.1 Housing Characteristics

Banpet low-cost housing is governmental housing project. The basic house consists of two storeys as shown in Fig. 5.3. At first storey, it was found the piloti space and multi-purpose area including one

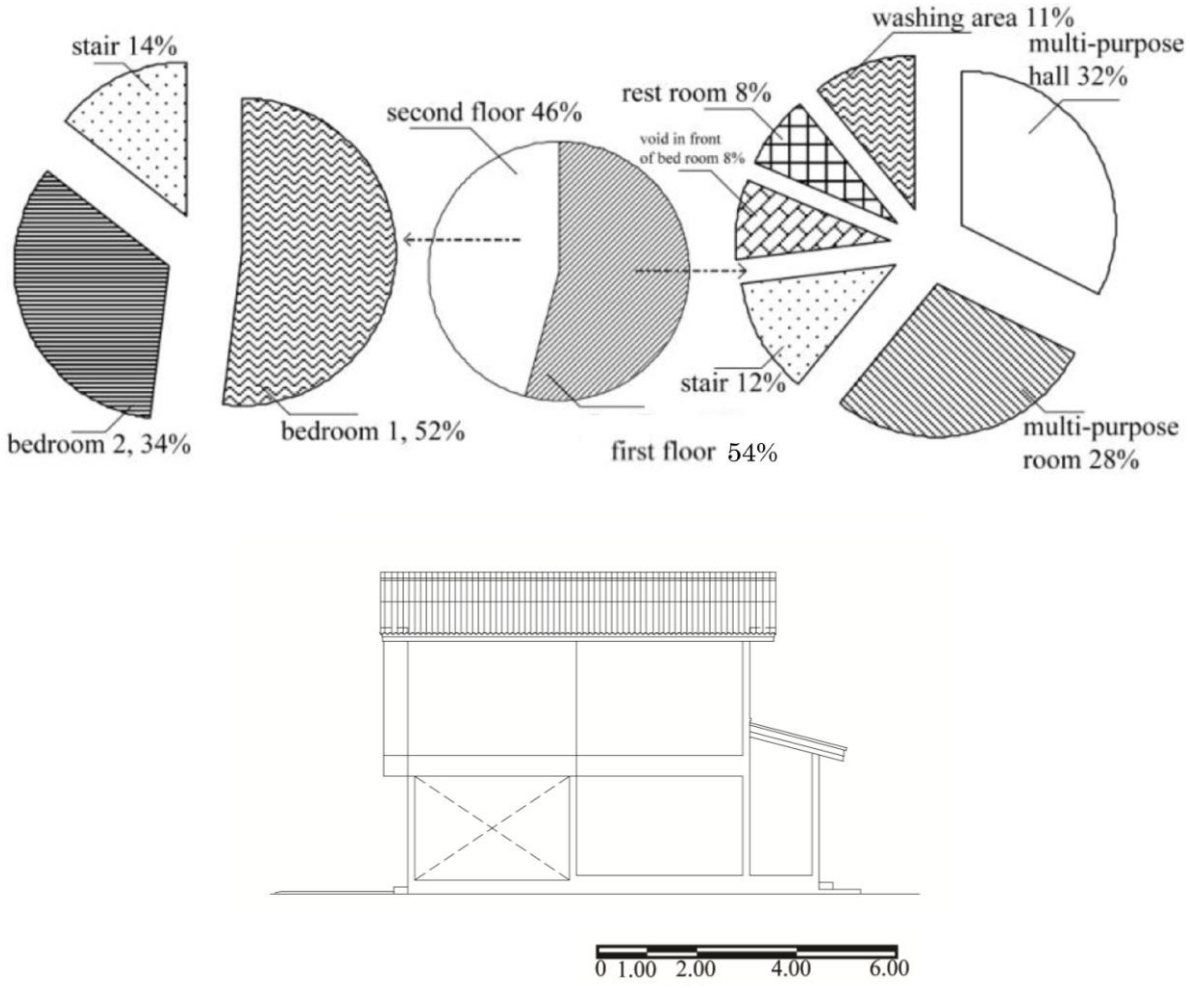

Fig. 5.3 Banpet Housing Design and Characteristics

restroom. At the second floor, it is bedroom area. Nonetheless, the area in relation to plot site is relatively small that causes the compact living condition, thereafter introduced housing extension by the dwellers (Tonmitr and Ogura, 2011).

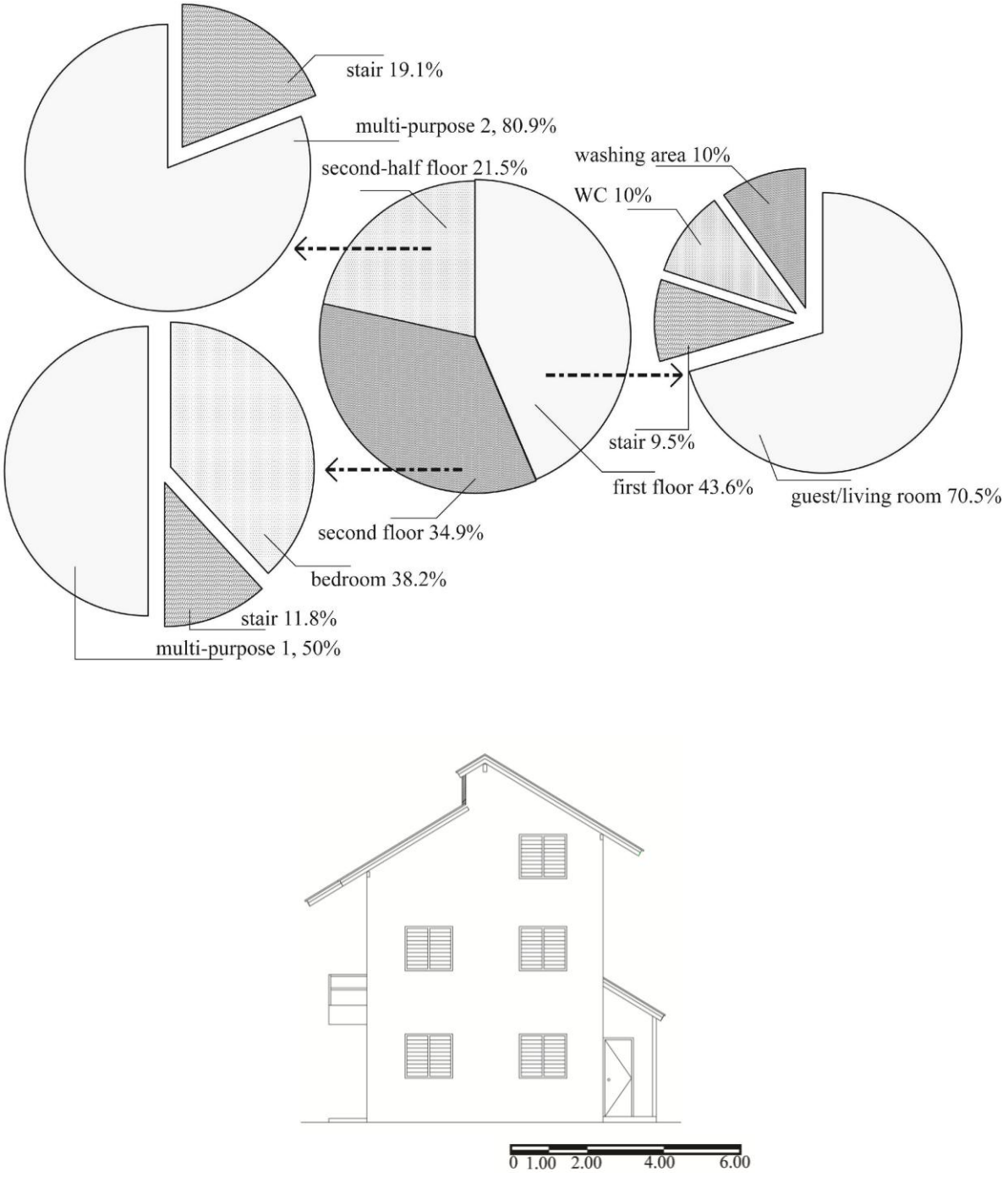

Fig. 5.4 Bang Bua Housing Design and Characteristics

As for Bang Bua Project, around 90% of housing were found to be two storey building. First storey functions act as guest room/ living room with one restroom. It was found bedroom and multi-purpose area for second floor as shown in Fig. 5.4. Nevertheless, it was found more luxurious than that of Banpet low-cost housing project planning.

Having investigated the 14 rai housing community project, it is apparent that housing is determined to use self-help design approach as dwellers' affordability. Therefore, there is a variety of housing styles. The number of storey is one and there are some two storey houses depends on dwellers' living condition. The apparent idea of planning, for instance multi-purpose space including inner storage or multi-purpose space with separate storage or multi-purpose plan arrangement as shown in Fig. 5.5.

The ratio of multi-purpose space per storage area varies from each house. However, some of the houses were found a little space arrangement for storage area, the reason is some of those dwellers decide to gain additional job outside apart from trash collector.

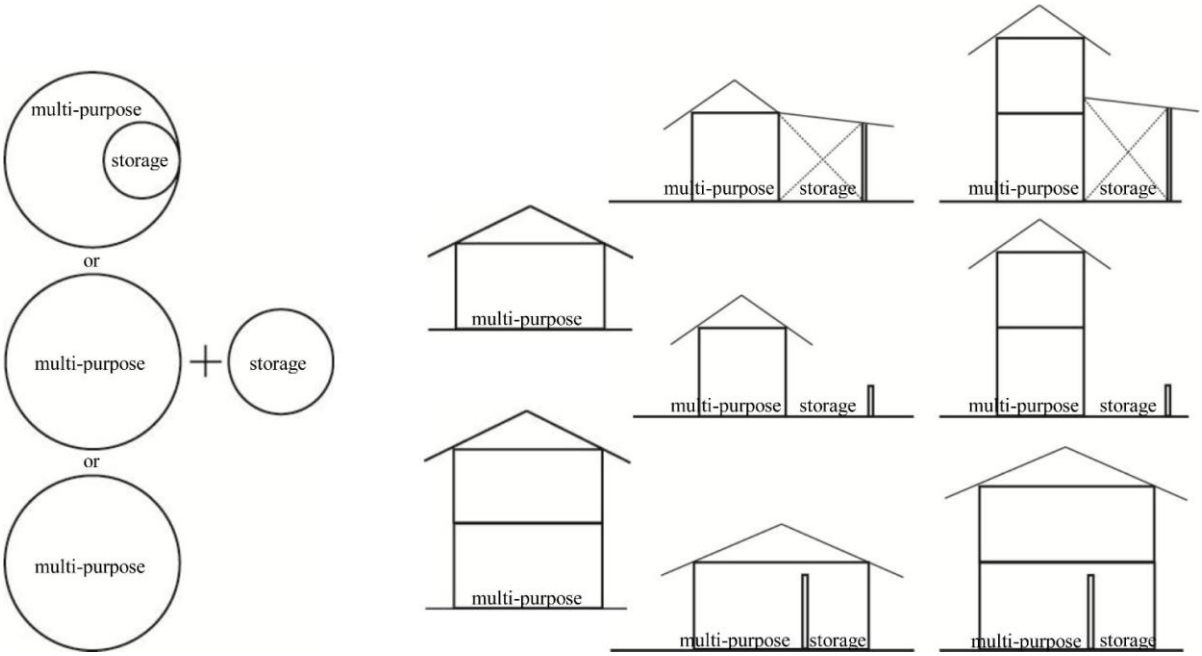

Fig. 5.5 14 Rai House Planning Characteristics Idea

5.10.2 Materials Provision

It is evident that, the usages of affordable materials are explored at Banpet low-cost housing project and some of the reused materials at the extension stage. As for Bang bua community housing, it is also

found the usage of affordable materials and some of the dwellers' house, some construction materials are used materials from their old house before the upgrading process. As for 14 rai community, it was found the usage of affordable materials, recycled and reused materials for its housing as shown in Fig. 5.6.

5.11 UTILIZED STRATEGY

5.11.1 Housing Extension

As for Banpet low-cost housing project case, it is due to the cause of compact living, extension strategy is made to fulfill dwellers' requirements and the need of more function. Therefore, extension is used as the dwellers' strategy for this project.

5.11.2 Negotiation and Leadership

It is apparent for the Bang Bua community project that leadership and negotiation are utilized to be the imperative step before starting the upgrading process (Tonmitr et al, 2012a). CODI helps this community as the intermediate actor between community and government. Additionally, community participatory process has played an imperative role in the design development.

Fig. 5.6 14 Rai Community Housing Characteristics

5.11.3 Occupation-based Income Generation

As for 14 rai community, Self community income generation based on dwellers' background has been

considered, thereafter, zero baht shop idea is determined to fulfill earning strategy.

5.12 14 RAI COMMUNITY'S STRATEGY

5.12.1 Poor Community Background

Previously, this community got eviction from community under the bridge, Aounnuch (Watnu et al, 2003). There are many of negotiations before dwellers got the land from NHA. Dwellers' background is found to be trash collector.

5.12.2 Self-determine Negotiation

It was apparent for the design negotiation of this community which self-determine process was proposed in the determination process. Community itself could get the land with the basic services provisions which are electricity and running water by the support of the NHA. On the other hand, financial subsidy process was negotiated with the CODI. Unlike the slum development process which CODI helps for both land title negotiation process and the financial management. It seems like intermediary strategy in comparison with Banpet project and Bang Bua community that community dwellers can negotiate on the support where is from different sources.

5.12.3 Trash to Cash/Accommodation Trade in Process

Fig. 5.7 Zero Baht Shop

It is due to the people's occupation background of this community that is trash collector. Their strategy is to turn crisis into opportunity. The strategy is to organize the cooperative, thereafter turn it into zero baht shop; the shop for trash trading process as shown in Fig. 5.7. It can be provided as cash or in form of accommodation in returning to the community members who participate in this process. The garbage is categorized into each type and compare with the price chart then turning into the money. Even young generation can learn about trash trading process.

5.12.4 Making Value-added Products Procedure (Recycled/ Reused Materials)

There is a product value-added process which was fulfilled by the community members as shown in Fig. 5.8. Therefore the knowledge and skill transfer process have been circulated within the community. Apart from garbage trading process, community members can use the recycle, reused materials and transform into value-added products and sell outside the community as the self home-made products. It is another way to gain supplement income generation by community participatory skilled-training process.

Fig. 5.8 Value-added Product from Recycle/ Reused Materials

5.12.5 Community Garden and Public Space

Availability of community space and public space has been arranged for 14 rai community. There is community vegetable garden to be served as raw product for daily life cooking. Multi-purpose courts are observed. These courts are utilized as public welfare facilities that are included within the community planning layout.

5.13 CONTRIBUTION OF EACH PROJECT

As for Banpet project, utilized strategy is the dwellers' extension process. Bang Bua community is apparent in terms of leadership, negotiation and community participatory process. It was apparent that 14 rai community is the case that use the self-determine process through negotiation with institutions. Therefore community dwellers are able to get support from NHA and CODI as shown in Table. 5.1. It is a kind of indirect coalition between support institutions which are NHA and CODI. Self-help construction is utilized for 14 rai community.

Table 5.1 Apparent Contribution of Each Project

Outlook topic	Banpet	Bang Bua	14 Rai
-Main support institution	NHA	CODI	NHA+CODI
-Negotiation supporter	NHA	CODI	Four Regions Slum Network
-Apparent point	House extension	Cooperative system	Zero baht shop+ Income Generation Background
-Housing material	Affordable material	Affordable material	Affordable material, recycle, reused
-Housing Plan	Patronized by NHA	Patronized by CODI	Self-help

This issue has shed light on intermediary strategy of self-determine process through negotiation has helped poor community to get patronized from different support institution sources. Moreover, indirect coalition from support institutions can be provided to suit dwellers' need through self-determine process. Additionally, occupation-based income generation plays a significant role in fulfilling the poor earning maneuver strategy for sustainable development of the poor community.

5.14 CONCLUSION

This chapter has pinpointed the characteristics of the Thai waqf-alike or Thai Sahakorn-Chumchon system which was found to be the key catalyst that help mobilizing the upgrading development processes. Initiated state and conceptual idea of management has been so far the core of the successful development and also to the real practice that has been occurred. The very apparent is its holistic strategy and cooperative approach. Thai Sahakorn-Chumchon acts as the monitorial, the permeable system, and the decentralizing of the determination by collaboration of community decision and government sector. Additionally, the most effective of the system is properties are unable to shift the possession to the outside owner; it is therefore able to ensure the longevity of the community system. This system itself is able to manage own community but the power of collaboration with the government makes it become double sustainable, particularly in terms of sustainability on the upgrading system for the developing world. The unique key role of cooperative system in relation to habitat management is cooperative has played its imperative role in helping to initiate the design development processes including community savings system and starting up the construction. Thereafter the design enhancement, design characteristics can be performed and concretely seen after the development processes accomplished.

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Chapter 6
Strengthening Community-based Rehabilitation: Practical Lesson Learned from the 2011 Unpredictable Tremendous Thailand Floods and Socio-Cultural Acclimatization of Properties Maneuver System, Asian Waterfront Settlements Contribution (Community Housing Maneuver System and Disaster Rehabilitation, with Contribution of Traditional Thai House Characteristics)

6.1 INTRODUCTION AND RESEARCH GAP

Throughout the year 2011, many Asian countries have suffered from the unpredictable natural catastrophe that harmed the human quality of life and the tremendous loss in properties. As for Thailand, the 2011 Thailand Floods were considered as the worst flooding catastrophe ever. Many of the dwellings have been damaged, destroyed and left many of the homeless. Slum dwellings have also affected by this impact, particularly, the slum waterfront settlements. Rehabilitation process through this disaster has been clarified. The study goes through practicality and field survey to clarify the circumstances and its rehabilitation procedure. Community-based rehabilitation was explored to play crucial role acclimatizing upon this catastrophe. Both architectural and socio-cultural behavioral patronization of floods acclimatization has been found its capability to cope with the flood circumstances. The study signifies that self-properties maneuver system help strengthening the process of community-based rehabilitation, furthermore shed light on its capability to survive and rehabilitate throughout the catastrophe and near future disaster maneuver.

Recently, many Asian countries have suffered from the unpredictable natural disaster crisis, for instance, the 2011 East Japan Tsunami (Supprasri et al, 2011) also to Thailand tremendous flood (Dai Kosui, in Japanese). So far the circumstances have happened that cause the loss of properties, life, particularly for the architectural properties (Handmer and Dovers, 2007).

Many scholars have studied on the topic of economical assessment from the crisis, report of the situation but it has been feebly documented on how the practical settlements have dealt with and survived through this circumstance, particularly the bottom highness level which is the poor housing or slum settlements in the Asian city, especially for Thailand. It is therefore imperative to scrutinize on how the grassroots people have coped with the unpredictable flood situation. Hence, an attempt has drawn to help shed light on how low-income people have acclimatized to the crisis, how effectiveness of inherited Thai housing (*Ruan Thai*) characteristics have affected on local Thai waterfront slum situation. Furthermore, to see how Thai Socio-cultural maneuver system has helped solving the situation and helps to seek the solution for the near future Asian waterfront settlement contribution,

using the case of Bang Bua community under *Baan Mankong* nationwide slum upgrading programme in Bangkok, Thailand.

The studied has explored that the potential of inherited *Ruan Thai* style has affected to the properties loss decreasing, although some misinterpretation of architectural compositions have been explored due to its limit area for functional requirements. It has furthermore shed light on the capability of the socio-cultural self-maneuver system which are *Sahakorn Chumchon* (community cooperative), *Chang Chumchon* (community skilled constructor), *Longkhak* (mutual patronized action) to help rehabilitating and keep on sustaining the low-income habitation, particularly, the Asian waterfront settlements for the near future unpredictable crisis to acclimatize from this practical prototype for each local and personal substances of the countries.

6.2 THE 2011 UNPREDICTABLE THAILAND FLOODS BACKGROUND

6.2.1 Over Estimated Flood Crisis in Thai History

It was so far the most tremendous flooding in at least five decades for Thai history catastrophe ever. More than 884 citizens were killed (Aon Benfield, 2012); furthermore millions of dwellers were left homeless or dislocated. It was said by the World Bank, the economic loss estimation was around 1.4 trillion Baht (45.7 billion USD). Additionally, it was not only Thailand in the Asian countries where has suffered from this catastrophe period, but also Laos, Cambodia, Vietnam, Myanmar, for instance. It is therefore the biggest issue of country rehabilitation to cope with.

Bang Bua community where is located in Bang Khen, Bangkok, the Thai middle region. As the altitude of the location, it is a wetland area where is the transitional water flows area before ending up at the Gulf of Thailand as shown in Fig. 6.1. It is therefore, the maximum flood extent area, it was also categorized in the major crisis zone.

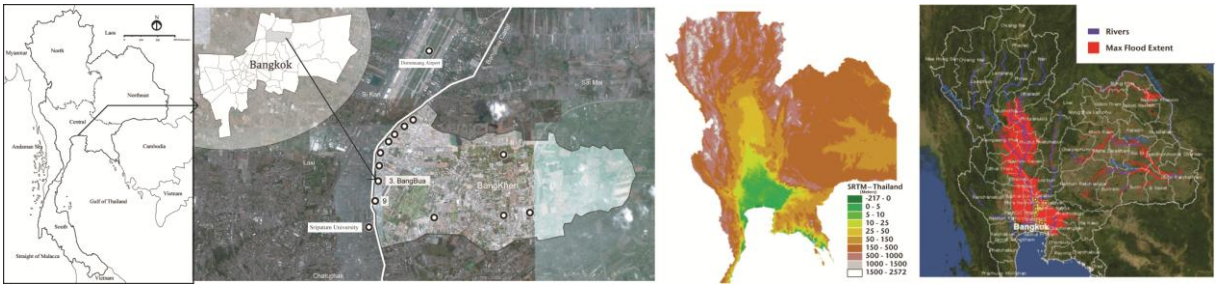

Fig. 6.1 Map of Thailand, Community Location and Physical Characterization due to the Floods. (*Photo : Author's Drawing* (two left figures), *Aorn Benfield* (two right figures))

6.2.2 Back Up and Reserved Strategic Plan for Habitat Catastrophe Prevention Zone

As for the flood prevention, Thailand has a major reservoir which is Bhumibol and Sirikit reservoir for the middle region. Nevertheless, it was over estimation for this time floods crisis. Realistically, Thailand has *Kamling* conceptual idea which was derived from King's flood maneuver strategy; it was about to find the vacant places or less-value pieces of land to be the transitional space where help keeping the amount of water in order to sustain the major whole part. It was due to the most tremendous floods catastrophe; therefore it should find integrated alternative tools to strengthen the near future crisis prevention.

6.3 CAPABILITY OF THE INHERITTED RUAN THAI INFLUENCE ON SLUM ARCHITECTURE

6.3.1 Possibility of Ruan Thai Characterization

Ruan Thai style varies from its region to region but the basic conceptual design is in similarity. For further reading see (Chaichongrak et al, 2002, Sthapitanonda and Mertens, 2005 and Supprasri et al, 2011). An apparent conceptual idea of *Ruan Thai* on floods maneuver is the presence of piloti space at the first storey level. It allows the multi-purpose activities to keep occurred. Moreover, the idea which is not to keep the precious thing, for instance, housing furniture and the open plan idea, it is therefore flexible to acclimatize when the catastrophe happened. To move the activities up to the reserved second floor is possible. Furthermore, Thai roofing characteristics which major categorized as gable roofing, hip roofing, and sometime mixed version renowned as gable-hip roofing style. Additionally, its benefit of stiff angle allows the fast drainage during the rainy season.

To clarify the sustainability of a traditional dwelling, its characteristics strength through a long way to go trail traditional dwellings is imperative to have an outlook on. It is therefore this outlook has been scrutinized in order to find its advantages for future adaptation on habitat unit. To have a clearer image of the traditional Thai housing characteristics, Traditional Suphanburi dwelling, located in Thailand has been made a scrutiny. Utilizing Architectural Equational-image approach, Architectural Mind mapping and Syntax have been proposed to the study prototype shown in Fig. 6.2. Significantly, the overview outlook of this approach is shown on the top left of Fig. 6.2 that is to provide a major conceptual process. The equational-image is found to play its crucial role in the scrutiny of the output contributions which is apparently shown in Fig.6.2. The top left of Fig. 6.2 shown the major procedure of scrutinized syntactical process; using A-graph software with justified graph to point the outcome out. The main finding contribution is the flexibility of open planning configuration. Space flexibility is found to play a major role of the traditional Thai house. Suphanburi Ruan Thai, flexible open space both at its first and second storey have been found significantly with the dwellers' privacy consideration. Vertical plane has been provided when tenants need the privacy for each of the space, for instance, bed room, Buddhist prayer room, and so forth.

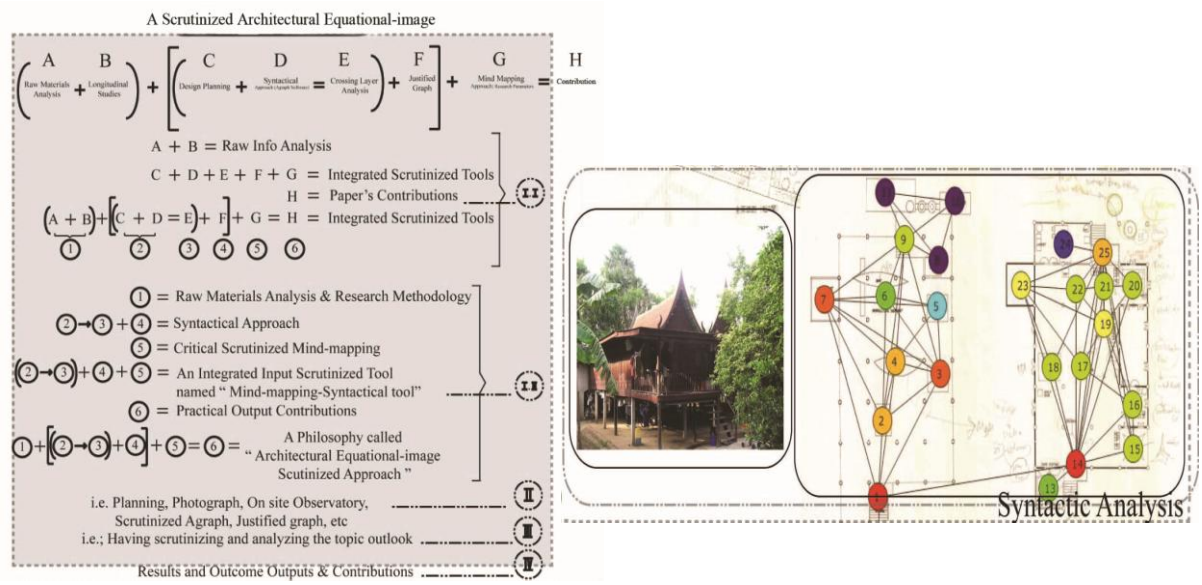

Fig. 6.2 Scrutinized Architectural Equational-image Approach (left), The Prototype of Traditional Thai House (right)

6.3.2 Bang Bua Housing Characteristics

It was found most of housing units in the Bang Bua community is two and a half storey type, it was few for the three storey construction. For the first floor functional characterization, it was used for guest room, living room and small restroom. For the second storey, it was found to be first multi-purpose space and one bedroom. Additionally, for the second-half level, second multi-purpose was recorded. Its elevation as a loft space allowed the capability of passive cooling to acclimatize from. For further reading see (Tonmitr et al, 2012) and Ref. 14 and 16. Additionally, further reading about Bang Bua project can be found at Ref. 6, 7, 15 and 21.

6.4 ARCHITECTURAL PATRONIZATION OF FLOODS ACCLIMATIZATION

6.4.1 Self-help Community Maneuver Strategy for Flood Prevention

Practically, Bang Bua community's strength has so far depended on the self-help community-based systematic process, apparently, in terms of bottom-up participatory design approach. It is therefore easy to cope with its members when catastrophe has come. Nonetheless, it was due to this time unpredictable crisis, hence, it takes time to deal with unfamiliar circumstance.

6.4.2 Capability of Acclimatized Architectural Characteristics to Slum Habitation as Self-prevent Emergency Reserved Strategic Plan

It was apparently due to the building structure and components, for instance, foundation structure, roofing structure also to chosen materials are self-determine approach. As for the major foundation which are pillars, cantilevers were intentionally calculated for strong enough structure even to cope with flooding issue by designing RC-columns and cantilevers. The intentional idea of some functions and elements have been derived from *Ruan Thai* consideration, for instance, 2 storey design approach where keep the first storey vacant as piloti area. In addition , kept the second storey flexible open plan and be private space combined with security deliberation as shown in Table 6.1.

6.4.3 Debilitated Ruan Thai Components Interpretation

Initially, the participatory design approaches have shown the intentional idea of piecemeal construction which is incrementally construct the enclosed façade from the top floor, in this term, mostly means a second storey, thereafter let the first floor enclosed respectively. For detailed planning please see Table 6.1. It was also due to the *Ruan Thai* conceptual idea of piloti space at the first step. Nonetheless, according to the limited piece of land, hence the final master plan was determined to enclose the first floor in order to gain the additional space and the security combination. Therefore, if the piloti space idea is still appear in the physical appearance, it could reduce the rehabilitation cost in terms of construction and materials recovering due to this time flooding which did not harm the second storey.

6.4.4 Crucial Role of Sahakorn Chumchon and Chang Chumchon Patronization on Architectural Rehabilitation

Apparently, Sahakorn Chumchon was found to be the intermediary key patronized platform which was reflected the influence of Thai self-maneuver system (Tonmitr and Ogura, 2012). The strength key role when the community was faced by the catastrophe situation was situation management. In terms of design rehabilitation, it acted as the distributed emergency loan for priority needed issues, for instance, recovered materials for urgent cases. Furthermore, it was provided the advice to its community members. Apart from Sahakorn Chumchon, there is one more significant actor who helps in the practical design therapy, this actor is called Chang Chumchon (CCC, community skilled worker) Under the individual circumstances, for example, CCC's house can be fixed by himself under no salary payment. On the other hand, other community members who are not CCC, CCC was used to help fixing those members under small amount budgets. It is therefore both two approaches have shed light on their capability for flood crisis design treatment.

Table 6.1 Architectural Patronization of Floods Acclimatization (*Source: Author's Drawing*)

Patronized Architectural Compositions	Inherited Thai Architectural Characterizations	Photograph of Architectural Acclimatization	Patronized Architectural Compositions	Inherited Thai Architectural Characterizations	Photograph of Architectural Acclimatization
-(*Sao*) Columns/ Pillars			-Green/Eco-friendly Aspect 1*		
-(*Karn*) Cantilevers			-Passive Cooling (Natural Energy Efficiency Aspect) 2*		
-(*Langkha*) Thai Roofing Characteristics: Elevation / Perspective			-Drainage System	Using Land Absorbability	Study Model
Vernacular Thai Gable Roofing Style (*Langkha Jua Puenthin*)			-Capability in terms of Privacy		
General Thai Gable Roofing Style (*Langkha Jua*)					
Thai Hip Roofing Style (*Langkha Pangha*)					
Thai Gable Hip Roofing Style (*Langkha Jua-Pangha*)					
-Capability of Thai Two/More Storey Building Style			-Privacy Design Consideration		Entrance Water Prevention
-Capable Piloti Space and Flexible Upper Floor Planning			-Easy Recovered/Affordable Materials Advantages		

1* For further reading, see Tonmitr, N. and Ogura, N., 2011a (Ref. 10)
2* For further reading, see Tonmitr, N. and Ogura, N., 2011b (Ref. 11)

Table 6.2 Socio-cultural Behavioral Patronization of Floods Acclimatization (*Source: Author's Drawing*)

Behavioral Patronized Acclimatization	Waterfront Behavioral Strategy	Acclimatize to Circumstances	Behavioral Patronized Acclimatization	Waterfront Behavioral Strategy	Acclimatize to Circumstances
-Fishery Skilled Earning		HOME → DAILY JOB; HOME ← JOB TEMPORARILY HALT; FISHING	-Coping Problematic Issue-- Mosquito Disturbance		MOSQUITO NET; NET
-Near River Activity Transportation gaining	INDIVIDUAL EARNING	SHARING IDEA; MAKE POCKET MONEY	-*Chang Chumchon*-- Mutual Community Based Recovery Skilled Patronization		
-Rainy Season Insects Catching Occupation-- Selling			-*Sahakorn Chumchon*	-Financial, -Housing Affordability, -Rehabilitated Materials Providing, -Emergency Loaning, -Materials Patronization	
-Waterfront Surviving Skills			-*Longkhak*-- Inherited Mutual Living Idea	-Taking Care Each Others, -Knowledges Transfering, -Skill Transfering/Sharing, -Materials Lending/Sharing, -Giving and Taking Process (Reparing-->Food/Small Amount of Money, etc.)	
			-Contributed Near Future Solution	-This Circumstances Lesson Learned--> Next Time Coming Floods Help--Strengthened Community, -Implemented Debilitated Gaps, -Empowering/ Finding/ Fulfilling Long Term Sustainability	

6.5 SOCIO-CULTURAL BEHAVIORAL PATRONIZATION OF FLOODS ACCLIMATIZATION

6.5.1 Waterfront Settlements' Way of Life

Back in Thailand, the strategy to pick up the site location has depended on how well the dwellers were able to acclimatize to the environment, it was therefore waterfront settlements are the priority capable focus. Additionally, Thai people's way of life is mutual patronization to the natural environment, that is to say life near water has been so far what Thai people familiar with.

6.5.2 Grasping the Crisis into Opportunities

It was noticeably that, during the unexpected floods crisis, Bang Bua members were easily acclimatized to the circumstances. For instance, they could not go outside to daily job, therefore they adapted by fishery skilled, and collected the insects for their earnings. Apparently, waterfront skills were inherited; well example was they used their boat rowing skill by turning the individual rowing to public purpose rowing so that they could earn some compensative money or even the swimming skill to survive through the floods situation as shown in Table 6.2. Nonetheless, there is still a harsh coping issue which is mosquito disturbance, although dwellers have been recommended to used abate sand granules. It is still problematic issue, especially for tenant who has infant.

6.5.3 Longkhak the Mutual Sustainable Patronized Action

Longkhak (mutual patronized action) is derived from Thai farmer's way of life. It was also influenced to the catastrophe rehabilitation, for instance, the recovered construction cost has been decreased due to *longkhak* idea. Cause of the construction cost has been paid by some small amount of money, returned by provided food, or in forms of returned assemble works to their neighbors. It is therefore *longkhak* has played its key role facilitating the slum rehabilitation process.

6.6 ASIAN WATERFRONT SETTLEMENTS CONTRIBUTION

(Paining and Gaining for the Near Future Crisis Strategic Plan)

Among the tremendous catastrophe in the year 2011 in Thailand, it was considered the worst natural disaster ever. Bang Bua community is the good case of self-community based rehabilitation maneuver, particularly for the waterfront settlements. It is therefore shed light on the flood coping process, even though; it has left the thing that is needed to be implemented. As the same Asian country level, it should learn and acclimatize to each of the country local and substances capability, for instance, the technique to use for dealing with the circumstances. Bang Bua community has shown the effectiveness of self-community based rehabilitation which adapts from its socio-cultural and Thai housing characterization. It is therefore local and personal substances have played its role strengthening the debility that waterfront settlements should find their unique tool to cope with flooding situation apart from external contemporary patronization so that to helps empowering the sustainability of the

settlements.

6.7 CONCLUSION

This chapter has pinpointed a clear analysis of floods maneuver system on architectural properties. Self-help community-based rehabilitation with Thai maneuver system were found to be the key strategic strength to both catastrophe management and sustainable development by using *Sahakorn Chumchon*, *Chang Chumchon*, and *Longkhak* patronization. Furthermore, the capability of *Ruan Thai* characterization could strengthen the slum waterfront settlements for flood crisis, although some misinterpretation of architectural elements has been explored due to the limit condition of area requirements. However, the main conceptual idea of flexible upper floor arrangement is able to play its role coping with the floods situation. Moreover, socio-behavioral acclimatization could also make the dwellers survived through their living habitation during floods crisis. Practical lesson learned from Bang Bua community could be the prototype of acclimatization for the Asian waterfront settlements, it should scrutinize to find the acclimatized tools of each of the country's local and personal substances so that to strengthen the sustainability of habitation through floods catastrophe.

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Chapter 7
Materials for Extension Low-income Housing: The Case of Bang Bua Community in Bangkok, Thailand

7.1 INTRODUCTION

Housing for the poor in Thailand in a period of a decade, Baan Mankong Programme (BMP) has been largely focused. This paper focuses on an architectural engineering point of view to explore the housing phenomena with its conversion as well as the usage of extension materials. Extension materials are clarified and made categorizations to unveil the trends of practical urban poor housing case, Bang Bua community in Bangkok, Thailand. Two types of extension were apparent which are roof and wall extension. The imperative factors to be determined for the extension materials consist of easiness of affordability, easiness of installation, materials cost, durability of usage as well as social situation; safety for instance.

In the context of developing countries, there are situations that squatter settlements have been inserted within the city, Bangkok of Thailand is one of those. An effort to cope with urban low-income settlements has been launched under the name of Baan Mankong Programme (BMP) aims at slum upgrading that is under a supervision of Community Organizations Development Institute of Thailand (CODI) since 2003. Bang Bua community has been selected to be a case of this research in order to explore the physical metamorphosis that occurred to the housing situation. Housing extension can show how dwellers have appropriated their space up to a practical need of user and inadequate function design (Tonmitr and Ogura, 2011). After dwellers have occupied the dwellings for around a decade, physical extensions have been made to the housing. This research has been conducted in order to clarify the usage of building materials and the materials trend of low-income housing extension or conversion that can be affordably applied for low-income people.

7.2 RESEARCH GAP, AIM AND METHODOLOGY

Bang Bua community housing in Bangkok has been utilized for an analysis. Despite studies on Bang Bua community can be found, the study trends are in the field of social science. The design contribution of two major low-income housing approaches in Thailand has been analyzed, shown in (Tonmitr and Ogura, 2012). A role of CODI and BMP has been clarified as shown in (Boonyabancha, 2005). (Usavagovitwong, 2006) shows the processes of upgrading the community. Additionally, the role of community architects and supporting key actors have been clarified as shown in (Tonmitr et al, 2012). While little attention has been focused on the architectural engineering field, this paper makes an effort to focus on materials for extension of low-income housing. A survey of all housing units (125 units) has been investigated as well as interviews, discussion with community dwellers and

Material	Materials Trends and Applications Characteristics	Material	Materials Trends and Applications Characteristics
Vinyl		Bamboo	
Slant Net		Metal Net/ Curved Steel	
Zinc Sheet		Small Steel Tube	
Corrugated Asbestos		Metal Panel	
Metal Sheet/ Coloured Metal Sheet		Zinc Panel	
Polycarbonate Sheet		Gypsum Panel	
Concrete Block		Green Wall/ Green Buffer	
Red Brick		Steel	
Real Wood		Reinforced Concrete/ Prefabricated Column	
Artificial Wood		Tile	

Fig. 7.1 Materials Using Trends and Their Applications

community leader, sketches, photographs, physical observation, with a focus on building materials for extensions of houses. This study aims to unveil the materials of housing extension or conversion phenomena through the following objectives:

-To clarify what materials can be affordably utilized for low-income housing extensions in a context of Thailand and to make categorizations of building materials for low-income housing extension.

-To explore the trend of materials using in a low-income settlements.

The next chapters will show the details, images, and analysis of the study.

7.3 MATERIALS USAGE AND CATEGORIZATIONS OF BUILDING MATERIALS FOR LOW-INCOME HOUSING EXTENSION

After dwellers conducted their occupation, the space conversion has occurred and a variety of materials has been chosen to convert the extension. Among the materials that have been utilized for space conversion, it can be majorly categorized into 4 categories; roof materials, wall materials, column materials and decorated materials respectively as shown in Fig. 7.1. As for the roof materials, vinyl, slant net, zinc sheet, corrugated asbestos, metal sheet/ coloured metal sheet, and polycarbonate sheet have been explored. For wall materials group, it can be further categorized into 5 sub groups which are block/ brick, wooden materials, metal materials, green wall/ green buffer, and finally a group of others. Block/ brick comprises of concrete block and red brick. Wooden materials contain real wood, artificial wood, and bamboo. Metal materials consist of metal net/ curved steel, small steel tube, metal panel, zinc panel, gypsum panel. Next sub group is green wall, made of natural plantation to use to be a screen or buffer for a privacy aspect. And the last sub group is the group of others, for

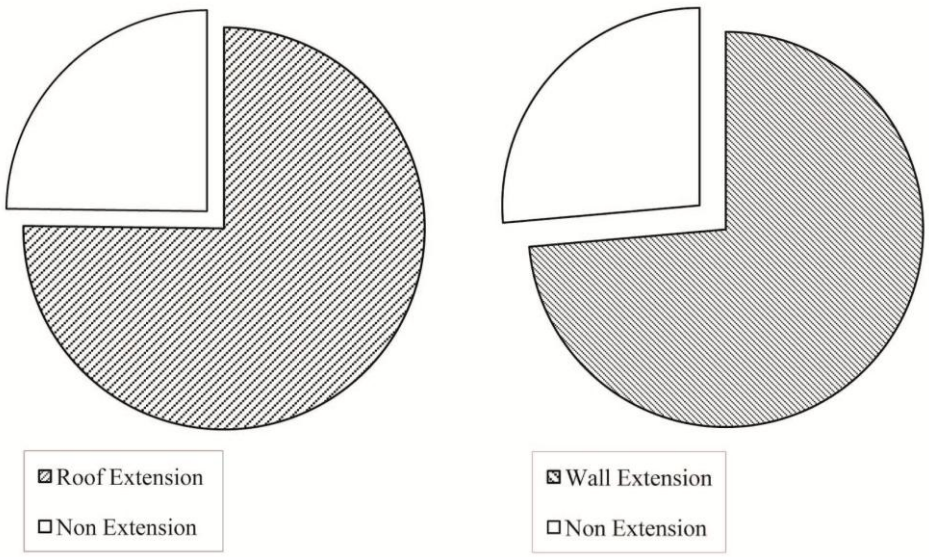

Fig. 7.2 Ratio of Extension and Non Extension Housing Phenomena of Roof and Wall

instance reused materials. Column materials are prefabricated column or on-site casting column. Additionally, decorated materials such as tiles have been used for decoration.

7.4 TREND OF MATERIALS USING IN A LOW-INCOME SETTLEMENTS

Apparently, two kinds of conversion were outstanding and widely conducted which are roof and wall conversion that will be discussed in this chapter.

7.4.1 Roof Materials for Housing Conversion

Table 7.1 Materials for Roof Conversion and Its Trends

Type of Materials for Roof Extension		Amount of House [house]		Percentage [%]	
Vinyl, Plastic	Advertisement Vinyl, Given free Vinyl, fabric	15	32	12	25.6
	Made to Order Roll Vinyl	17		13.6	
Slant Net		9		7.2	
Zinc Sheet		6		4.8	
Corrugated Asbestos		21		16.8	
Metal Sheet/ Coloured Metal Sheet		12		9.6	
Others (Mixed Materials e.g. Metal Sheet & Vinyl), Polycarbonate Sheet		14		11.2	
Non Extension		31		24.8	
Total		125		100	

At the ratio of roof extension and non-roof extension house as in Fig. 7.2 (left), ratio is 75.2 per 24.8 shows that roof conversion trend is popular at about third quarter of all houses conducted the extension. Vinyl/ plastic material is the most popular trend to use for conducting the extension around 25.6%. Within this percent, it can be looked insight into this situation, there are two types of vinyl that can be categorized. By this, the percent of using reused vinyl and made to order vinyl is similar about 13 percent each type. On the other hand, zinc sheet is not very widely used and found the least in number at 4.8% as shown in Table 1. Despite zinc sheet material price in Thailand is cheap, but the trend of usage in this community is not so popular. It implies that even the urban poor, if to choose materials for roof conversion, they prefer to use other materials instead of zinc sheet even the price is higher, that might be the result of zinc property that it keeps heat and is not good to use as an insulation. Therefore, it provides hot and uncomfortable living condition at day time. Also when it is raining, noise disturbance is problem as well as rust problem if to use this material. Corrugated asbestos, type of others, metal sheet, and slant net are used respectively from highly demand until less popular demand. Corrugated asbestos is cheap, able to provide shading for residences and in comparison to zinc sheet heat prevention property is better. Metal sheet is better than zinc sheet in terms of durability against rust, even a price is a little bit higher. Slant net is cheap, light, easy installation but if to use the purpose is only to provide shading at the same time is able to let the light come inside that housing

conversion area.

7.4.2 Wall Materials for Housing Conversion

Table 7.2 Materials for Wall Conversion and Its Trends

Type of Materials for Wall Extension		Amount of House [house]		Percentage [%]	
Brick, Block	Concrete Block	33	34	26.4	27.2
	Red Brick	1		0.8	
Wood	Real Wood	4	15	3.2	12
	Artificial Wood	7		5.6	
	Bamboo	4		3.2	
Wall Made of Metal Materials	Metal Net, Curved Steel	13	16	10.4	12.8
	Metal Sheet	2		1.6	
	Zinc Sheet	1		0.8	
Green Wall, Green Buffer e.g. trees, bushes		20		16	
Others e.g. Reused Materials		7		5.6	
Non Extension		33		26.4	
Total		125		100	

Fig. 7.2 (right) shows that the ratio of wall conversion and non- wall conversion is 73.6 per 26.4, it is almost third quarter of houses that have the houses converted by making wall conversion. Apparently, this ratio is in popularity similar to the roof conversion and non- roof conversion ratio which indicated that conversion phenomena are necessary for the urban poor living. As shown in Table 10.2, type of materials for wall extension can be majorly sorted into 5 groups which are brick/block, wood, metal materials, green wall/ green buffer, and type of others respectively. Brick/ block is found the most popular to utilize for conducting wall conversion while type of others e.g. reused materials is found the least in popularity. It implies that even they are urban poor, still they prefer to use new material for wall extension that might be because the durability of new materials and cost is not so high to afford. Green wall, metal materials, and wood group correspondingly are to be used lesser than brick/ block group but to be utilized more than a type of others. As for brick/ block group, two types are categorized. Concrete block is explored to be used widespread, it might be because of its characteristic. A size of concrete block is larger than a size of red brick, therefore it saves time consuming for an installation process. Nonetheless, it is heavier than a red brick. As for a green wall/ green buffer group, plantation can be used for making a wall conversion. Houses that wall conversion made of wood and metal materials are in similar number. Metal net/ curved steel is mostly explored to be utilized, whereas metal sheet and zinc sheet are used in similar number. Although metal and zinc sheet are easier to make an installation, still metal net and curved steel are found more popular to be used. It

might be because of steal prevention aspect that dwellers felt to use metal net or curved steel are safer. Wall conversion made of wood can be categorized into 3 types. Artificial wood is found the most popular to be used, while houses that used real wood and bamboo for wall conversion are in the same number. The reason that artificial wood is explored to be widely used than real wood and bamboo might be because of the price of it and easiness to find.

7.5 CONCLUSION

A reality of dweller's occupation has shown the necessary of customized space conversion. Consequently, building materials have been chosen to be used for the extension. About third quarter of all houses have been found to conduct space conversion both for roof extension and wall extension, which indicated the necessary of space conversion and the need of materials for dwellers' customized space. Vinyl is found the most popularity in usage for roof conversion while zinc sheet is the least to be considered to use by dwellers. Concrete block is explored to be the most popular to be used for wall conversion, while type of others e. g. reused materials are in the least popularity to be used for wall conversion. The results of the research show the real situation as well as trends of the urban poor housing in the aspect of utilized materials in the context of Thailand. The factors apart from the reasons of easiness of affordability, materials cost, easiness of installation, and durability of usage, social situation is also one of those factors to be determined the materials to be utilized for urban poor housing conversion, for instance steal prevention as for safety aspect.

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Chapter 8
Sustainable Strategy for Governmental Urban Poor Housing Development in Thailand: Contribution of Self-customize Income Generation Space (Importance of IGS & Factors Impacted on IGS Enhancement)

8.1 INTRODUCTION

Within a period of a decade, Baan Mankong Programme (BMP) has been a critical topic of discourse as for urban poor housing scenario in Thailand. This paper unveils the contribution of Income Generation Space (IGS) on the BMP, tools to get IGS, clarifies the categorization of IGS in the BMP as well as pinpoints the imperative factors which help for the IGS enhancement strategy. IGS houses are clarified and made categorizations to unveil the contribution of IGS and trends of spatial utilization of a practical urban poor housing case, Tawanmai community in Khon Kaen, Thailand. The imperative factors for IGS enhancement strategy consist of chronological change, dwellers' keenness, dwellers' occupation, gender implication, household maneuver system, dweller's education level, as well as transportation issue.

Across the globe particularly in the context of developing countries, squatter settlements have been inserted within the main city so far as well as Khon Kaen Province in Thailand. An attempt to cope with urban low-income settlements has been launched under the Baan Mankong Programme (BMP) aims at slum upgrading that is under a supervision of Community Organizations Development Institute (CODI). Tawanmai community has been chosen as a case of this research in order to explore the contribution of Income Generation Space (IGS) on the BMP. Nevertheless, intention and reality in planning are needed to be clarified. The compact living environment caused the dwellers to appropriate their space even in a different housing approach (Tonmitr and Ogura, 2011). This research has been conducted in order to clarify the reality of urban poor housing environment in terms of a survival strategy named IGS and unveiled the imperative factors that help IGS enhancement strategy.

8.2 RESEARCH GAP, AIM AND METHODOLOGY

Tawanmai community housing in Khon Kaen, Thailand has been utilized for an analysis. Formerly, this community is a squatter settlement. Thereafter, this community has collaborated with CODI under the BMP, renowned as slum relocation project. Despite studies on the BMP can be found, still an outlook of the space to generate income has been put little attention. There are some scholars who study about the BMP, but the efforts of research are different from this study as follows. The design contribution of two major low-income housing approaches in Thailand has been analyzed and clarified, as shown in (Tonmitr et al, 2012c). The lessons learned of low-income housing scenarios in Thailand

have been clarified as shown in (Tonmitr and Ogura, 2012b). A role of CODI and BMP has been clarified as shown in (Boonyabancha, 2005). (Usavagovitwong, 2006) shows the processes of upgrading the community. Additionally, the role of community architects and supporting key actors have been clarified as shown in (Tonmitr and Ogura, 2012a). Moreover, materials for extension low-income housing have been unveiled as shown in (Tonmitr, 2014). In the context of developing housing world, there are some scholars who are interested in the workplace at home. Kellett and Tipple focused an attention on the concept of home as workplace, still it yet to be found in a context of Thailand as illustrated in (Kellett and Tipple, 2000). In a context of Thailand, Tonmitr & Ogura clarified self-build metamorphosis process and the contribution of IGS in the low-cost housing project in Thailand (Baan Aua Arthorn) as shown in (Tonmitr and Ogura, 2013). While little attention has been focused on the BMP about the aspect of the space to generate income for dwellers, this paper puts an endeavor to unveil the contribution of IGS on the BMP as well as imperative factors for the BMP enhancement strategy. A survey of all housing units (145 houses including one central usage house) has been made an investigation as well as interviews, particularly aimed at all IGS target houses (around 30 houses). The integration of graphic recording techniques with recorded discussions has been used to gain the data. Discussion with community dwellers and leader, photographs, video records, sketches, physical observation, and spatial configurations with focus on the contribution of IGS have been made to gain insight into the real circumstances. This research aims to unveil the self-customize IGS in the BMP through the following objectives and outlooks:

-To unveil the contribution of IGS and clarify categorizations of IGS.

-To pinpoint and explore the imperative factors impacted on IGS enhancement.

The next chapters will show the details, images, and analysis of the study.

8.3 IMPORTANCE OF IGS IN URBAN POOR HOUSING AND TOOLS TO GET IGS

Houses in Tawanmai community are basically planned and provided in the form of row house type. First floor area covers about 40 m^2. With the area about 4x10 m^2, each unit could facilitate the basic functional needs and thereafter caused the compact living style. House unit itself, particularly at the first storey, could be utilized as IGS and found to be multiple usage functions. Dwellers use that space to generate income up to their keenness, occupation, and need. Therefore, IGS shows that house can be utilized apart from acting as the living habitation, it is able to be used as the function for generating income for the users. The way to afford IGS needs the strategy and tool to cope with, self-customize method is explored to help dwellers to get IGS by arranging and introducing equipments into the intended space. Spatial considerations and organizations will be discussed in the following chapters.

8.4 PHYSICAL CHARACTERISTICS, TYPICAL CASE AND ITS CATEGORIZATION

Among the number of about 30 IGS houses, it can be majorly categorized into two groups that are “Generating income at home” and “Generating works at home while gaining income outside” which

will be conducted analysis in this section.

8.4.1 Generating Income at Home through Utilizing IGS

As an illustration in Fig.8.1 (left), house no. 73 as a representative of houses in this group, dwellers customized their space for barber shop purpose. Therefore, hair salon equipments have been employed and introduced to IGS for instance, hair cutting seat, two hair equipments counters with two mirrors attached, two rear mirrors of the seats have been made installation at the rear wall of those two seats for visualized purpose, additionally, waiting sofas for customers have been provided. Apart from hair cutting seat, there is also hair washing seat that is slightly organized at the left rear position of first floor plan. Moreover, for entertaining customers, television corner is planned as well as magazine shelf is provided. Showing that, as for an occupation that the specific equipments are needed, dwellers have to provide their job equipments and customize them according to the basic given space. It implied the need of investment budget and recovery period. As for this house, tenures have their saving before initiating the shop therefore it was not a large deal for them to customize their workplace and recovery period of the equipment cost is within one year. In the case of the dwellers that wish to take loan for job creation, the most popular way is to make contract with their community cooperative with low interest rate. It was few that loaning has been done with outside community financial system

House No.73		House No.77	
			
Income Generation Activities	Other Activities in IGS	Income Generation Activities	Other Activities in IGS
-8:00AM-12:00PM Beauty Salon Activities (For Morning Session)	-12:00PM-13:00PM Lunch Time :Introducing Small Desk and Chairs into IGS	-3:00AM-5:00AM Products (Food) Preparing (For Morning Session) :Introducing Food Preparing Equipments into IGS	-10:00AM-11:00AM Relax Time :Introducing Mat, Bed Sheet, Pillow into IGS
-13:00PM-18:00PM Beauty Salon Activities (For Afternoon Session)	-18:00PM-8:00AM Relax Time :Introducing Mat, Bed Sheet, Pillow into IGS	-11:00AM-14:00PM Products (Food) Preparing (For Afternoon Session) :Introducing Food Preparing Equipments into IGS	-20:00PM-3:00AM Relax Time :Introducing Mat, Bed Sheet, Pillow into IGS

Fig. 8.1 IGS Typical Houses and IGS Utilization

by the key reasons that their cooperative system is reliable, provision of the community welfare, and the circulation of the money within its self-manage community.

8.4.2 Generating Works at Home through Utilizing IGS while Gaining Income Outside

Taking an example of house no. 77 in Fig. 8.1 (right) as a representative of houses in this group, IGS is designated for selling food activities. Users' intention is to have space for preparing food products to sell outside. Selling grilled pork, chicken with sticky rice is their earning activities. Hence there is the need of space for preparing and cooking foods, for instance, cutting meat, sticky rice cooking, washing area, and food storage area. Refrigerator is organized in front of the house area for keeping the raw meat and cooked food. In the past, dwellers have to buy ice for freezing their food in average 40 baht/day. After inviting the fridge, additional monthly electricity fee is only 200 baht. In this case, dwellers are therefore able to save money about 840 baht/ month. As spatial utilization in Fig. 8.1, at front zone of first floor area, desks and chairs, TV shelf are provided along the front wall and right side of the wall. Nevertheless, IGS is provided in the middle position. Dwellers can use IGS as well as multi-purpose space. For example, this space is needed while preparing the food. When food preparing activities are accomplished, mat is introduced to this space and utilize for recreation activities like watching TV. At the rear zone of the first storey, it was designated to be small kitchen, cooking zone, and washing area. After foods are prepared, dwellers go out to sell their products

8.5 MAJOR IMPERATIVE FACTORS FOR IGS DEVELOPMENT

Major imperative factors impacted on IGS development will be pinpointed in this chapter.

8.5.1 Chronological Change and IGS Utilization

"…..Selling grilled pork, chicken with sticky rice is my job. I use this space every day. I prepare food to sell outside through utilizing this IGS. Every day I wake up at 3 o'clock and go to market for shopping the raw materials for making my food to sell. Thereafter, it takes time to prepare the food to sell until 5 o'clock, and then I go out with my wife to sell my products. Around 10 o'clock, we finish our morning session and arrive our home. We then change IGS for relaxing area, put soft bed sheet on the floor, watch television. Around 1 hour later, we keep this space clean and put plastic mat instead to preparing our product again. Around 2 o'clock in the afternoon we go out to sell our food again and finally get back to our home around 8 o'clock in the evening every day. Except Sunday which is our relax time. This space is a key part of my daily life as my organ. IGS has made my family survived. Before I have only motorcycle attached with

Fig. 8.2 Dweller of House no. 77 and Chronological Change with IGS Utilization

There are some scholars who question about time and spatial organization of workplace. Kellett & Tipple [8] have their question that “Does the time affect to spatial organization?” still their research has yet to reach this outlook of investigation. By utilizing the typical case of house no. 77 as shown in Fig. 8.2, it shows that chronological change has an impact on IGS utilization. It might because of the limitation of the given area, therefore IGS has been found its way combined with another functions for instance relaxing space, dining space, temporary motorcycle storage space at night time or even sleeping space. The evidence has shown that IGS has played its imperative role as multi-purposes space due to its chronological change usage of each house.

8.5.2 Imperative Factors for IGS Development

Apart from chronological change and spatial organization, there are imperative factors that can be listed and pinpointed for IGS enhancement strategy as shown in Table 8.1.

Table 8.1 Imperative Factors for IGS Enhancement Strategy

Imperative Factors for IGS Enhancement	Importance and Characteristic
Chronological Change	Impacting on Spatial Customization
Dweller's Keeness	Leading to the Alternative of Occupation
Dweller's Occupation	Implying the Gender that can Conduct the Activities
Gender Implication	Not Relate Much on Spatial Utilization of Low-income Thai Society
Household's Maneuver System	Help to Shape Up Income Generation Activities and Spatial Utilzation
Dweller's Education Level	Just in some Cases that Technical Skill & Knowledge are needed
Transportation System	Mini Truck, Motorcycle Attached with Cart are Popular

Gender implication does not related much on the spatial utilization, any of the gender in low-income Thai society can use IGS to generate their tasks or income, depend on keenness and occupation of user. Nevertheless, between those 3 imperative factors, it can be pinpointed the relation of them. Keenness leads to the alternative of occupation, and occupation will tell the gender that can perform that occupation. Thereafter, spatial customization will be adapted to those of 3 factors. When those 3 factors are involved with chronological change, management will help to shape up the activities and spatial customization. Education level does not affect much on earning activities about food selling or commercial, still technical education is needed for IGS user who conducted the specific earning for instance electronic devices repairing. Additionally, transportation is one of those significant factors. In the case of generating tasks at home while gaining income outside, transportation is needed for the earning activities. There are 2 popular vehicle types, first is to use mini truck and second is to use motorcycle which attached the cart alongside. According to the investigation, the second type was found to be more popular and it might be because of the cost of affordability and the convenience of usage and a compact parking space.

8.6 CONCLUSION

Governmental urban poor housing conditions cause a compact living environment. Dwellers make adaptation through the basic given unit by their own approach, utilizing self-customize method that leads the contribution of IGS. Apart from functioning as living habitat purpose, house itself can be used as the space to generate income for dwellers. It can be majorly categorized into two groups which are "generating income at home through utilizing IGS" and "generating works at home through utilizing IGS while gaining income outside". Equipments to generate income vary from each earning purpose but to be organized within the same given area. Imperative factors for considering IGS enhancement could be pinpointed as chronological change with spatial organization, users' keenness, users' occupation, gender implication, household maneuver system, dweller's education level, and also transportation issue. It is therefore imperative for housing planners, designers, and policy makers as well as dwellers side to put IGS into consideration that pave the way for the future sustainable housing development scenarios.

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Chapter 9
Low-income Lifestyle and Demand on Technologies and Facilities in Income Generation Space Utilizing Family in Khon Kaen Province, Thailand
(IGS Utilizing Family in Relation to Technologies)

9.1 INTRODUCTION

In the era that urban poor housing has been a critical topic of discourse, Thailand through Community Organizations Development Institute (CODI) has launched the program called Baan Mankong Program (BMP), slum upgrading program. This research represents the case under the BMP to unveil which occupation can be performed by low-income Thai through utilizing their own houses, named Income Generation Space (IGS), make categorization of occupation through utilizing IGS trends to explore low-income lifestyle. Additionally, aiming to clarify what technologies and facilities that are needed in supporting the lifestyle and earning, sort out categorization of those necessities. The outcome revealed that popular earning is selling food, occupation that give services to customers, trade, and mixed occupation respectively. While the imperative issues for earning through IGS involved with communication, transportation, and earning lifestyle with daily life outlook. This research showed that at present, the demand on technologies and facilities has entered urban earning lifestyle through IGS, even in urban low-income community. Technologies, communication, transportation are mutually adapted to urban lifestyle. Moreover, the research has shed light on what urban low-income are needed and deficient, particularly the trends in IGS utilizing family. It will pave the way for a sustainable low-income housing program.

In a past decade, there are efforts to cope with the living habitation for low-income people in Thailand supported by governmental side (Tonmitr et al, 2012c). Although, there are previous projects to support urban poor housing development in Thailand since 1970s (Tonmitr et al, 2012b), still it was not so concrete effectiveness. There are two major approaches on low-income housing development in the past decade. First is Baan Eua-Arthorn Project (BEP) or low-cost housing project. Tonmitr and Ogura clarified the self-build metamorphosis and contribution of Income Generation Space (IGS) in the BEP (Tonmitr and Ogura, 2013). Second approach is renowned as Baan Mankong Program (BMP) or slum upgrading program that is under the supervision of Community Organizations Development Institute (CODI). There are previous scholars who were interested in the BMP, for instance, Boonyabancha clarifies the role of the CODI and the BMP (Boonyabancha, 2005). A study on processes to support the community under the BMP could also be found (Usavagowitwong and Posriprasert, 2006). The role of community architects and supporting key actors were also clarified

(Tonmitr et al, 2012a). Nonetheless, studies on the BMP in architectural field were not much to be found. Tonmitr clarified materials for extension low-income housing under the BMP (Tonmitr, 2014). Additionally, the study on the BMP particularly in the aspect of space to generate income has been found little attention. The contribution of IGS on the BMP was clarified (Tonmitr et al 2014). In order to extend the outlook of IGS, this article aims to focus on low-income lifestyle and demand on technologies and facilities in IGS utilizing house as well as to find the trends and factors that impacted on IGS enhancement strategy for the BMP.

Fig. 9.1 Tawanmai Community Layout Plan and Location of IGS Utilizing Family

9.2 STUDY AIM AND RESEARCH METHODOLOGY

The study aims to unveil the IGS utilizing family through the following objectives and outlooks:

-Clarify the position of IGS utilizing families on community layout plan.

-Explore the trends of occupation through using IGS as well as make categorization of the occupation.

-Delineate the trends of demand on technologies and facilities, and sort out the imperative point in each group.

The combination of graphic recording techniques and recorded discussions as well as questionnaire surveys has been utilized to collect the data and brainstorm the idea.

9.3 LOCATION OF IGS UTILIZING FAMILTY

To achieve the goal of the study, Tawanmai community in Khon Kaen Province, Thailand that is under BMP is utilized for the analysis. Formerly, this community was a squatter settlement, thereafter it has collaborated with CODI that has been known as slum relocation project. The community is located in the urban area of Khon Kaen and it is near Khon Kaen University.

Whole houses (145 houses plus 1 community center) in the community have been investigated to clarify all of the phenomena. Among 55 IGS houses that can be explored, 31 houses were selected to be analyzed. The location of IGS houses in the master plan are shown in Fig. 9.1. Houses were determined as a role type housing that is according to the participatory design of the community dwellers and the stakeholders (Tonmitr and Ogura, 2014).

9.4 OCCUPATION AND TRENDS IN IGS UTILIZING FAMILY

As illustrated in Table 9.1, occupation in IGS Utilizing family can be majorly categorized into four groups. 45.16% (14 out of 31 houses) were found to be selling food occupation. 22.58% (7 out of 31 houses) were explored to be the occupation that gives services to the customer. Additionally, 16.13% (5 out of 31 houses) were found to be commercial occupation. Finally, 16.13% (5 out of 31 houses) were mixed occupation type. It could be seen the trends that the popular occupation through utilizing IGS are selling food, occupation that gives services to the customers, and commercial as well as mixed occupation at the same amount of finding respectively. The phenomena implied that low-income Thai people of this community are keen on cooking food and selling activities, that might be because of it takes low investment budget. The occupation that gives services to the customer, needs technologies or equipments as well as owner's skill, for instance electronics repair shop that is slightly more difficult than food selling activities. The commercial occupation is just like goods trading processes, therefore skilled owner is on high demand. Mixed occupation is just the alternative way to gain additional household's income. These results proposed the imperative outlooks for future low-income housing design not to be only considered about pure architecture but also the occupation and users' lifestyle,

Table 9.1 Purpose of Utilizing IGS in each House

House No.	Purpose of Utilizing IGS
2	Esarn fried chicken & Sticky rice selling
3	Esarn fried chicken & Sticky rice selling
5	noodle selling
6	beef noodle, grilled breef ball and flowers selling
7	beef noodle, grilled breef ball and flowers selling
9	grocery store
10	grocery store
11	laundry shop
12	laundry shop
18	food selling
19	food selling
20	grilled pork, grilled chicken and sticky rice selling
23	made to order food selling
25	car repair shop
26	boiled chicken with oily rice selling
33	food selling
38	brochure distribution
39	second hand shoes and shave ice selling
41	made to order food selling
44	retail shop, coin laundry service and tailor's shop
45	retail shop, coin laundry service and tailor's shop
46	electronics repair shop
47	electronics repair shop
50	vegetable selling
59	used metal materials selling
60	die-cast metal car model selling
62	chilli stem cutting
65	grilled octopus selling
67	fried meatball selling
71	milk beverage selling
72	milk beverage selling

Table 9.2 Demand on Technologies and Facilities in IGS Utilizing Family

House No.	Car (Sedan)	Car (Truck)	Motorbike	Tuk Tuk (Thai) (3 Wheels Motorbike)	Bicycle	Landline Telephone	Mobile Phone	Fridge	Washing Machine	Air Conditioner	Fan	TV	Curtain	Other Needs (Determine)
2	-	1	1	-	-	1	2	1	1	1	2	3	3	-
3	-	-	1	-	-	1	2	1	1	1	3	3	3	-
5	1	-	1	-	-	-	2	1	1	1	2	1	3	-
6	-	-	2	-	-	-	2	1	1	1	2	2	4	water purifier machine
7	-	-	2	-	3	-	3	1	2	1	3	2	3	-
9	-	1	1	-	1	-	2	1	-	1	2	1	3	-
10	-	1	-	-	1	-	3	1	1	1	3	1	3	-
11	-	-	1	-	2	-	1	1	1	-	2	2	3	-
12	-	-	1	-	2	-	2	1	-	-	3	2	3	-
18	-	1	2	-	1	-	3	1	1	1	4	3	6	-
19	-	-	1	-	1	-	2	1	1	1	4	3	6	-
20	1	-	1	-	-	-	2	1	1	1	2	1	3	-
23	1	-	1	-	1	-	3	1	1	1	2	2	3	-
25	-	1	1	-	1	-	2	1	1	-	2	2	3	-
26	-	1	-	-	-	-	2	1	1	-	1	1	3	-
33	-	-	2	-	-	-	2	1	1	-	2	1	3	-
38	-	-	1	-	1	-	2	1	1	-	2	1	3	-
39	-	1	1	-	1	-	2	1	1	-	1	1	3	-
41	-	-	1	-	1	-	2	1	1	-	2	1	3	-
44	-	1	2	-	1	-	4	2	2	1	3	1	6	-
45	-	1	-	-	-	-	1	1	1	-	1	1	3	-
46	-	1	1	-	-	-	1	1	1	-	1	1	3	-
47	-	1	2	-	-	-	3	1	1	1	3	2	3	-
50	-	-	1	-	-	-	1	1	1	-	1	1	3	-
59	-	1	-	-	1	-	2	1	1	-	2	1	3	-
60	-	-	1	-	-	-	2	1	1	-	2	1	3	-
62	-	-	1	-	-	-	3	1	1	-	1	1	3	water purifier machine
65	-	1	2	-	-	-	3	1	1	1	3	2	3	-
67	-	1	2	-	-	-	3	1	1	1	3	2	3	-
71	-	-	1	-	-	-	1	1	1	-	1	1	3	-
72	-	1	1	-	-	-	3	1	1	-	2	1	3	-
Average	0.1	0.48	1.13	-	0.58	0.06	2.03	1.03	1	0.48	2.16	1.55	3.32	0.03
Available (houses)	3	15	27	0	14	2	31	31	29	15	31	31	31	1
Non (houses)	28	16	4	31	17	29	0	0	2	16	0	0	0	30

particularly the IGS for selling food activities, commercial, the occupation that gives services to customer and mixed occupation.

9.5 DEMAND ON TECHNOLOGIES AND FACILITIES

9.5.1 Trends of IGS Utilizing Family and Its Demand

As shown in Table 9.2, the popular facilities sorted from maximum to minimum average of availability are curtain (3.32/house), fan (2.2/house), mobile phone (2.03/house), TV (1.55/house), Motorbike (1.13/house), fridge (1.03/house), washing machine (1/house), bicycle (0.58/house), car (truck) (0.48/house), car (saloon) (0.1/house), landline telephone (0.06/house), tuk tuk (3 wheels motorbike) (none), respectively.

As for sedan car, availability and none of availability of the house is 9.68%/90.32%. Car (truck), the ratio found to be 48.39%/51.61%. Motorbike, the ratio is 87.10%/12.90%. Tuk tuk, the ratio found to be 0%/31%. Bicycle, the ratio is 45.16%/54.84%. Washing machine, the ratio is 93.55%/6.45%. Landline telephone, the ratio explored to be 6.45%/93.55% in contrast to washing machine. Air conditioner, the ratio found to be 48.39%/51.61%. While the results showed that the ratio of mobile phone, fan, fridge, TV, and curtain are in the same number that is 100%/0%. These phenomena implied that mobile phone, washing machine, motorbike, car (truck), air conditioner, fan, fridge, TV, and curtain are presently in need for urban low-income IGS utilizing family.

9.5.2 Categorization of Demand on Technologies and Facilities

Fig. 9.2 Categorization of Demand on Technologies and Facilities in IGS Utilizing Family

After analyzing of Table 9.2, consequently it could be categorized into major three groups as continuously illustrated by the schematic diagram in Fig. 9.2. which are as follows; group of

supporting earning and daily life activities (group 1), group of communication (group 2), and group of transportation (group 3). Within the group 1, the high demands are curtain, fan, TV, fridge, washing machine, air conditioner, respectively. Fridge, fan, curtain, and TV are needed in every house. As for the group 2, mobile phone showed highly demand more than landline telephone. This might because mobile phone is easily to afford in Thailand. The prepaid system is available and there is no need to pay for monthly fee or even registration. Therefore, in comparison to landline system, it is cheaper and landline telephone seems to be used in old time lifestyle. Within the group 3, the high demands are motorbike, bicycle, car (truck), sedan car, and tuk tuk, respectively. It might be because the price of affordability, less parking area required, and flexibility of usages. Motorbike price is lesser than car, needs lesser parking lot, as well as can be attached side cart for transportation and consumes lesser petrol in comparison to the car. All of three groups which have been shown, implicated the imperative outlooks that are practically needed for low-income community housing particularly in Thailand. As for the users who wish to use their house to support income generation activities, three groups are mutually supported each other, both for their earning and daily life activities. Technologies and facilities are needed for supporting the occupation. Communication technologies help the IGS utilizing families to easily contact their customers and make the appointment to sell their products, for instance. Transportation is needed for IGS users that preparing their products at home, while going to sell their products outside the home which is more convenient for them to have their own transportation. Users can arrange their time more efficiently.

9.6 CONCLUSION

Urban low-income housing under the CODI collaboration of this community showed the results that house can be utilized apart from acting as a residing function but also able to support earning activities. This contribution space called as IGS. Occupation in the IGS utilizing family can be majorly sorted into four types. Selling food is found to be the most popular occupation. Second was found to be the occupation that gives services to the customers, while commercial activities occupation and mixed occupation type was explored to be the same amount of number and lesser popular than that of the previous two types. The demand of technologies and facilities that support in earning showed that IGS utilizing families have put the first demand on the technologies and facilities that supports their earning and life style, next is communication, thereafter is transportation issue. These have shown that occupation comes at the first priority, and then dwellers use technology for the communication to support their earning activities. Thereafter dwellers use vehicle for their transportation, both for their mobility and transport their products to sell to their customers. This research clarifies what occupation can be performed through utilizing IGS, as well as pinpoints what technologies and facilities are needed for the IGS utilizing family. Future low-income housing development project should pay attention to IGS outlook that will pave the way for a sustainable low-income housing program.

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Chapter 10
Self-build Metamorphosis and Contribution of Income Generation Space to Sustaining Low-income Housing Strategy
The Case of Banpet District of Khon Kaen Province, Thailand

10.1 INTRODUCTION, PREVIOUS STUDIES AND RESEARCH GAP

This chapter clarifies the metamorphosis process of dwelling units throughout dwellers' occupation and extension in low-cost housing projects provided by the National Housing Authority (NHA) at Banpet District, Khon Kaen Province, Thailand. It has shed light on an apparent outlook on a survival strategy made by dwellers through their occupation time. Tenures showed their maneuver of space extension which could sustain low-income life activities. Apart from acting as a living habitation, the incremental self-help extended area itself could help residents generating their income within their houses, called the Income Generation Space (IGS). About 77% of houses in the research area conducted the extension. About half of dwelling units in the study area are extended for IGS. Moreover, the spatial characteristics of IGS as a multi-purpose space can serve the desire of dwellers. Furthermore, it has a capability of solving the poverty issue as an essential possibility that is needed to be implemented in the near future low-income habitation strategy. IGS has supported the dwellers' continuous occupation and could also reflect the nature of how low-income Thai people have survived through basic given living conditions.

Low-cost housing has become an increasingly significant area of discourse, particularly in developing countries where a majority of population can hardly afford high cost luxury shelters and efforts are directed towards speeding the production (Kamruzzaman and Ogura, 2009). Over the past decade, low-cost housing projects in Thailand have also become increasingly focused as the habitat for low-income people that form the greater part in Thailand. The Thai's National Housing Authority (NHA) has played a momentous role as a key provider[*1)] from the governmental side, helping facilitate and making the residences available as a response to the great demand of low-income living habitations. However, because of the budgetary limit, which caused the compact living environment, the desires for more space and function were found after post occupancy. It also occurred in the nationwide low-cost housing project (*Baan Aua Arthorn*) in Khon Kaen, and it caused dwellers to conduct the extension for their habitation (Tonmitr and Ogura, 2011).

The study clarifies the metamorphosis (see Ref. 8): a transformation, a marked change in appearance, character, condition or function ("Metamorphosis") of low-cost housing units of Banpet District, Khon Kaen Province, Thailand through dwellers' self-built extension actions in order to see how dwellers

have survived and acclimatized to circumstances during the occupation period, and what residents have done for their habitation is the outlook of this study. There are academic scholars who studied about housing for low-incomes in many countries, but each has a different effort from this study and this issue of extended income generation space (IGS) has been given little attention, particularly as the nationwide low-cost housing strategy in Thailand after the first endeavor period of international trends in the 1970s-1980s, for instance, as follows. (Tanaka et al, 2002), looked at the characteristics and Shared-terrace at Chitlada state railway housing in Bangkok Thailand. Also they studied spatial characteristics of sites and services extension by the tenures of *Tung Song Hong* Settlement in Thailand (Tanaka et al, 2003). Interestingly, during the fiscal year in which Tanaka et al. published that paper, it was just the initiated stage of the low-cost housing project agenda that has just launched.[*2)] Although the ceased construction time of core housing in Thailand was in the late 1980s, it seems like it was the end of the official first trial & error low-income Thai housing era and near the climax period of living transformations at *Tung Song Hong*. (Chiranthanut and Funo, 2008), studied the spatial formation of the *Kaloeng* house in the Mukdahan province in Thailand. Generally, the low-cost housing project in Thailand was negatively assessed by its inadequate function and compact living style; few scholars have been able to explore its strength and significant possibility. There is only little study to explicate the transformation process of nationwide low-cost housing in Thailand. As shown, (Natakun and O'Brien, 2009), studied the modification of a government-built housing project at *Klong 3* (3rd Canal), *Rangsit*, Bangkok, Thailand. Furthermore, (Pandelaki and Shiozaki, 2011), looked at the typologies of core housing adjustments in Semarang City in Indonesia. It is therefore imperative to gain insight into the role of auto-extended or modified space, as well as the capability of the extended space, particularly income generation space (IGS) in low-cost and low-income housing.

10.2 STUDY AIM AND RESEARCH METHODOLOGY

This study aims to unveil the self-build extensions that contribute to IGS conducted by dwellers, through the following objectives and means:

-Delineate why using the extension in order to see how metamorphosis creates the space for income generation by observing its extension characteristics.

-Explore the purpose of the extension and type of IGS in relation to the extended area of each type.

-Determine the implemented strategy that the self-built IGS extension phenomenon is operative in the NHA's low-cost housing project.

This chapter draws attention to research carried out in Khon Kaen. In the pre-discussion period, aiming at gaining the actual evidences and practical adaptations with the dwellers' occupation since the initial phase was performed after having decentralized the NHA strategies.[*3)] Additionally, as for the contribution period of over 2 years since late 2009 till 2012 both onsite and during the round table critical discussion, the international conferences and symposiums were also performed to strengthen

and ensure the cover insight into issues of the low-cost housing project, particularly in Thailand. Primary data collaborates with secondary data were performed and investigated. As for primary data, a survey of 605 housing plots was conducted. Physical observations of all housing plots in the study area were also undertaken. In-depth face-to-face interviews with the community leader, and semi-structured interviews with the practical dwellers also fulfilled the thinking procedure. Follow-up typical target discussions were held onsite. Furthermore, contacting NHA officers, included interview and direct discussion with the NHA section head who takes responsibility for the *Esarn*[*4)] zone, in addition to Khon Kaen NHA area key person officers, Khon Kaen low-cost housing project's onsite manager staff, Khon Kaen NHA staff and internal actors who are practical dwellers who live in the Banpet project. A telecommunication procedure, telephone, electronic mails, etc., also have been executed after the on-site investigation when finding some significant points that need to cross-check and make deeper points with the *Esarn* zone NHA staff in order to clarify the house metamorphosis and the human behavioral influences, the desires of dwellers and the role of IGS, all for both planners part and dwellers side. Additionally, the mind maps[*5)] process has also been applied while brainstorming and scrutinizing the idea analysis. The endeavor to elucidate the typical characteristic of extended housing units in this project has been conducted. And the secondary data has been achieved from NHA and the NHA Thailand headquarter library with the help of NHA Bangkok librarians as well as Khon Kaen officers. In addition, international journals have also been reviewed in terms of related fields and topics. However, as a Thai person with the capability of the Thai language, both the Middle and *Esarn* local indigenous Thai languages, and the realization of real *Thai-Esarn* customs and life's activities, the author allowed an insight into the outlook, nature and a closer engagement with respondents.

To this end, the paper will first present the context of the research area. In the following section, the paper will focus on the NHA fundamental house and extension house. Thereafter, the IGS extension house and four types of IGS extensions will be discussed. Additionally, this paper will recapitulate the self-built IGS extension and focus on some of its strengths.

10.3 CONTEXT OF RESEARCH AREA

According to the site location, it is located in the Banpet District in Khon Kaen Thailand which is in the Northeastern (*Esarn*) region. As from the Banpet project Fig.10.1 (2), the number of total houses is around 2,000. The number of research areas is 605 houses and the picked-up typical samples are shown in Fig.10.1 (3) which is a typical housing area. Also, 16 typical housings were picked up and clarified in Fig. 10.2 to be the representative of 310 IGS extension houses which are further categorized into four types in Fig. 10.3. Due to the *Esarn* region, there is also the influence of socio-cultural or behavioral aspects that have affected the living conditions as well as the architectural acclimatization, the influence on the housing space, particularly on the extended metamorphosis space.

As from the empirical study and analysis, it has unveiled that about 77% of dwelling units have shown the way of their self-help piecemeal metamorphosis for their extension in variations and a variety of purposes. Among the variation of purposes, apparently, about half of houses in the research area maneuvered their dwellings for IGS, which have shown the significance or the key role of the capability of generating income, principally for *Esarn* low-income life activities, which depend on the keenness of their earnings, as shown in Table 13.1.

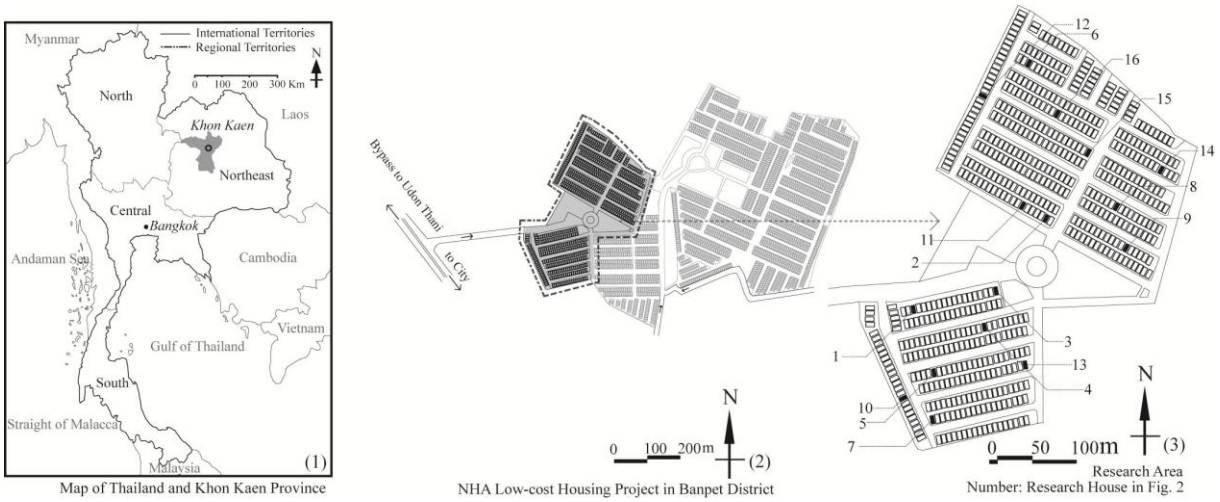

Fig. 10.1 Khon Kaen Province: Geographical Location and Site Location

10.4 NHA FUNDAMENTAL HOUSE AND EXTENSION HOUSE

This section analysis of metamorphosis and self-built extension was made to represent their individual characteristics. The basic NHA house and extended characteristics are presented.

10.4.1 NHA Fundamental House Characteristics

At the first stage, the basic NHA house provided by the NHA was two-storey housing on moderately small plots. The plot assesses 14x6 meters (84 m^2). Planning which has a ground floor area covering 29 m^2, leaving 55 m^2 of open space. Therefore, the building covered 35% of the plot size and left 65% as an open space arrangement. With the cause of compact living due to the relation between coverage and open space, consequently, this possibly caused the tenants' desire of more space and function. Thereafter, the results introduced extensions.

10.4.2 Overview of the Metamorphosis and Self-built Extension House Characteristics

After the dwellers occupied the house, it could be categorized into three groups which are the non-extension group, extension for living purpose group and extension for IGS group. The study majorly focuses on extension for the IGS group. The IGS extension sorted by income generation characteristics will be discussed in 5.1. The purpose of extension and extended elements and

Fig. 10.2 Extended Space and Its Characteristics

Fig. 10.2 Continued…

materials will be analyzed in 5.2 together with the Thai self-sufficient economy[*6)] style that has influenced the housing extension. Thereafter, the IGS extension sorted by shop type in relation to its extended area will be discussed in 10.6.

10.5 IGS EXTENSION HOUSE

Table 10.1 Purpose of Extended Space and Its Analyzed Characteristics

House No.	Purpose of Income Generation Space	Extension Direction	Income Characteristics	Extension Function	Extension Area (m^2)
1	copy and typing shop	front and left side extension	generate task at IGS	typing area, copying area living area, semi-outdoor front sitting area	23.3
2	grocery store	front, left and right side extension	generate income at IGS	grocery area, living area	27.6
3	typing, in-door parking	front, left and right side extension	generate task at IGS	living area, typing area, parking, clothes hanging area	37.5
4	grocery store, washing shop	front, left and right side extension	generate income at IGS	grocery area, washing machine standing area	27.5
5	motorcycle repairing	left side extension	generate task at IGS	motorcycle repairing	5.1
6	internet shop	front, left and right side extension	generate task at IGS	internet café	27.5
7	dry pork seller	all direction extension	generate task at IGS gain income outside	clothes hanging area, semi-outdoor sitting area	32.4
8	metal skilled worker	front, left and right side extension	generate task at IGS gain income outside	metal working area, living space, clothes hanging area, cooking area	25.3
9	fashion shop	front, left and right side extension	generate income at IGS	clothes fashion selling, bag, etc. area	21.3
10	beauty salon, barber	front, left and right side extension	generate income at IGS	beauty salon salon, hair cutting area, living area	24.5
11	music rental organizer	front, left and right side extension	generate task at IGS gain income outside	multi-purpose area, temporary storage	17.6
12	utilities grocery store, good selling shop	front, left and right side extension	generate income at IGS	selling area, storage area	19.7
13	washing and laundry shop	all direction extension	generate task at IGS	lauandry area, living area	26.8
14	game shop	all direction extension	generate income at IGS	game and internet playing area, living area	27.5
15	northeastern grilled rice style, grilled pork shop	all direction extension	generate income at IGS	food preparing and selling area	35.2
16	food cooking and food preparing	front, left and right side extension	generate income at IGS generate income outside	food preparing, selling area, eating area	26.5

10.5.1 Income Generation Characteristics of IGS Extension

IGS is usually combined with a fundamental building and an additional utilized structure, for instance additional columns and an additional roofing structure. Nevertheless, some elements, for example some supporting elements that bear the load of the roofing structure, still have been attached to the previous beam of the basic provided house as found in most of the investigated dwellings. These space characteristics have played a significant role, acting as the place to generate income for low-income earners, and additionally as the place to support low-income earners' activities to acclimatize through their daily life by utilizing their habitation. The results of the analysis showed that this space can be categorized into three major groups sorted by income generation characteristics. First, it was called "Generating income at home". This means the dwellers could establish their income within their living plot, apart from utilizing the NHA basic provided house, as a living function purpose. Tenures could use their money that they invested to purchase their home for their working place, as shown in extended purposes (Table 10.1). It was the self value-added functions that dwellers tried to modify their living habitation with during the occupation period. This covers grocery stores and retail shops selling consumer goods (e.g. snacks, *kaokua* (dried warm rice), salt, sugar, pepper, dried chili, soap, shampoo, toothpaste, toothbrushes, brooms), small restaurants that have the eating area within the

extension house (made to order menu, it is a kind of Thai-style low-income restaurant), barber shops which include male and female barber shops, service shops including laundromats, clothes drying shops, cloth ironing shops, coin laundry shops, tailor's shops, clothes repairing shops, and tutor schools. The examples are 2, 4, 5, 9, 10, 12, 13, 15 and 16 in Fig. 10.2. Next, the space was named "Generating tasks at home while gaining income outside" for instance 7, 8 and 11 in Fig. 10.2. Dwellers use their extended functions for the workplace as a preparation for their goods before going out to sell their products, as shown in Table 10.1. This covers curved metal shops, aluminum installation shops, food selling that involves preparing food at home but selling it outside (e.g. *mooping* (grilled pork), *kaiyang* (grilled chicken), dim sum, cooked food, ice cream), agriculture shops (e.g. fertilizer selling, plant selling), and beverage vendors. The final space was named "Generating income at home by using technology." This means the dwellers are able to generate the task and gain income within the IGS by using some of the technology support in earnings. This covers computer typing shops, copy and print shops, book binding shops, and internet service shops. The examples are 1, 3, 6 and 14 in Fig. 10.2. Moreover, IGS is very flexible in terms of its functions and usages. Due to Thai activities, particularly for the *Esarn* (Northeastern Thailand) socio-behavioral aspect, there are many ceremonious occasions and get-together parties in the evening time after working hours. Dwellers are able to flexibly maneuver this space by relocating some furniture into the rear side of the house plot or keeping it on one side of this IGS, such as shelves or moving new furniture into this area according to each purpose. It was often that dwellers introduced *Krae* (A kind of bamboo group chair) into this space. IGS is even used for arranging the religious ceremony or house warming, for instance, practicing the monk's ceremony as the Thai's belief, after their son was successful in graduation that people usually promised to be a monk for such a time like 1 week or 1 month to learn the Buddhist religion in returning to their parents who take care of him until he got success.

10.5.2 IGS Extended Space Elements and Materials

As for the extension, more than three quarters of dwellers tried to complete their basic territory by filling cement mortar with a wooden block or using a green buffer from a local plantation, showing the self-sufficient Thai economy that can adapt to the extension style. For the structure and roof covering of the extended space, all of them used the process of adding columns and a roofing structure. Moreover, more than 90 % of the wall plane was made for their vertically enclosed space. Around 50 % of dwellers attached outdoor curtains using the fabric advertisement cut-outs. It is noticeable that most of the houses have arranged a place for attaching the king's photograph and a Buddha shelf which reflects the way of a low-income earners' life and Thai society that pays respect to their king and Buddha as shown in Table 10.2. Both IGS and floor paving are mainly found as their income generation activities. For the overhead plane structure which is the roofing, metal structures are mainly used in this project with the corrugated asbestos tile paving. For the column, RC columns were mostly found for the structure, and few were explored to be wooden. For the vertical plane enclosure,

materials were both found to be concrete blocks and red bricks finished with cement-sand mortar. The opening frame was mostly found in the aluminum frame or wooden materials. The recycled wooden frame will also be investigated.

Table 10.2 Extended Elements of IGS with the Extended Materials Usage

House No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Extended elements																
plantation	○				○		○			○			○		○	○
territory finishing*	○	○	○	○		○		○	○	○		○	○	○	○	○
adding column	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
adding roofing structure	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
wall plane	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○
outdoor curtain**				○			○		○		○		○	○	○	
semi-outdoor kitchen					○		○	○			○				○	○
storage area	○	○	○	○		○		○	○		○	○	○		○	○
clothes hanging area	○	○	○	○	○		○	○			○		○			○
parking area			○		○			○								
attached window	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○
attached partition		○		○		○				○	○		○	○		
place for attaching King's picture	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Buddha shelf	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
multipurpose living area	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○
income generation area	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
floor paving	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Materials																
RC column	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
cement pavement		○	○	○	○		○	○	○	○	○	○	○		○	○
tile pavement	○			○		○			○	○			○	○	○	
wooden column							○									
red brick	○					○										
concrete block		○	○	○	○		○	○	○	○	○	○	○	○	○	○
wooden window frame							○									
aluminum window frame	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
shutter opening type		○		○					○			○		○		
normal clear glass type	○			○	○			○	○		○	○		○	○	○
tinted glass			○			○	○			○			○			
wooden roofing structure						○										
metal roofing structure	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
metal with fabric roofing					○			○			○		○		○	
metal sheet roofing									○					○		
corrugated asbestos roofing	○	○	○	○	○	○	○	○		○	○	○	○		○	○
interior emulsion painting	○		○		○	○	○	○	○	○			○	○		
exterior emulsion painting	○		○		○	○			○	○			○			

* The initial basic territory provided by NHA is a curved metal fence that is unfinished type.
** Outdoor curtains were mostly the usage of fabric or plastic advertisements cut out and attached to the housing facade.

As the metamorphosis plans shown in Fig. 10.2, the extended space of the houses ranged between 5.1 m^2 to 37.5 m^2 (Table. 10.1). As for the metamorphosis planning, it could be seen that the trend of the extended direction was mostly found in front of the house at the approach direction. Additionally, the side extension and back extension of the NHA basic house plan were also explored. Depending on the purposes of extended IGS, some of the IGS need the enclosure area for dweller's purposes. For instance, house no. 1 in Fig. 10.2 is an example of a dweller's intention that wished to conduct the extension space for computer typing with copy and print activities. The purpose of IGS extension is outlined in Table 10.1. The need of an enclosed space for typing activities, as well as for copy and

print, brought the dweller to build a vertically enclosed plane at the front and left side of the basic plan for additional space for working activities by using a concrete block finishing with cement-sand mortar and plastic colouring. Some IGS need the flexible and clear space arrangement; therefore, dwellers have made only the front folding door for opening while dwellers are doing their tasks, for example house no. 8 in Fig. 10.2, where the occupant had made the metal folding door and arranged an open plan. It is because dweller's intention that needs for the working area for metal workshop and side of the extended space for storage maneuver (Table. 10.2).

10.6 IGS EXTENSION SORTED BY TYPE OF SHOP AND RELATION WITH ITS EXTENDED AREA

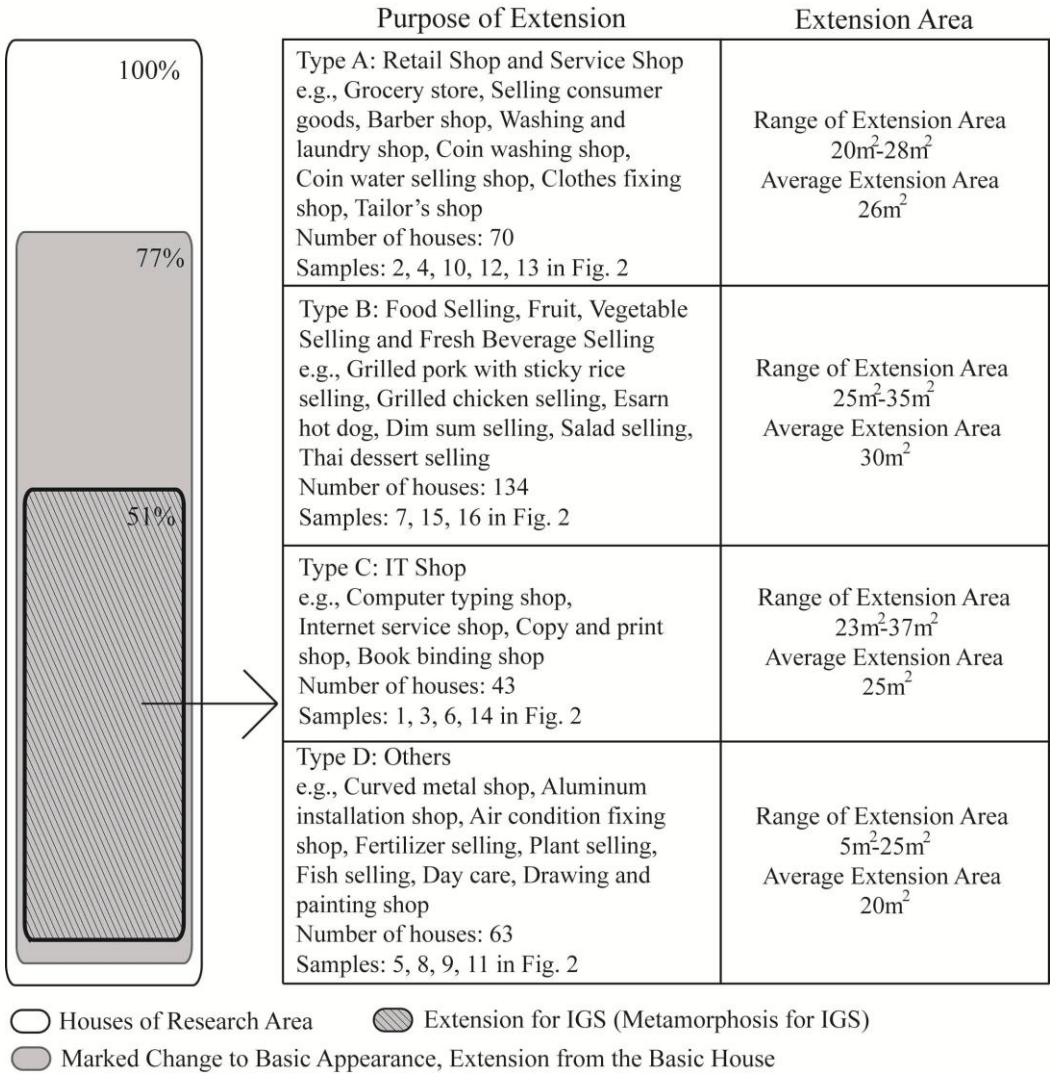

Fig. 10.3 Extension Purpose, IGS and Size Relationship

In order to unveil the extension phenomena, whole houses in the study area (605 houses) have been investigated. The results show that about 77% of houses in the study area have the extended houses that imply the tremendous need for the extension of the house. About half of the houses in the study area made IGS extensions. Within the IGS extension houses (310 houses), it can be categorized into 4 types sorted by the type of shop. Type A (70 houses), retail shops and the service shops, covers grocery stores, shops selling consumer goods, barber shops, wash and laundry shops, coin laundry shops, coin water selling shops, clothes fixing shops, and tailor's shops. Type B (134 houses), shops selling food, fruit, vegetables and beverage, covers shops selling grilled pork with sticky rice, grilled chicken, Esarn hot dogs, dim sum, salads, and Thai desserts. Type C (43 houses), IT shops, covers computer typing shops, internet service shops, copy and print shops, and book binding shops. Type D (63 houses), other types of shops, covers curved metal shops, aluminum installation shops, air conditioner fixing shops, shops selling fertilizer, shops selling plants, shops selling fish, daycare centers, and made to order drawing and painting shops. The IGS extension trend shows that the most popular type is type B (43%); on the other hand, type C is the least in number of extension houses (14%). These situations imply that selling food activity is an easy way for earning with less investment in comparison to IT shops. IT shops might need the higher investment for technology such as purchasing computers to support the income generation activities. Types A and D are about 20% in popularity, slightly higher than type C.

The average of extension area in relation to each type from maximum to minimum are type B, type A, type C, and type D, respectively, as shown in Fig. 10.3. This indicates the need of a large space extension for food selling purposes. The retail shops, the service shops and IT shops have a similar number of average extension areas while type D requires the least amount of extension areas. As an illustration, house no. 2 (as a representative of 70 houses in IGS extension house Type A), the dweller's extension purpose is to make a grocery store, therefore the front approach has been designated as a selling area with arranged goods shelves to serve consumers in Fig. 10.2. In house no. 16 (as a representative of 134 houses in IGS extension house Type B), the purpose of selling food made the owner conduct the IGS space for preparing, cooking, selling and eating food, as shown in Fig. 10.2. Taking an example of house no. 1 (as a representative of 43 houses in IGS extension house Type C), dwellers conducted the IGS space for computer typing, copy and print activities, as in Fig. 10.2. In house no. 8 (as a representative of 63 houses in IGS extension house Type D), IGS extension has been made for performing the metal workshop, arranged in the form of flexible planning, as seen in Fig. 10.2. The extension situation has shown the need for additional space, particularly for IGS in order to fulfill the low-cost housing strategy. These phenomena contribute to further sustainable low-income housing supplies that the need of the extension space for IGS should put into consideration.

10.7 CONCLUSION

The effort to provide low-cost housing by the NHA showed the outcome of a compact living environment. In these situations, the dwellers solve the housing conditions by their own styles using self-built metamorphosis, consequently leading to the contribution of IGS. Apart from functioning as a living habitat, the residence is able to add value by suiting each of the life activities and purposes of the dwellers through the dwellers' self-built metamorphosis process. Metamorphosis reflects different income generation characteristics affecting the different usage of IGS: generating income at home, generating tasks at home while gaining income outside, and generating income at home by using technology. Additionally, the dwellers' intention influence on spatial composition and the usage of extension elements and materials. Consequently, the type of IGS shop indicates the average difference in utilizing the extension area. Food-selling activities require a large extension area while the retail shop, the service shop and IT shop need smaller spaces. Also, other types of shops require the smallest extension area. The phenomena that about 77% of houses in the research area have made an extension or change to the basic given house, and about half of houses in the research area have made an IGS extension is very imperative for sustaining the housing strategy. Moreover, IGS plays a significant role in supporting the dwellers' continuous occupation and could reflect the nature of how low-income Thai people have survived through their living environment which could contribute to the prototype on a wider scale to acclimatize. Furthermore, it could help the housing planners and it could be one of the most essential possible issues to be considered and implemented that help pave the way for a future development project as a key theme for sustainability of living habitations.

NOTES

*1) Key providers were major categorized as government organization and NGOs. Intermediary Institution in collaboration with self community management was found to be the apparent aspect of sustainable housing issues, particularly, for low-income people. For further reading, see 7).

*2) Reference 15) and 16).

*3) This Low-cost housing strategy has been decentralized from Thai NHA in 2003 and was used as a major nationwide low-cost housing strategy (*Baan Aua Arthorn*); furthermore, it was considerable as the minor change endeavor version of the international low-income housing trends which entered Thailand in the 1970s-1980s renowned as Site & Services. See 14) for further reading and detailed information, also References 2) and 4).

*4) *Esarn* is indigenous local Thai language renowned as the Northeastern part of Thailand.

*5) Mind maps have been widely used in many branches of study fields, renowned as an essential critical thinking process. It provides a strategy for analyzing the materials, integrating critical thinking and problem solving skills. For further reading, see 3) and 6).

*6) Thai Self-sufficient economy philosophy has been derived from the present King of Thailand's thought. It is due to Thailand is major agricultural country, therefore first intentional conceptual thought was major aiming at low-income people but how well it was, depends on the application process of users.

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Chapter 11
Self-customization for Income Generation Space in the Baan Mankong Program
The case of Tawanmai Community Housing in Khon Kaen Province, Thailand

11.1 INTRODUCTION, PREVIOUS STUDIES AND RESEARCH GAP

This chapter is the continuation of the previous chapter concerning research on Income Generation Space (IGS) in a low-income housing project in Khon Kaen Province, Thailand.[*1)] This chapter clarifies the self-customization and the contribution of IGS in the Baan Mankong Program (BMP) facilitated by the Community Organizations Development Institute (CODI) at Tawanmai community of Khon Kaen Province in Thailand. Self-customized IGS survival strategy was found to be used by the dwellers throughout their occupation period. It has unveiled the two major categorizations of IGS as well as the imperative outlook of spatial utilization and its time variation. The provided housing condition can be utilized apart from functioning as a living habitat, also can be used as a place for the facility to generate income for its users. More than one-third of the houses in the research area, where the houses are planned and placed in rows, are self-customized for IGS. IGS has also shed light on its flexibility of usage possibilities that can be adjusted according to the dwellers' purposes. The phenomena have shown the need of IGS in the BMP that could be implemented in future low-income housing scenarios, as well as for a wider scale of housing development, that pave the way for a sustainable low-income housing program in Thailand.

Over the past decade, low-income housing in Thailand, by provisions from the governmental side as a key provider[*2)] and facilitator, has majorly focused on two famous housing scenarios (Tonmitr and Ogura, 2012c: Yap and Wandeler, 2010). The first approach is referred to as the *Baan Eua-Arthorn Project* (BEP), which is renowned as a low-cost housing project that is provided by the National Housing Authority (NHA). The way of thinking of its planning has been derived from the planning and design processes of the NHA's architectural team. Census survey data of Thailand was utilized at that time. After that, the average household size and density was determined to be about 4 people per household. Following that, a compact livable area for household members was designated. As well as, the NHA had its own standard; therefore, drawings and specifications for residential building of the BEP were required to conform to the design standard of the NHA[*3)]. Community density of two-storey single house type did not exceed 12 units per rai[*4)]. Public spaces and utilities are required, for instance, community centers, green parks and playgrounds, kindergartens, sport fields, central water treatment ponds, roads, as well as pedestrian walkways. Additionally, the two-storey single house

required a floor area of 48 m^2 or more. This type of house should be built on a plot of no less than 20 wa^{2} [*5)] with a land-frontage side of 6 meters or more. For the housing discussed in the previous paper[*1)], the same rules were used, for instance, 4 household members per family, and a community density of 10.28 families per rai, or approximately 42 people per rai. The second approach referred to as the *Baan Mankong Program* (BMP), or a secured housing program, is mainly facilitated by the Community Organizations Development Institute (CODI). The basic idea and concepts of the CODI are to support and empower urban and rural community organizations through financial assistance, housing development, and environmental improvement[*6)]. In addition, the basic idea and concepts of the Baan Mankong Collective Housing Program are based on the concepts of a people-driven housing development process, utilized participatory design scheme, placing Thailand's slum communities and their community networks at the center of a long-term development process, and comprehensive solutions to land title and housing problems in Thai cities[*6)]. The way of the BMP's Tawanmai community planning was achieved at the beginning of the upgrade processes. It has depended on the affordability of capable monthly payments of each dweller. The area of each plot was calculated from all the new given community area, which subtracted public space, public area and inner-community roads for instance, thereafter divided by the number of households. This article represents a case under the BMP that has a different agenda from the BEP in order to unveil the contribution of Income Generation Space (IGS) in the different housing program as well as the strategy to get IGS. Therefore, the Tawanmai community of Khon Kaen Province, Thailand, a new housing site has been utilized for this research.

Although there are academic scholars who have studied about low-income housing in many countries, each has a different endeavor from this study. And this issue of self-customization contributes to IGS, particularly for the BMP, and a small scale of row-type housing has been given little attention, for instance as follows. In the past study, (Tipple, 1996) published a paper by emphasizing the positive issue of extensions as sustainable development. Additionally, (Kellett and Tipple, 2000) showed the meaning of using homes as a workplace, still the research has yet to reach the investigation of spatial organization and its time variation. Nonetheless, their study in the context of Thailand is few to adequately verify. (Pandelaki and Shiozaki, 2011), studied the typologies of core housing adjustment in Indonesia. (Chiranthanut and Funo, 2008), looked at the spatial formation in the rural housing case from the *Kaloeng* house in the Mukdahan province of Thailand. Additionally, (Tanaka et al, 2003), studied spatial characteristics of site and services extension by the tenures in the *Tung Song Hong* settlement in Thailand. Among the numbers of research on the BMP of Thailand, it could be seen that most of the studies were concerned in the field of social science or management, for instance, (Boonyabancha, 2005) clarified the process of the BMP. (Usavagovitwong and Posriprasert, 2006), showed a way to support the community under the BMP. (Tonmitr et al, 2012b) unveiled the lessons learned from low-income housing scenarios in Thailand that covered the BMP and the BEP project.

Moreover, they showed the role of community architects and supporting key actors in the BMP (Tonmitr et al, 2012a). Additionally, (Tonmitr, 2014) clarified materials for low-income housing extensions in the BMP.

Nevertheless, little attention has been paid on an architectural point of view, especially in the sense of a verification of a reality of dwellers' housing after a post-occupancy period and the aspect of IGS for the BMP. The approach to get IGS is different from the NHA low-cost housing project. Tonmitr and Ogura[11)] clarified the intention and reality in planning low-cost housing and found housing extension as a tool for survival strategy by the dwellers. However, for this research area, self-customization of the space was found to be a tool to get IGS. Therefore, in order to explore the implemented strategy for the future of low-income housing, it is imperative to gain insight into the aspect of self-customized spaces that contribute to IGS for urban underprivileged housing under the condition of a limited space, even in a row house.

11.2 STUDY AIM AND RESEARCH METHODOLOGY

This study aims to unveil the self-customizations that contribute to IGS in the BMP conducted by dwellers, how IGS plays its imperative role in the BMP, through the following objectives and means:

-Explore the reasons why using self-customization to unveil how self-customized space effectuates IGS by observing its spatial characteristics.

-Delineate the purpose and categorization of IGS in the BMP.

-Pinpoint the outlook of IGS utilization and its time variation that help to develop IGS strategy for the BMP.

-Define the strategy that the self-customized IGS is operative for the BMP and a small scale of row-type housing for low-income housing, although how to afford IGS utilizing different method from IGS in the BEP.

This chapter draws attention to the research carried out in Khon Kaen during September and October 2012, March and April 2013, as well as September and October 2013, and March 2014 through both onsite and round-table critical discussions. Primary data in collaboration with secondary data have been collected and investigated. As for the primary data, an onsite survey of whole houses (145 houses plus 1 community center) was conducted. Physical observations of all housing in the community were also undertaken. The integration of graphic recording techniques with recorded discussions has been utilized to collect ideas. The questionnaires for IGS house owners were employed to see the owners' intention for space usage and time sequence, how they affect in space usage and time is analyzed in this paper. In-depth face-to-face interviews with the community leader, together with semi-structured interviews with the dwellers helped to fulfill the supported outlook. Additionally, follow-up target discussions, which were held directly onsite, went straight to the dwellers' homes. Furthermore, direct

Fig. 11.1 Khon Kaen Province: Geographical Location

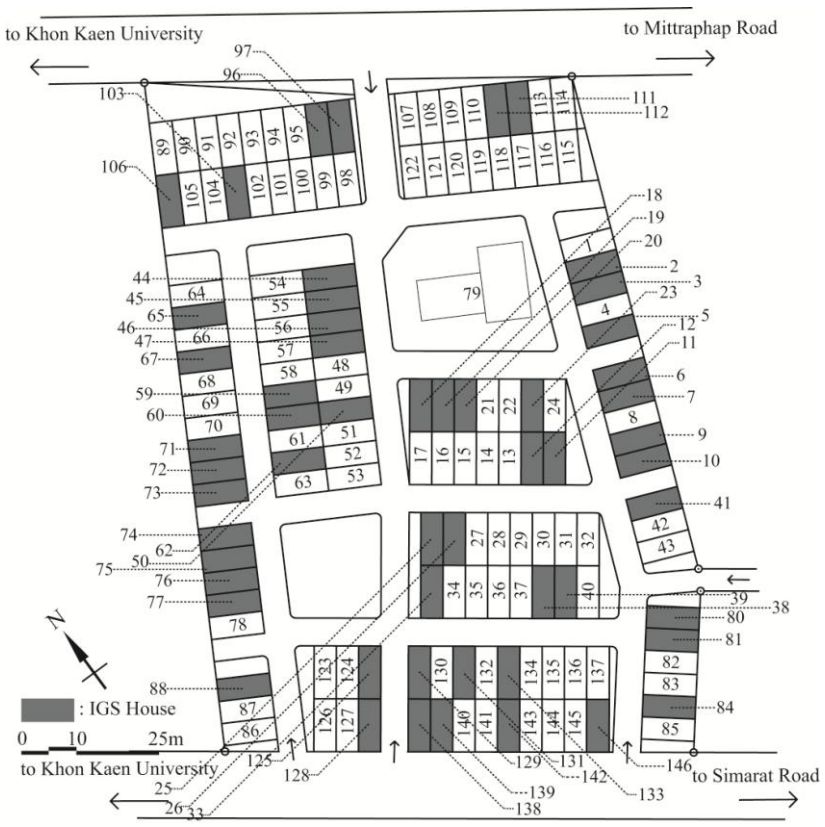


Fig. 11.2 Research Site Location

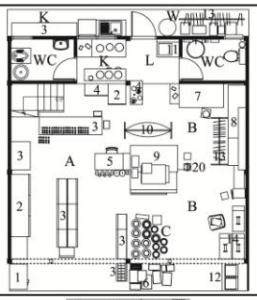
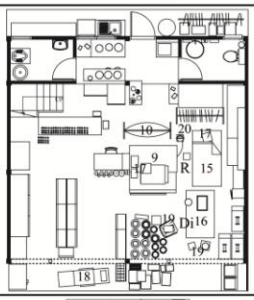
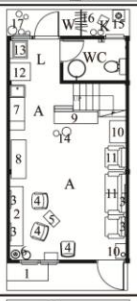
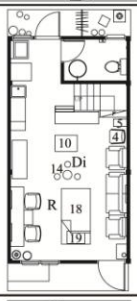
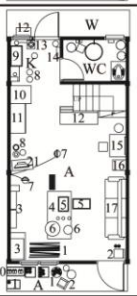
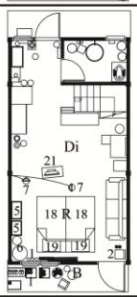
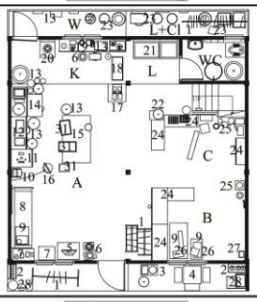
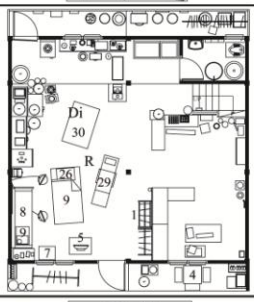
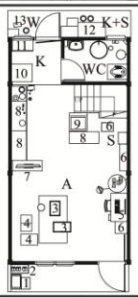
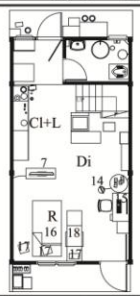
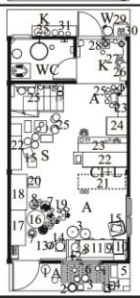
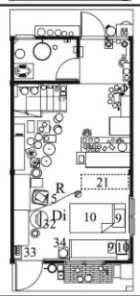
House No. &Type	House Exterior Utilization	House Interior Utilization	Income Generation Activities in IGS and Spatial Configuration	Other Activities in IGS and Spatial Configuration
44-45 A	 A: selling, cashier, products display area B: tailor's activity WC: toilet C: storage L: laundry area K: kitchen W: washing & clothes drying R: relaxing, sleeping area Di: dining area	1: cooler box 2: refrigerator 3: shelf 4: cupboard for food 5: cashier 6: box 7: ironing desk 8: cupboard for clothes 9: Thai seat 10: Thai style bed  11: washing machine 12: coin washing machine 13: clothes hanger rack 14: sewing machine 15: bed sheet 16: mat 17: pillow 18: camping bed 19: seat 20: fan		
73 A	 A: IGS for beauty salon activity K: kitchen L: laundry area R: relaxing, sleeping area Di: dining area W: washing & clothes drying WC: toilet	1: Thai short leg table 2: salon desk 3: mirror 4: salon seat 5: movable salon tools desk 6: salon equipments, hair steamer machine 7: hair washing seat 8: display cupboard  9: TV set desk 10: shelf 11: sofa 12: refrigerator 13: washing machine 14: small dining table set 15: gas stove 16: clothes hanger rack 17: utensils, pots 18: bed sheet 19: pillow		
131 A	 A: IGS for paper craft work K: kitchen R: relaxing, sleeping area Di: dining area W: washing & clothes drying WC: toilet	1: raw materials for paper craft work 2: small seat 3: bed sheet & blanket 4: mat 5: box 6: bowl 7: fan 8: utensils, pots 9: table 10: refrigerator 11: cupboard for food 12: shelf  13: gas stove 14: water purifier 15: desk set with mirror 16: bookshelf 17: sofa 18: bed sheet 19: pillow 20: shoe shelf 21: television		
2-3 B	A: IGS for food preparing activity B: grandmother's room C: storage K: kitchen L: laundry area L: laundry+clothes hanging area R: relaxing, sleeping area W: washing WC: toilet Di: dining area  1: clothes hanger rack 2: shoe shelf 3: box for keeping food 4: semi-outdoor table set 5: television 6: gas 7: small shelf 8: Thai sofa 9: bed sheet 10: small locker 11: refrigerator	12: cupboard for food 13: utensils, pots, pan 14: cooler box 15: mat 16: fan 17: Chinese spirit house 18: shelf for utensils 19: kitchen desk 20: gas stove 21: washing machine 22: water tank  23: water jar 24: cupboard for clothes 25: drinking bottles 26: pillow 27: trash box 28: pot, flowerpot 29: camping bed 30: Esarn mat 31: food box		
65 B	 A: IGS for squid preparing K: kitchen K+S: kitchen+ storage S: storage R: relaxing, sleeping area Cl+L: clothes+ laundry area Di: dining area W: washing & clothes drying WC: toilet	1: tools box 2: shoe shelf 3: food storage box 4: food cooler box 5: computer desk 6: shelf 7: television 8: cupboard for clothes 9: washing machine 10: refrigerator 11: cupboard for food  12: food cooler 13: washing equipments 14: fan 15: computer 16: bed sheet 17: pillow 18: camping bed		
128 B	 A: IGS for Esarn food preparing K: kitchen S: storage R: relaxing, sleeping area Cl+L: clothes+ laundry area Di: dining area W: washing & clothes drying WC: toilet 1: charcoal stove 2: pan 3: pot 4: food tray 5: shelf 6: bamboo chair 7: bowl 8: plate 9: pillow 10: bed sheet 0 1.00 2.00 4.00 6.00m	11: Esarn wooden chair 12: seasoning bottles 13: fan 14: short leg wooden seat 15: seat 16: round table 17: TV desk set 18: showcase shelf 19: rice cooker 20: box 21: Buddha shelf & spiritual shelf 22: cupboard for clothes 23: kitchen desk  24: refrigerator 25: utensils 26: cooking tools shelf 27: gas tank 28: gas stove 29: trash box 30: fish sauce & oil bottles 31: utensils drying shelf 32: television 33: shoe shelf 34: drinking water tank		

Fig. 11.3 Adjustment of IGS Spatial Configuration and Characteristics

interviews and discussions with key persons who were in charge of this project were completed, which included municipality officers that are responsible for the BMP, the head of the *Esarn*[*7)] zone CODI and his officers, and practical dwellers who live in the Tawanmai community, as well as the persons who contribute to developing the Tawanmai community. Telecommunication processes (telephone, Skype, e-mail, etc.) were sometimes used to fulfill new finding outlooks, all aimed at gaining the data from the side of the planners, policy makers and dwellers. Moreover, the mind maps[*8)] technique was also employed while brainstorming the idea analysis. The secondary data was achieved from the *Esarn* CODI office, community library, community records, and Khon Kaen University library. In addition, international journals have also been reviewed in terms of related fields. However, as a Thai person with the skill of the Thai language, both the Middle and *Esarn* local indigenous Thai languages, and the realization of real *Thai-Esarn* customs, the author was allowed an insight into the outlook, nature and a closer engagement with respondents.

11.3 CONTEXT OF RESEARCH AREA

Site location is located in the Khon Kaen Province of Thailand, as shown in Fig. 11.1. The Tawanmai community was utilized for an analysis, as shown in Fig. 11.2. Formerly, this community was a squatter settlement. Thereafter, this community has collaborated with CODI under the BMP, was renowned as a slum relocation project, and was completed in 2007. The role and contribution of the CODI are majorly to support community organizations and networks, encourage participatory design approaches, strengthen land by securing tenure, coordinate with the supporting key actors, including local institutions and academic institutions, enhance financial cooperatives as well as implement long-term loaning processes. Therefore, after this community has joined in the BMP, the CODI has helped to shape-up the upgrading processes of the community, which covered financial management, design processes, and a community management system, by emphasizing the participatory design and focusing on people as the core of development. As from the Tawanmai community in Fig. 11.2, the total number of houses is 145 plus 1 community housing center. The number of research area is 145 houses and the obtained samples are shown in Fig. 11.2. Also, 8 typical housings were picked up, drawn, and clarified in Fig. 11.3 to be the representatives of 55 self-customized IGS houses, which are further made categorization into two types (IGS type A and IGS type B)[*9)]. As from the empirical study and analysis, it was unveiled that approximately 38% of the houses in the research area maneuvered their dwellings for IGS, which has shown the significance of the capability for generating income. The purpose of income-generation activities depends on the keenness of dwellers' earnings, as shown in Fig. 11.7.

11.4 INTENTION AND REALITY IN PLANNING TAWANMAI CODI HOUSING

This section analysis was made to represent intention and reality in planning Tawanmai housing as well as to unveil the importance of self-customized IGS.

11.4.1 Tawanmai CODI Fundamental House Characteristics and Its Housing Type

The basic given houses in the Tawanmai community housing were basically provided into two types. Most of the houses (138 houses) were two-storey housings on moderately small plots; less amount of houses number were designated to be one-and-a-half-storey houses (7 houses). Housing design is in

the form of a row house type. Each house plot assessed about 4x8.5 meters (34 m^2), which had a ground floor area covering the whole given area, as shown in Fig. 11.4. Therefore, houses were built up at the maximum limit of the given area. That possibly has caused the dwellers to customize their own space. Consequently, this contributed to the self-customized IGS for dwellers who needed to use their home as a workplace and support their income generation activities.

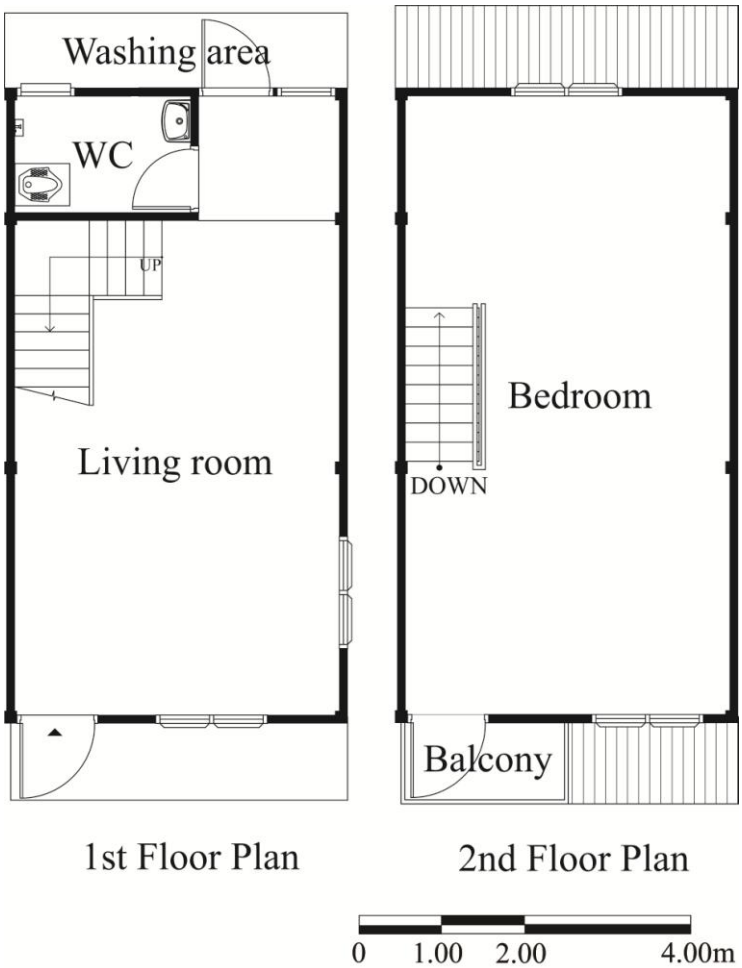


Fig. 11.4 Standard House Planning of Tawanmai Community Housing

11.4.2 Self-customization and Meaning of IGS in the BMP

The method to afford IGS in the BMP differs from the BEP project. Despite the self-built metamorphosis found as an imperative tool to get IGS in the BEP, self-customization was found as a tool to gain IGS in the BMP. As described, housing characteristic in Tawanmai housing is a row house

type that the building coverage occupied almost all the plotted areas. By these circumstances, there is little space that might be able for extension where is the small front space of the house around 4 m^2 (1m extended, 4x1 meters). Nevertheless, it is able to be only temporary extension according to the building by laws and community rules. Therefore, self-customizing the space inside the house was found its important strategy for coping with the limited area. Self-customized interior space is sometimes also found the connectivity to the front space of the house, transitional space, product display space, for instance. Majorly, the first floor interior space is found to be mainly utilized space for IGS by customizing that space for each of income generation activity and purpose in Fig. 11.3. The standard, or the basic house planning, is shown in Fig. 11.4.

11.5 IGS IN THE BMP AND ITS SPATIAL CHARACTERISTIC

To explore the spatial characteristics of IGS, the spatial configuration planning has been drawn both at the time when IGS has been used for income generation activities and when the IGS has been utilized for other activities in order to unveil the reality of spatial organization and its time variation, as shown in Fig. 11.3. Using the house no. 44-45 in Fig. 11.3 as an example, the owners were a big family and owned two houses. The space needed for a retail shop, coin laundry service and tailoring shop brought the dwellers to create a connecting space by not building an internal wall between the no. 44 and 45 houses. Therefore, they could have a large space for those activities. More importantly, the left house (house no. 45) was designated to be a retail shop where consumer goods shelves, cooling fridges and a cashier desk were arranged. The right house (house no. 44) was utilized as a tailoring shop for the husband to perform clothes-repairing, ironing, cutting and designing activities. In front of the house no. 44, there were two coin washing machines provided for extra income generation activities. This spatial organization was used for both income generation activities and for other activities that utilized this IGS. There was one large wooden desk-like-bed for sitting, relaxing, sleeping or even for use as a dining table, as shown in Fig. 11.3. Referring to the illustration of house no. 131 in Fig. 11.3, the dwellers' self-customizing purpose was to have enough space for making Po-ngern, Po-tong and Chat tong (ceremonious paper craft work) as well as for relaxing and sleeping area. The dwellers introduced mat and paper craft equipments into IGS when conducting their income generation activities. Thereafter, if the tasks were completed, the materials were kept and the area was clean, then welcome a soft bed sheet, pillows, and a mosquito net instead for relaxing and sleeping purpose. It indicates the flexibility of IGS usage that can be adjusted. In the no. 2 and 3 houses, the purpose of selling Esarn fried chicken with sticky rice made the owner conduct the IGS for preparation, as well as for storing and cooking food, as shown in Fig. 11.3. The no. 2 house and half of left part of the no. 3 house were designated to be used for income generation activities, as shown in Fig. 11.3. The right-half of the no. 3 house was arranged for their grandmother's living space, as shown in Fig. 11.3. It is similar to the no. 131 house in type A in terms of spatial management that if the users finished the income generation tasks, the IGS is kept clean and utilized for recreation and relaxing activities instead. Taking a sample

of the no. 128 house in Fig. 11.3, the dwellers' job was selling Esarn food. The dwellers arranged the IGS for food-selling activities, similar to no. 65. They used the IGS for preparing and cooking food to sell outside, as well as to utilize space as a recreation and relaxing area. The usage of IGS is quite similar to the no. 73, 131, 2 and 3 houses in that they can rearrange space according to their intentions for use.

11.6 PURPOSE AND CATEGORIZATION OF IGS IN THE BMP

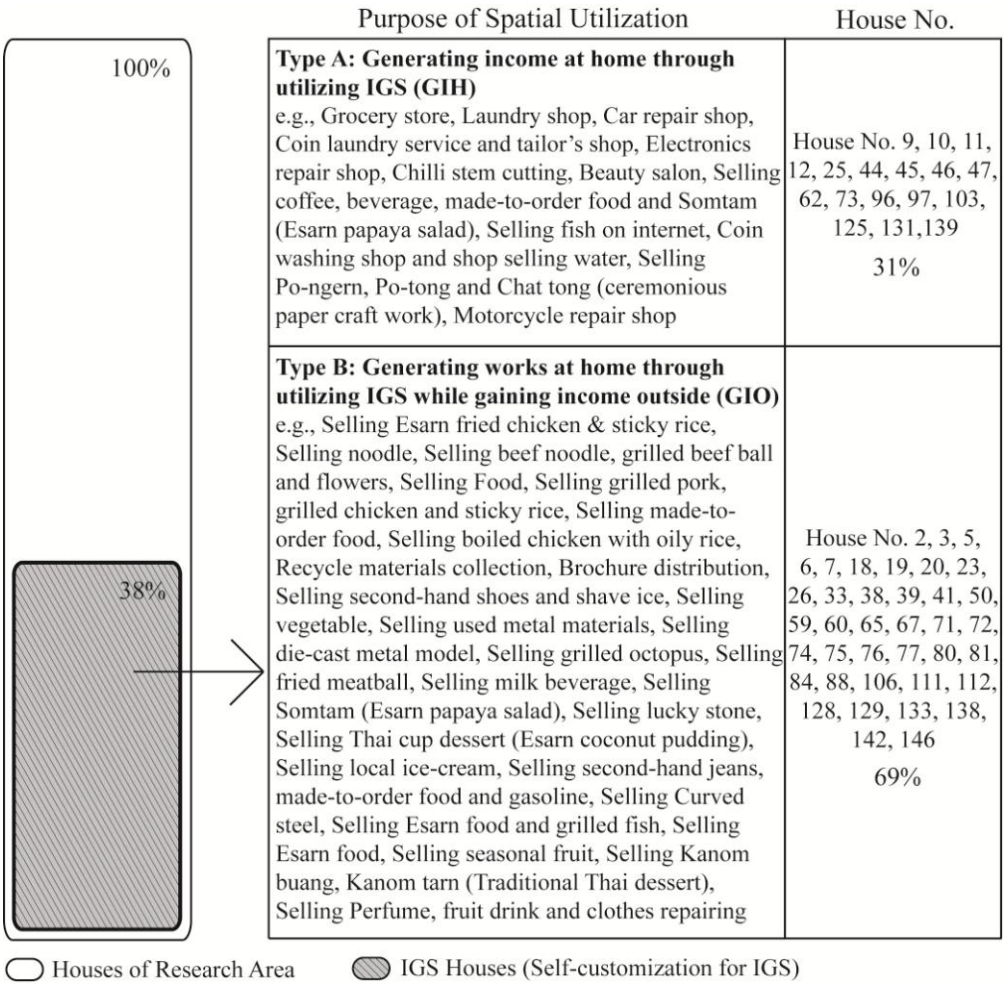


Fig. 11.5 Categorization of IGS and Purpose of Spatial Utilization

Whole houses in the research area (145 houses) have been investigated and clarified, in order to unveil the IGS phenomena. The outcomes of the results show that approximately 38% or more than one-third of the houses in the study area have the houses customized for IGS utilization that imply a need for IGS in the BMP, particularly, even for row-type housing. Within the number of self-customized IGS houses (55 houses), this number (38%) can be categorized into two the types in Fig. 11.5. Type A (17

houses) which generating income at home through utilization of IGS (GIH). It can be noticed that income generation activities of the GIH type mostly regard services occupations that give the services to the customer; still, some are found to be a combination of services and trades. Type B (38 houses) which is generating works at home through utilizing IGS while gaining income outside (GIO). As shown in Fig. 11.5, it therefore can be seen that income generation activities of GIO type mainly concern about the selling of food and products. As for these situations, the type that gains a high popularity is type B (approximately 69%) while lesser popular type of IGS is type A (approximately 31%). Popularity depended on the needs and keenness for earning of each house that all formed within this community. The results have shown that most of the income generation activities are IGS type B, which is preparing or generating tasks at home, while going to sell outside. Dwellers have to go or approach their customers more than waiting for customers to come to their home. The phenomena indicate that selling food, including fruits, vegetables and beverages are the occupations that low-income people are keen on. It might be because of the reasons that less investment is needed, less depending on technology, and high education is not needed. Nevertheless, it greatly depends on the skills and experiences gained from practicing. On the other hand, type A may need an investment budget to afford technologies, electronic devices, tools and equipments that support in earning, for instance purchasing a refrigerator, cooler, iron, dryer, washing machine, water cooler machine, salon chair, computer, car and motorcycle repair tools, and air pump. Selling vegetables is categorized in type B that is because the dwellers went to sell their vegetables outside, and the home is usually utilized for keeping their vegetables before preparing to sell them outside or it is used as vegetable storage. Grocery store is in type A because the dwellers sell their products as well as gain income at home and no need to sell their products outside.

11.7 IGS UTILIZATION AND ITS TIME VARIATION

11.7.1 Importance and Flexibility of Self-customized IGS

Fig. 11.6 (left) shows an example of the importance of IGS utilization according to its time variation of IGS type A house. Dwellers usually spend their time in IGS for all day. Different kinds of activities happen throughout the day but to be organized within the same space which is IGS. The activities include both income generation and recreation activities. Spatial organization is adjusted when the purpose of usage changes by introducing equipments or tools that are necessary for those of the activities. For example, Po-ngern, Po-tong and Chat tong (Thai ceremonious paper craft work) making equipments are welcomed when income generation occurs. On the other hand, when the tasks are finished, those materials are kept and introducing mats, soft bed sheets, and pillows instead when the usage is changed for relaxing activities. Fig. 11.6 (right) illustrates a sample of IGS type B in relation to spatial utilization and its time variation. Depending on the dwellers' occupation that is about selling food, dwellers use their IGS for preparing food to sell outside of the home. When they go out to sell their products, IGS usage intensity is low. IGS is also organized as a relaxing space or sleeping area

when food-preparing activities are done. It can be noticed that even though the type of IGS is different, IGS alterations are similar in terms of flexibility. This might be due to the limited area of each house; therefore IGS has been found its way to be used as flexible possibility. Additionally, it shows the importance of IGS that is needed for dwellers to survive by using their home apart from functioning as a living habitat.

House No.131 (Type A)	**House No.128 (Type B)**
"…..My family and I do a craft work, but it is special craft work called Po-ngern, Po-tong and Chat tong (in Thai). Paper craft work for using in Buddhist religious ceremony. Making method has been inherited from generation to generation. Every day, I start utilizing this space for my income generation activities, making paper craft works to sell through using this IGS. I start around 7 o'clock making my products until 12 o'clock. The IGS is changed to be dining area, introducing the small desk and mat. We have lunch and relaxing time until 1 o'clock that we start our task again. This spatial utilization is changed again, keep the space clear introducing mat and paper craft work equipments to this area. For the afternoon session, IGS is used until 5 o'clock that we finish our duty every day. There are people who come to my home and buy our products. After 5 o'clock, we then change the usage of IGS into recreation activities as well as use IGS to be our bedroom by welcoming mats, soft bed sheets and pillows. I am very proud that my job helps supporting Buddhist religion for religious ceremony that our products are to be used. Without the IGS, it is hard for my family to survive….."	"…..Selling grilled pork, grilled chicken and Esarn food is my job. I use this space every day. I use this IGS for preparing my food to sell outside. I always wake up at 3 o'clock, then go to market for buying the raw materials for preparing food to sell. Thereafter, it takes time until 5 o'clock till food preparing is finished, then I go out with my wife to sell my products. Around 9 o'clock, we finish our morning session selling and reach back our home. We then change IGS for recreation area to do relaxing activities, put soft bed sheet and pillow on the floor, watch TV. One hour later, we keep this space clean and clear as well as put plastic mat instead to preparing our food again. Around 3 o'clock in the afternoon, we go out to sell our food again and finally get back to our home around 8 o'clock in the evening every day. We clean the utensils using one hour. After that, we use IGS to be sleeping area until 3 o'clock that we wake up again. IGS has made our family survived. I am able to afford mini truck for our products transportation. Previously, we used only motorcycle attached with cart….."

Fig. 11.6 Dwellers and Activities in IGS

11.7.2 Time and Utilization of IGS in the BMP

In order to unveil the relation between spatial utilization of IGS and its time variation, IGS houses have been investigated and clarified, which is shown in Fig. 11.7. After the analysis of Fig. 11.7, the analysis of spatial utilization of IGS and its time variation have been highlighted. The complexity of layers of IGS intensity can be seen. It can be further categorized into two major sessions for analysis, a morning and afternoon session. In the morning session, the highest density of using IGS for income generation activities is due to 6:00-12:00, while around 4:00-6:00 is lesser density of IGS utilization. In the afternoon, the high time for IGS usage is from 12:00-18:00. From 18:00-21:00, there is a lesser popularity to perform the tasks in the IGS. From 21:00-4:00, usually the intensity of IGS utilization is low. Dwellers use IGS for other purposes apart from income generation activities, for instance, recreational purposes like relaxing and sleeping. Moreover, it can be explored that, dwellers of IGS type A houses spend their time in IGS more than IGS type Bs. In the case that dwellers use IGS for a sleeping area as well as income generation, the IGS is used for all day long. For IGS type B, dwellers put attention to use in the time that they use IGS for preparing the products to sell outside. When they are not around, IGS utilization intensity is low. Still, there are some deficits of IGS that could be considered when implementing the development outlook of IGS in the BMP. Income generation activities may interrupt the recreation area. As for type A, if there are income generation activities in IGS, the IGS can still be utilized as a recreation or relaxing space as well, but some of the supporting in earning area may take up space of recreation area. In type B, time will indicate the income generation activities time and relaxing time that mostly used IGS in different period of time of the day.

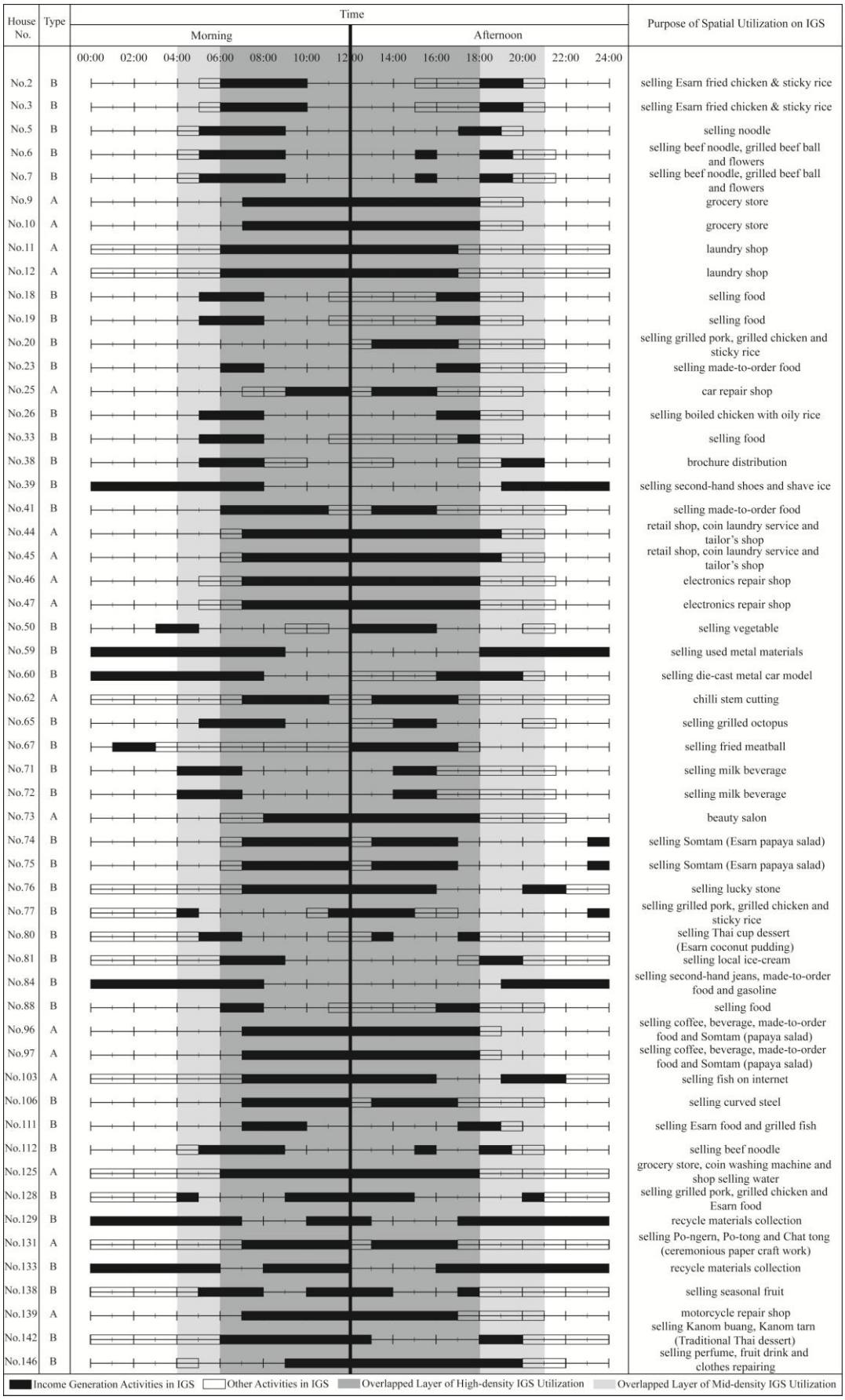


Fig. 11.7 Spatial Utilization of IGS and its Time Variation

In this sense of a limited space for row-type housing, to utilize IGS as a flexible space is one alternative for urban low-income dwellers. Even in local or rural area of Thailand, in low-income traditional housing, people still live in that way (multi-purpose way: such as working space, living space, sleeping space, dining space), only toilet which has been separated. And this type is widely accepted in Thailand, particularly for low-income, and Esarn local underprivileged housing style. As for the low-income Thai dwellers, flexible IGS is most the practical answer for them, since they can use the maximum benefits of the limited space. Additionally, in some cases, they can use the income generation time and relaxing time together to be able to have a good time to strengthen family relationships communicating, talking to each other as well as completing the task, simultaneously. Therefore, the purpose of income generation and type of IGS has an impact on IGS spatial utilization and its time variation. Additionally, the intensity of IGS utilization in the daytime is higher than nighttime. IGS has flexibility of usage; it can be utilized apart from functioning as an IGS. It can also be used for recreation or relaxing purpose for low-income daily life.

11.8 CONCLUSION

Housing provision by CODI in the BMP showed the result of a compact space and living habitation. Dwellers try to adapt to the situations by their own survival solutions utilizing self-customization, thereupon conducting to the contribution of IGS for the dwellers who needed to use their home to support their earning activities. The type of IGS in the BMP can be majorly clarified into two types: type A (generating income at home through utilizing the IGS) and type B (generating works at home through utilizing the IGS while gaining income outside). The type A mostly concerns income generation by giving the services to the customer, some are combined with trades. The type B mostly concerns about selling food and products, and IGS users or dwellers usually approach their customers outside the home. Although the type of IGS is different, IGS alterations are in similarity in terms of flexibility. IGS can be used not only for acting as an IGS, but also for recreation purposes and other activities to be organized within the same area. Nonetheless, IGS has some deficit in that is income generation activities might interrupt the recreation area in the case that dwellers utilize the income generation time and relaxing time together. Still, there is an advantage that dwellers can have family time together while earning profit and completing recreation activity simultaneously. Dwellers in the type A houses spend time in the IGS more than the type Bs, that is used only at the time of preparing products to sell outside the home. In comparison, dwellers use the IGS during the daytime more than nighttime of the day. The purpose of income generation and the type of IGS has an impact on spatial utilization and its time variation. It has shed light on planning strategies, showing that IGS is important both for the BEP and the BMP. Although, the governmental housing program, the type of house and the effort to get IGS are in difference, IGS is still needed for the BMP, particularly for small scale row-type housing that can be used for strategy development. It is quite clear that from the imperative outlook of IGS, self-customized flexible IGS should be put insight into consideration for future

low-income housing projects, both from a policy distribution and design point of view that could help to implement the BMP strategy to be a sustainable low-income housing program in the context of Thailand.

NOTES

*1) The paper entitled "Self-build Metamorphosis and Contribution of Income Generation Space to Sustaining Low-income Housing Strategy, The Case of Banpet District of Khon Kaen Province, Thailand" is published in Journal of Architecture and Planning (Transaction of AIJ) in Vol.78, No.693, pp. 2281-2289, 2013.

*2) Key providers were majorly categorized as government organizations and NGOs. The Intermediary Institution in collaboration with self community management was found to be the apparent aspect of sustainable housing issues, particularly, for low-income people. For further reading, see 6).

*3) For more detailed information, see the Baan Eua-Arthorn Project, Khon Kaen T. (Banpet District), (Project Schedule of Baan Eua-Arthorn 4), Document of the NHA, production and construction 4, project administration 2, September 2005 (in Thai).

*4) In the Thai measurement system, 1 rai = 400 wa^2.

*5) In the Thai measurement system, 1 wa =2 meters, therefore, 1 wa^2 = 4 m^2.

*6) For more detailed information, see the CODI's website, www.codi.or.th.

*7) *Esarn* is an indigenous local Thai language renowned as the Northeastern area of Thailand.

*8) Mind maps have been widely used in many branches of study fields, renowned as an essential critical thinking process. It provides a strategy for analyzing the materials, integrating critical thinking and problem solving skills. For additional reading, see 3) and 5).

*9) Categorizations of IGS type A and B with the purpose of IGS utilization are clarified in chapter 6 of this paper.

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Chapter 12
Requisiteness of Income Generation Space (IGS) in Non-IGS Family for Supporting Sustainable Income Generating Activities The Case of Tawanmai Community Housing in Khon Kaen Province, Thailand

12.1 INTRODUCTION AND RESEARCH GAP

The need of a survival through daily life living forces human being to conduct an occupation. As for low-income people, every square meter of their habitat has very meaningful of usage. Apart from functioning as a residing shelter, the space of home that can be fulfilled the users' requirements for supporting income generating activities is so called as Income Generation Space (IGS).

As for Thailand where the low-income habitation issues still remain as a crucial developing topic, there are two major governmental housing approaches which deal with housing provision, as well as housing development for the grassroots people, the Baan Eua-Arthorn Project (BEP) and the Baan Mankong Program (BMP) (Tonmitr et al, 2012a: Tonmitr et al, 2012b). There were previous studies concerning on IGS into the housing enhancement outlooks; Tonmitr and Ogura, 2013 contributed the imperative outlook of self-built metamorphosis that contributes the IGS in the BEP. Tonmitr and Ogura, 2014 also explored self-customization strategy contributes the IGS in the BMP, as well. Additionally, the study on the demand on technologies and facilities is clarified (Tonmitr et al, 2014b). Moreover, the IGS can be integrated with the planning outlook for the sustainable planning point of view (Tonmitr et al, 2014a).

According to above mentioned, the IGS has played an imperative role supporting the earning activities in the IGS utilizing families. On the other hand, it is important to know the requisiteness, as well as trend of the IGS in non-IGS utilizing family for supporting the income generating activities. Therefore, this chapter aims to clarify on those mentioned through the following objectives and efforts:

-Delineate requisiteness of IGS in non-IGS family for supporting the earning activities.
-Unveil the trends and purposes of income generating activities of that requisiteness.

12.2 RESEARCH CONTEXT, SITE LOCATION AND METHODOLOGY

12.2.1 Community Housing Background

Tawanmai housing community was previously renowned in Khon Kaen Province of Thailand as the name "Dynamo Community". It was due to the original location of the community was located near the area that has many of the dynamo repair shops. The community later joined into the BMP that is under the supervision of the Community Organizations Development Institute (CODI), which has

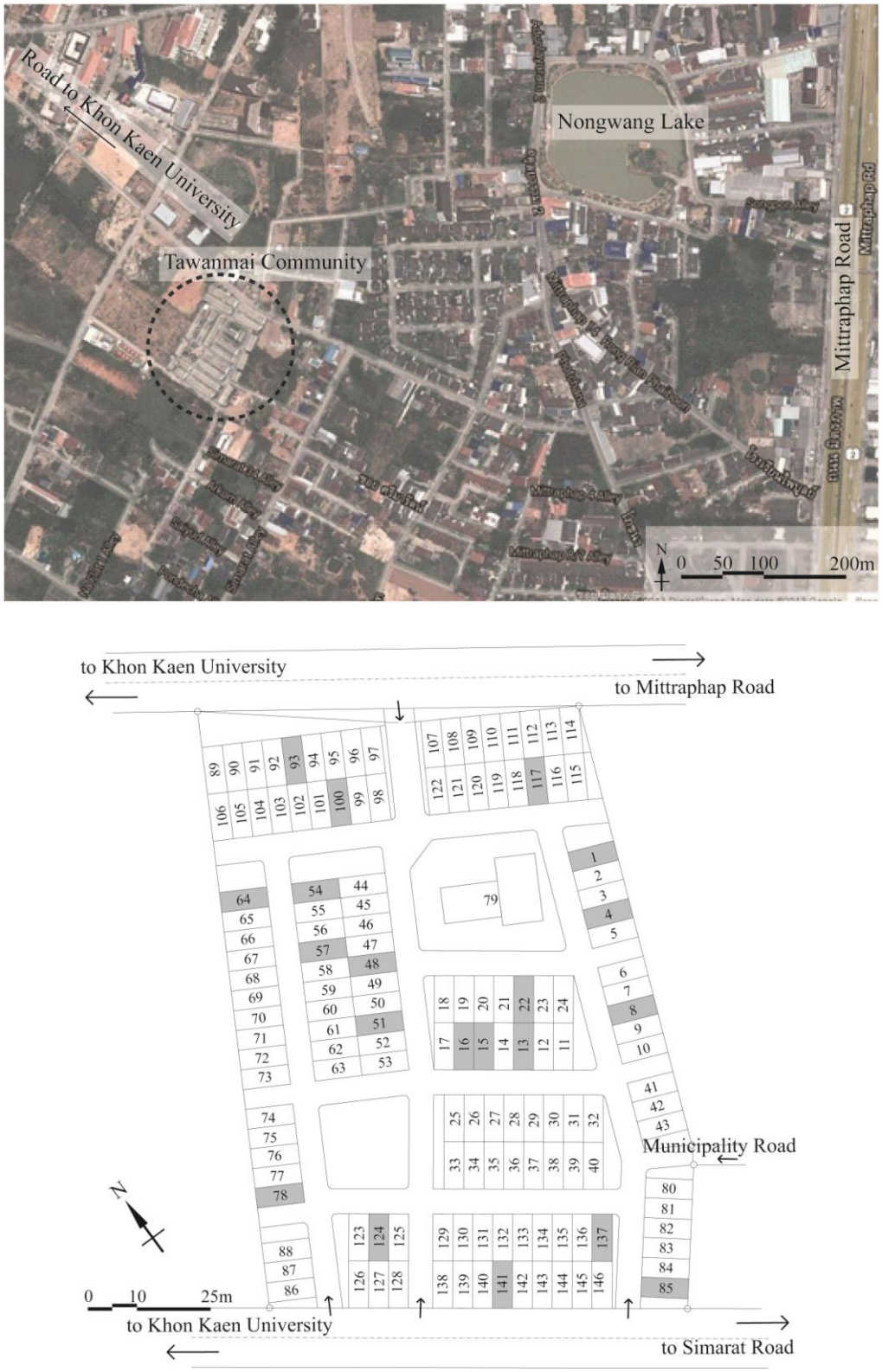

Fig. 12.1 Tawanmai Community Housing Aerial Photo (Google Maps) and Randomly Selected Non-IGS Families Location

supported this community to have re-upgrading processes. Thereafter all the households have been relocated as known in the planning strategies as a slum relocation project. Later on, community name has been changed after the completion of the redevelopment processes.

Fig. 12.2 Tawanmai Housing Characteristics and Daytime & Nighttime Atmosphere

12.2.2 Significant Timeline of Tawanmai Housing Development

Table 12.1 Imperative Timeline of Development Processes

Imperative Timeline of Development Processes	Date of Event
Establisment of Saving Group	14 October 2003
Official Establishment of Community Cooperative	26 May 2004
Purchasing the Land 8,5000,000 Baht by Cooperative	3 June 2004
Initial Day of Land Filling for Construction	July 2004
Starting Construction of Retaining Wall and Plot Distribution	12 November 2004
Starting First Phase Consturction	11 July 2005
Completion of All Project Consturction Phase	20 February 2007

The development processes have been started with initiating the saving group on 14 October 2003 as shown in Table 12.1. This strategy's implication is to bring dwellers all together for housing development participation. Then saving groups have been changed to be the cooperative scheme. Therefore, the community cooperative was established on 26 May 2004. Thereafter, the community has to buy the land for development of its habitat. Formerly, this community was a squatter settlement. Afterward, the community has collaborated with CODI, and started slum relocation project. Therefore, the construction processes were started in the same year. As for first phase construction, it has been launched on 11 July 2005. Construction has been completed on February 2007.

12.2.3 Context and Methodology

Tawanmai community housing has been utilized for this research as a case under the BMP (Boonyabancha, 2005) focusing on the IGS outlook. Whole houses in the research area have been made investigation. The community consists of 145 housing units plus 1 community center (Tonmitr and Ogura, 2014). The targets were randomly selected from non-IGS families (20 houses of non-IGS families) in order to answer the objectives of the research, as illustrated in Fig. 12.1. And the data has been consequently clarified and shown in the next following chapters.

The community atmosphere and housing characteristics can be seen in Fig. 12.2. Housing of this community were designated in a form of row type housing which major of housing units were two-storey housing.

12.3 REQUISITENESS OF IGS IN NON-IGS FAMILY

Fig. 12.3 Sample of IGS Utilization for Supporting Ceremonious Paper Craft Work

12.3.1 Significance of IGS in IGS Utilizing Families

IGS has played a crucial role supporting low-income earning activities. Home where the dwellers conduct a living in can be made value-added. Apart from functioning as a residing shelter, home can be utilized as a place for fulfilling and supporting income generating activities (Tonmitr and Ogura, 2013: Tonmitr and Ogura, 2014). IGS has supported the continuous living of dwellers and housing units itself could be transformed or made configuration to suit the purposes of the users.

12.3.2 Sample of IGS Configuration

In order to gain clearer image of how the IGS has been utilized, the sample of IGS utilization is shown in Fig. 12.3. Dwellers use IGS for making Po-ngern, Po-tong and Chat tong (Ceremonious paper craft work). The space was provided and customized for making the paper craft work. Mats and paper craft making equipments were introduced to the area, then the production processes were initiated.

Table 12.2 Purpose and Requisiteness of IGS

House No.	Having/ Not Having an Interest to Have IGS	Purpose of IGS Requisiteness
1	Y(O)	Selling Beverage, Coffee, Milk Beverage
4	Y(O)	Selling Food
8	Y(O)	Utilizing as Grocery Shop
13	Y(O)	Utilizing as Grocery Shop
15	Y(O)	Utilizing as Grocery Shop
16	N(X)	–
22	N(X)	–
48	Y(O)	Beauty Salon
51	Y(O)	Selling Vegetable
54	Y(O)	Selling Beverage, Coffee, Milk Beverage
57	Y(O)	Selling Food
64	N(X)	–
78	N(X)	–
85	N(X)	–
93	N(X)	–
100	Y(O)	Selling Beverage, Coffee, Milk Beverage
117	Y(O)	Selling Food
124	Y(O)	Electronics Repair Shop
137	N(X)	–
141	Y(O)	Selling Food

Y(O) = Yes, Having Interest
N(X) = No, Not Having Interest

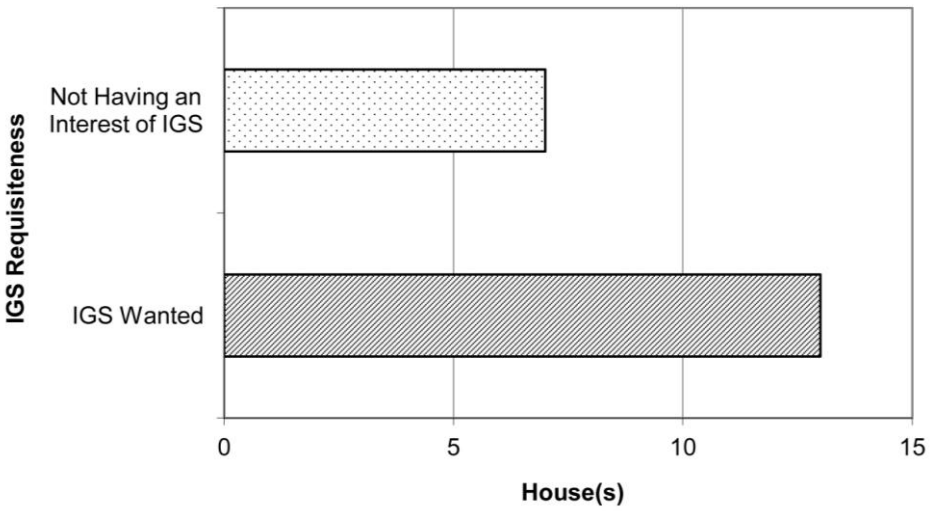

Fig. 12.4 IGS Demand in Non-IGS Families

12.3.3 Non-IGS Families and the Requisiteness of IGS

According to research aims & objectives, there is an important to gain insight into the outlook of IGS in non-IGS families. Questions have been proposed to non-IGS families whether there is the requisiteness of IGS for supporting the income generating activities, as well as the dwellers' interest of having IGS. Results show quite interesting number of non-IGS households that expressed their interest of having their home customized for IGS, as shown in Table 12.2, in which more than half of non-IGS families wanted to have IGS and utilized the IGS for supporting their daily life earning activities.

Due to Table 12.2, it can be further made categorizations into details. 65% of the randomly selected non-IGS families wanted to take IGS into their consideration, while 35% found no-interest of having the IGS as shown in Fig. 12.4. By these numbers, it shows the trend of IGS demand that is incrementally increasing for urban low-income housing community.

12.4 REQUIREMENTS OF INCOME GENERATING ACTIVITIES IN NON-IGS FAMILIES

As from Fig. 12.5, the most popular purpose of utilizing IGS has been required for supporting the selling food activities which is 30.8% of all purposes. The purpose utilizing IGS for selling beverage and using as a grocery store are in same requirement as about 23%. And miscellaneous requirements of using IGS in non-IGS families are found to be equal as selling beverage, as well as grocery shop. Sample of that demand, for instance, to use for beauty salon, electronics repair space, and selling vegetable.

After having known the gradually increasing demand of configuring the home to be IGS in non-IGS families, results implied the future requisiteness of IGS for supporting the dwellers' earning activities.

Moreover, results have shown the trend of activity that is most wanted to be performed in IGS which is supporting the selling food activity.

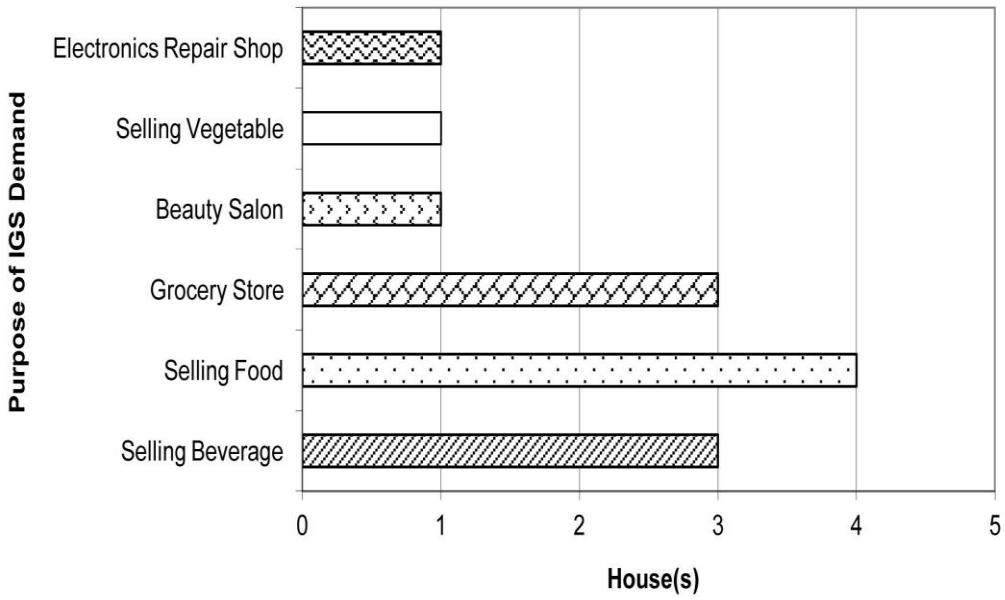

Fig. 12.5 Purpose of Requisiteness of IGS in Non-IGS Families

12.5 CONCLUSION

The necessity of a survival through a daily life forces urban low-income community housing dwellers to conduct an occupation. Dwellers found their way to integrate the income generating activities to the home function, as known as the IGS. By using IGS, the space that is able to support the earning activities. IGS has played a crucial role helping the users to generate their income. Focusing on non-IGS families whether there is a requisiteness of availability of the IGS, the outcomes have shown that IGS has been put an interest in. More than half of the research targets expressed the interest of requisiteness to have IGS for supporting income generating activities. Additionally, the highest demand is to have the IGS for supporting selling food activities, while selling beverage, utilizing IGS as a grocery store, as well as miscellaneous showed the same number of the demand. The demand of IGS found to be important for low-income daily life earning, and showed the need even in the non-IGS families. The IGS has shed light its contribution and should be therefore integrated in the low-income housing policy both for policy distribution and design enhancement, as well.

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Chapter 13
Generating Income by Utilizing Income Generation Space (IGS) for Sustainable Savings Management

13.1 INTRODUCTION

Poverty is one of the most critical issues that is needed to be considered for the national development plan for most of the developing countries. Thailand as well, there are two major governmental low-income housing schemes that have dealt with urban low-income habitat (Tonmitr et al, 2012); the Baan Eua-Arthorn Project (BEP, low-income housing project) and the Baan Mankong Program (BMP, slum upgrading program). Considering poverty in relation to habitat, Income Generation Space (IGS) is found to play its important contribution on the low-income dwellers for both of the two schemes (Tonmitr and Ogura, 2013, Tonmitr and Ogura, 2014a). The home space can be utilized to support the income generating activities. In other words, home can be used apart from a residing purpose, but also be able to support to create income for its users. While considering on the IGS and income point of view, it is imperative to unveil the outlooks as follows:

-How much the income can be generated by utilizing IGS for supporting income generating activities?
-What kind of expenditure do the dwellers have to concern with? And after monthly expenditures have been paid, how much money is kept as household monthly savings?

Therefore, this chapter aims to clarify above mentioned outlooks in order to plan sustainable savings management by utilizing Tawanmai community housing in Thailand as a case to be analyzed.

13.2 COMMUNITY ATMOSPHERE AND IGS UTILIZING FAMILY

Tawanmai community housing under a supervision of Community Organizations Development Institute (CODI) located in Khon Kaen Province, Thailand was chosen as a case for the analysis. There are 145 houses plus 1 community housing center and the community detailed layout plan can be seen in the past paper (Tonmitr and Ogura, 2014b). Whole housing units of the community have been investigated in order to systematically unveil the whole housing phenomena. IGS utilizing target families have been randomly selected and clarified corresponded to the aims of above mentioned, as the samples of typical IGS utilizing houses atmosphere shown in Fig. 13.1.

Fig. 13.1 Typical IGS Utilizing House Atmosphere: IGS for Selling Esarn Food (left), IGS for Selling Fried Meatball (right)

13.3 MONTHLY INCOME AND EXPENDITURES

Monthly income of each household as shown in Table 13.1, the maximum is 28,000 Baht/ Month, while the lowest is 12,000 Baht/ Month that made the average outcome as 18,793 Baht/ Month. Each household has to pay monthly 1,725 Baht as for the habitat expenditure totally 15 years including land cost 1,273 Baht/ Month and house cost 452 Baht/ Month (Tonmitr and Ogura, 2014b). The data showed that the highest monthly electricity expenditure is 490 Baht, the lowest is 210 Baht, and represented the average value to be about 333 Baht/ Month. As for monthly running water cost, the maximum is 290 Baht, meanwhile the minimum is 90 Baht, and the average is 176 Baht. It can be seen that the average monthly expense for electricity is almost about two times higher than that of the running water expenditure. Additionally, average daily expenditure is 359 Baht/ Day which came from the highest record 600 Baht/ Day and the lowest record 250 Baht/ Day. Furthermore, expenditure for children and elderly were recorded. The lowest monthly expenditure for children is equal to the highest monthly expenditure for elderly. About 53% of houses have to manage the finance for children, while about 13% of whole households have to pay for elderly. These trends have shown that although the nuclear family situation is normally found for the urban poor family, extended family still can be explored even in a few numbers. Most of the popularity of utilizing IGS showed the trend of selling

Table 13.1 Household Income, Expenditures and Savings.

House No.	Monthly Income (Baht/Month)	Housing Expenditure			Electricity Expenditure (Baht/Month)	Running Water Expenditure (Baht/Month)	Daily Expenditure (Baht/Day)	Children Expenditure (Baht/Month)	Elderly Expenditure (Baht/Month)	Miscellaneous Expenditure (Baht/Month)	Monthly Savings (Baht/Month)	Purpose of IGS Utilization
		Habitat (Baht/Month)	Total Period (Year)	Period to Go (Year) @2015								
a	12,000	1,725	15	5	320	100	250	-	-	2,255	100	selling Esarn fried chicken & sticky rice
b	15,000	1,725	15	5	320	90	300	-	1,000	2,765	100	selling Esarn fried chicken & sticky rice
c	12,000	1,725	15	5	300	200	300	-	-	275	500	selling noodle
d	21,600	1,725	15	5	250	120	300	-	-	10,405	100	selling grilled pork, grilled chicken and sticky rice
e	22,000	1,725	15	5	380	160	300	3,500	-	7,035	200	selling made-to-order food
f	26,800	1,725	15	5	490	260	550	-	-	7,325	500	selling boiled chicken with oily rice
g	15,000	1,725	15	5	320	170	300	-	-	3,685	100	selling food
h	18,000	1,725	15	5	300	100	350	2,000	-	3,275	100	selling second-hand shoes and shave ice
i	18,000	1,725	15	5	400	260	360	2,000	-	2,715	100	selling made-to-order food
j	16,000	1,725	15	5	280	150	250	2,500	-	3,745	100	selling vegetable
k	18,500	1,725	15	5	290	140	280	3,000	-	4,745	200	selling used metal materials
l	17,000	1,725	15	5	210	180	350	1,500	-	2,385	500	selling die-cast metal car model
m	21,000	1,725	15	5	230	140	400	-	1,500	4,905	500	chilli stem cutting
n	21,000	1,725	15	5	440	280	500	2,000	-	1,055	500	selling grilled octopus
o	28,000	1,725	15	5	460	290	600	2,000	-	5,325	200	selling fried meatball
Average	18,793	1,725	15	5	332.67	176	359	1,233.33	166.67	4126.33	253.33	*Esarn is an indigenous local Thai language renowned as the Northeastern part of Thailand

food activities which are on high demand. According to the monthly income and the purpose of IGS utilization, the processes of preparing the products, quantity according to selling period and selling price have an effect on the gained income. The price of meatball is lower than that of the fried chicken, selling amount might be higher, preparing processes are shorter and easier to sell as a snack not for regular meal like fried chicken & sticky rice. Additionally, it can be said that miscellaneous expenditure has the high influence on the total monthly expenditure. If this cost can be decreased, dwellers are able to have more monthly savings.

13.4 MONTHLY INCOME AND SUSTAINABLE SAVINGS MANAGEMENT

As for monthly income, the average monthly income is 18,793 Baht/ Month. Comparing the highest monthly income and the lowest monthly income, the average monthly income is relatively high that is because of maximum is 28,000 Baht/ Month while the minimum is 12,000 Baht/ Month. The gap is more than two times higher. Looking at house a, house c and house o, the monthly savings of house o is also two times of house a. As a comparison of monthly income of house a and house c, although the monthly income is in the same amount of number but monthly savings are quite different. That implication is, no matter how much the income is gained, savings can be varied depending on how well of the expenditure management. Therefore, if the expenditure, particularly miscellaneous expenditure is well managed (decreased) and the leasing period has been accomplished, the monthly savings could be made higher. At least 1,725 Baht/ Month is kept plus the amount of the miscellaneous expenditure that can be saved. It therefore can be seen that IGS has helped to support the habitat owners to generate income since the IGS has been utilized. An integration of the IGS and well savings management has shed light on its potential to help low-income to survive through the given habitat conditions against the poverty.

13.5 CONCLUSION

In order to cope with poverty issue, IGS has played a significant role as a place to support the income generating activities. By utilizing IGS, dwellers are able to create income and use the income for monthly expenditures. Data has reflected that dwellers has to pay as usual for fundamental facilities cost, pay for their habitat by installments. More than half of the households have to organize to pay for their children expenditure, and a few can be found to pay for the elderly as extended families in urban low-income environment. The IGS has potential to support in generating income for its users. If dwellers could manage to pay lesser, particularly on the miscellaneous cost, as well as after the habitat payment can be accomplished, dwellers can manage to have more monthly savings. It is therefore imperative to make an insight consideration on IGS strategy integrated with the effective sustainable savings management for the sustainability of low-income habitat enhancement.

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Chapter 14
Integrating Income Generation Space into Sustainable Low-income Housing Planning Outlook in Thailand

14.1 INTRODUCTION

Planning effort is one of the most important factors that contribute to the practical success of many housing development programs. And low-income housing development has been so far a critical topic of discussion. Thailand in a past decade, there has been two concrete governmental low-income housing scenarios that have played effective roles in provision and development low-income housing for its country. First endeavor is renowned as to the Baan Eua-Arthorn Project (BEP) that is provided by the National Housing Authority (NHA) of Thailand, and the second referred as to the Baan Mankong Program (BMP) that is supported by the Community Organizations Development Institute (CODI). The BEP aims to provide low-cost housing nationwide, while the BMP focuses on slum upgrading issues. This chapter aims to clarify on how IGS outlook can be integrated into the planning point of view. The research results showed that IGS plays its importance and effective role that could be used as a strategy to support low-income daily life earnings both for the BEP and the BMP. Additionally, the research outcomes revealed the possibility to utilize IGS integrated into planning strategy to help implementing a sustainable low-income housing program in Thailand.

Urban low-income housing has been so far a critical topic of discourse at both policy level as well as planning point of view. Since the 1970s, there were many efforts trying to solve the illegal land title of low-income settlements. Thailand as well, the concrete effort has been initiated around the 1970s when 1973 that the country officially established the National Housing Authority (NHA) (Tonmitr et al, 2012a). Up to the 2003, two major effective housing strategies have been launched (Tonmitr et al, 2012b); the Baan Eua-Arthorn Project (BEP) by provision of NHA, and the Baan Mankong Program (BMP) by the Community Organizations Development Institute (CODI) (Boonyabancha, 2005). The BEP plays its role on provision of low-cost housing while the BMP plays its role on upgrading slums nationwide. Still there is little attention that has been paid on the topic of Income Generation Space (IGS) in the BEP and the BMP, particularly in the aspect of focusing the IGS in planning point of view. In order to provide the sustainable strategy, IGS has been found its effective role to support low-income daily life earning. There are some previous studies that put the importance of IGS into consideration in the governmental urban low-income housing development project in Thailand that can be found. For instance, Tonmitr and Ogura, 2013, clarified the self-built metamorphosis and contribution of IGS in the BEP of Thailand. Additionally, Tonmitr and Ogura, 2014, showed the contribution of self-customized IGS in the BMP in Thailand, as well. In order to provide the sustainable housing planning strategy, this chapter therefore aims to clarify the outlook of IGS which

can be integrated in planning point of view to implement the sustainable low-income housing development program. And the way of thinking of the planning will be clarified.

14.2 STUDY SCOPE AND RESEARCH METHODOLOGY

This chapter aims to focus on IGS outlook in terms of planning point of view through these following objectives and means:

-Comparing IGS planning strategy to the past famous planning idea in Asian level, in order to find its advantage in integrating IGS into the planning point of view.

-Proposing the planning strategy which integrating IGS into planning outlook to implement the sustainable low-income housing program.

The combination of graphic recording techniques and recorded discussions as well as surveys has been utilized to collect the data and brainstorm the idea. Additionally, Mind maps schematic planning ideas have been drawn for the analysis.

14.3 BEP, BMP PLANNING CHARACTERISTICS

There was also the famous idea for housing development in Asian level of Antonio Ismael Risianto, which was said about first step is to let the bazaar or market appear then position housing around bazaar, in which the details can be seen in (Risianto, 1989). The implication is to first create the place for the job and then let the housing enclosed nearby. While the IGS integrated in planning model shows the apparent capability in another way as shown in Fig.14.1. The way of thinking of the planning, firstly, the design was initiated main theme by the planners (the BEP case) or using the participatory design (the BMP case) which could let the practical dwellers to really participate and showed their requests at the beginning of the planning processes. The implementation processes can be fulfilled after a period of occupation. The planning idea can be seen in Fig.14.2, which the first is to locate the public space or community shared space for instance the central court, or the community center, as well as designated the housing units location simultaneously. Dwellers can utilize their house as a place to facilitate in generating income referred as to Income Generation Space (IGS) for dwellers who want to use their home to support their earnings. IGS itself can act as the market, there are many IGS house within its community, therefore IGS can also act as the variety kind of markets for its community. The way to develop the new community also put the idea that find the site location which is near the market, therefore IGS idea can be utilized to support the market idea, as well. Future possibilities of community expansion can be occurred by using the idea of IGS integrated in planning point of view.

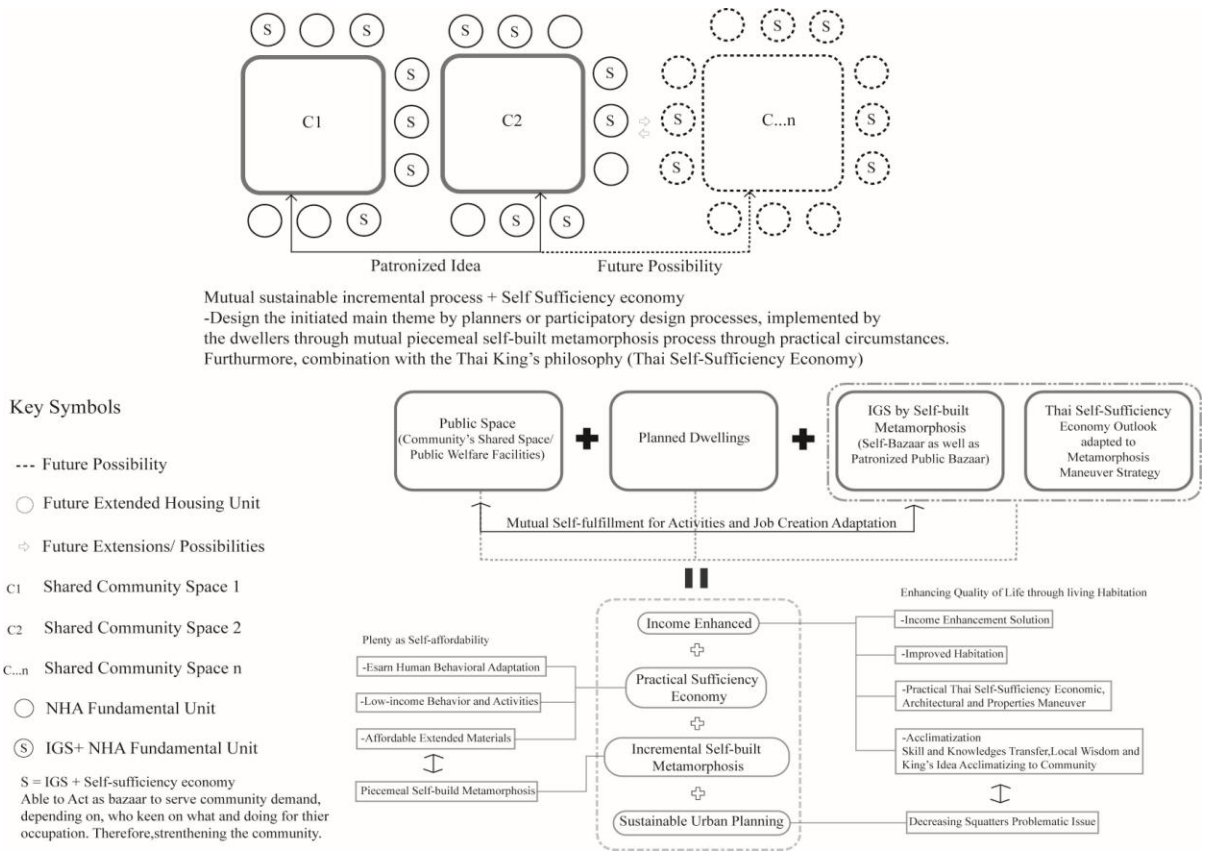

Fig. 14.1 Mind Maps of Schematic Planning Ideas of Utilizing IGS Integrated in Planning Outlook

14.4 IGS AND PLANNING OUTLOOK

14.4.1 Importance of IGS for Low-income Housing

Fig. 14.2 Sample of IGS House Type A

Since IGS is a place to support the income generation activities, dwellers who want to use their home as a workplace are able to use the IGS concept. IGS plays its imperative role to support the low-income earning activities for instance IGS is utilized to be a grocery store, barber shop, even can be utilized as a place to preparing products or cooking food to sell outside the home. There are two major types of IGS which IGS type A is generating income at home by using IGS, and type B is generating tasks at home by using IGS while gaining income outside the home. It can be seen the sample atmosphere of the IGS type A and the IGS type B in Fig. 14.2 and Fig. 14.3, respectively.

As shown in Fig.14.2, house owner utilizes IGS for doing ceremonious handcraft paper work called Po-ngern, Po-tong, and Chat-tong to sell. In Thai ngern means silver, while tong means gold. Therefore, the work space is created by customizing the space for doing paper work. Esarn (Northeastern part of Thailand) Mats are introduced to the working area. Additionally, paper work equipments are welcome to the IGS to support users' earning in daily life. It can be seen in Fig. 14.3 which is a sample of IGS type B, dwellers utilized their home for the place to preparing, cooking the food, and products to sell outside. These phenomena indicate that there are needs to utilizing the IGS, house is able to be utilized apart from the residing function, but also for the supporting in earnings function. Moreover, IGS in the outlook of community planning, IGS plays its significant role to support the community. Therefore dwellers can make spatial adjustments to their home to support their earning activities by utilizing the IGS.

Fig. 14.3 Sample of IGS House Type B

14.4.2 Integrating IGS into Sustainable Housing Planning Strategy

In order to propose IGS strategy into the low-income housing planning point of view, schematic mind maps have been drawn as shown in Fig.14.1. Three important items are mutually supported to each other which are public space, planned dwellings, and IGS plus Thai self-sufficiency economy. IGS can be inserted into planning point of view. Each of the planned dwellings is able to act as IGS house depends on the owners who want to use their home as a workplace to patronize income generation activities. Public space, for instance, community center, playground are organized within the community to ensure that all of the basic welfare facilities are provided. The advantage of this integrated IGS into planning model can be described. Income enhanced according to the dwellers can use their home to support their income generation activities, therefore the cost to rent outside places is lower. In some purposes of income generation activities, there is no need to find another place to support earnings for instance utilizing house as grocery store, barber shop, etc. Fig. 14.4 shows IGS utilizing houses location in the planning. This is an example of the reality of the community in Khon Kaen province in Thailand called Tawanmai community under the BMP that the community puts consideration of IGS as an important aspect.

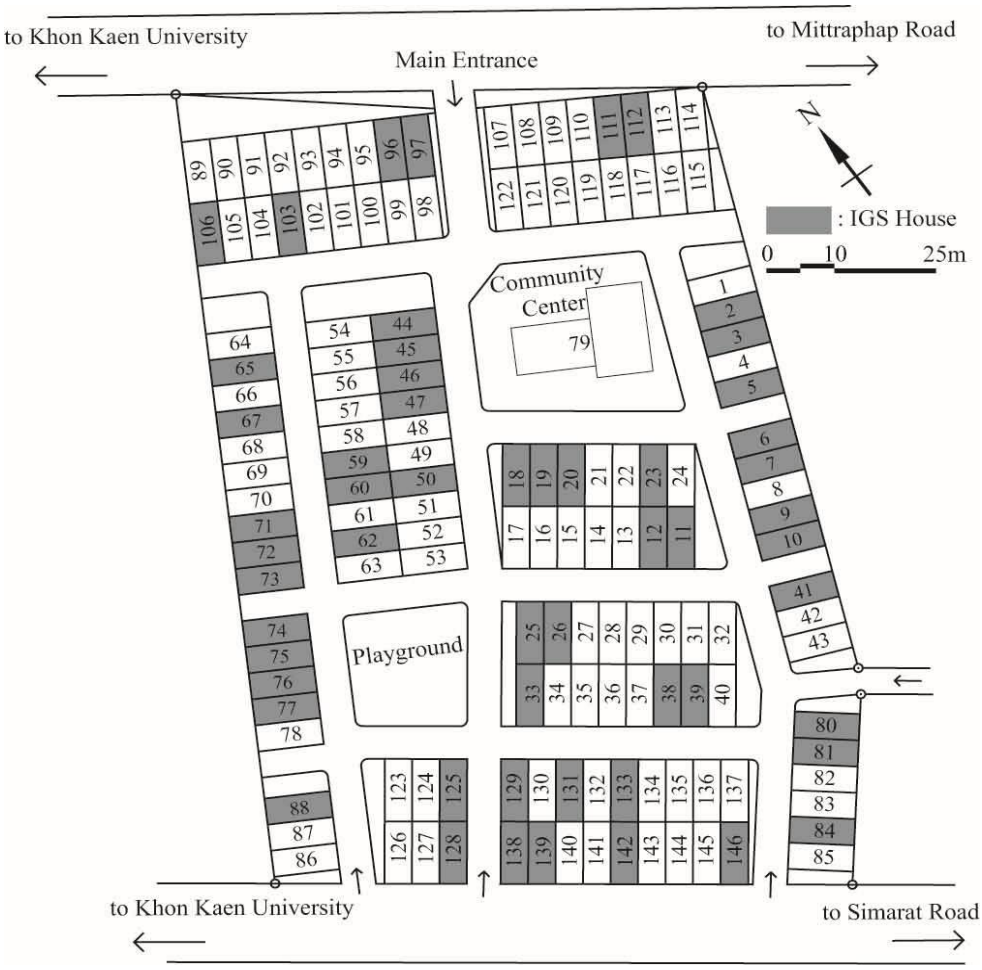

Fig. 14.4 Tawanmai Community Layout and Location of IGS Utilizing Family

In the BEP, dwellers used self-built metamorphosis as the tool to get IGS, therefore house itself is also improved and suits for each housing dwellers purpose. As for the BMP, it was found that the dwellers utilized self-customization to gain IGS due to its limited area that is hardly able to conduct the extension. Moreover, IGS has flexibility of usage, it can also be adjusted, organized according to dwellers' purposes. In other words, it can be said that IGS is not only can be used as IGS, but also can be utilized for other functions such as relaxing area or family space by conducting the new spatial configuration. In low-income Thai society, there is an idea that is derived from Thai King's thought referred as to self-sufficiency economy. Since Thailand is an agricultural basis country, people try to live their life easily depend on each person affordability. Therefore, self-build process is the way that the low-income uses to extend, build, manage their house. After put the important on the IGS that integrated outlook, low-income housing community can become more self-independent or stronger. Nevertheless, encouraging the low-income community network simultaneously is the way to strengthen the community collaboration, as well as the design participatory scheme help much in provision of the dwelling to answer to the real needs of the dwellers.

14.5 CONCLUSION

The endeavor to provide and develop low-income housing needs good strategy to fulfill the housing program. Planning is one of the most significant factors that bring the success to the project. Utilizing IGS integrated in to planning strategy showed efficient outcome. Dwellers can manage their houses themselves to suit each of the income generation activity purpose. Planned houses can be utilized not only for the residing purpose but can be used as the place to support earnings for the dwellers who want to use their home for income generation. Although market idea is needed for daily life, IGS utilizing houses at the same time can also act as their own market for their own low-income community. The IGS integrated in planning model can be utilized in the future low-income housing project or to add IGS strategy in the planning outlook that will pave the way for sustainable low-income housing program.

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Chapter 15
Demand for Sustainable Urban Low-income Housing Development: Comparative Study on the Governmental Urban Low-income Housing Programme in Khon Kaen Province, Thailand

15.1 INTRODUCTION

Back in a past decade, there were two major low-income housing approaches in Thailand (Tonmitr et al, 2012). Baan Eua Arthorn Project (BEP, low-cost housing project) and Baan Mankong Programme (BMP, slum upgrading programme) have been utilized for major urban poor housing scenarios. While the study on the BEP and the BMP can be found, the efforts seemed to put an important analysis on each separated programme (Tonmitr and Ogura, 2013, Tonmitr, 2014a). Therefore, this chapter initiated from the outlook that "Why there are two approaches?" Thereafter, this study tries to answer the initiated question by utilizing the case of the same province in Thailand. Banpet district low-income housing project has been chosen as the case under the BEP. And Tawanmai community has been picked up as the case under the BMP. The study aims to clarify the two projects through the following objectives and means:

-Clarify the similarity and disparity of the two projects.

-Delineate and find out the advantage and disadvantage between the two approaches to strengthen and develop these two scenarios.

15.2 RESPONSIBLE ORGANIZATION AND SUPPORTING INSTITUTION

The BEP is under the supervision of National Housing Authority (NHA), while the BMP is under Community Organizations Development Institute (CODI). As for the Banpet project, main stakeholders are the NHA, local municipality, and buyers. While the collaboration processes of Tawanmai community housing contains major 9 stakeholders that participate in the processes. Those of the 9 key actors are community dwellers, CODI, Faculty of Architecture of Khon Kaen University (KKU), Faculty of Humanities and Social Sciences (KKU), Rajamanhkla Institue of Technology (Khon Kaen), Khon Kaen Provincial Administrative Organization, Khon Kaen Municipality, land owner, and Urban Community Organization. Therefore, it could be seen that the practical collaboration processes for the Tawanmai community is better than that of the Banpet project.

15.3 COMMUNITY MANAGEMENT, LOANING SYSTEM AND EXPANSION METHOD

Both of the two programmes utilized self-help method as their approach. While community management was different approach. The BEP, although it has own community leader, still the strategy to get the members all together is not strong such as to hold on the meeting for discussion and community development action. On the other hand, the BMP seemed to have stronger connection

among their members. It also has own community leader as well as cooperative committee team. There are 13 committees that have been chosen from their member to be their representatives (Tonmitr and Ogura, 2014b). There are monthly meeting to be held to bring all of the dwellers in the community to have a chance for discussion, hear the progress of their cooperative, and share their idea to develop their community. As for loaning, the BEP, the provision of government housing bank is available but the dweller has to go directly to contact. While the BMP, CODI acts as the intermediary actor that help to deal with the government. Money has been transferred to dwellers by their cooperative.

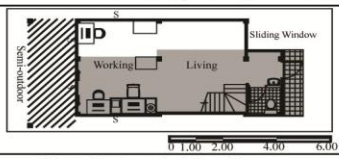
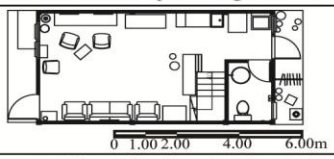
Outlook	BEP (Banpet Housing)	BMP (Tawanmai Community Housing)
1.Responsible Governmental Organization	National Housing Authority (NHA)	Community Oganizations Development Institute)
2.Supporting Local Institution and Collaboration	Municipality	Dwellers, CODI, Faculty of Architecture (KKU), Faculty of Humanities and Social Sciences (KKU), Rajamanhkla Institute of Technology, Provincial Administrative Organization, Municipality, land owner, Urban Community Organization
3.Approaches	Self-help	Self-help
4.Maneuver System	Although there is a Community Leader, it has not so Strong Network, just some Mutuality in some Cases.	Community Leader and Community Cooperative System--Participatory Approach
5.Loaning Processes	Finding themselves or deal with Government Housing Bank	Long-term Loan System (CODI+Community)
6.Housing Design	Survey Design	Participatory Design
7.Housing Type	Two Storey Detached House	Two Storey, One and a Half Storey
8.Contribution Strategy	IGS	IGS
9.Tool to get IGS	Self-built Metamorphosis (Extension)	Self-customized, Spatial Organization
10.IGS Contribution Plan		
11.Tool to get IGS	New Project for New Buyer (Low-income) with Low-price	Old Squatter, Upgrading based on Land-shortage or illegal Land Title

Fig. 15.1 Imperative Comparative Outlook of BEP and BMP

15.4 HOUSING DESIGN AND HOUSING TYPE

The BEP took the survey approach, then build the house that suits everyone in general. The BMP approaches by conducting a participatory design that means stakeholders including the dwellers can take part in the design processes at the beginning, request what they need and finally conclude the master plan. The BMP has more about the participation in the housing processes than the BEP. The house in Banpet community was designated to be two-storey housing on moderately small plot. It left the open space surrounding the building itself. On the other hand, Tawanmai community housing has been designed as a row-house type which occupied all plot.

15.5 IGS CONTRIBUTION FOR URBAN POOR HOUSING DEVELOPMENT

Due to chapter 15.4, the survival strategy could be similarly found that is maneuvering income generation space (IGS), but the tool to afford IGS is in difference. Banpet project, it was found that

self-build metamorphosis was utilized as a tool to get IGS. While for Tawanmai housing, there is not plenty of the space to conduct the extension, therefore it used self-customization approach to gain IGS by arranging the domestic spatial organization as shown in Fig. 15.1. The IGS utilization planning are shown in Fig. 15.1 to represent the samples of how dwellers utilize the IGS in both the BEP and the BMP. Additionally, there is one more outlook that is important for covering the governmental urban low-income housing demand. The BEP played an imperative role to provide a new housing project for new buyers with the low-price. The BMP played the significant role to cope with the people who have illegal land title to gain their legal right to live or to solve the land eviction problem. Since there are variety of low-income urban poor which are both the old squatters and new urban low-income that tend to become new squatter settlements if they cannot find the legal place to live. Therefore, two major housing approaches should play their role simultaneously for covering all the urban low-income housing demand of its province and wider scale of its country.

15.6 CONCLUSION

In order to be able to cover the urban poor housing demand as well as to implement the sustainable strategy for housing development scenarios in Thailand, collaboration process is needed at the first step of development. Thereafter, participatory design process should be proposed to the development scheme that will bring the practical demand of all stakeholders. The community management system helps to shape up the affordability of housing process. Community organization maneuvers the long-term loaning process that help for the house payment of the dwellers. To cover all urban low-income housing demand in Thailand, and since there are both old and new squatters, therefore the BEP and the BMP should play their role simultaneously. And the outlook of IGS should be paid attention to help the dwellers to have their habitat not only for residing but also able to generate income, as well.

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Chapter 16
Conclusion

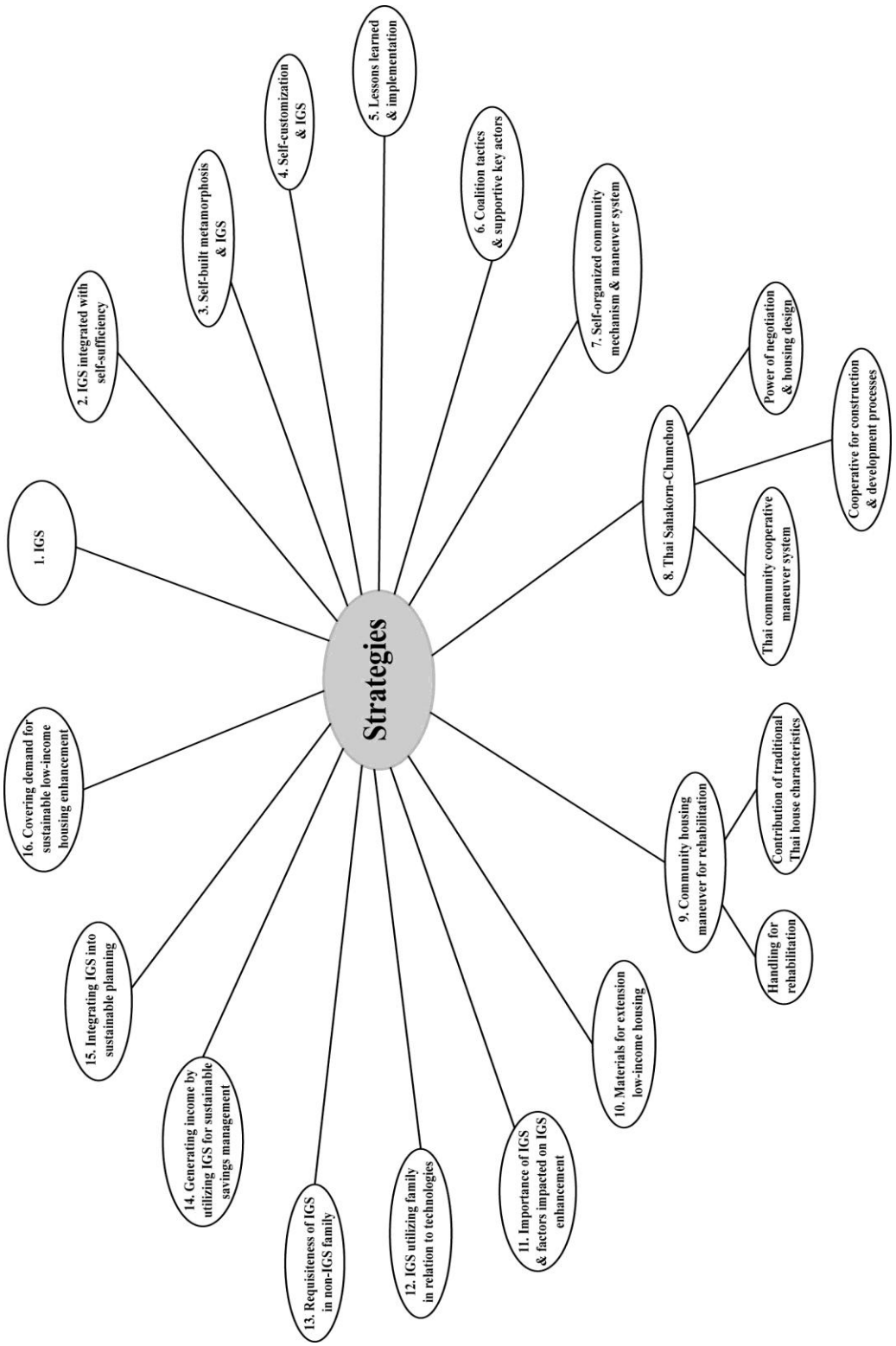


Fig. 16.1 Summarized Mind Maps of Dissertation's Contribution Strategies

16.1 INTRODUCTION

This dissertation contributes and fortifies the imperative outlooks that low-income housing circumstances in the developing housing world can be enhanced, implemented, as well as strengthened both for the habitat policy distribution level and the housing design enhancement. It provides the sustainable practical strategies that reflect the necessity of present housing needs and shed light to the sustainability of future low-income housing development. Apparently, It provides coherent instances on how to strengthen the housing programme and explore the sustainable implementation.

Utilizing Thailand as the study prototype, the study focuses on low-income housing, low-cost housing, squatter settlement as well as low-income settlement, majorly involves with the housing scenarios under the governmental housing programme in order to find out the sustainable concrete way of the implementation. The study clarifies the sustainability of low-income habitation that covers all the nationwide housing scenarios which contains two major housing programmes within. The first programme referred to as the Baan Eua-Arthorn Project (BEP), which is renowned as a low-cost housing project that is provided by the National Housing Authority (NHA). The second approach referred to as the Baan Mankong Program (BMP), or a secured housing programme, that is majorly facilitated by the Community Organizations Development Institute (CODI). It therefore can be seen clear outlooks that cover all the practical governmental housing practices in Thailand. Additionally, to cover insight into the enhancement processes, research sites were chosen both for the main regional city (Utilizing Khon Kaen Province Prototype), as well as the capital city of Thailand (Utilizing Bangkok Prototype) to clarify the whole housing image of the nationwide level, consequently to be a prototype of the Asian wide and International development level that could be made an adaptation from.

The study contains the critical analysis and solutions of the imperative housing enhancement outlooks. The lessons learned of Thai housing development are structured as for the first chapter. The imperative outlooks of the sustainable housing enhancement have been systematically organized, included the aspects as follows: Collaboration tactics and supportive key actors, sustainable community maneuver system (construction management, financial management, and habitat management), characteristics and sustainability of Thai Sahakorn-Chumchon (Thai community cooperative maneuver system), Cooperative system as the initiative of the development processes, participatory design and the housing design, alternative chosen supportive institutions, negotiation and housing design characteristics, community housing maneuver system and disaster rehabilitation, contribution of the traditional Thai house characteristics on low-income community habitation, materials for extension of low-income housing, importance of Income Generation Space (IGS) and factors impacted on IGS enhancement, IGS utilizing family in relation to technologies, self-built metamorphosis and contribution of IGS in the BEP, self-customization for IGS in the BMP, requisiteness of IGS in

non-IGS family, generating income by utilizing IGS for sustainable savings management, integrating IGS into sustainable low-income housing planning outlook, covering all of the demand for sustainable low-income housing development, all of these imperative issues are clarifies respectively as a flow of the study framework to cover insight into all of the significant outlooks of the practical sustainable development. Finally, all of those practical contributions are systematically overall organized and summarized within this final chapter for comprehensive understanding the highlights and contributions of this dissertation. In which, it will pave the way for the sustainable low-income housing enhancement in Thailand, Asian wide level, as well as the developing housing world to learn from, and make the mutual adaption to each local, personal substance, and context of each country.

In order to achieve the clear image, mind maps of the summarized contribution strategies is illustrated in Fig. 16.1. Accordingly, the highlight details of contribution strategies are as follows:

16.2 CONTRIBUTION OF IGS TO SUSTAINING LOW-INCOME HOUSING STRATEGY

As for the given basic condition housing units/ participatory design housing master plans have been distributed to the dwellers, after a period of occupancy and residing. There were changes which have been conducted to the original units due to the customization that depended on each of the dweller purposes of utilization. Those of the circumstances could have been found in both of the BEP, as well as the BMP. Those phenomena are very important for the housing policy distribution, also for the housing design enhancement processes. Because of the grassroots means low-income, lower quality of life, and fewer opportunities in comparison to the others level of income people. In order to improve that situation, income is one of the most imperative issues to make the insightful consideration on. Dwelling unit is very meaningful to the low-income, especially the secured housing or the legal tenure both for land and architecture itself. Therefore, the habitat that can be utilized to support to create the income for its owners is very helpful to the low-income after gaining the secured housing to live in. Apart from only acting as the residing function, habitat which has the space to support the income generating activities have been unveiled, referred as to Income Generation Space (IGS). Particularly, the IGS has played a significant role supporting the low-income dwellers' earning processes. This strategy is explored actively and effectively works both for the BEP and the BMP scenarios by utilizing the self-built metamorphosis as well as self-customization as tools to get the IGS. As for the BEP, the study revealed that about 77% of houses in the research area conducted the extension. About half of dwelling units in the study area are extended for the IGS. Moreover, the spatial characteristics of IGS as a multipurpose/ flexible space can serve the desire of dwellers. It furthermore has a capability of solving the poverty issue as an essential possibility or the core of low-income enhancement issue that is needed to be fulfilled in the near future low-income habitation strategy. The IGS has supported the dwellers' continuous occupation and could also reflect the nature of how low-income Thai people have survive through fundamental given living conditions. As for the BMP,

Self-customized IGS survival strategy was explored to be utilized by the dwellers throughout their occupation period. More than one-third of the houses in the research area are self-customized for IGS. The study has further shown that, even in the non-IGS utilizing family, there is a positive trend that the IGS is demanded to support the dwellers' income generation activities. IGS has also shed light on its flexibility of usage possibilities that can be implemented in future low-income housing scenarios, as well as for a wider scale of housing enhancement, that will pave the way for a practical housing program and sustainable habitation to conduct an occupation in.

16.3 IGS AND THE SELF-SUFFICIENCY INTEGRATION

The self-sufficiency economy is attached in deep root of Thai people realization that it was the King's philosophy that has been distributed to Thai people. It is therefore has a reflection on the processes of the metamorphosis and self-customization. Moreover the construction skill and knowledge transfer has been spread within the community. The way of conducting an extension/ self-customization relied on incremental self-sufficiency procedures which mean the whole tasks have been split out into the several tasks. The volume of each task depends on the affordability, expediency, and practicality of each dweller and the construction management. And it is due to the sufficiency of each person is in difference, the IGS is able to create income for each dweller, thereafter the dweller has more of the affordability, better quality of life, earn more income than it was used to be. All of these are the core aims of poverty reduction by utilizing habitat or architecture itself effectively. The IGS shows its effective potentiality according to famous nationwide self-sufficient economy philosophy. In which Thai self-sufficient economy philosophy has been derived from the present King of Thailand's thought. It is due to Thailand is a major agricultural country, therefore first intentional conceptual thought was major aiming at low-income people, but how well it was, depends on the application processes of the users. By integrating IGS and self-sufficient consideration into the architectural point of view, it shows the effective practical outcome of sustainable housing enhancement.

16.4 SELF-BUILT METAMORPHOSIS AND CONTRIBUTION OF IGS

The effort to provide low-cost housing by the NHA showed the outcome of a compact living environment. In these situations, the dwellers solve the housing conditions by their own styles using self-built metamorphosis, consequently leading to the contribution of IGS. Apart from functioning as a living habitat, the residence is able to add value by suiting each of the life activities and purposes of the dwellers through the dwellers' self-built metamorphosis process. Metamorphosis reflects different income generation characteristics affecting the different usage of IGS: generating income at home, generating tasks at home while gaining income outside, and generating income at home by using technology. Additionally, the dwellers' intention influence on spatial composition and the usage of extension elements and materials. Consequently, the type of IGS shop indicates the average difference in utilizing the extension area. Food-selling activities require a large extension area while the retail

shop, the service shop and IT shop need smaller spaces. Also, other types of shops require the smallest extension area. The phenomena that about 77% of houses in the research area have made an extension or change to the basic given house, and about half of houses in the research area have made an IGS extension is very imperative for sustaining the housing strategy. Moreover, IGS plays a significant role in supporting the dwellers' continuous occupation and could reflect the nature of how low-income Thai people have survived through their living environment which could contribute to the prototype on a wider scale to acclimatize. Furthermore, it could help the housing planners and it could be one of the most essential possible issues to be considered and implemented that help pave the way for a future development project as a key theme for sustainability of living habitations.

16.5 SELF-CUSTOMIZATION FOR IGS CONTRIBUTION

The dissertation revealed that housing provision by CODI in the BMP showed the result of a compact space and living habitation. Dwellers try to adapt to the situations by their own survival solutions utilizing self-customization, thereupon conducting to the contribution of IGS for the dwellers who needed to use their home to support their earning activities. The type of IGS in the BMP can be majorly clarified into two types: type A (generating income at home through utilizing the IGS) and type B (generating works at home through utilizing the IGS while gaining income outside). The type A mostly concerns income generation by giving the services to the customer, some are combined with trades. The type B mostly concerns about selling food and products, and IGS users or dwellers usually approach their customers outside the home. Although the type of IGS is different, IGS alterations are in similarity in terms of flexibility. IGS can be used not only for acting as an IGS, but also for recreation purposes and other activities to be organized within the same area. Nonetheless, IGS has some deficit in that is income generation activities might interrupt the recreation area in the case that dwellers utilize the income generation time and relaxing time together. Still, there is an advantage that dwellers can have family time together while earning profit and completing recreation activity simultaneously. Dwellers in the type A houses spend time in the IGS more than the type Bs, that is used only at the time of preparing products to sell outside the home. In comparison, dwellers use the IGS during the daytime more than nighttime of the day. The purpose of income generation and the type of IGS has an impact on spatial utilization and its time variation. It has shed light on planning strategies, showing that IGS is important both for the BEP and the BMP. Although, the governmental housing program, the type of house and the effort to get IGS are in difference, IGS is still needed for the BMP, particularly for small scale row-type housing that can be used for strategy development. It is quite clear that from the imperative outlook of IGS, self-customized flexible IGS should be put insight into consideration for future low-income housing projects, both from a policy distribution and design point of view that could help to implement the BMP strategy to be a sustainable low-income housing program in the context of Thailand.

16.6 LESSONS LEARNED AND STRATEGIES IMPLEMENTATION

The dissertation revealed and pinpointed a clear analysis of international housing trend and its acclimated strategies to Thailand. Self-help properties management was found to play an important role in both initiation and sustainability of the design project. Furthermore, government patronization also still need to be fulfilled in the most practical terms and the idea should be derived from lessons learned by real dwellers' acclimation. Self-help metamorphosis is found to be an apparent strength of low-cost housing theme. Moreover, every schemes is unable to leave one alongside, but it should play its role simultaneously mobilize the overall low-income habitation scheme. Finally, these lessons learned are able to be scrutinized for the international developing housing world as a prototype of the acclimatization to the unique local and personal substances of the low-income architectural properties maneuver, for the near future strategic habitation plan.

16.7 COLLABORATION TACTICS AND SUPPORTIVE KEY ACTORS

To fortify the low-income habitation design strategy means not only the civil management but the physical design procedure also. It was found that the hybrid prototype key actor strategy is able to cope with the actual slum design development process. By the patronization of self-internal and external key actor, it is able to mobilize the design process to become concrete development. As well as, the leadership and power of negotiation that was the first step of the enhancement. Additionally, the collaboration among the community members, community architect, Changchumchon (Community skilled worker), and the government side should make clear understanding since the upgrading process is formed out so that to make the long term sustainability of improved slum habitation, as well.

16.8 SELF-ORGANIZED COMMUNITY MECHANISM (CONSTRUCTION MANAGEMENT, FINANCIAL MANAGEMENT AND HABITAT MANAGEMENT)

In order to develop community housing under the BMP, the need of practical collaboration comes into the first step. Understanding of the BMP and community participation played a significant role of the housing development. The strategy to bring community members all together by utilizing saving group activity, thereafter changed to be community cooperative scheme showed the capability to integrate financial system and construction management together. Dwellers can take part in the practical development, request their needs, share their ideas, or even assess and monitor the project. Additionally, long term loan system in relation to housing type helps dwellers to afford the houses together with land, and some of their money can be utilized as their welfare system. Therefore, the collaboration between many stakeholders, cooperative and the long term loan system in relation to housing type have played the imperative role for the affordability of sustainable urban poor housing.

16.9 THAI SAHAKORN-CHUMCHON, COOPERATIVE AS THE INITIATIVE OF CONSTRUCTION MANAGEMENT, PARTICIPATORY DESIGN, NEGOTIATION AND DEVELOPMENT PROCESSES

The characteristics of the Thai waqf-alike or Thai Sahakorn-Chumchon system which was found to be the key catalyst that help mobilizing the upgrading development processes. Initiated state and conceptual idea of management has been so far the core of the successful development and also to the real practice that has been occurred. The very apparent is its holistic strategy and cooperative approach. Thai Sahakorn-Chumchon acts as the monitorial, the permeable system, and the decentralizing of the determination by collaboration of community decision and government sector. Additionally, the most effective of the system is properties are unable to shift the possession to the outside owner; it is therefore able to ensure the longevity of the community system. This system itself is able to manage own community but the power of collaboration with the government makes it become double sustainable, particularly in terms of sustainability on the upgrading system for the developing world. The unique key role of cooperative system in relation to habitat management is cooperative has played its imperative role in helping to initiate the design development processes including community savings system and starting up the construction. Thereafter the design enhancement, design characteristics can be performed and concretely seen after the development processes accomplished.

16.10 COMMUNITY HOUSING MANEUVER SYSTEM AND HANDLING FOR REHABILITATION, CONTRIBUTION OF TRADITIONAL THAI HOUSE CHARACTERISTICS

Self-help community-based rehabilitation with Thai maneuver system were found to be the key strategic strength to both catastrophe management and sustainable development by using *Sahakorn Chumchon, Chang Chumchon*, and *Longkhak* patronization. Furthermore, the capability of *Ruan Thai* characterization could strengthen the slum waterfront settlements for flood crisis, although some misinterpretation of architectural elements has been explored due to the limit condition of area requirements. However, the main conceptual idea of flexible upper floor arrangement is able to play its role coping with the floods situation. Moreover, socio-behavioral acclimatization could also make the dwellers survived through their living habitation during floods crisis. Practical lesson learned from Bang Bua community could be the prototype of acclimatization for the Asian waterfront settlements, it should scrutinize to find the acclimatized tools of each of the country's local and personal substances so that to strengthen the sustainability of habitation through floods catastrophe.

16.11 MATERIALS FOR EXTENSION LOW-INCOME HOUSING

A reality of dweller's occupation has shown the necessary of customized space conversion. Consequently, building materials have been chosen to be used for the extension. About third quarter of all houses have been found to conduct space conversion both for roof extension and wall extension,

which indicated the necessary of space conversion and the need of materials for dwellers' customized space. Vinyl is found the most in popularity of usage for roof conversion while zinc sheet is the least to be considered to utilize by dwellers. Concrete block is explored to be the most popular to be used for wall conversion, while type of others e. g. reused materials are in the least popularity to be used for wall conversion. The results of the research show the real situation as well as trends of the urban poor housing (Utilizing Bang Bua community in Bangkok as a case) in the aspect of utilized materials in the context of Thailand. The factors apart from the reasons of easiness of affordability, materials cost, easiness of installation, and durability of usage, social situation is also one of those factors to be determined the materials to be utilized for urban poor housing conversion, for instance steal prevention as for safety aspect.

16.12 SIGNIFICANCE OF IGS AND FACTORS IMPACTED ON IGS ENHANCEMENT

Governmental urban poor housing conditions cause a compact living environment. Dwellers make adaptation through the basic given unit by their own approach, utilizing self-customize method that leads the contribution of IGS. Apart from functioning as living habitat purpose, house itself can be used as the space to generate income for dwellers. It can be majorly categorized into two groups which are "generating income at home through utilizing IGS" and "generating works at home through utilizing IGS while gaining income outside". Equipments to generate income vary from each earning purpose but to be organized within the same given area. Imperative factors for considering IGS enhancement could be pinpointed as chronological change with spatial organization, users' keenness, users' occupation, gender implication, household maneuver system, dweller's education level, and also transportation issue. It is therefore imperative for housing planners, designers, and policy makers as well as dwellers side to put IGS into consideration that pave the way for the future sustainable housing development scenarios.

16.13 IGS UTILIZING FAMILY IN RELATION TO TECHNOLOGIES

Urban low-income housing under the CODI collaboration of this community (Utilizing Tawanmai community housing in Khon Kaen as a prototype) showed the results that house can be utilized apart from acting as a residing function but also able to support earning activities. This contribution space called as IGS. Occupation in the IGS utilizing family can be majorly sorted into four types. Selling food is found to be the most popular occupation. Second was found to be the occupation that gives services to the customers, while commercial activities occupation and mixed occupation type was explored to be the same amount of number and lesser popular than that of the previous two types. The demand of technologies and facilities that support in earning showed that IGS utilizing families have put the first demand on the technologies and facilities that supports their earning and life style, next is communication, thereafter is transportation issue. These have shown that occupation comes at the first priority, and then dwellers use technology for the communication to support their earning activities.

Thereafter dwellers use vehicle for their transportation, both for their mobility and transport their products to sell to their customers. This research clarifies what occupation can be performed through utilizing IGS, as well as pinpoints what technologies and facilities are needed for the IGS utilizing family. Future low-income housing development project should pay attention to IGS outlook that will pave the way for a sustainable low-income housing program.

16.14 REQUISITENESS OF IGS IN NON-IGS FAMILY

The necessity of a survival through a daily life forces urban low-income community housing dwellers to conduct an occupation. Dwellers found their way to integrate the income generating activities to the home function, as known as the IGS. By using IGS, the space that is able to support the earning activities. IGS has played a crucial role helping the users to generate their income. Focusing on non-IGS families whether there is a requisiteness of availability of the IGS, the outcomes have shown that IGS has been put an interest in. More than half of the research targets expressed the interest of requisiteness to have IGS for supporting income generating activities. Additionally, the highest demand is to have the IGS for supporting selling food activities, while selling beverage, utilizing IGS as a grocery store, as well as miscellaneous showed the same number of the demand. The demand of IGS found to be important for low-income daily life earning, and showed the need even in the non-IGS families. The IGS has shed light its contribution and should be therefore integrated in the low-income housing policy both for policy distribution and design enhancement, as well.

16.15 GENERATING INCOME BY UTILIZING INCOME GENERATION SPACE (IGS) FOR SUSTAINABLE SAVINGS MANAGEMENT

In order to cope with poverty issue, IGS has played a significant role as a place to support the income generating activities. By utilizing IGS, dwellers are able to create income and use the income for monthly expenditures. Data has reflected that dwellers has to pay as usual for fundamental facilities cost, pay for their habitat by installments. More than half of the households have to organize to pay for their children expenditure, and a few can be found to pay for the elderly as extended families in urban low-income environment. The IGS has potential to support in generating income for its users. If dwellers could manage to pay lesser, particularly on the miscellaneous cost, as well as after the habitat payment can be accomplished, dwellers can manage to have more monthly savings. It is therefore imperative to make an insight consideration on IGS strategy integrated with the effective sustainable savings management for the sustainability of low-income habitat enhancement.

16.16 INTEGRATING IGS INTO SUSTAINABLE LOW-INCOME HOUSING PLANNING

The endeavor to provide and develop low-income housing needs good strategy to fulfill the housing program. Planning is one of the most significant factors that bring the success to the project. Utilizing IGS integrated in to planning strategy showed efficient outcome. Dwellers can manage their houses

themselves to suit each of the income generation activity purpose. Planned houses can be utilized not only for the residing purpose but can be used as the place to support earnings for the dwellers who want to use their home for income generation. Although market idea is needed for daily life, IGS utilizing houses at the same time can also act as their own market for their own low-income community. The IGS integrated in planning model can be utilized in the future low-income housing project or to add IGS strategy in the planning outlook that will pave the way for sustainable low-income housing program.

16.17 COVERING THE DEMAND FOR SUSTAINABLE URBAN LOW-INCOME HOUSING ENHANCEMENT

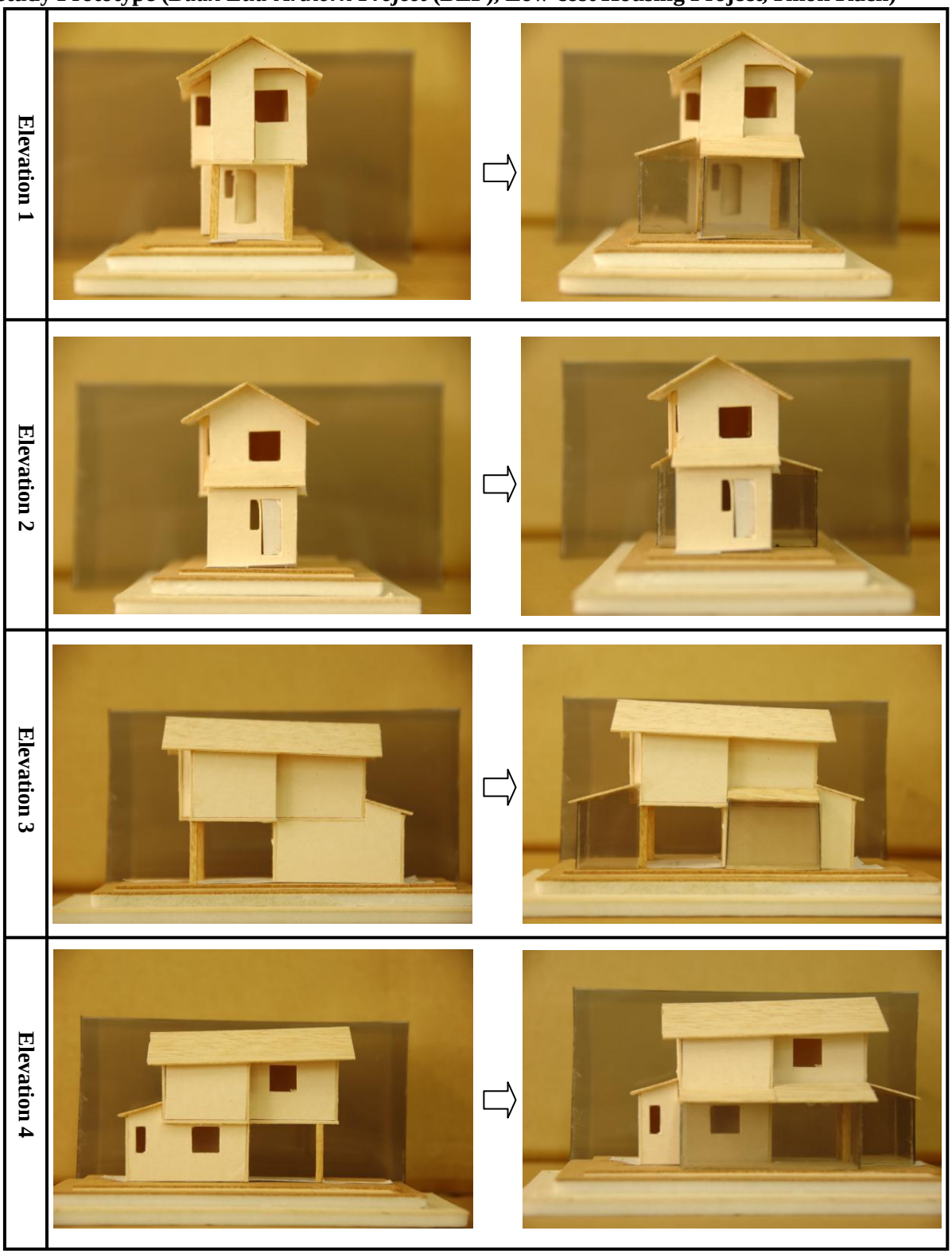
In order to be able to cover the urban poor housing demand as well as to implement the sustainable strategy for housing development scenarios in Thailand, collaboration process is needed at the first step of development. Thereafter, participatory design process should be proposed to the development scheme that will bring the practical demand of all stakeholders. The community management system helps to shape up the affordability of housing process. Community organization maneuvers the long-term loaning process that help for the house payment of the dwellers. To cover all urban low-income housing demand in Thailand, and since there are both old and new squatters, therefore the BEP and the BMP should play their role simultaneously. And the outlook of IGS should be paid attention to help the dwellers to have their habitat not only for residing but also able to generate income, as well.

Two major governmental low-income housing approaches have played an important role in provision of the habitat for the country. Because of there is the demand of legal land secured tenure, both for the enhancement of the upgrading projects and the tend-to-be squatter possibilities. The BEP and the BMP have a capability to cover those of the demands. It should therefore keep both of the two running simultaneously, by implementing and strengthening with the sustainable strategies. Or if there is the near future new housing programme, it should keep two of those as the lessons learned and fulfilled it with those mentioned strategies. Habitat and planning characteristics might be participatory designed in the alternative way rather than a massive production, or if there is an obstacle according to budgetary limit or so forth, it should be at least empowered the participatory design to suit the real needs. As well as, the programme should be put the IGS insight into the consideration at both of the policy distribution, planning and housing design level in order to provide the practical sustainable habitat to settle in, securely and sustainably.

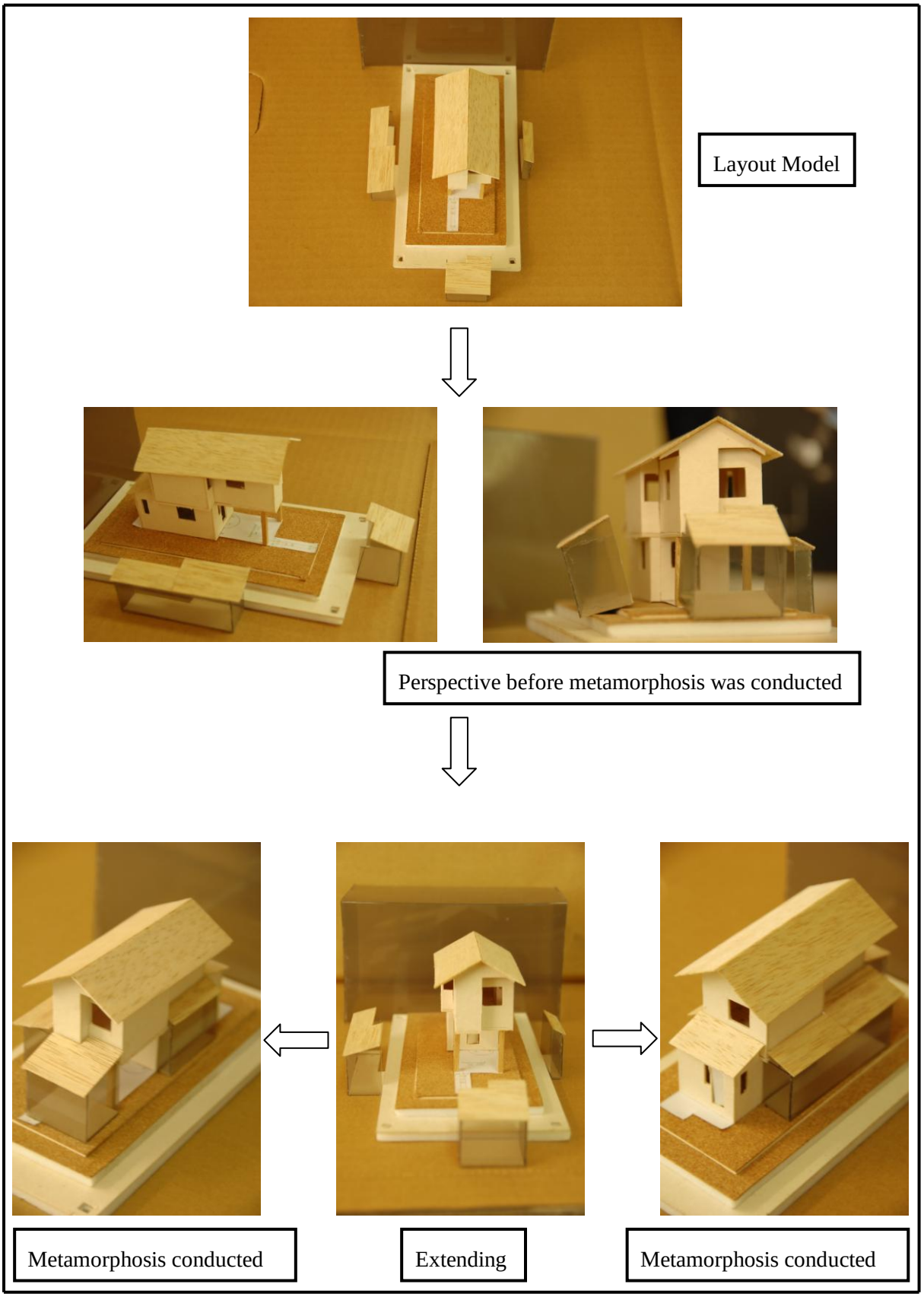
APPENDIXES

Appendix 1

Study Prototype (*Baan Eua-Arthorn Project* (BEP), Low-cost Housing Project, Khon Kaen)



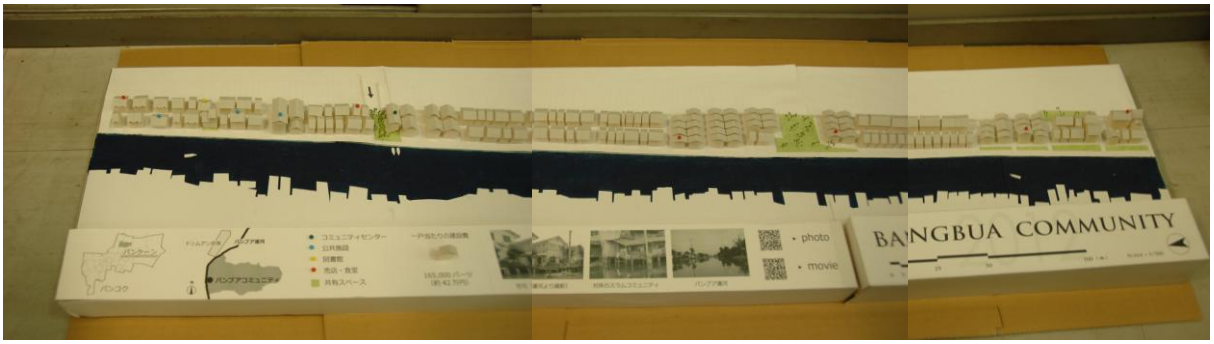
The Conception of Metamorphosis: Fundamental House Version and Metamorphosis Version

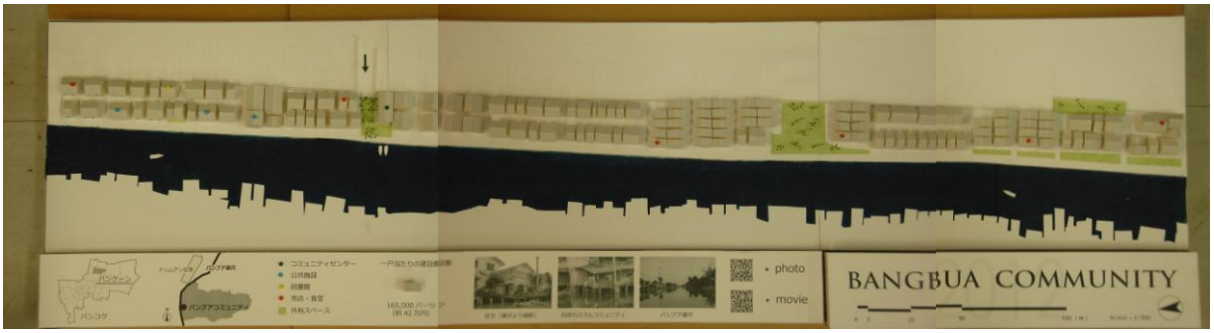


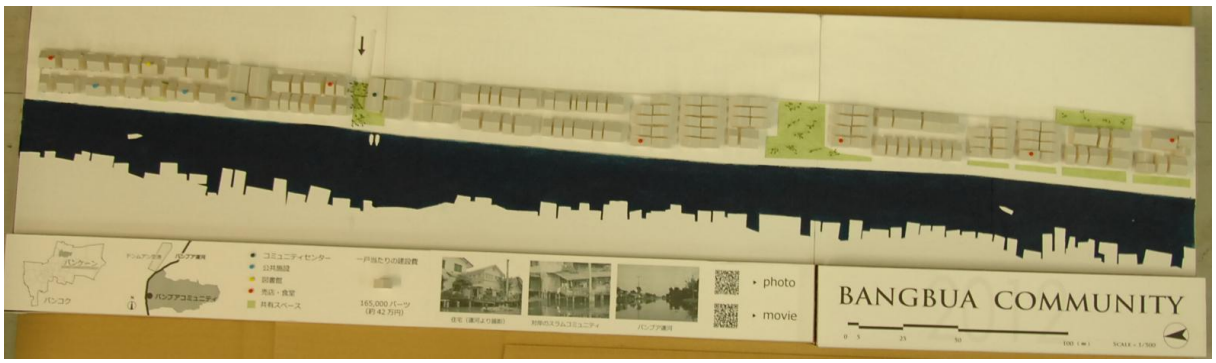
Processes of Metamorphosis of Low-cost Housing, Extension Outlook

Appendix 2

Study Prototype (Bang Bua Slum Upgrading Project, *Baan Mankong Program* (BMP), Bangkok)





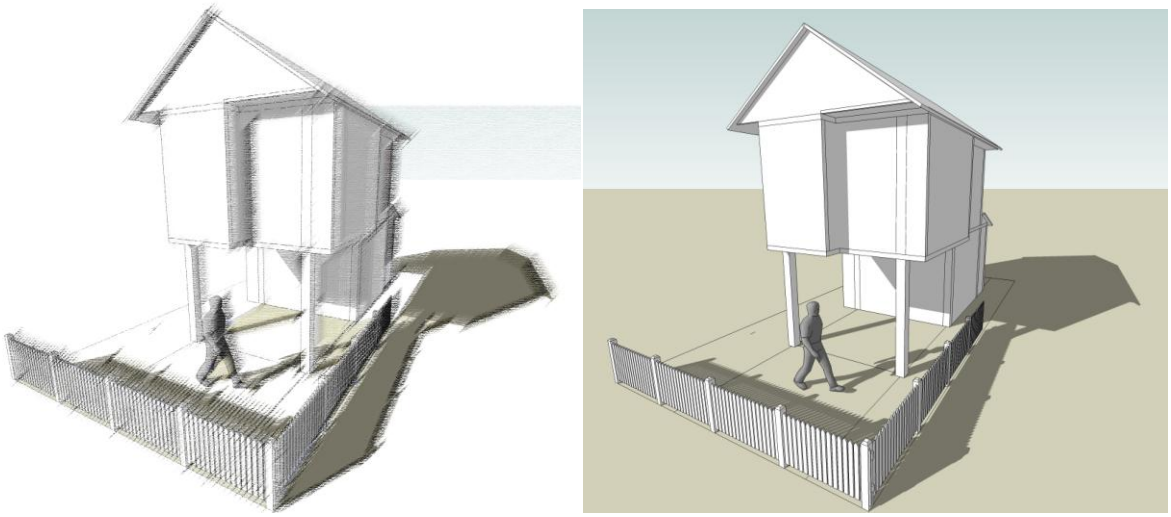


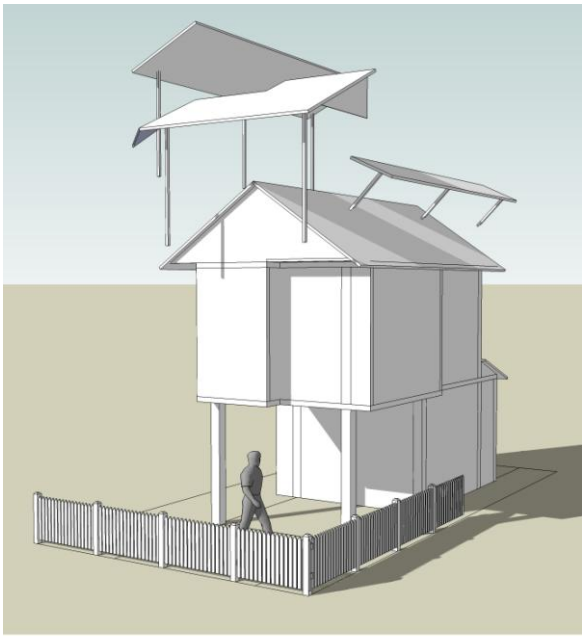
CODI Study Prototype with its Physical Characteristics.

Elevation Model with Project Overview of Bang Bua Housing

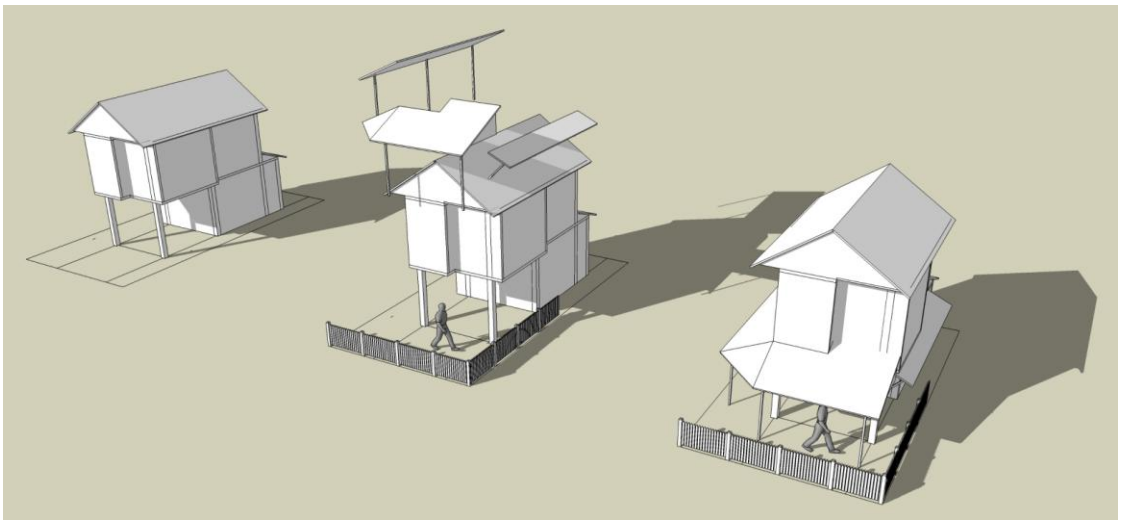
Appendix 3

3D Study Prototype Approach with Computer Simulation, 3D Modeling and Metamorphosis Outlook

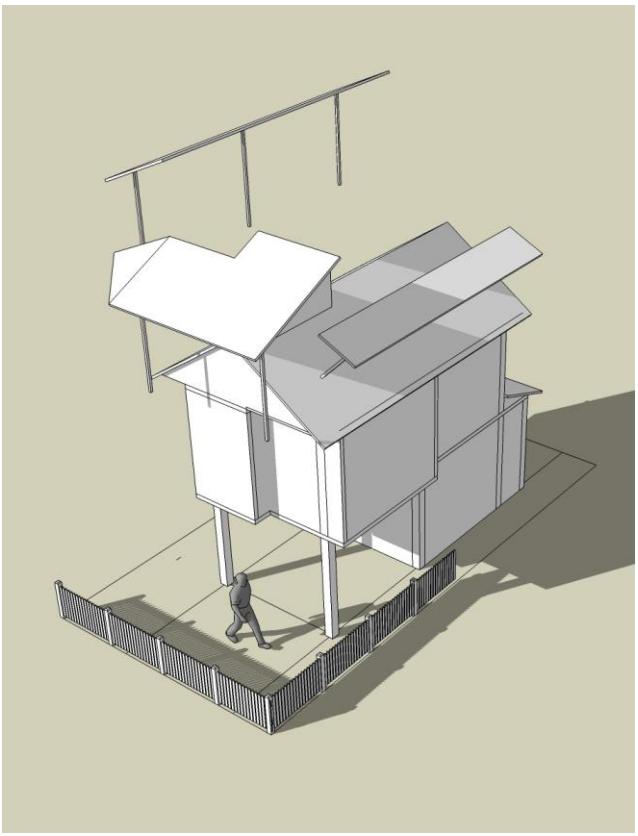




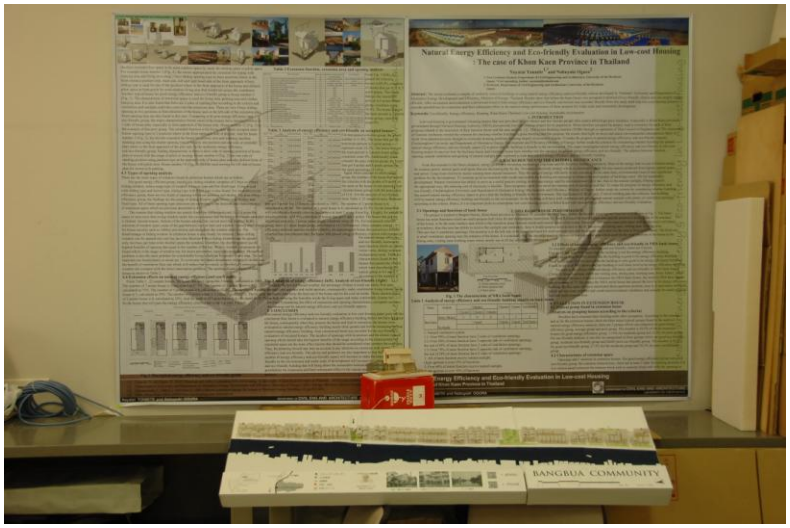
3D Modeling and Simulation Study of Metamorphosis in NHA
Low-cost Housing Project through Extension Process



3D Computational Study of Extension Characteristics and Metamorphosis Stage



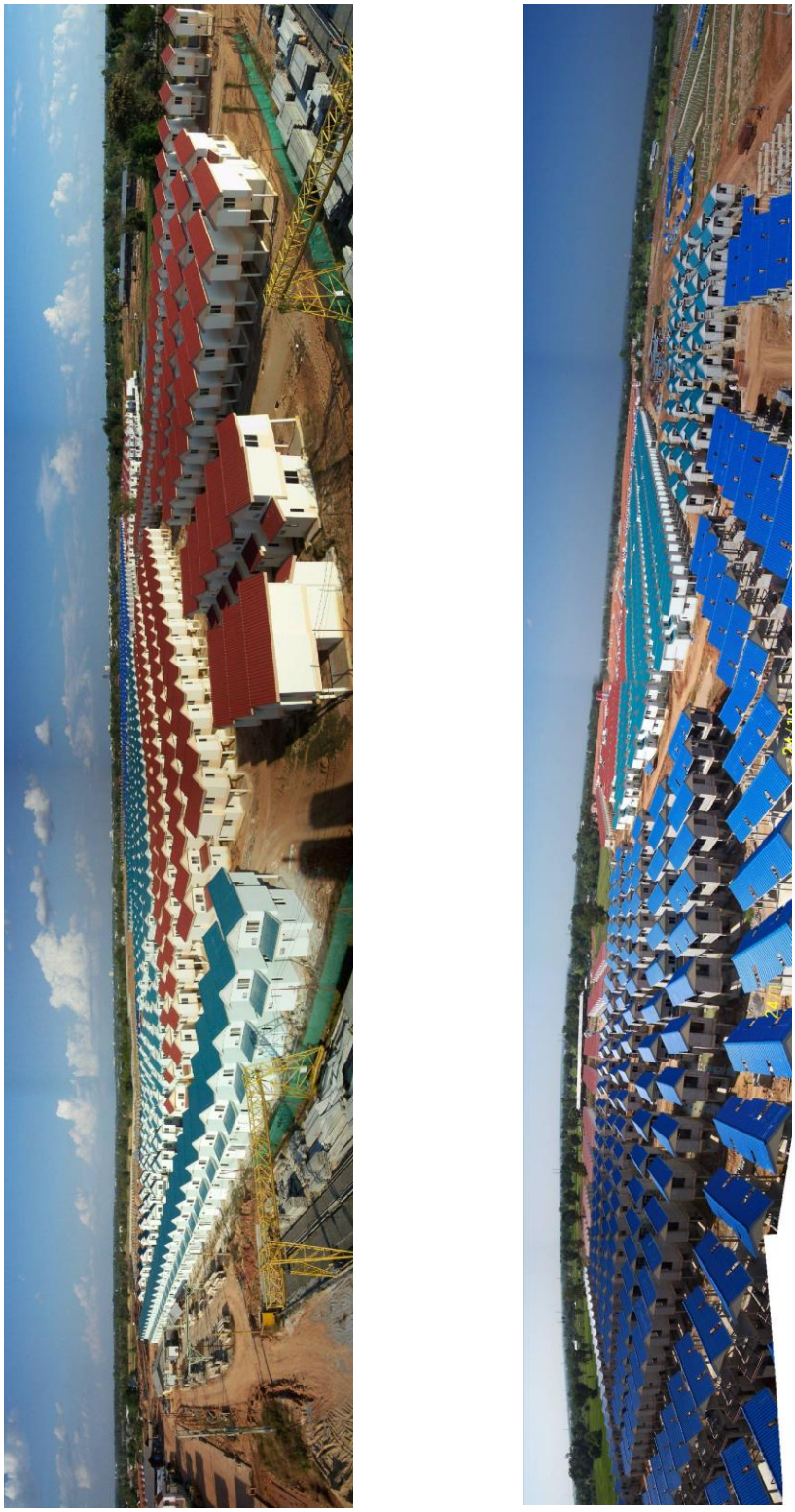
House Metamorphosis: Illustration of House Extension Concept



Integration Study of 3D Computer Simulation and Model Study

Appendix 4

Low-cost Housing *Baan Eua-Arthorn Project* (BEP) Bird's Eye View with Its Context

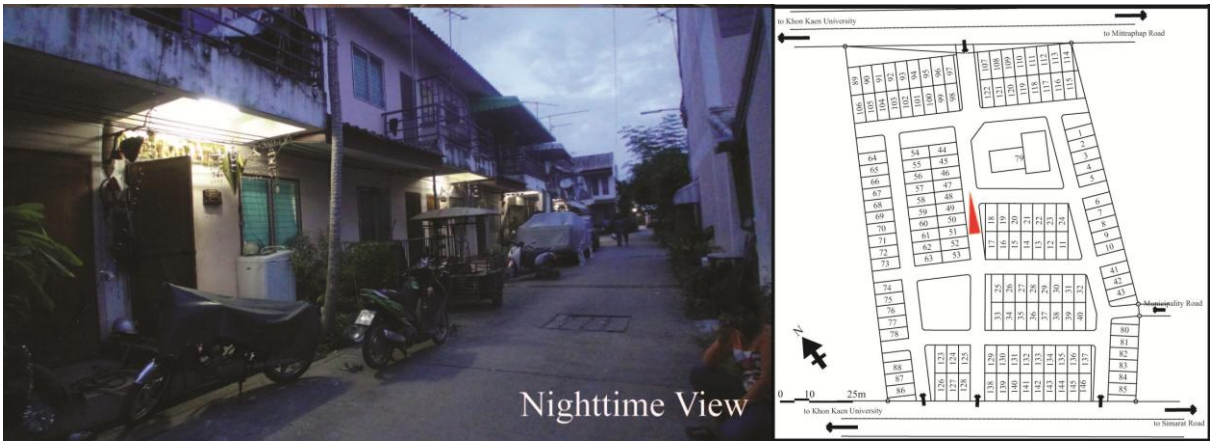


Low-cost Housing Project Khon Kaen, Bird's Eye View (*Source: Manit, NHA*)

Appendix 5

Baan Mankong Program (BMP) and Atmosphere: Tawanmai Community Housing Case

Tawanmai Community Housing Atmosphere and Housing Characteristics: Daytime Atmosphere



Tawanmai Community Housing Atmosphere and Housing Characteristics: Nighttime Atmosphere

Appendix 6

Baan Mankong Program (BMP) and Atmosphere: Bang Bua Community Case

Bang Bua Community Atmosphere and Housing Characteristics

Appendix 7

Alternative Chosen Supportive Institutions and Negotiation Case: 14 Rai Community Case

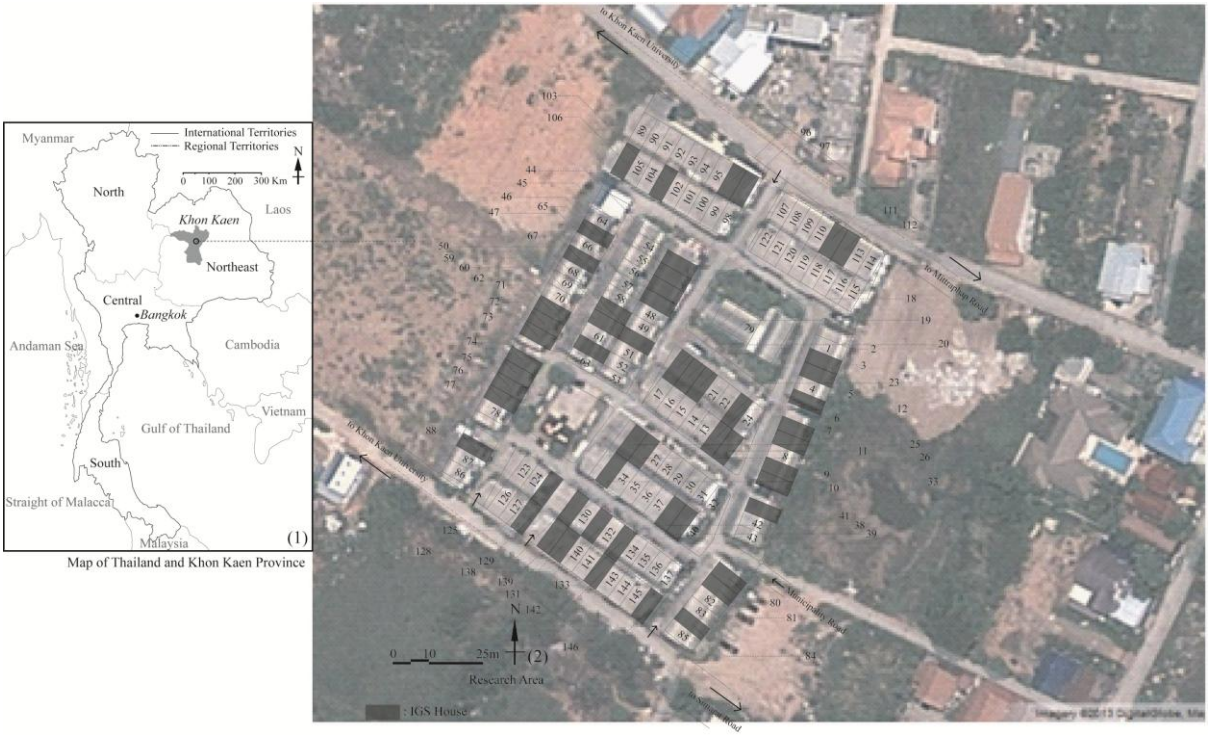
14 Rai Community Atmosphere and Housing Characteristics

Appendix 8

Aerial Photograph of Banpet Site Project (BEP)

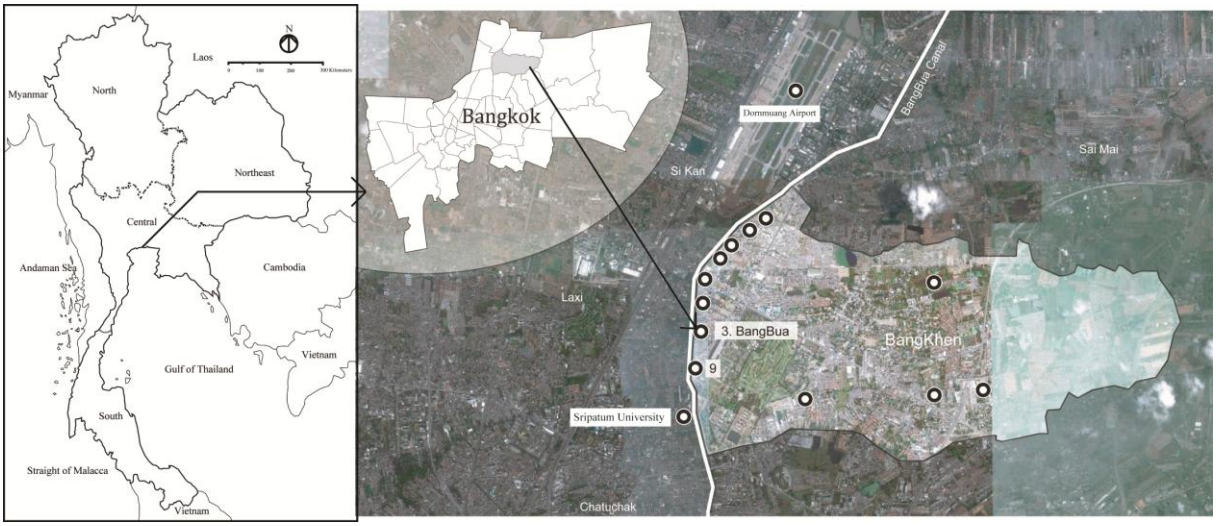
Appendix 9

Aerial Photograph of Tawanmai Community Housing (BMP)



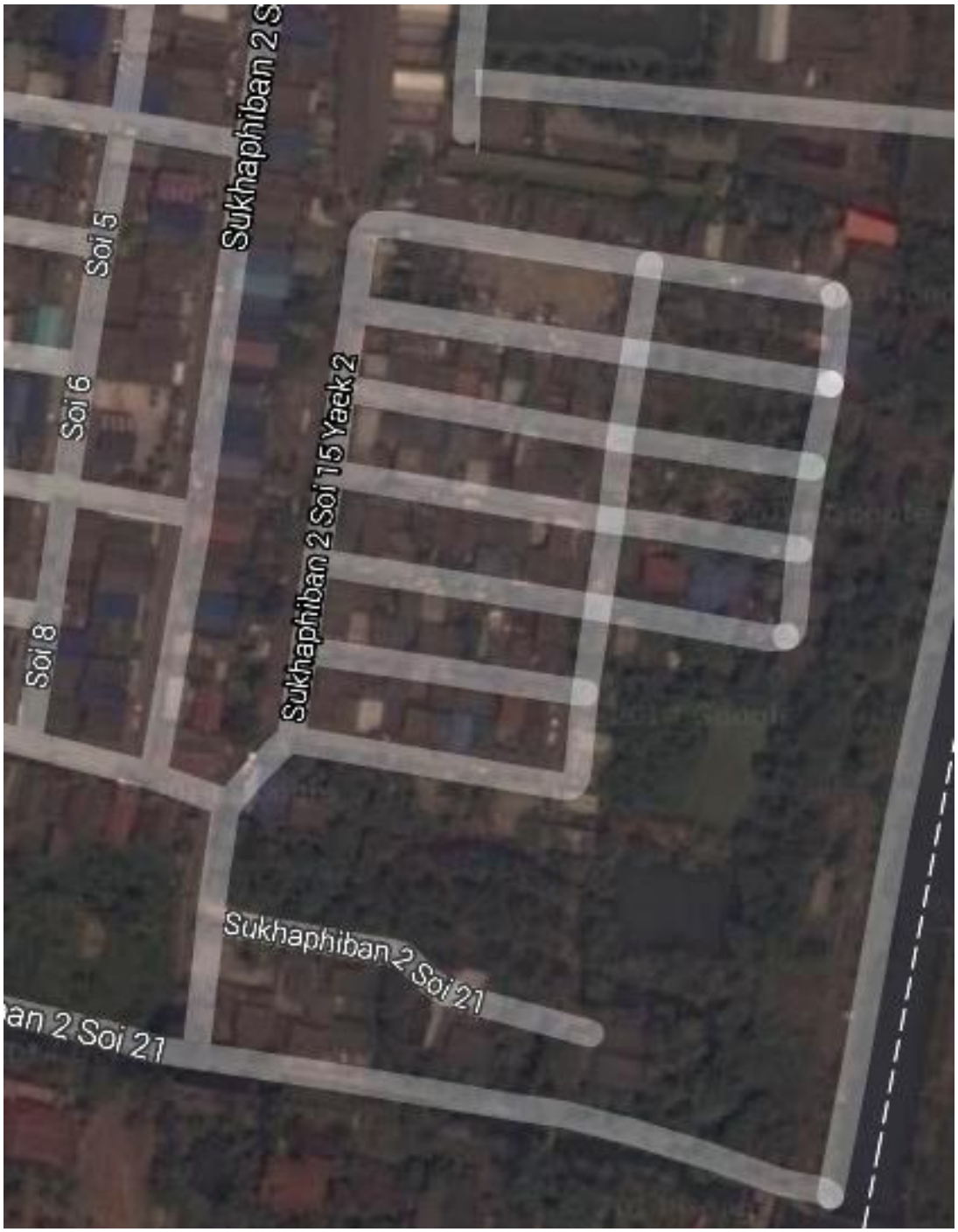
Appendix 10

Aerial Photograph of Bang Bua Community Housing (BMP)



Appendix 11

Aerial Photograph of 14 Rai Community



These sets of questionnaire are made for the integration of the research purposes, researcher asks for your kind help to fill in and make a response. In which, the data will be utilized for the study of housing. Appreciation is directed to your kindness in advance.

Questionnaire

Part 1 Questionnaire on the Study of Habitat

1. Household owner's name_____ Dweller's age_____year (s) old Gender_____

2. Occupation_____ Highest education level_____

3. Number of household member_____person(s) *If it is an extended family, please identify. (e.g. grandparents, cousins) _____

Do you have elderly, infant or child who live together? *If there is, please make an identification

4. Average monthly income_____ Baht

5. When did you purchase this land/ get this plot?_____

6. When have you been started residing in this dwelling? A.D._____ How long has this dwelling be constructed/ existed_____year (s)

7. Average floor area/ floor_____m^2

8. Construction cost of your house _____baht

9. Your house was constructed by yourself or by hiring labour force to help? _____*If hiring, how much does it cost?_____Baht/ day

10. How much does the house maintenance cost? (e.g. repairing the deterioration of the housing materials cost) _____ Baht/ day

11. How much monthly salary do you get? _____ Baht/ day How much do you have to pay by installments for your housing? _____ Baht/ day Total period of paying by installments? _____year(s) Period to go for paying by installments _____ year(s)

12. How much do you have to pay for monthly electricity cost? _____ Baht/ day Pay for running water cost? _____ Baht/ day Pay for daily stipend? _____Baht Pay for your children?_____ Baht/ day Pay for elderly in your family? _____ Baht/ day Average of your saving? _____ Baht/ day Miscellaneous cost? _____ Baht/ day

13. How many people who involve with your housing maintenance?_____ person(s) who? (*Please identify)_____ Stand for? _____

14. How many dwellings were already finished construction at the time that you started your residing? _____

15. How long have your house been constructed until completion? _____ year(s)

--How long for the main structure has been constructed?

Foundation_____ year(s) Column, cantilever structure_____ year(s)

Roofing structure_____ year(s)

--How long have your building envelope been constructed until completion? (Building envelope e.g. wall, door, window, roof)

Finishing wall_____ month(s)/ year(s) Installation of openings frame (e.g. door, window frame)_____ month(s)/ year(s) Roofing installation_____ month(s)/ year(s) Colour finishing_____ month(s)/ year(s) Fence_____ month(s)/ year(s) Growing plantation_____ month(s)/ year(s) Name of plantation_____

16. Problems found about housing and suggestions?

_____

Part 2 Questionnaire on Interior & Exterior Space Utilization, Configuration and Income Generation Space (IGS)

1. Which space do you put the most attention on (*Please inform the purpose of utilizing that area)

A. 1st floor multi-purpose space _____

B. Kitchen _____

C. Bedroom_____

D. WC (Rest room) _____

E. Washing area_____

F. Other space_____

2. Do you conduct an extension to your dwelling unit?

Which of the area? What is the purpose?

_____

3. How many square meter of that space? _____

4. Who design the extension space of your dwelling? (*Please choose one)

a. you yourself b. you+ your family c. you+ your family+ cousin d. you+ your neighbor (*Please specify)_____

5. Do you have extended area in front of your house? _____What is that area?_____m^2

6. When have you initiated the first extension? A.D. _____ Which is the area for?_____

Is there still any extension/ modification to your house at this moment? _____ What is the purpose of utilizing that area/ space?_____

7. Who are the users of those area/ space?

A. 1st floor multi-purpose space _____

B. Kitchen _____

C. Bedroom_____

D. WC (Rest room) _____

E. Washing area_____

F. Other space_____

8. Period of time that the space/ area is utilized? (e.g.8:00-16:00)_____

A. 1st floor multi-purpose space _____

B. Kitchen _____

C. Bedroom_____

D. WC (Rest room) _____

E. Washing area_____

F. Other space_____

9. What is the purpose of that Income Generation Space (IGS)? (e.g. utilized for selling dessert, selling food, selling coffee & beverage, laundry space, drying food (food preservation)

_____

10. How much do you gain from that IGS_____Baht/ month

11. How do you satisfy with IGS or customized space (e.g. by configuration of the furniture)_____

_____

12. Average utilized space/ floor? _____m^2

13. Problems found about housing metamorphosis/ extension/ customization after period of occupation and suggestions?

_____

Part 3 Questionnaire on <u>Building Construction Materials</u>

1. Total price of your house until completion_____ Baht

   Land price of your plot_____ Baht

2. What is type of building material (*Please choose the appropriate one)

a. permanent material b. semi-permanent material c. temporary material

3. What is type of structure? (*Please choose the appropriate one)

a. permanent material b. semi-permanent material c. temporary material

4. Materials price (buying price during the construction period)

-Foundation material cement _____ Baht Steel_____ Baht

-Wall material cement_____ Baht Steel_____ Baht Opening frame_____ Baht Door_____ Baht Window _____ Baht

-Roofing material Steel for roofing structure_____ Baht Roof tile_____ Baht

-Miscellaneous material (*Please specify) _____ Baht

5. Type of material (*Please choose the appropriate one)

a. New material b. used-material from previous dwelling c. Mixed material (New and used-material from previous house) d. Miscellaneous material (*Please specify)_____

6. How do you afford the materials (*Able to choose more than one)

a. New material b. recycled material c. Was given from neighbor/ from cousins

d. Miscellaneous material (*Please specify) _____

7. Suggestions or required things for building construction materials improvement?

_____

Part 4 Questionnaire on <u>Building Extension Materials</u>

1. Which part have you had your house extended/ transformed? _____

What is the extension purpose?_____

2. What is type of extension materials? (*Please choose the appropriate one)

a. permanent material b. semi-permanent material c. temporary material

3. What is type of extended structure? (*Please choose the appropriate one)

a. permanent material b. semi-permanent material c. temporary material

4. Extended materials price (buying price during the construction period)

-Foundation material cement _____ Baht Steel_____ Baht

-Wall material cement_____ Baht Steel_____ Baht Opening frame_____ Baht Door_____ Baht Window _____ Baht

-Roofing material Steel for roofing structure_____ Baht Roof tile_____ Baht

-Miscellaneous material (*Please specify) _____ Baht

5. Type of material (*Please choose the appropriate one)

a. New material b. used-material from previous dwelling c. Mixed material (New and used-material from previous house) d. Miscellaneous material (*Please specify)_____

6. How do you afford the materials (*Able to choose more than one)

a. New material b. recycled material c. Was given from neighbor/ from cousins

d. Miscellaneous material (*Please specify) _____

7. Suggestions or required things for building extension materials improvement?

_____

Part 5 Questionnaire on Affordability of the Housing Units, Design Participatory and Community Maneuver System

1. How many times of the community monthly meeting? _____ time(s)/ month

What is the topic of the meeting? _____

Who has to join the meeting? _____

2. How many times of the meeting that is organized outside of the community?

_____ time(s)/ month

What is the topic of the meeting? _____

Who has to join the meeting? _____

3. What do you gain from attending the meeting? What is the disadvantage and advantage?

_____

4. Suggestions or required things that are needed to be improved?

_____

Part 6 Questionnaire on Cooperative System, Housing finance, Housing Loaning and Community Welfare System

1. How long have you been a member of the saving group? _____Since A.D._____

2. What is the role of the saving group in the development?

_____

3. How much of your monthly saving with the saving group? _____Baht/ Month

4. How much do you have to pay for housing cost? _____Baht/ month

How long have you been paying? _____ year, month How many year to go for housing payment?_____

5. How much do you have to pay for land cost? _____ Baht/ month

How long have you been paying? _____ year, month How many year to go for housing payment?_____

6. Have you ever made loan contract with the saving group? _____

Amount of money? _____Baht

7. How much do you get the monthly share? _____ Baht/ month

8. What kind of welfare do you get? _____

9. Suggestions or the things that should be improved?

_____

Part 7 Questionnaire on Physical Characteristics, Planning Maneuver System and Planning & Design Policy

1. Your land/ plot size? _____ m^2/ wa^2 (*1wa=2 meters)

2. What is type of building structure? (*Please choose the appropriate one)

a. permanent structure b. semi-permanent structure c. temporary structure

3. How many storey of your dwelling _____storey How many storey is intentionally designed for supporting in terms of structure? How many storey can be extended? _____How many storey housing in your community in general? What is the housing type in general? _____ Why do you choose for example 1, 2 storey building type? What is the reason for determining the number of the storey of your house?

_____

4. Who design your house? (*Please choose the appropriate one)

a. you yourself b. you yourself+ your family c. you yourself+ your family+ cousins

d. you yourself+ neighbour e. you yourself+ engineer f. you yourself+ architect g. CODI

h. academic institution supervisor (e.g. University lecturer, Professor) i. contractor/ builder

j. others (*Please specify) _____

5. Who build your house? (*Please choose the appropriate one)

a. you yourself b. you yourself+ your family c. you yourself+ your family+ cousins

d. you yourself+ neighbour e. you yourself+ engineer f. you yourself+ architect g. CODI

h. academic institution supervisor (e.g. University lecturer, Professor) i. contractor/ builder

j. others (*Please specify) _____

6. Who design structure system of your house? (*Please choose the appropriate one)

a. you yourself b. you yourself+ your family c. you yourself+ your family+ cousins

d. you yourself+ neighbour e. you yourself+ engineer f. you yourself+ architect g. CODI

h. academic institution supervisor (e.g. University lecturer, Professor) i. contractor/ builder

j. others (*Please specify) _____

7. What is type of structure (*Please choose the appropriate one)

a. permanent structure b. semi-permanent structure c. temporary structure

8. Is the layout of the site plan appropriate for the climate, topography and surrounding neighbourhoods? How?

_____

9. Is the layout of the site plan economical, encouraged income generating activities, considering land use and infrastructure? How?

_____

10. Does the layout of the site plan contribute to creating a safe, pleasant and creative of the neibourhood? How?

_____

11. Is there any need for different of the house types according to location, topography and family size, or family condition? How?

_____

12. Is there any change in the planning concept and housing characteristics between past and present?

_____

13. Why the planning principle/ regulation have changed? (For example there is the increasing demand of the habitat, the limitation of the housing space/ area)

_____

_____

14. What kind of change/ transformation/ modification have you conducted so far in comparison with the early planning? (For example there is extension of utilized space, roof extension, transformed the wall, made the additional wall)

_____

_____

15. Do you think anything negative in these housing construction trends or the thing that is essential for the housing enhancement? (*Able to choose more than one)

a. Poor living environment b. Poor neighbourhood c. Poor infrastructure d. High density living e. Inadequate ventilation f. Inadequate light g. Others (*Please specify)

_____

16. Is there any open space, public park, playground, parking area and community space in this area? Is that adequate? Is there anything that needed to be improved? How many square meters?

_____

_____

17. What are the most urgent needs for housing enhancements in areas of legality, safety, durability, sustainability, health, welfare, comfort and space utilization?

_____

_____

18. Suggestions or the things that should be improved?

_____

Part 8 Questionnaire on Housing Quality

Physical Sustainability

1. What is type of roof tile? (*Please choose the appropriate one)

a. permanent material (corrugated asbestos roof tile) b. semi-permanent material (Zinc sheet, Metal sheet) c. Temporary material (nature material, straw+ bamboo frame)

d. Others (*Please specify) _____

2. What is type of wall material? (*Please choose the appropriate one)

a. red brick finished with cement-sand mortar b. concrete block finished with cement-sand mortar

c. gypsum board d. Others (*Please specify) _____

3. What is type of floor material? (*Please choose the appropriate one)

a. Reinforced concrete (RC) b. Tiling and paving c. Linoleum

d. Others (*Please specify) _____

4. Suggestions or the things that should be improved?

_____

Housing Infrastructure

5. How do you afford the running water? (*Please choose the appropriate one)

a. Tab water from public supply b. Tab water from underground water c. Central community Tab water d. From river or canal e. Others (*Please specify) _____

6. How is the status of electricity supply? (*Please choose the appropriate one)

a. Connected b. Not-connected c. Others (*Please specify) _____

7. What is the status of sewage water disposal? (*Please choose the appropriate one)

a. Connected to public disposal pipe b. Household septic tank/ grease tap

c. Others (*Please specify) _____

8. What is the status of solid waste disposal? (*Please choose the appropriate one)

a. Municipality's disposal service b. Self-help community disposal service c. Non of any disposal system/ free damping d. Domestic sewage tank

e. Others (*Please specify) _____

9. How is the storm water drainage system? (*Please choose the appropriate one)

a. Surface drainage provided b. No surface drainage provided c. Storm water collection provided d. Others (*Please specify) _____

10. How is the status of road network? (*Please choose the appropriate one)

a. Bituminous concrete road b. Asphalt road c. Compacted road finished with small stone surface d. Earthen road e. Others (*Please specify) _____

11. Suggestions or the things that should be improved?

_____

Living Density, Households Density

12. How many persons are there in your house? _____Person(s)

13. How many persons per room? (*Please choose the appropriate one)

a. > 2.5 b. 2-2.5 c. 1.5-2 d. < 1.5 e. Others (*Please specify) _____

14. How many persons per bedroom? (*Please choose the appropriate one)

a. > 4 b. 3-4 c. 2-3 d. < 2 e. Others (*Please specify) _____

15. How many households per occupied dwelling unit? (*Please choose the appropriate one)

a. > 2 b. 2 c. 1 d. Others (*Please specify) _____

16. How do you manage the kitchen? (*Please choose the appropriate one)

a. Inside the house b. Using front area of the house c. Using back area of the house

d. None e. Others (*Please specify) _____

17. What about the utilization of the toilet? (*Please choose the appropriate one)

a. Private inside the house (at 1st floor) b. Using the central toilet of the community c. None

d. Others (*Please specify) _____

Technologies, Facilities and Accommodations

18. Do you have car in your possession? a. Yes b. No How many?_____no.(s)

What is the type? (e.g. saloon or truck/ pickup)_____

19. Do you have your hired company's car? a. Yes b. No What is the company's name?

What is the company? (e.g. taxi company, transportation company) _____

20. Do you have motorcycle in your possession a. Yes b. No How many?_____no.(s)

21. Do you have Tuk Tuk (Three wheel Thai customized-cycle) in your possession? a. Yes b. No

How many?_____no.(s)

22. Do you have bicycle in your possession? a. Yes b. No How many? _____no.(s)

23. Do you have washing machine in your possession? a. Yes b. No

How many? _____no.(s)

24. Do you have landline in your possession? a. Yes b. No How many?_____no.(s)

25. Do you have mobile phone in your possession? a. Yes b. No How many?_____no.(s)

26. Do you have air conditioner in your possession? a. Yes b. No

How many?_____no.(s)

27. Do you have fan in your possession? a. Yes b. No How many?_____no.(s)

28. Do you have refrigerator in your possession? a. Yes b. No How many?_____no.(s)

29. Do you have television (TV) in your possession? a. Yes b. No

How many?_____no.(s)

30. Do you have curtain attached inside of your house? a. Yes b. No

How many?_____no.(s)

31. Do you need more facilities? What are the facilities that you need in addition?

_____

Part 9 Questionnaire on Housing Quality and Environment of Pre-developed Condition

1. How was the situation of the infrastructure in the previous housing condition?

a. Road inside the community? Yes/ No b. Running water? Yes/ No

c. Electricity? Yes/ No d. Sewerage? Yes/ No

e. Drainage? Yes/ No f. Waste collection? Yes/ No

g. Gas? Yes/ No h. Phone? Yes/ No

2. How was the situation of the infrastructure when you started dwelling here (new condition)?

a. Road inside the community? Yes/ No b. Running water? Yes/ No

c. Electricity? Yes/ No d. Sewerage? Yes/ No

e. Drainage? Yes/ No f. Waste collection? Yes/ No

g. Gas? Yes/ No h. Phone? Yes/ No

3. From when you first got infrastructure service?

a. Road inside the community A.D._____ b. Running water? A.D._____

c. Electricity? A.D._____ d. Sewerage? A.D._____

e. Drainage? A.D._____ f. Waste collection? A.D._____

g. Gas? A.D._____ h. Phone? A.D._____

4. How did you gain the infrastructure facility? (e.g. running water, electricity, telephone, road, drainage system, sewerage, gas) *Please describe

_____

5. How much does the connection of the infrastructure cost? _____Baht

How much does it cost to the construction cost? _____Baht

6. Is the present infrastructure adequate for the sustainable living? How?

_____

Part 10 Questionnaire on Characteristics of Building Construction & Extension Materials

1. Is the construction material easily available? Yes/ No

2. What kind of material you wish to utilize in terms of cost effective?

a. High cost b. Medium cost c. Less cost d. Average cost Used materials

3. How about the cost of your utilized building materials?

a. Reasonable b. High c. Too high

4. Which building material is pricing more in the recent years? Why?

_____

5. Who purchase the building materials for your house?

a. Owner b. Contractor c. Others (*Please specify) _____

6. Are the construction techniques and materials appropriate for the context, climate and natural disaster?

_____

7. Are the construction techniques and materials appropriate for maintenance and extension?

_____

8. Suggestions or the things that should be improved?

_____

Part 11 Questionnaire on Construction Labour

1. What kind of labour do you need during the construction processes? (*Able to choose more than one)

a. Masonry b. Surveyor c. Electrical fitting d. Water and sanitary fitting e. Metal skilled worker f. Carpenter g. Gas fitting h. Curved steel skilled worker i. Painting j. Others (*Please specify) _____

2. Are all types of labour adequate? Yes/ No

3. Who hire the all types of labour force for construction of your house?

a. Owner b. Contractor c. CODI/ NHA d. Others (*Please specify) _____

4. Who pay for the labour?

a. Owner b. Pay buy installments through CODI/ NHA

c. Others (*Please specify) _____

5. What is the payment method for the labour?

a. Daily payment basis b. Monthly payment c. Volume of work basis

d. Others (*Please specify) _____

6. How do you know the labours

a. From neighbour b. From cousins c. yourself

d. Others (*Please specify) _____

7. Do you give supervision of the construction to the labours?

_____

8. Suggestions or the things that should be improved?

_____

Part 12 Questionnaire on Materials Purchase Management

1. Who manage to purchase construction materials for you?

a. you yourself b. CODI/ NHA c. Others (*Please specify)_____

2. What about purchasing system? Is paying by installments ok or do you have to pay only by cash?

_____

_____

3. How many material traders are conducting business near your locality?

a. brick stone cement sand_____ b. steel_____ c. Electrical equipment_____

d. water fitting _____ e. paint/ colouring _____ f. wood _____

g. door & window _____ h. Others (*Please specify) _____

4. Suggestions or the things that should be improved?

_____

Part 13 Questionnaire on Construction Management and Processes

1. When have you started to reside in this Province (Khon Kaen)? A. D. _____How long have you totally been? _____year(s)

2. Are the details of construction drawing adequate? How?

_____

3. Have you had construction schedule or project administration during the construction period? How long of each house has to be completed (day, month, year)?

_____

4. Do you have criteria for screening the contractor? How? (*Please choose the appropriate one)

a. keenness of contractor b. experience of contractor c. having known the fame of contractor d. CODI helped to select e. Others (*Please specify) _____

5. How about construction method? (*Please choose the appropriate one)

a. Modern technology utilizing hi-technology b. Majorly using local skilled constructor

c. Mixed with a. and b. e. Others (*Please specify) _____

6. Where did you manage to keep construction materials during the construction period? (*Please choose the appropriate one)

a. Nearby road b. Nearby area c. Central community space

d. Others (*Please specify) _____

7. Did you have contemporary accommodation during construction period?

Yes/ No Where? _____

8. Did you have temporary accommodation for labours?

Yes/ No Where? _____

9. How did you manage the utilization of water and electricity during construction period of your house? (*Please choose the appropriate one)

a. Found yourself b. Got help from neighbour c. Others (*Please specify) _____

10. Problems/ Obstacles found during the construction period? (*Please explain)

_____

_____

11. Is the finished construction of your house satisfied? How? (*Please explain)

_____

_____

12. Suggestions on construction processes and management or things that should be implemented?

_____

_____

*** **Appreciation to you for your time to kind answer this questionnaire** ***

These sets of questionnaire are made for the integration of the research purposes, researcher asks for your kind help to fill in and make a response. In which, the data will be utilized for the study of housing. Appreciation is directed to your kindness in advance.

House No._____

Page1

Questionnaire

Part 1 Questionnaire on the Study of Space Utilization for Income Generating Activities (IGA), (Focusing on the IGS & IGA)

1. Household owner's Name_____ Age_____ year(s) old Gender_____

Occupation_____

2. Name of person who responses to the questionnaire_____ Age_____ year(s) old Gender_____

Occupation _____

3. Name of **Income Generation Space (IGS) user** at your house_____ Age_____ year(s) old

Gender_____ Occupation _____

4. Number of family member_____people

5. Do you utilize the space at your house to support your income generating activities? How? aa. Yes, I do bb. No, I don't

If you utilize, **you utilize that space for?** (purpose of utilization) __ a. grocery store b. prepare food to sell outside the home c. repair electronic equipments d. use as the space for keeping/ feeding animals (e.g. fish/ dog), and sell it by utilizing internet to contact customer e. selling beverage/ coffee/ fresh milk f. cutting meat, cooking rice, frying chicken, washing area, prepare to sell outside the home g. others (*Please specify) _____

6. Do you have an interest of having/ organizing space for IGS at your home? How? aa. Yes, I do bb. No, I don't If yes, **you utilize that space for?** (purpose of utilization)__ a. grocery store b. prepare food to sell outside the home c. repair electronic equipments d. use as the space for keeping/ feeding animals (e.g. fish/ dog), and sell it by utilizing internet to contact customer e. selling beverage/ coffee/ fresh milk f. cutting meat, cooking rice, frying chicken, washing area, prepare to sell outside the home g. others (*Please specify) _____

7. Do you satisfy with IGS at your home? How? aa. Yes, I do bb. No, I don't__a. size of space is enough for supporting income generating activities b. size of space is too small, need the additional space c. space has no privacy, need additional partition/ wall for privacy aspect d. others (*Please specify)_____

8. At home IGS/ space that is able to support income generating activities makes your life better? How? aa. Better bb. Not better __ a. formerly possessed only motorcycle, possess car at present ____no.(s) b. gaining more income c. my daily life is more comfortable d. save time to prepare products to sell outside the home e. satisfy that there is space at home that is able to support income generation activities, no need to earning/working outside (e.g. utilize as grocery store) f. others (*Please specify) _____

9. How much daily income can you gain from **utilizing IGS**? a. 100-200 Baht/day b. 201-300 Baht/day c. 301-400 Baht/day d. 401-500 Baht/day e. 501-600 Baht/day f. 601-700 Baht/day g. 701-800 Baht/day h. 801-900 Baht/day i. 901-1,000 Baht/day j. more than 1,000 Baht/day k. others (*Please specify)_____ Baht/day

10. Having IGS at your home affect to your life style? How?

a. Able to control working schedule/ don't have to rush b. Home is very important for life and earning activities c. Gaining more time to take care/ spend with my children and family d. Very happy with at home IGS

e. others (*Please specify) _____

11. What kind of income generation activities do you conduct by utilizing IGS support in earnings?

a. grocery store b. prepare food to sell outside the home c. repair electronic equipments d. use as the space for keeping/ feeding animals (e.g. fish/ dog), and sell it by utilizing internet to contact customer e. selling beverage/ coffee/ fresh milk f. cutting meat, cooking rice, frying chicken, washing area, prepare to sell outside the home

g. others (*Please specify) _____

12. What kind of income generation activities do you conduct in IGS, and when is the period of time? (*Please explain) e.g. 5:00-8:00 Preparing food to sell outside the home for morning session. 11:00-14:00 Preparing food to sell outside the home for afternoon session.

A. 24:00-1:00 Utilize IGS for _____ **B.** 1:00-2:00 Utilize IGS for _____

C. 2:00-3:00 Utilize IGS for _____ **D.** 3:00-4:00 Utilize IGS for _____

E. 4:00-5:00 Utilize IGS for _____ **F.** 5:00-6:00 Utilize IGS for _____

G. 6:00-7:00 Utilize IGS for _____ **H.** 7:00-8:00 Utilize IGS for _____

I. 8:00-9:00 Utilize IGS for _____ **J.** 9:00-10:00 Utilize IGS for _____

K. 10:00-11:00 Utilize IGS for _____ **L.** 11:00-12:00 Utilize IGS for _____

M. 12:00-13:00 Utilize IGS for _____ **N.** 13:00-14:00 Utilize IGS for _____

O. 14:00-15:00 Utilize IGS for _____ **P.** 15:00-16:00 Utilize IGS for _____

Q. 16:00-17:00 Utilize IGS for _____ **R.** 17:00-18:00 Utilize IGS for _____

S. 18:00-19:00 Utilize IGS for _____ **T.** 19:00-20:00 Utilize IGS for _____

U. 20:00-21:00 Utilize IGS for _____ **V.** 21:00-22:00 Utilize IGS for _____

W. 22:00-23:00 Utilize IGS for _____ **X.** 23:00-24:00 Utilize IGS for _____

13. How do you **customize/ organize IGS** for conducting income generating activities (*Please explain) e.g. 5:00-8:00 Pave linoleum for preparing food to sell outside the home for morning session. 11:00-12:00 Keep linoleum, pave matt instead for relaxation. 12:00-14:00 Pave linoleum for preparing food to sell outside the home for afternoon session.

A. 24:00-1:00 Utilize IGS for _____ **B.** 1:00-2:00 Utilize IGS for _____

C. 2:00-3:00 Utilize IGS for _____ **D.** 3:00-4:00 Utilize IGS for _____

E. 4:00-5:00 Utilize IGS for _____ **F.** 5:00-6:00 Utilize IGS for _____

G. 6:00-7:00 Utilize IGS for _____ **H.** 7:00-8:00 Utilize IGS for _____

I. 8:00-9:00 Utilize IGS for _____ **J.** 9:00-10:00 Utilize IGS for _____

K. 10:00-11:00 Utilize IGS for _____ **L.** 11:00-12:00 Utilize IGS for _____

M. 12:00-13:00 Utilize IGS for _____ **N.** 13:00-14:00 Utilize IGS for _____

O. 14:00-15:00 Utilize IGS for _____ **P.** 15:00-16:00 Utilize IGS for _____

Q. 16:00-17:00 Utilize IGS for _____ **R.** 17:00-18:00 Utilize IGS for _____

S. 18:00-19:00 Utilize IGS for _____ **T.** 19:00-20:00 Utilize IGS for _____

U. 20:00-21:00 Utilize IGS for _____ **V.** 21:00-22:00 Utilize IGS for _____

W. 22:00-23:00 Utilize IGS for _____ **X.** 23:00-24:00 Utilize IGS for _____

14. What is the **obstacle** to **gain IGS** at home?

a. Lack of finance b. Lack of knowledge in conducting an occupation c. Current occupation is not related in utilizing IGS at home (*Please specify the current occupation)_____ d. The home space is too small to organize the space to be IGS e. Have to ask permission from cooperative/ community in advance

f. Others (*Please specify) _____

15. What is **obstacle** in utilizing at home IGS? (e.g. home space is too small, budgetary limit)

a. Space is too small b. Budgetary limit c. Lack of equipments in conducting that of income generation activity (e.g. Lack of gas stove, large utensil/ pot for preparing food to sell outside the home

d. Others (*Please specify) _____

16. Do you have part time job? What kind of part time job do you do except from earning by utilizing at home IGS? (e.g. do a part time job at a restaurant, do a part time job as a house keeper near your community)

a. Do part time job at a restaurant b. Do part time job as a house keeper near your community

c. Do a part time job as a child keeper d. Do general part time jobs e. Cooking food for a special event

f. Others (*Please specify) _____

17. Do you ask for loan? How about loaning for conducting income generating activity?

aa. Yes bb. No **If yes, how often?** __ a. Once a month b. Once a year c. Twice a year

d. Others (*Please specify) _____

18. Who do you get loan from? How? Where?

a. Loaning from Sahakorn Chumchon (community cooperative) b. Unofficial loan c. Loaning from friends d. Loaning from relatives e. Loaning from bank for agriculture and agricultural cooperatives f. Loaning from government savings bank

g. Loaning from government-owned bank h. Others (*Please specify) _____

19. What kind of income generating activity do you get a loan for?

a. Purchasing product/ good for grocery store b. Purchasing materials for preparing food to sell outside the home

c. Purchasing equipments for conducting income generating activity in IGS d. Purchasing motorcycle for supporting IGS

transportation of products e. Purchasing pick up/ truck for transporting the products to sell f. Purchasing cart for transportation of products to sell g. For your children's education h. For your children's uniform i. Purchasing additional utensils j. Others (*Please specify) _____

20. How long for the contract of the loaning period? How many percentage of the interest?

a. 4% of interest/ year b. 6% of interest/ year c. 8% of interest/ year d. 10% of interest/ year

e. 12% of interest/ year f. Others (*Please specify) _____

21. How often do you involve with the loaning processes? How many times a year?

a. Once a month b. Once a year c. Twice a year

d. Others (*Please specify) _____

22. How much do you gain from utilizing IGS (daily/ monthly)?

a. 1,000 -2,000 Baht/month b. 2,001-3,000 Baht/month c. 3,001-4,000 Baht/month d. 4,001-5,000 Baht/month

e. 5,001-6,000 Baht/month f. 6,001-7,000 Baht/month g. 7,001-8,000 Baht/month h. 8,001-9,000 Baht/month

i. 9,001-10,000 Baht/month j. 10,001-12,000 Baht/month k. 12,001-15,000 Baht/month l. 15,001-20,000 Baht/month

m. 20,001-30,000 Baht/month n. More than 30,001 Baht/month

o. Others (*Please specify)_____ (Baht/day, Baht/month)

23. Who utilize IGS at your home? Who utilize the most? When is the period of utilization? (*Please specify)

a. Father utilizes _____ - _____ o'clock b. Mother utilizes _____ - _____ o'clock

c. Son utilizes _____ - _____ o'clock d. Daughter utilizes _____ - _____ o'clock

e. Grandfather utilizes _____ - _____ o'clock f. Grandmother utilizes _____ - _____ o'clock

g. Others (*Please specify) _____

24. Do you need additional equipments for income generating activities? What kind of equipments?

aa. Yes bb. No **<u>If yes, what?</u>** **<u>*Please specify</u>** _____

25. Which type of house do you intentionally need (detached housing/ row type housing)? Which type is better for your income generating activities?

a. Single storey detached house b. Two storey detached house c. Single storey twin house

d. Two storey twin house e. Single storey row house f. Two storey role house

g. Others (*Please specify) _____ What is the reason of that chosen type?

_____

26. What about permission of using home as IGS? Is it need for to ask for a permission in advance, with whom?

aa. Yes bb. No **<u>Ask the permission from?</u>** __ a. Community leader b. Community committees c. Community cooperative d. Municipality e. CODI f. Others (*Please specify) _____

27. What should be implemented/ improved on housing regulations/ laws? What kind of issue that is yet to be enough at this moment?

a. Be more flexible for allowance to build more space in the same plot b. Decreasing set back around the house

c. Others (*Please specify) _____

28. Does the time variation has an effect on spatial utilization? (e.g. spatial organization, arrangement of interior furniture)

aa. Yes, it does bb. No, it doesn't How?

_____

29. Does the keenness/ skill on conducting the occupation has an effect on choosing the income generating activities to perform in IGS?

aa. Yes, it does bb. No, it doesn't How?

_____

30. Does the gender have an effect on utilizing IGS? (e.g. selling food is only for female's task)

aa. Yes, it does bb. No, it doesn't How?

_____

31. Is the level of education necessary for conducting income generation activities in IGS? (e.g. need high education)

aa. Yes, it is bb. No, it isn't How?

_____

32. Is the transportation necessary for moving the product to sell outside the home?

aa. Yes, it is bb. No, it isn't What kind of vehicle do you use at present?

a. Handcart b. Bicycle attached with side car c. Motorcycle d. Motorcycle attached with side car

e. Pick up/ truck f. Saloon g. Tuk Tuk (three-wheel motorcycle with roof covering)

h. Public bus/ two rows seat bus i. Three-wheel motorcycle j. Three-wheel bicycle

k. Others (*Please specify) _____

House No._____

Questionnaire

Part 2 Questionnaire on Utilization of IGS to Support Income Generating Activities (e.g. Utilize your home as a grocery store or prepare food to sell outside the home)

Description Please make a ✓ in a column of each answer that appropriately suits your opinion

Issue of Question Focusing on IGS Outlook	Evaluation Level					
	Very High (5)	High (4)	Moderate (3)	Low (2)	Very Low (1)	No need/ No Use (0)
1) Questionnaire on Importance of IGS						
1. Do you want at home IGS?						
2. Do you have an interest of having IGS at your home?						
3. Do you have IGS at your home (e.g. products selling space, food preparing space)?						
4. Do you satisfy with IGS?						
5. Can IGS at your home help you create income for your family? Useful?						
6. Others (*Please specify)						
3) Questionnaire on Location of IGS						
1. Utilize lower floor (first floor) to suport Income Generating Activity (IGA)						
2. Utilize upper floor (second floor) to suport IGA						
3. Utilize lower floor (first floor) inside the house to suport IGA						
4. Utilize lower floor (first floor) in front of the house (front porch) to suport IGA						
5. Utilize lower floor (first floor) back of the house to suport IGA						
6. You conduct IGA at home						
7. Others (*Please specify)						
3) Questionnaire on Utilizing IGS Permission						
1. If there is request to utilize IGS at home, do you need the permission?						
2. Ask for the permission from community committee						
3. Ask for the permission from community cooperative						
4. Ask for the permission from the municipality						
5. Is there any obstacle of permission to use at home IGS						
6. Do you want to adjust the housing permission? (e.g. to be more flexible)						
7. Others (*Please specify)						
4) Questionnaire on Characteristics of IGS Utilization						
1.You prepare products at home, and go to sell outside the home, community						
2. You earn money outside the home, not use at home IGS						
3. Do you do a part time job?						
4. Others (*Please specify)						
5) Questionnaire on Obstacle of Using the IGS						
1. Is there any obstacle on utilizing at home IGS?						
2. Is the IGS size too small?						
3. Do you need more space for IGS?						
4. Others (*Please specify)						

6) Questionnaire on Space Configuration for IGS						
1. Do you want to have your house extended?						
2. Do you want to have your house extended for IGA?						
3. Do you want to have your house decorated?						
4. Do you want to have your house decorated for IGA?						
5. Have you configured your home space for IGA?						
6. Have you extended your house?						
7. Have you extended your house for IGA?						
8. Have you decorated your house?						
9. Have you decorated your house for IGA?						
10. Others (*Please specify)						
7) Questionnaire on Financial Management for IGS						
1. Do you need skill or additional knowledge for conducting IGA by utilizing IGS?						
2. Is there any need for fund for IGA by utilizing IGS?						
3. Do you lack of fund for conducting IGA by utilizing IGS?						
4. Have you borrowed money for investment for IGA?						
5. Have you borrowed money for extension/ house maintenance for IGA?						
6. Have you borrowed money from community cooperative?						
7. Have you borrowed money from relatives?						
8. Have you borrowed money from neighbor/ friend?						
9. Have you borrowed money from bank out of the community?						
10. Have you borrowed money from outsourced finance?						
11. How about rate of interest?						
12. You borrow money once a month						
13. You borrow money once a year						
14. Others (*Please specify)						
8) Questionnaire on Gender Implication and IGS Utiliztion						
1. Father utilizes IGS						
2. Mother utilizes IGS						
3. Son utilizes IGS						
4. Daughter utilizes IGS						
5. Male relative utilizes IGS						
6. Female relative utilizes IGS						
7. Grandfather (mother's side) utilizes IGS						
8. Grandmother (mother's side) utilizes IGS						
9. Grandfather (father's side) utilizes IGS						
10. Grandmother (father's side) utilizes IGS						
11. Others (*Please specify)						
9) Questionnaire on Requisiteness of Equipments for Supporting IGA of IGS						
1. Is your present IGS appropriate for IGA?						
2. House space is to small for conducting IGA						
3. Are equipments for conducting IGA plenty?						
4. Do you need additional equipments for conducting IGA?						
5. Others (*Please specify)						

10) Questionnaire on Requisiteness of Mobility, Vehicle and Transportation for Supporting Earning Activities						
1. Need of motorcycle for conducting occupation (e.g. transportation of the products to sell outside the home)						
2. Need of motorcycle attached with side car for conducting occupation (e.g. transportation of the products to sell outside the home)						
3. Need of handcart for conducting occupation (e.g. transportation of the products to sell outside the home)						
4. Need of bicycle attached with side car for conducting occupation (e.g. transportation of the products to sell outside the home)						
5. Need of car for conducting occupation (e.g. transportation of the products to sell outside the home)						
6. How often of the public bus that pass by the community?						
7. Others (*Please specify)						
11) Questionnaire on Time and Utilization of IGS						
1. You utilize IGS around 24:00-1:00 o'clock						
2. You utilize IGS around 1:00-2:00 o'clock						
3. You utilize IGS around 2:00-3:00 o'clock						
4. You utilize IGS around 3:00-4:00 o'clock						
5. You utilize IGS around 4:00-5:00 o'clock						
6. You utilize IGS around 5:00-6:00 o'clock						
7. You utilize IGS around 6:00-7:00 o'clock						
8. You utilize IGS around 7:00-8:00 o'clock						
9. You utilize IGS around 8:00-9:00 o'clock						
10. You utilize IGS around 9:00-10:00 o'clock						
11. You utilize IGS around 10:00-11:00 o'clock						
12. You utilize IGS around 11:00-12:00 o'clock						
13. You utilize IGS around 12:00-13:00 o'clock						
14. You utilize IGS around 13:00-14:00 o'clock						
15. You utilize IGS around 14:00-15:00 o'clock						
16. You utilize IGS around 15:00-16:00 o'clock						
17. You utilize IGS around 16:00-17:00 o'clock						
18. You utilize IGS around 17:00-18:00 o'clock						
19. You utilize IGS around 18:00-19:00 o'clock						
20. You utilize IGS around 19:00-20:00 o'clock						
21. You utilize IGS around 20:00-21:00 o'clock						
22. You utilize IGS around 21:00-22:00 o'clock						
23. You utilize IGS around 22:00-23:00 o'clock						
24. You utilize IGS around 23:00-24:00 o'clock						
25. Others (*Please specify)						

12) Questionnaire on Time and Utilization of IGS for Other Activities (e.g. relaxation, sleeping, watching TV, reading books, meeting)						
1. You utilize IGS for other activities around 24:00-1:00 o'clock						
2. You utilize IGS for other activities around 1:00-2:00 o'clock						
3. You utilize IGS for other activities around 2:00-3:00 o'clock						
4. You utilize IGS for other activities around 3:00-4:00 o'clock						
5. You utilize IGS for other activities around 4:00-5:00 o'clock						
6. You utilize IGS for other activities around 5:00-6:00 o'clock						
7. You utilize IGS for other activities around 6:00-7:00 o'clock						
8. You utilize IGS for other activities around 7:00-8:00 o'clock						
9. You utilize IGS for other activities around 8:00-9:00 o'clock						
10. You utilize IGS for other activities around 9:00-10:00 o'clock						
11. You utilize IGS for other activities around 10:00-11:00 o'clock						
12. You utilize IGS for other activities around 11:00-12:00 o'clock						
13. You utilize IGS for other activities around 12:00-13:00 o'clock						
14. You utilize IGS for other activities around 13:00-14:00 o'clock						
15. You utilize IGS for other activities around 14:00-15:00 o'clock						
16. You utilize IGS for other activities around 15:00-16:00 o'clock						
17. You utilize IGS for other activities around 16:00-17:00 o'clock						
18. You utilize IGS for other activities around 17:00-18:00 o'clock						
19. You utilize IGS for other activities around 18:00-19:00 o'clock						
20. You utilize IGS for other activities around 19:00-20:00 o'clock						
21. You utilize IGS for other activities around 20:00-21:00 o'clock						
22. You utilize IGS for other activities around 21:00-22:00 o'clock						
23. You utilize IGS for other activities around 22:00-23:00 o'clock						
24. You utilize IGS for other activities around 23:00-24:00 o'clock						
25. Others (*Please specify)						
13) Questionnaire on Other Purposes of Utilizing IGS						
1. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as relaxation space						
2. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as bedroom						
3. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as eating space						
4. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as workplace						
5. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) for reading book						
6. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as dressing space						
7. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as storage						
8. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as cooking space						
9. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as bicycle parking space						
10. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as motorcycle parking space						
11. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as living room						
12. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as recreation space						
13. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) for organizing ceremonies						
14. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as laundry space						
15. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as ironing space						
16. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as shower space						
17. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as exercise space						
18. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) as keeping/ feeding animals space						
19. Apart from utilizing your home as IGS, utilizing lower floor (1st floor) for other purposes						

<u>Part 3</u> Questionnaire on Suggestions and Recommendations of IGS Utilization

Utilizing home apart from a residing purpose, home can be used for supporting income generation activities by utilizing IGS.

What should be implemented/ enhanced?

1. What should be enhanced about importance of utilizing at home IGS? (e.g. space is too small, need larger space)

a. Space is too small, need larger space b. Need more flexible housing regulations

c. Others (*Please specify) _____

2. Does location of at home IGS have an effect on conducting income generating activities? (e.g. 1st floor, upper floor, exterior space of the house, front space of 1st floor, rear space of 1st floor, exterior space back of the house).

Which position suit you best?

a. 1st floor b. Upper floor c. Exterior space of the house d. front space of 1st floor

e. Rear space of 1st floor f. Exterior space back of the house

g. Others (*Please specify) _____

3. What should be enhanced about permission of utilizing IGS for income generating activities? (e.g. able to build more space, be more flexible regulations)

a. Delay of permission should be faster b. Need more of the space for IGS c. Need more of the space for extension

d. Need more flexible of housing regulations e. Others (*Please specify) _____

4. What should be enhanced about characteristics of IGS? (e.g. prepare all things at home to sell, or prepare some parts and finish outside)?

a. Need to prepare all things at home before going to sell outside the home b. Prepare some parts at IGS and finish outside at the selling area c. Others (*Please specify) _____

5. What should be enhanced about obstacle in utilizing IGS?

a. IGS at present is too small, need more space for IGS b. Lack of finance for extending the business c. Lack of equipments for conducting that of the income generation activity (e.g. large rice cooker (utensil), Large pot, fridge)

d. Others (*Please specify) _____

6. What should be enhanced about spatial organization for IGS? (e.g. furniture arrangement, decoration or extension)

a. Limit of the space to purchase new furniture to put in, therefore have to choose only that of the necessity b. Need additional furniture for conducting income generating activity (e.g. fridge, storage) c. Need brighter of lighting system in IGS (not plenty of light at the present) d. Want to decorate IGS (e.g. pave additional tiles for easily cleaning the space)

e. Others (*Please specify) _____

7. What should be enhanced about financial management for IGS? (e.g. rate of interest, payback period, financial source)

a. Need low-interest rate financial source b. Need long term loan finance c. Need long term loan with low-interest rate finance d. Need workshop training of financial knowledge e. Need knowledge training of cooperative, savings, and financial management f. Others (*Please specify) _____

8. Does gender implication have an effect on and IGS utilization? (e.g. Which gender utilize IGS more?)

a. Male utilizes IGS more than female b. Female utilizes IGS more than male

c. Male utilizes IGS as equal as female d. Gender does not have an effect on IGS utilization. Whoever can utilize the IGS
e. Others (*Please specify) _____

9. What should be enhanced about demand on equipments & tools in conducting income generating activities by utilizing IGS?

a. Need additional/ more equipments for conducting income generating activities such as (*Please specify)
_____

b. No need for additional equipments, it is plenty at this moment c. Need vehicle for transportation of products such as (*Please specify) _____ d. Others (*Please specify) _____

10. What should be enhanced about demand on vehicle, transportation system for income generating activities?

a. Handcart b. Bicycle attached with side car c. Motorcycle attached with side car
d. Pick up/ truck e. Saloon f. Three-wheel motorcycle g. It is enough
h. Others (*Please specify) _____

11. What should be enhanced about period of time and IGS utilization?

a. It is good to spend the time on IGS in the morning period b. It is good to spend the time on IGS in the afternoon period
c. It is good to spend the time on IGS at nighttime d. Others (*Please specify) _____

12. What should be enhanced about period of time, time variation and IGS utilization for extra activities apart from income generating activities (e.g. relaxation, sleeping, watching television, reading a book, meeting)

a. It is good to do extra activity in IGS apart from income generating activities in the morning period b. It is good to do extra activity in IGS apart from income generating activities in the afternoon period c. It is good to do extra activity in IGS apart from income generating activities at nighttime d. Able to conduct both income generating activities and extra activities at the same time e. Others (*Please specify) _____

13. What is other purpose of utilizing at home IGS apart from using IGS for income generating activities? What do you utilize IGS for? (e.g. relaxation, watching television, eating)

a. Sitting b. Sleeping c. Watching TV d. Listening to music e. Working
f. Teaching homework for children g. Exercising h. Dressing i. Ironing j. Cloth drying
k. Storage l. Motorcycle parking m. Bicycle parking n. Others (*Please specify) _____

*** **Appreciation to you for your time and your kindness to answer this questionnaire** ***

แบบสอบถาม

แบบสอบถามชุดนี้จัดทำขึ้นเพื่อใช้ประกอบการวิจัย ผู้วิจัยขอความอนุเคราะห์ในการตอบแบบสอบถาม ซึ่งข้อมูลเหล่านี้นำไปใช้เพื่อศึกษาชุมชนตัวอย่างในการจัดการชุมชน จึงขอขอบพระคุณท่านล่วงหน้ามา ณ โอกาสนี้

แบบสอบถาม

ส่วนที่ 1 ศึกษาที่อยู่อาศัย

1. เจ้าของบ้านชื่อ_____ อายุผู้อยู่อาศัย_____ปี เพศ_____

2. อาชีพ_____ ระดับการศึกษาสูงสุด_____

3. จำนวนสมาชิกในครอบครัว_____คน หากเป็นครอบครัวขยายโปรดระบุสมาชิก เช่น ปู่ ย่า ตา ยาย ญาติ_____ ท่านมีผู้สูงอายุ หรือเด็กเล็กอาศัยอยู่ที่บ้านหรือไม่ ถ้ามีโปรดระบุ_____

4. รายได้เฉลี่ยต่อเดือน_____ บาท

5. ซื้อที่ดินนี้เมื่อไร_____

6. เข้าอยู่อาศัยเมื่อ พ.ศ.25_____ สร้างบ้านหลังนี้มาแล้ว _____ปี

7. พื้นที่ใช้สอยเฉลี่ยต่อชั้น_____ตร.ม.

8. ค่าใช้จ่ายในการก่อสร้างบ้านของท่าน _____บาท

9. ท่านสร้างบ้านด้วยตัวเอง หรือจ้างช่างมาช่วยสร้าง_____ถ้าจ้างค่าแรง_____บาท/วัน

10. ค่าบำรุงรักษาซ่อมแซมบ้าน เช่น การซ่อมแซมวัสดุที่ชำรุด _____บาท/เดือน

11. ท่านมีรายได้? _____บาท/เดือน ต้องผ่อนชำระค่าที่อยู่อาศัย _____บาท/เดือน เป็นเวลาทั้งสิ้น_____ปี เหลือระยะเวลาอีกกี่ปีจึงจะหมดภาระการผ่อน _____ ปี

12. ท่านต้องจ่ายค่าไฟฟ้า _____บาท/เดือน ค่าน้ำ _____บาท/เดือน ค่าใช้จ่ายกินอยู่ต่อวัน _____บาท ค่าเลี้ยงดูบุตร_____บาท/เดือน ค่าเลี้ยงดูผู้สูงอายุ _____บาท/เดือน เงินออมเฉลี่ย _____บาท/เดือน ค่าใช้จ่ายเบ็ดเตล็ดอื่นๆ _____บาท/เดือน

13. มีคนที่เกี่ยวข้องในการซ่อมแซมบ้านกี่คน?_____คน ใครบ้าง?_____ทำหน้าที่?_____

14. ขณะที่ท่านเริ่มเข้าอยู่อาศัยที่บ้านของท่าน มีบ้านที่สร้างเสร็จแล้วในชุมชนกี่หลัง_____

15. ใช้เวลาในการก่อสร้างบ้านของท่านจนแล้วเสร็จนานเท่าใด_____ ปี

--โครงสร้างหลัก ใช้เวลานานเท่าใด

ฐานราก_____ ปี โครงสร้างเสา คาน_____ ปี โครงหลังคา_____ ปี

--เปลือกอาคาร ใช้เวลานานเท่าใด (สิ่งปิดล้อมเช่น ผนัง ประตู, หน้าต่าง, หลังคา)

ผนังก่ออิฐฉาบปูน_____ ปี ติดตั้งวงกบ ประตูหน้าต่าง_____ ปี มุงหลังคา_____ ปี ทาสี เก็บรายละเอียด_____ ปี ทำรั้วกัน_____ ปี ปลูกต้นไม้_____ ปี ชื่อต้นไม้หรือพืชผักที่ปลูก_____

16. ปัญหาที่พบเกี่ยวกับบ้าน และควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 2 พื้นที่ใช้สอยภายใน ภายนอกบ้าน และพื้นที่สร้างรายได้

1. ท่านให้ความสำคัญกับพื้นที่ใดมากที่สุด (โปรดระบุวัตถุประสงค์การใช้พื้นที่)

ก. ห้องเอนกประสงค์ชั้นล่าง _____

ข. ห้องครัว _____

ค. ห้องนอน_____

ง. ห้องน้ำ_____

จ. พื้นที่ซักล้าง_____

ฉ. อื่นๆ_____

2. ท่านมีการต่อเติมหรือไม่

ส่วนใดของบ้าน และเพื่อใช้สอยอะไร

_____

3. พื้นที่ต่อเติมกี่ตารางเมตร_____

4. ใครเป็นคนออกแบบต่อเติมบ้านของท่าน (โปรดเลือกหนึ่งข้อ)

ก. ตัวท่านเอง ข. ตัวเอง+ครอบครัว ค. ตัวเอง+ครอบครัว+ญาติ ง. ตัวเอง+เพื่อนบ้าน

ระบุ_____

5. ท่านมีพื้นที่ต่อเติมปรับปรุงหน้าบ้านหรือไม่_____เป็นพื้นที่อะไร_____กี่ตารางเมตร

6. เริ่มมีการต่อเติมครั้งแรก พ.ศ.25_____ ซึ่งเป็นพื้นที่ที่ใช้เพื่อการ_____

ปัจจุบันยังมีการต่อเติมปรับปรุงอยู่หรือใหม่_____เป็นพื้นที่เพื่อการ_____

7. ใครเป็นคนใช้พื้นที่นั้นๆ

ก. ห้องเอนกประสงค์ชั้นล่าง_____

ข. ห้องครัว_____

ค. ห้องนอน_____

ง. ห้องน้ำ_____

จ. พื้นที่ซักล้าง_____

ฉ. อื่นๆ_____

8. ช่วงระยะเวลาที่ใช้พื้นที่ (เช่น 8:00-16:00)_____

พื้นที่เอนกประสงค์ชั้นล่าง_____

ห้องครัว_____

ห้องนอน_____

ห้องน้ำ_____

พื้นที่ซักล้าง_____

อื่นๆ (โปรดระบุ)_____

9. พื้นที่สร้างรายได้นั้นเป็นพื้นที่อะไร เช่น ขายขนม ขายกาแฟ ซักอบรีด ตากอาหารแห้ง

_____

10. พื้นที่สร้างรายได้นั้น ทำให้ท่านมีรายได้กี่บาทต่อเดือน_____บาท

11. ความพึงพอใจต่อพื้นที่สร้างรายได้ หรือพื้นที่ที่ท่านจัดเฟอร์นิเจอร์พื้นที่ใช้สอยเอง_____

_____

12. พื้นที่ใช้สอยเฉลี่ยต่อชั้น_____ตร.ม.

13. ปัญหาที่พบเกี่ยวกับการต่อเติมปรับปรุงพื้นที่ใช้สอยของบ้านหลังจากที่ท่านเข้าไปอยู่อาศัย ควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 3 วัสดุที่ใช้ใน<u>การสร้างบ้าน</u>

1. ราคา**บ้าน**ของท่านเบ็ดเสร็จ_____ บาท

   ราคา**ที่ดิน**ของท่าน_____ บาท

2. ใช้วัสดุประเภทไหน (โปรดเลือกหนึ่งข้อ)

ก. วัสดุถาวร ข. วัสดุกึ่งถาวร ค. วัสดุชั่วคราว

3. ใช้โครงสร้างประเภทไหน

ก. โครงสร้างถาวร ข. โครงสร้างกึ่งถาวร ค. โครงสร้างชั่วคราว (โปรดเลือกหนึ่งข้อ)

4. ราคาวัสดุ (ราคา ณ ตอนที่ซื้อมาสร้าง)

-วัสดุทำฐานราก ปูน_____ บาท เหล็ก_____ บาท

-วัสดุทำผนัง ปูน_____ บาท เหล็ก_____ บาท วงกบ_____ บาท ประตู_____ บาท หน้าต่าง _____ บาท

-วัสดุทำหลังคา เหล็กโครงหลังคา_____ บาท กระเบื้อง_____ บาท

-วัสดุเบ็ดเตล็ดอื่น (โปรดระบุ)_____ บาท

5. ชนิดของวัสดุ(โปรดเลือกหนึ่งข้อ)

ก. วัสดุใหม่ ข. วัสดุเก่าจากบ้านหลังเดิมก่อนปรับปรุง ค. วัสดุใหม่+วัสดุเก่าจากบ้านหลังเดิมก่อนปรับปรุง

ง. อื่นๆ(โปรดระบุ)_____

6. การได้มาซึ่งวัสดุ (สามารถเลือกได้มากกว่าหนึ่งข้อ)

ก. ซื้อใหม่ ข. วัสดุรีไซเคิล ค. เพื่อนบ้านหรือญาติพี่น้องให้มา ง. อื่นๆ(โปรดระบุ)_____

7. ข้อเสนอแนะ หรือสิ่งที่อยากได้ให้แก้ไขปรับปรุงเรื่องวัสดุที่ใช้ในการสร้างบ้าน

_____

ส่วนที่ 4 วัสดุที่ใช้ใน<u>การต่อเติม</u>

1. ท่านมีการต่อเติมปรับปรุงส่วนใดของบ้าน_____ วัตถุประสงค์การต่อเติมปรับปรุงเพื่อ_____

2. การต่อเติมปรับปรุง ใช้วัสดุประเภทไหน (โปรดเลือกหนึ่งข้อ)

ก. วัสดุถาวร ข. วัสดุกึ่งถาวร ค. วัสดุชั่วคราว

3. การต่อเติมปรับปรุง ใช้โครงสร้างประเภทไหน

ก. โครงสร้างถาวร ข. โครงสร้างกึ่งถาวร ค. โครงสร้างชั่วคราว (โปรดเลือกหนึ่งข้อ)

4. ราคาวัสดุที่ใช้ในการต่อเติมปรับปรุง (ราคา ณ ตอนที่ซื้อมาสร้าง)

-วัสดุทำฐานราก ปูน_____ บาท เหล็ก_____ บาท

-วัสดุทำผนัง ปูน_____ บาท เหล็ก_____ บาท วงกบ_____ บาท ประตู_____ บาท หน้าต่าง _____ บาท

-วัสดุทำหลังคา เหล็กโครงหลังคา_____ บาท กระเบื้อง_____ บาท

-วัสดุเบ็ดเตล็ดอื่น (โปรดระบุ)_____ บาท

5. ชนิดของวัสดุ(โปรดเลือกหนึ่งข้อ)

ก. วัสดุใหม่ ข. วัสดุเก่าจากบ้านหลังเดิมก่อนปรับปรุง ค. วัสดุใหม่+วัสดุเก่าจากบ้านหลังเดิมก่อนปรับปรุง

ง. อื่นๆ(โปรดระบุ)_____

6. การได้มาซึ่งวัสดุ (สามารถเลือกได้มากกว่าหนึ่งข้อ)

ก. ซื้อใหม่ ข. วัสดุรีไซเคิล ค. เพื่อนบ้านหรือญาติพี่น้องให้มา ง. อื่นๆ(โปรดระบุ)_____

7. ข้อเสนอแนะ หรือสิ่งที่อยากได้เรื่องวัสดุที่ใช้ในการต่อเติมปรับปรุงบ้าน

_____

ส่วนที่ 5 การได้มาซึ่งบ้าน การมีส่วนร่วมและการจัดการชุมชน

1. ท่านมีการประชุมที่จัดภายในชุมชน_____ ครั้ง/เดือน

หัวข้อในการประชุมเรื่องใดบ้าง_____

ใครเป็นผู้เข้าร่วมในการประชุม_____

2. ท่านมีการประชุมที่จัดภายนอกชุมชน_____ ครั้ง/เดือน

หัวข้อในการประชุมเรื่องใดบ้าง_____

ใครเป็นผู้เข้าร่วมในการประชุม_____

3. สิ่งที่ได้จากการประชุม ข้อดีและข้อด้อย_____

4. ข้อเสนอแนะ หรือสิ่งที่อยากได้ปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 6 กลุ่มออมทรัพย์

1. ท่านเข้าร่วมเป็นสมาชิกกลุ่มออมทรัพย์มาแล้วกี่ปี_____ตั้งแต่ พ.ศ.25_____

2. กลุ่มออมทรัพย์ช่วยในการพัฒนาด้านใดบ้าง_____

3. ท่านมีการออมกับกลุ่มออมทรัพย์_____บาท/ เดือน

4. ท่านต้องชำระค่าบ้าน_____บาท/ เดือน ชำระมาแล้วกี่ปี/เดือน_____ เหลืออีกกี่ปี/เดือนจึงจะแล้วเสร็จ_____

5. ท่านต้องชำระค่าที่ดิน_____บาท/ เดือน ชำระมาแล้วกี่ปี/เดือน_____ เหลืออีกกี่ปี/เดือนจึงจะแล้วเสร็จ_____

6. เคยกู้เงินกับกลุ่มออมทรัพย์หรือไม่_____จำนวนเงิน_____บาท

7. ได้รับเงินปันผล_____ บาท/เดือน

8. ได้รับสวัสดิการด้านใดบ้าง_____

9. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 7 ลักษณะทางกายภาพ และการวางผังจัดการ

1. พื้นที่ดินของท่านขนาด_____ ตร. ม./ ตร. วา.

2. ชนิดของโครงสร้าง (โปรดเลือกหนึ่งข้อ)

ก. โครงสร้างถาวร ข. โครงสร้างกึ่งถาวร ค. โครงสร้างชั่วคราว

3. บ้านของท่านเป็นบ้านกี่ชั้น_____ชั้น โครงสร้างบ้านมีไว้เพื่อก่อสร้างบ้านได้กี่ชั้น_____ บ้านโดยทั่วไปในชุมชนเป็นบ้านกี่ชั้น_____ ทำไมท่านจึงเลือกบ้าน 1, 2 ชั้น_____

4. ใครเป็นคนออกแบบบ้านของท่าน (โปรดเลือกหนึ่งข้อ)

ก. ตัวเอง ข. ตัวเอง+ครอบครัว ค. ตัวเอง+ครอบครัว+ญาติ ง. ตัวเอง+เพื่อนบ้าน

จ. ตัวเอง+วิศวกร ฉ. ตัวเอง+สถาปนิก ช. พอช ซ. อาจารย์มหาวิทยาลัย ฌ. บริษัทผู้รับเหมา ญ. อื่นๆ โปรดระบุ_____

5. ใครเป็นคนลงมือสร้างบ้านของท่าน (โปรดเลือกหนึ่งข้อ)

ก. ตัวเอง ข. ตัวเอง+ครอบครัว ค. ตัวเอง+ครอบครัว+ญาติ ง. ตัวเอง+เพื่อนบ้าน

จ. ตัวเอง+วิศวกร ฉ. ตัวเอง+สถาปนิก ช. พอช ซ. อาจารย์มหาวิทยาลัย ฌ. บริษัทผู้รับเหมา ญ. อื่นๆ โปรดระบุ_____

6. ใครเป็นคนออกแบบระบบโครงสร้างบ้านของท่าน (โปรดเลือกหนึ่งข้อ)

ก. ตัวเอง ข. ตัวเอง+ครอบครัว ค. ตัวเอง+ครอบครัว+ญาติ ง. ตัวเอง+เพื่อนบ้าน

จ. ตัวเอง+วิศวกร ฉ. ตัวเอง+สถาปนิก ช. พอช ซ. อาจารย์มหาวิทยาลัย ฌ. บริษัทผู้รับเหมา ญ. อื่นๆ โปรดระบุ_____

7. ชนิดของโครงสร้าง (โปรดเลือกหนึ่งข้อ)

ก. โครงสร้างถาวร ข. โครงสร้างกึ่งถาวร ค. โครงสร้างชั่วคราว

8. พื้นที่ตั้งของโครงการมีความเหมาะสมต่อสภาพภูมิอากาศ ทำเลที่ตั้ง และการประกอบอาชีพ รวมทั้งพื้นที่โดยรอบชุมชน หรือไม่ อย่างไร_____

9. พื้นที่ตั้งของโครงการมีการคำนึงถึง ส่งเสริมด้านเศรษฐกิจ การประกอบอาชีพของคนในชุมชน มีการพิจารณาด้านการใช้ประโยชน์ที่ดิน และระบบสาธารณูปโภค หรือไม่ อย่างไร_____

10. พื้นที่ตั้งของโครงการส่งเสริมให้เกิดความปลอดภัยในการดำรงชีพ ความรู้สึกปลอดภัย ความพึงพอใจมีความสุขในการอยู่อาศัย และการอยู่ร่วมกับเพื่อนบ้านหรือไม่ อย่างไร

_____

11. มีความจำเป็นหรือไม่ อย่างไร ที่จะต้องการมีแบบบ้านที่ต่างกัน สืบเนื่องมาจากเรื่องที่ตั้ง ภูมิประเทศ หรือขนาดของครอบครัว และสภาพครัวเรือน หรือไม่ อย่างไร_____

12. มีการเปลี่ยนแปลงใดบ้างเกี่ยวกับแนวคิดในการวางผังหรือการสร้างบ้านของท่าน ระหว่างอดีตและปัจจุบัน_____

13. ทำไมกฎหมายหรือข้อกำหนดในการสร้างบ้านของท่าน จึงมีการปรับเปลี่ยนไป (ตัวอย่างคำตอบเช่น ความต้องการพื้นที่อยู่อาศัยเพิ่มขึ้น ขนาดพื้นที่บ้านจำกัด)_____

_____

14. การเปลี่ยนแปลงของบ้านของท่านอะไรบ้าง ที่ท่านได้ลงมือปรับตกแต่ง เปรียบเทียบกับตอนเริ่มเข้าอยู่อาศัยทีแรก (ตัวอย่างคำตอบเช่น มีการต่อเติมพื้นที่ใช้สอย ต่อเติมหลังคา ทุบผนัง ก่อผนังเพิ่ม)_____ _____

15. ท่านคิดว่ามีสิ่งใดบ้างในด้านไม่ค่อยดี หรืออยากปรับปรุง เกี่ยวกับแนวโน้มเกี่ยวกับบ้านของท่าน (สามารถเลือกได้มากกว่าหนึ่งข้อ)

ก. สิ่งแวดล้อมไม่ค่อยดี ข. พื้นที่ข้างเคียงไม่ค่อยดี ค. ระบบสาธารณูปโภคไม่ดี ง. การอยู่อาศัยแออัดเกินไป จ. การระบายอากาศไม่เพียงพอ ฉ. แสงไฟไม่เพียงพอ ช. อื่นๆ โปรดระบุ_____

16. มีพื้นที่เปิดโล่ง สวนสาธารณะ สนามเด็กเล่น ที่จอดรถยนต์ พื้นที่ส่วนกลางภายในชุมชนหรือไม่? ต้องการปรับปรุงด้านใดบ้าง? พื้นที่ประมาณกี่ ตรม.?

_____

17. อะไรคือสิ่งที่ต้องการเร่งด่วนที่สุด หรือสิ่งที่อยากให้ปรับปรุงมากที่สุด เกี่ยวกับการพัฒนาบ้าน ที่อยู่อาศัยในพื้นที่ชุมชน เช่น ความปลอดภัย กฎหมายข้อบังคับ ความคงทนยั่งยืน สุขภาพการดำรงชีพ ความสะดวกสบาย หรือพื้นที่ใช้สอย_____

18. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 8 คุณภาพของบ้าน

<u>ความยั่งยืนทางกายภาพ</u>

1. ชนิดของวัสดุมุงหลังคา คืออะไร (โปรดเลือกข้อที่เหมาะสม)

ก. วัสดุคงทนถาวร (หลังคากระเบื้องลอนคู่) ข. วัสดุกึ่งถาวร (หลังคาเหล็กสังกะสี) ค. วัสดุชั่วคราว ไม่ถาวร (หญ้าคาและโครงไม้ไผ่) ง. อื่นๆ โปรดระบุ_____

2. วัสดุที่ใช้ทำกำแพง คืออะไร (โปรดเลือกข้อที่เหมาะสม)

ก. อิฐแดงฉาบปูน ข. อิฐบล็อกฉาบปูน ค. ผนังเบา ยิปซั่ม ง. อื่นๆ โปรดระบุ_____

3. วัสดุที่ใช้ทำพื้น คืออะไร (โปรดเลือกข้อที่เหมาะสม)

ก. คอนกรีตเสริมเหล็ก ข. ปูกระเบื้อง ค. ปูเสื่อน้ำมัน ง. อื่นๆ โปรดระบุ_____

4. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

<u>ระบบสาธารณูปโภคของบ้าน</u>

5. การใช้น้ำของบ้านท่านเป็นแบบใด (โปรดเลือกข้อที่เหมาะสม)

ก. ก๊อกน้ำที่บ้านต่อมาจากสาธารณะ ข. ก๊อกน้ำที่บ้านจากน้ำบาดาล ค. ก๊อกน้ำสาธารณะรวมของชุมชน ง. น้ำจากแม่น้ำหรือจากลำคลอง จ. อื่นๆ โปรดระบุ_____

6. สถานะระบบไฟฟ้าเป็นอย่างไร (โปรดเลือกข้อที่เหมาะสม)

ก. ได้รับการต่อ มีใช้แล้ว ข. ไม่ได้รับการต่อไฟฟ้า ค. อื่นๆ โปรดระบุ_____

7. ระบบระบายน้ำเสียของบ้านท่านเป็นแบบใด (โปรดเลือกข้อที่เหมาะสม)

ก. ต่อกับระบบท่อน้ำเสียสาธารณะของเทศบาล ข. ถังแห้ง บ่อดักไขมันครัวเรือน ค. อื่นๆ โปรดระบุ_____

8. ระบบระบายสิ่งปฏิกูลของบ้านท่านเป็นแบบใด (โปรดเลือกข้อที่เหมาะสม)

ก. ระบบบริการของเทศบาลมาช่วยเก็บ ข. ระบบบริการช่วยเก็บของชุมชนเอง ค. ไม่มีระบบใดๆ ง. ถังบำบัดสำเร็จรูปของครัวเรือน จ. อื่นๆ โปรดระบุ_____

9. สถานะของการระบายน้ำเป็นอย่างไร (โปรดเลือกข้อที่เหมาะสม)

ก. มีการจัดเตรียมการระบายน้ำฝน ข. ไม่มีการระบายน้ำ ค. มีการจัดเก็บน้ำฝนไว้ใช้ ง. อื่นๆ โปรดระบุ_____

10. สถานะถนนเชื่อมต่อเป็นอย่างไร (โปรดเลือกข้อที่เหมาะสม)

ก. ถนนคอนกรีต ข. ถนนลาดยาง ค. ถนนโรยกรวดหิน ง. ถนนดินลูกรัง จ. อื่นๆ โปรดระบุ_____

11. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

ความหนาแน่นในการอยู่อาศัย

12. มีผู้อยู่อาศัยในบ้านท่านกี่คน_____คน

13. ห้องหนึ่งห้องใช้งานกี่คน (โปรดเลือกข้อที่เหมาะสม)

ก. มากกว่า 2.5 คน ข. 2-2.5 คน ค. 1.5-2 คน ง. น้อยกว่า 1.5 คน จ. อื่นๆ โปรดระบุ_____

14. ห้องนอนหนึ่งห้องใช้งานกี่คน (โปรดเลือกข้อที่เหมาะสม)

ก. มากกว่า 4 คน ข. 3-4 คน ค. 2-3 คน ง. น้อยกว่า 2 คน จ. อื่นๆ โปรดระบุ_____

15. มีกี่ครอบครัวอาศัยในบ้านของท่าน (โปรดเลือกข้อที่เหมาะสม)

ก. มากกว่า 2 ครอบครัว ข. 2 ครอบครัว ค. 1 ครอบครัว ง. อื่นๆ โปรดระบุ_____

16. การใช้งานห้องครัวเป็นอย่างไร (โปรดเลือกข้อที่เหมาะสม)

ก. อยู่ในบ้าน ข. ใช้พื้นที่หน้าบ้าน ค. ใช้พื้นที่หลังบ้าน ง. ไม่มี จ. อื่นๆ โปรดระบุ_____

17. การใช้งานห้องน้ำเป็นอย่างไร (โปรดเลือกข้อที่เหมาะสม)

ก. ส่วนตัวภายในบ้านที่ชั้นล่างบ้าน ข. ใช้ห้องน้ำรวมของชุมชน ค. ไม่มี ง. อื่นๆ โปรดระบุ_____

สิ่งอำนวยความสะดวกพิเศษอื่นๆ

18. บ้านของท่านมีรถยนต์ในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่คัน?_____คัน รถเก๋งหรือรถกระบะ?_____

19. ท่านมีรถของบริษัทที่ท่านทำงานให้ไว้ใช้หรือไม่ ก. มี ข. ไม่มี บริษัทอะไร? (เช่น บริษัทแท็กซี่ บริษัทขนส่งของ)_____

20. บ้านของท่านมีมอเตอร์ไซต์ในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่คัน?_____คัน

21. บ้านของท่านมีรถตุ๊กตุ๊กในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่คัน?_____คัน

22. บ้านของท่านมีรถจักรยานในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่คัน?_____คัน

23. บ้านของท่านมีเครื่องซักผ้าในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

24. บ้านของท่านมีโทรศัพท์บ้านหรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

25. บ้านของท่านมีโทรศัพท์มือถือหรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

26. บ้านของท่านมีเครื่องปรับอากาศ (แอร์)ในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

27. บ้านของท่านมีการใช้พัดลมหรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

28. บ้านของท่านมีตู้เย็นในครอบครองหรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

29. บ้านของท่านมีทีวี (TVโทรทัศน์) หรือไม่ ก. มี ข. ไม่มี จำนวนกี่เครื่อง?_____เครื่อง

30. บ้านของท่านมีการใช้ผ้าม่านหรือไม่ ก. มี ข. ไม่มี จำนวนกี่ที่?_____ที่

31. ท่านต้องการสิ่งอำนวยความสะดวกใดเพิ่มอีกบ้าง

_____

ส่วนที่ 9 คุณภาพของบ้าน

1. สถานการณ์ของสาธารณูปโภคเป็นอย่างไรเมื่อท่านเริ่มเข้ามาอาศัยที่**ชุมชนที่ตั้งเก่า**ก่อนที่จะย้ายมาที่ตั้งใหม่นี้

ก. มีถนนภายในชุมชนหรือไม่? มี/ ไม่มี ข. มีระบบประปาน้ำใช้หรือไม่? มี/ ไม่มี

ค. มีไฟฟ้าใช้หรือไม่? มี/ ไม่มี ง. มีระบบกำจัดสิ่งปฏิกูลหรือไม่? มี/ ไม่มี

จ. มีระบบการระบายน้ำหรือไม่? มี/ ไม่มี ฉ. มีระบบจัดเก็บของเสียครัวเรือนหรือไม่? มี/ ไม่มี

ช. มีก๊าซหุงต้มใช้หรือไม่? มี/ ไม่มี ซ. มีระบบโทรศัพท์เข้าถึงชุมชนหรือไม่? มี/ ไม่มี

2. สถานการณ์ของสาธารณูปโภคเป็นอย่างไรเมื่อท่านเริ่มเข้ามาอาศัยที่**ชุมชนที่ตั้งใหม่นี้**

ก. มีถนนภายในชุมชนหรือไม่? มี/ ไม่มี ข. มีระบบประปาน้ำใช้หรือไม่? มี/ ไม่มี

ค. มีไฟฟ้าใช้หรือไม่? มี/ ไม่มี ง. มีระบบกำจัดสิ่งปฏิกูลหรือไม่? มี/ ไม่มี

จ. มีระบบการระบายน้ำหรือไม่? มี/ ไม่มี ฉ. มีระบบจัดเก็บของเสียครัวเรือนหรือไม่? มี/ ไม่มี

ช. มีก๊าซหุงต้มใช้หรือไม่? มี/ ไม่มี ซ. มีระบบโทรศัพท์เข้าถึงชุมชนหรือไม่? มี/ ไม่มี

3. เมื่อปี พ.ศ. ใด ที่ท่านเริ่มมีระบบบริการสาธารณูปโภคดังต่อไปนี้

ก. เริ่มมีถนนภายในชุมชน พ.ศ.25_____ ข. เริ่มมีระบบประปาน้ำใช้ พ.ศ.25_____

ค. เริ่มมีไฟฟ้าใช้ พ.ศ.25_____ ง. เริ่มมีระบบกำจัดสิ่งปฏิกูล พ.ศ.25_____

จ. เริ่มมีระบบการระบายน้ำ พ.ศ.25_____ ฉ.เริ่มมีระบบจัดเก็บของเสียครัวเรือน พ.ศ.25_____

ช. เริ่ม มีก๊าซหุงต้มใช้ พ.ศ.25_____ ซ. เริ่มมีระบบโทรศัพท์เข้าถึงชุมชน พ.ศ.25_____

4. ท่านได้รับระบบสาธารณูปโภคพื้นฐานได้อย่างไร เช่น น้ำ ไฟฟ้า ระบบโทรศัพท์ ถนน ระบบการระบายน้ำ ระบบการจัดการน้ำเสียครัวเรือน ก๊าซหุงต้ม (โปรดอธิบาย)

_____

5. ค่าใช้จ่ายในการเชื่อมต่อระบบสาธารณูปโภคบ้านของท่าน ใช้งบประมาณเท่าใด?_____บาท

ราคาค่าก่อสร้างบ้านของท่านเท่าใด?_____บาท

6. ท่านคิดว่าระบบสาธารณูปโภคในปัจจุบันเพียงพอต่อการอยู่อาศัยระยะยาวหรือยัง? อย่างไร?

_____

ส่วนที่ 10 วัสดุที่ใช้ก่อสร้างบ้าน และวัสดุที่ใช้ในการต่อเติมบ้าน

1. วัสดุที่ใช้สร้างบ้านทั้งหมดหาได้ง่ายหรือไม่ ใช่/ ไม่ใช่

2. วัสดุประเภทใดที่ท่านอยากใช้ในแง่ของราคา

ก. วัสดุราคาสูง ข. วัสดุราคาปานกลาง ค. วัสดุราคาถูก ง. วัสดุราคาถูกแพงคละๆกัน จ. วัสดุใช้แล้ว/ วัสดุมือสอง

3. ราคาวัสดุก่อสร้างบ้านของท่านเป็นอย่างไร?

ก. ราคาสมเหตุสมผล ข. ราคาสูง ค. ราคาสูงมาก

4. วัสดุก่อสร้างใดที่ราคาแพงขึ้นเมื่อเร็วๆนี้? _____ทำไม?_____

5. ใครเป็นคนจัดซื้อวัสดุก่อสร้างสำหรับบ้านของท่าน

ก. เจ้าของบ้าน ข. บริษัทรับเหมาก่อสร้าง ค. อื่นๆโปรดระบุ_____

6. วิธีการก่อสร้าง และวัสดุก่อสร้างเหมาะสมต่อสภาพท้องถิ่น และดินฟ้าอากาศ ภัยธรรมชาติหรือไม่?

_____

7. วิธีการก่อสร้าง และวัสดุก่อสร้างเหมาะสมต่อการซ่อมแซมบ้านและการต่อเติมหรือไม่?

_____

8. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 11 แรงงานในการก่อสร้าง

1. แรงงานในการก่อสร้างประเภทใดที่ท่านต้องการระหว่างกระบวนการก่อสร้างบ้านของท่าน (สามารถเลือกได้มากกว่าหนึ่งข้อ)

ก. ช่างปูน ข. ช่างส่องกล้องสำรวจ ค. ช่างไฟฟ้า ง. ช่างประปา จ. ช่างเหล็ก ฉ. ช่างไม้

ช. ช่างติดตั้งแก๊ส ซ. ช่างทำเหล็กดัด ฌ. ช่างทาสี ญ. ช่างอื่นๆโปรดระบุ_____

2. ช่างประเภทต่างๆขาดแคลนหรือไม่ ใช่/ ไม่ใช่

3. ใครเป็นคนจ้างช่างประเภทต่างๆมาสร้างบ้านของท่าน?

ก. เจ้าของบ้านเอง ข. ผู้รับเหมาก่อสร้าง ค. พอช. ง. อื่นๆโปรดระบุ_____

4. ใครเป็นคนจ่ายค่าจ้างแรงงาน?

ก. เจ้าของบ้านเอง ข. ชำระผ่าน พอช. ค. อื่นๆโปรดระบุ_____

5. วิธีจ่ายค่าจ้างแรงงานเป็นอย่างไร?

ก. จ่ายค่าจ้างเป็นรายวัน ข. จ่ายค่าจ้างเป็นรายเดือน ค. จ่ายตามปริมาณงาน ง. อื่นๆโปรดระบุ_____

6. ท่านรู้จักช่างได้อย่างไร?

ก. จากเพื่อนบ้าน ข. จากญาติๆ ค. ติดต่อด้วยตัวท่านเอง ง. อื่นๆโปรดระบุ_____

7. ท่านเป็นผู้ให้คำแนะนำในการก่อสร้างแก่ช่างด้วยหรือไม่? ถ้าไม่ ใครเป็นคนให้แนะนำด้านการก่อสร้าง?

_____

8. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 12 การซื้อวัสดุก่อสร้าง

1. ใครเป็นคนจัดการซื้อวัสดุก่อสร้างสำหรับบ้านท่าน

ก. ตัวท่านเอง ข. พอช. ค. อื่นๆโปรดระบุ_____

2. วิธีการซื้อเป็นอย่างไร? ผ่อนชำระได้หรือไม่ หรือ ชำระเงินสด?

_____

3. ในบริเวณใกล้เคียงที่ตั้งชุมชน มีร้านค้าวัสดุก่อสร้างกี่ร้าน?

ก. ร้านค้า อิฐ หิน ปูน ทราย ซีเมนต์_____ร้าน ข. ร้านค้าเหล็ก_____ร้าน ค. ร้าน เครื่องใช้ไฟฟ้า_____ร้าน ง. ร้านขายวัสดุประปา _____ร้าน ค. ร้านขายสี _____ร้าน ง. ร้านขายไม้ _____ร้าน จ. ร้านขายประตูหน้าต่าง _____ร้าน ฉ. ร้านค้าวัสดุอื่นๆโปรดระบุ_____ร้าน

4. ข้อเสนอแนะควรปรับปรุงด้านใดบ้าง

_____

ส่วนที่ 13 กระบวนการก่อสร้าง

1. ท่านเริ่มอยู่อาศัยที่จังหวัดขอนแก่นตั้งแต่ พ.ศ.2_____เป็นระยะเวลาทั้งสิ้น_____ปี

2. แบบก่อสร้างต่างๆมีรายละเอียดเพียงพอหรือไม่ อย่างไร?_____

3. มีการกำหนดระยะเวลาโครงการว่าต้องแล้วเสร็จนานเท่าใดหรือไม่ตอนที่สร้าง? บ้านแต่ละหลังต้องสร้างเสร็จภายในกี่วัน/ เดือน?_____

4. ท่านมีหลักเกณฑ์ในการเลือกผู้รับเหมาก่อสร้างอย่างไร (โปรดเลือกข้อที่เหมาะสม)?

ก. ความถนัดของผู้รับเหมา ข. ประสบการณ์ของผู้รับเหมา ค. รู้จักว่าผู้รับเหมามีชื่อเสียง ง. พอช. ช่วยเลือกให้ จ. อื่นๆโปรดระบุ_____

5. กรรมวิธีการก่อสร้างเป็นอย่างไร (โปรดเลือกข้อที่เหมาะสม)?

ก. สมัยใหม่ทันสมัย ใช้เทคโนโลยีสูง ข. ใช้ช่างท้องถิ่นเป็นหลัก ค. ผสมผสานทั้งข้อ ก. และ ข. ง.อื่นๆ โปรดระบุ_____

6. ท่านเก็บ วางวัสดุก่อสร้างไว้ที่ไหน ระหว่างการก่อสร้าง (โปรดเลือกข้อที่เหมาะสม)?

ก. ถนนข้างเคียง ข. พื้นที่ข้างเคียง ค. ภายในพื้นที่ชุมชนส่วนกลาง ง. อื่นๆโปรดระบุ_____

7. ท่านมีที่พักชั่วคราวสำหรับท่าน ขณะกำลังสร้างบ้านใหม่ยังไม่แล้วเสร็จหรือไม่? ใช่/ ไม่ใช่

8. มีการจัดเตรียมที่พักชั่วคราวสำหรับแรงงานก่อสร้างหรือไม่? ใช่/ ไม่ใช่

9. ท่านมีการจัดการใช้น้ำและไฟฟ้าระหว่างการก่อสร้างบ้านของท่านอย่างไร (โปรดเลือกข้อที่เหมาะสม)?

ก. ช่วยตัวเอง ข. ได้รับความช่วยเหลือจากเพื่อนบ้าน ง. อื่นๆโปรดระบุ_____

10. ปัญหาที่ท่านพบระหว่างการก่อสร้างมีอะไรบ้าง โปรดอธิบาย?

_____

11. บ้านที่สร้างแล้วเสร็จนั้นถูกใจท่านหรือไม่ อย่างไร โปรดอธิบาย?

_____

12. ข้อเสนอแนะ เกี่ยวกับกระบวนการก่อสร้าง หรือสิ่งที่อยากได้?

_____

***** ขอขอบพระคุณท่านที่ได้สละเวลาให้ความอนุเคราะห์ใน *****
การตอบแบบสอบถามในครั้งนี้

แบบสอบถามชุดนี้จัดทำขึ้นเพื่อใช้ประกอบการวิจัย ผู้วิจัยขอความอนุเคราะห์ในการตอบแบบสอบถาม ซึ่งข้อมูลเหล่านี้นำไปใช้เพื่อศึกษาชุมชนตัวอย่างในการจัดการชุมชน จึงขอขอบพระคุณท่านล่วงหน้ามา ณ โอกาสนี้

บ้านเลขที่_____

หน้าที่1

แบบสอบถาม

<u>ส่วนที่ 1</u> ศึกษาการใช้พื้นที่ที่บ้านในการช่วยสร้างรายได้ ไม่ว่าจะเป็นค้าขายที่บ้าน หรือเตรียมของที่บ้าน แล้วนำไปขายข้างนอก

1. เจ้าของบ้านชื่อ_____ อายุ____ปี เพศ_____ อาชีพ_____

2. ชื่อผู้กรอกแบบสอบถาม_____ อายุ____ปี เพศ_____ อาชีพ_____

3. <u>ชื่อผู้ใช้งานพื้นที่สร้างรายได้</u>ที่บ้านท่าน_____ อายุ_____ปี เพศ_____ อาชีพ_____

4. จำนวนสมาชิกในครอบครัว_____คน

5. ท่าน**<u>มีการใช้</u>**พื้นที่ที่บ้านท่านช่วยในการหารายได้หรือไม่ อย่างไร **กก. มี ขข. ไม่มี <u>ถ้ามีใช้เป็นพื้นที่</u> __ ก.**ขายของชำ **ข.** เตรียมกับข้าวไปขายนอกบ้าน **ค.** ซ่อมอุปกรณ์อิเล็กทรอนิกส์ **ง.** เป็นที่เลี้ยงปลา หมา ขายทางอินเตอร์เน็ต **จ.** ขายเครื่องดื่ม กาแฟ นมสด **ฉ.** สับเนื้อ หุงข้าว ทอดไก่ ซักล้าง เตรียมไปขายนอกบ้าน **ช.** อื่นๆ (โปรดระบุ)_____

6. ท่าน**<u>มีความสนใจที่จะจัดให้มี</u>**พื้นที่ช่วยสร้างรายได้ที่บ้านท่านหรือไม่ อย่างไร **กก. มีความสนใจอยากได้ ขข. ไม่มีความสนใจ <u>เพื่อเป็นพื้นที่</u>__ ก.** ขายของชำ **ข.** เตรียมกับข้าวไปขายนอกบ้าน **ค.** ซ่อมอุปกรณ์อิเล็กทรอนิกส์ **ง.** เป็นที่เลี้ยงปลา หมา ขายทางอินเตอร์เน็ต **จ.**ขายเครื่องดื่ม กาแฟ นมสด **ฉ.** สับเนื้อ หุงข้าว ทอดไก่ ซักล้าง เตรียมไปขายนอกบ้าน **ช.** อื่นๆ (โปรดระบุ)_____

7. ท่าน**<u>พอใจกับพื้นที่ช่วยสร้างรายได้</u>**ที่บ้านหรือไม่ อย่างไร **กก. พอใจ ขข. ไม่พอใจ __ก.** พื้นที่ขนาดเพียงพอต่อการสร้างรายได้ **ข.** พื้นที่มีขนาดเล็กเกินไป อยากได้พื้นที่เพิ่ม **ค.** พื้นที่โล่งเกินไป อยากได้ผนังกั้นความเป็นสัดส่วน **ง.** อื่นๆ (โปรดระบุ)_____

8. พื้นที่ช่วยสร้างรายได้ที่บ้านท่าน ช่วยให้ชีวิตท่านดีขึ้นหรือไม่ อย่างไร **กก. ดีขึ้น ขข. ไม่ดีขึ้น __ ก.** แต่ก่อนมีแค่มอเตอร์ไซต์ ปัจจุบันมีรถยนต์____คัน **ข.** หารายได้ได้มากขึ้น **ค.** สะดวกในการใช้ชีวิตประจำวัน **ง.** ประหยัดเวลาในการเตรียมของไปขายนอกบ้าน **จ.** มีพื้นที่ที่บ้านช่วยในการหาเงิน ไม่ต้องออกไปทำงานนอกบ้าน เช่น เปิดร้านขายของชำ **ฉ.** อื่นๆ (โปรดระบุ)_____

9. ท่าน**<u>ใช้พื้นที่หารายได้หารายได้ได้วันละเท่าไร</u> ก.** 100-200บาทต่อวัน **ข.** 201-300บาทต่อวัน **ค.** 301-400บาทต่อวัน **ง.** 401-500บาทต่อวัน **จ.** 501-600บาทต่อวัน **ฉ.** 601-700บาทต่อวัน **ช.** 701-800บาทต่อวัน **ซ.** 801-900บาทต่อวัน **ฌ.** 901-1,000บาทต่อวัน **ญ.** มากกว่า 1,000 บาทต่อวัน **ฎ.**อื่นๆ (โปรดระบุ)_____บาทต่อวัน

10. การมีพื้นที่ช่วยสร้างรายได้ที่บ้านท่าน ส่งผลกระทบต่อสไตล์การใช้ชีวิตประจำวันของท่านอย่างไร

ก. สามารถกำหนดตารางเวลาการทำงานเองได้ ไม่ต้องรีบเร่ง **ข.** บ้านสำคัญต่อการใช้ชีวิตและการหารายได้อย่างมาก **ค.** สามารถมีเวลาอยู่กับลูก ดูแลลูกได้มากขึ้น **ง.** มีความสุขกับพื้นที่ช่วยหารายได้ที่บ้านมาก **จ.** อื่นๆ (โปรดระบุ)_____

11. ท่านใช้พื้นที่ช่วยสร้างรายได้ที่บ้าน ทำกิจกรรมส่งเสริมการหารายได้อะไรบ้าง

ก. ขายของชำ **ข.** เตรียมกับข้าวไปขายนอกบ้าน **ค.** ซ่อมอุปกรณ์อิเล็กทรอนิกส์ **ง.** เป็นที่เลี้ยงปลา หมา ขายทางอินเตอร์เน็ต **จ.** ขายเครื่องดื่ม กาแฟ นมสด **ฉ.** สับเนื้อ หุงข้าว ทอดไก่ ซักล้าง เตรียมไปขายนอกบ้าน **ช.**อื่นๆ (โปรดระบุ)_____

12. ท่านใช้พื้นที่ช่วยสร้างรายได้ที่บ้าน ทำกิจกรรมส่งเสริมการหารายได้**ระยะเวลาใดบ้าง กี่โมงถึงกี่โมง (*โปรดระบุรายละเอียด)** เช่น 5:00-8:00น. <u>เตรียมอาหารไปขายนอกบ้านรอบเช้า</u> 11:00-14:00น. <u>เตรียมอาหารไปขายนอกบ้านรอบบ่าย</u>

ก. 24:00-1:00 ใช้(ระบุ)_____ **ข.** 1:00-2:00 ใช้(ระบุ)_____

ค. 2:00-3:00 ใช้(ระบุ)_____ **ง.** 3:00-4:00 ใช้(ระบุ)_____

จ. 4:00-5:00 ใช้(ระบุ)_____ **ฉ.** 5:00-6:00 ใช้(ระบุ)_____

ช. 6:00-7:00 ใช้(ระบุ)_____ **ซ.** 7:00-8:00 ใช้(ระบุ)_____

ฌ. 8:00-9:00 ใช้(ระบุ)_____ **ญ.** 9:00-10:00 ใช้(ระบุ)_____

ฎ.10:00-11:00 ใช้(ระบุ)_____ **ฏ.** 11:00-12:00 ใช้(ระบุ)_____

ฐ. 12:00-13:00 ใช้(ระบุ)_____ **ฑ.** 13:00-14:00 ใช้(ระบุ)_____

ฒ. 14:00-15:00 ใช้(ระบุ)_____ **ณ.** 15:00-16:00 ใช้(ระบุ)_____

ด. 16:00-17:00 ใช้(ระบุ)_____ **ต.** 17:00-18:00 ใช้(ระบุ)_____

ถ. 18:00-19:00 ใช้(ระบุ)_____ **ท.**19:00-20:00 ใช้(ระบุ)_____

ธ. 20:00-21:00 ใช้(ระบุ)_____ **น.** 21:00-22:00 ใช้(ระบุ)_____

บ. 22:00-23:00 ใช้(ระบุ)_____ **ป.** 23:00-24:00 ใช้(ระบุ)_____

13. ท่านมี**การปรับเปลี่ยนการการจัดพื้นที่**ใช้พื้นที่ช่วยสร้างรายได้ที่บ้าน ทำกิจกรรมส่งเสริมการหารายได้**อย่างไรบ้าง (*โปรดระบุรายละเอียด)** เช่น 5:00-8:00น. ปูผ้ายาง เสื่อเพื่อเตรียมอาหารไปขายนอกบ้านรอบเช้า 11:00-12:00น. เก็บผ้ายางปูฟูกนอนพักผ่อนแทน 12:00-14:00น. ปูผ้ายาง เสื่อเพื่อเตรียมอาหารไปขายนอกบ้านรอบบ่าย

ก. 24:00-1:00 ใช้(ระบุ)_____ **ข.** 1:00-2:00 ใช้(ระบุ)_____

ค. 2:00-3:00 ใช้(ระบุ)_____ **ง.** 3:00-4:00 ใช้(ระบุ)_____

จ. 4:00-5:00 ใช้(ระบุ)_____ **ฉ.** 5:00-6:00 ใช้(ระบุ)_____

ช. 6:00-7:00 ใช้(ระบุ)_____ **ซ.** 7:00-8:00 ใช้(ระบุ)_____

ฌ. 8:00-9:00 ใช้(ระบุ)_____ **ญ.** 9:00-10:00 ใช้(ระบุ)_____

ฎ.10:00-11:00 ใช้(ระบุ)_____ **ฏ.** 11:00-12:00 ใช้(ระบุ)_____

ฐ. 12:00-13:00 ใช้(ระบุ)_____ **ฑ.** 13:00-14:00 ใช้(ระบุ)_____

ฒ. 14:00-15:00 ใช้(ระบุ)_____ **ณ.** 15:00-16:00 ใช้(ระบุ)_____

ด. 16:00-17:00 ใช้(ระบุ)_____ **ต.** 17:00-18:00 ใช้(ระบุ)_____

ถ. 18:00-19:00 ใช้(ระบุ)_____ **ท.**19:00-20:00 ใช้(ระบุ)_____

ธ. 20:00-21:00 ใช้(ระบุ)_____ **น.** 21:00-22:00 ใช้(ระบุ)_____

บ. 22:00-23:00 ใช้(ระบุ)_____ **ป.** 23:00-24:00 ใช้(ระบุ)_____

14.อะไรเป็น**อุปสรรค**ต่อการ**ได้มา**ซึ่งพื้นที่ช่วยสร้างรายได้ที่บ้าน

ก. ขาดแคลนด้านการเงิน **ข.** ขาดความรู้ในการประกอบอาชีพ **ค.** อาชีพที่ทำอยู่ไม่จำเป็นต้องใช้พื้นที่สร้างรายได้ที่บ้าน *โปรดระบุอาชีพ_____ **ง.** พื้นที่ที่บ้านมีขนาดเล็กเกินไปในการจัดพื้นที่ **จ.** ต้องมีการขออนุญาตกับสหกรณ์ก่อน **ฉ.** อื่นๆ (โปรดระบุ)_____

15. **อุปสรรค**ในการประกอบอาชีพโดยใช้พื้นที่ในบ้านมีอะไรบ้าง เช่น ขนาดพื้นที่บ้านเล็กไป, การเงินขาดแคลน

ก. ขนาดพื้นที่บ้านเล็กไป **ข.** ขาดแคลนด้านการเงิน **ค.** ขาดแคลนอุปกรณ์ในการประกอบอาชีพนั้นๆ เช่น ขาดเตาแก๊สหุงต้ม หม้อขนาดใหญ่ เพื่อเตรียมอาหารไปขายนอกบ้าน **ง.** อื่นๆ (โปรดระบุ)_____

16. ท่านมีอาชีพเสริมอะไรบ้างนอกจากการหารายได้โดยใช้พื้นที่ช่วยสร้างรายได้ที่บ้าน เช่น ทำงานนอกเวลา (พาร์ททาม) ร้านอาหาร ทำงานเป็นแม่บ้านข้างนอกชุมชน

ก. ทำงานนอกเวลา (พาร์ททาม)ร้านอาหาร **ข.** ทำงานเป็นแม่บ้านข้างนอกชุมชน **ค.** ทำงานเป็นพี่เลี้ยงเด็กนอกบ้าน **ง.** รับจ้างทั่วไป **จ.** รับจ้างทำอาหารเหมาไปขายงานเทศกาลวันสำคัญ **ฉ.** อื่นๆ (โปรดระบุ)_____

17. ท่านมีการกู้เงินมาลงทุนเป็นอย่างไรบ้าง

กก. มี **ขข. ไม่มี** **ถ้ามีบ่อยแค่ไหน** __ **ก.** 1 ครั้งต่อเดือน **ข.** 1 ครั้งปี **ค.** 2 ครั้งปี **ง.** อื่นๆ (โปรดระบุ)_____

18. ท่านมีการกู้เงินมาลงทุนกับใคร จากที่ไหน แหล่งใด

ก. กู้กับสหกรณ์ชุมชน **ข.** กู้นอกระบบ **ค.** กู้กับเพื่อนฝูงคนรู้จัก **ง.** กู้กับญาติพี่น้อง **จ.** กู้กับธนาคาร ธกส. **ฉ.** กู้กับธนาคารออมสิน **ช.** กู้กับธนาคารของรัฐ **ซ.**อื่นๆ (โปรดระบุ)_____

19. ท่านมีการกู้เงินมาลงทุนมาทำอะไรบ้าง

ก. เตรียมซื้อสินค้ามาขายที่ร้านขายของชำ **ข.** ซื้อวัตถุดิบเพื่อเตรียมอาหารออกไปขายนอกบ้าน **ค.**ซื้อเครื่องมืออุปกรณ์ในการประกอบอาชีพด้วยพื้นที่ช่วยสร้างรายได้ **ง.** ซื้อมอเตอร์ไซต์เพื่อการขนส่ง **จ.** ซื้อรถกระบะเพื่อขนของไปขาย **ฉ.** ซื้อรถเข็นเพื่อใส่ของออกไปขาย

ช. เพื่อค่าเทอม การศึกษาบุตร **ซ.** เพื่อค่าชุดนักเรียนลูก **ฌ.** ซื้อเครื่องครัวเพิ่ม **ญ.** อื่นๆ (โปรดระบุ)_____

20. ระยะเวลาในการกู้เงินสัญญากี่ปี ดอกเบี้ยเป็นอย่างไรกี่เปอร์เซ็นต์

ก. ดอกเบี้ยร้อยละ 4 ต่อปี **ข.** ดอกเบี้ยร้อยละ 6 ต่อปี **ค.** ดอกเบี้ยร้อยละ 8 ต่อปี **ง.** ดอกเบี้ยร้อยละ 10 ต่อปี

จ. ดอกเบี้ยร้อยละ 12 ต่อปี **ฉ.** อื่นๆ (โปรดระบุ)_____

21. ท่านมีการกู้เงินมาลงทุนบ่อยแค่ไหน กี่ครั้งต่อปี

ก. 1 ครั้งต่อเดือน **ข.** 1 ครั้งปี **ค.** 2 ครั้งปี **ง.**อื่นๆ (โปรดระบุ)_____

22. ท่านมีรายได้จากการใช้พื้นที่หารายได้ที่บ้านท่าน รายได้เฉลี่ยของท่านกี่บาทต่อวัน กี่บาทต่อเดือน

ก. 1,000-2,000บาทต่อเดือน **ข.** 2,001-3,000บาทต่อเดือน **ค.** 3,001-4,000บาทต่อเดือน **ง.** 4,001-5,000บาทต่อเดือน

จ. 5,001-6,000บาทต่อเดือน **ฉ.** 6,001-7,000บาทต่อเดือน **ช.** 7,001-8,000บาทต่อเดือน **ซ.** 8,001-9,000บาทต่อเดือน

ฌ. 9,001-10,000บาทต่อเดือน **ญ.** 10,001-12,000 บาทต่อเดือน **ฎ.** 12,001-15,000 บาทต่อเดือน **ฏ.** 15,001-20,000 บาทต่อเดือน

ฐ. 20,001-30,000 บาทต่อเดือน **ฑ.** มากกว่า 30,001บาทต่อเดือน **ฒ.**อื่นๆ (โปรดระบุ)_____บาทต่อวัน

23. ใครใช้พื้นที่สร้างรายได้ที่บ้านท่านบ้าง ใครใช้มากที่สุด ช่วงเวลาใด โปรดระบุ

ก. พ่อ ใช้เวลา_____น.-_____น. **ข.** แม่ ใช้เวลา_____น.-_____น. **ค.** ลูกชาย ใช้เวลา_____น.-_____น.

ง. ลูกสาว ใช้เวลา_____น.-_____น. **จ.** คุณปู่/ ตา ใช้เวลา_____น.-_____น.

ฉ. คุณยาย/ ย่า ใช้เวลา_____น.-_____น. **ช.** อื่นๆ (โปรดระบุ)_____

24. ท่านต้องการอุปกรณ์ ข้าวของเครื่องใช้ในการหารายได้อะไรเพิ่มไหม

ก. ต้องการ **ข. ไม่ต้องการ** **<u>ถ้าต้องการ *อะไรโปรดระบุ</u>** _____

25. ใจจริงท่านอยากได้บ้านเดี่ยวแยกเป็นหลัง หรือบ้านแถว บ้านประเภทใดเหมาะแก่การสร้างรายได้กับท่านมากกว่ากัน

ก. บ้านเดี่ยวชั้นเดียว **ข.** บ้านเดี่ยว 2ชั้น **ค.** บ้านแฝดชั้นเดียว **ง.** บ้านแฝด 2ชั้น **จ.** บ้านแถวชั้นเดียว **ฉ.** บ้านแถว 2ชั้น

ช. อื่นๆ (โปรดระบุ)_____ เหตุผลเพราะอะไร_____

26. เรื่องการขออนุญาต กฎต่างๆในการใช้บ้านเป็นที่ประกอบอาชีพเป็นอย่างไรบ้าง ต้องมีการขออนุญาตก่อนไหม ขอกับใคร

กก. ต้องขอ **ขข. ไม่ต้องขอ** **<u>ขอกับใคร</u>** __ **ก.** หัวหน้าชุมชน **ข.** คณะกรรมการชุมชน **ค.** สหกรณ์ชุมชน **ง.** เทศบาล

จ. พอช. **ฉ.** อื่นๆ (โปรดระบุ)_____

27. เรื่องกฎหมาย ข้อบังคับเกี่ยวกับบ้านท่าน ท่านคิดว่าควรจะปรับปรุงแก้ไขอย่างไรบ้าง เรื่องใดที่อยากได้เพิ่มที่คิดว่าปัจจุบันยังไม่ดีพอ

ก. ลดหย่อนผ่อนผันลงให้สร้างพื้นที่ได้มากขึ้น **ข.** ลดระยะร่นรอบนอกบ้านให้น้อยลง **ค.** อื่นๆ (โปรดระบุ)_____

28. ระยะเวลาส่งผลต่อการใช้พื้นที่หรือไม่ เช่นการจัดพื้นที่ข้าวของเครื่องใช้ **ก. มีผล** **ข. ไม่มีผล**

อย่างไร_____

29. ความถนัด ทักษะส่งผลต่อการเลือกอาชีพที่ท่านทำในพื้นที่สร้างรายได้หรือไม่ **ก. มีผล** **ข. ไม่มีผล**

อย่างไร_____

30. เรื่องเพศมีผลต่อการประกอบอาชีพในพื้นที่สร้างรายได้ หรือไม่ เช่น อาชีพทำอาหารขาย ทำได้แต่เพศหญิงเท่านั้น **ก. มีผล** **ข. ไม่มีผล**

อย่างไร_____

31. ระดับการศึกษาจำเป็นมากไหมในการประกอบอาชีพโดยใช้พื้นที่สร้างรายได้ เช่น ต้องการการศึกษาสูง **ก. จำเป็น** **ข. ไม่จำเป็น**

อย่างไร_____

32. เรื่องการขนส่งจำเป็นไหม ในการขนของออกไปขายนอกบ้าน **กก. จำเป็น** **ขข. ไม่จำเป็น** ปัจจุบันท่านใช้ยานพาหนะอะไร

ก. รถเข็นแรงคน **ข.** รถเข็นติดจักรยาน **ค.** รถมอเตอร์ไซต์ **ง.** รถมอเตอร์ไซต์มีพ่วงข้าง **จ.** รถกระบะ **ฉ.** รถเก๋ง

ช. รถตุ๊กตุ๊ก **ซ.** รถโดยสารประจำทาง **ฌ.** รถสามล้อซาเล้ง **ญ.** รถสามล้อถีบ **ฎ.** อื่นๆ (โปรดระบุ)_____

บ้านเลขที่_____

<u>แบบสอบถาม</u> การศึกษาโครงการบ้านมั่นคง ชุมชนตะวันใหม่ อำเภอเมืองจังหวัดขอนแก่น

<u>ส่วนที่ 2</u> ศึกษาประเด็นเกี่ยวกับการใช้พื้นที่ที่บ้านช่วยสร้างหรือส่งเสริมการสร้างรายได้ เช่น ใช้บ้านท่านเปิดร้านขายของ หรือใช้บ้านเตรียมอาหารแล้วนำไปขายนอกบ้าน

<u>คำชี้แจง</u> โปรดทำเครื่องหมาย ✓ลงในช่องว่างหน้าคำตอบแต่ละข้อที่ตรงตามความเห็นท่านเพียงคำตอบเดียว

ประเด็นคำถามเกี่ยวกับพื้นที่สร้างรายได้ที่บ้าน	ระดับการประเมิน					
	มากที่สุด (5)	มาก (4)	ปานกลาง (3)	น้อย (2)	น้อยที่สุด (1)	ไม่ต้องการ/ไม่ใช้ (0)
1)ความสำคัญของพื้นที่ช่วยสร้างรายได้ที่บ้าน						
1.ท่านต้องการพื้นที่สร้างรายได้ที่บ้านท่านหรือไม่						
2.ท่านมีความสนใจในพื้นที่สร้างรายได้ที่บ้านหรือไม่						
3.ท่านมีพื้นที่สร้างรายได้ที่บ้านท่านหรือไม่ เช่น ที่ขายของ, ที่เตรียมอาหารเพื่อออกไปขายนอกบ้าน						
4.พอใจกับพื้นที่หารายได้ที่บ้านแค่ไหน						
5.พื้นที่สร้างรายได้ที่บ้านท่านสร้างประโยชน์ ช่วยท่านหาเงินได้หรือไม่						
6.อื่นๆ (*โปรดระบุ)						
2)ตำแหน่งของพื้นที่ช่วยสร้างรายได้ที่บ้าน						
1.ใช้พื้นที่ชั้นล่าง (ชั้นหนึ่ง) ในการหารายได้						
2.ใช้พื้นที่ชั้นบน (ชั้นสอง) ในการหารายได้						
3.ใช้พื้นที่ชั้นล่าง (ชั้นหนึ่ง) ภายในบ้านในการหารายได้						
4.ใช้พื้นที่ชั้นล่าง (ชั้นหนึ่ง) หน้าบ้านในการหารายได้						
5.ใช้พื้นที่ชั้นล่าง (ชั้นหนึ่ง) หลังบ้านในการหารายได้						
6.ท่านประกอบอาชีพ ทำงานหารายได้ที่บ้าน						
7.อื่นๆ (*โปรดระบุ)						
3)การขออนุญาตใช้พื้นที่บ้านในการช่วยสร้างรายได้						
1.หากท่านต้องการประกอบอาชีพโดยใช้พื้นที่สร้างรายได้ที่บ้าน ท่านต้องขออนุญาตก่อนหรือไม่						
2.ขออนุญาตกับกรรมการชุมชน						
3.ขออนุญาตกับสหกรณ์ชุมชน						
4.ขออนุญาตกับเทศบาล						
5.ท่านประสบปัญหาในการขออนุญาตใช้พื้นที่ในบ้านประกอบอาชีพหรือไม่						
6.ท่านต้องการเปลี่ยนแปลงกฎหมายเกี่ยวกับการสร้างบ้านหรือไม่ เช่น ได้พื้นที่มากขึ้น ลดระยะร่นถอยให้น้อยลง						
7.อื่นๆ (*โปรดระบุ)						
4)ลักษณะการใช้พื้นที่บ้านช่วยสร้างรายได้						
1.ท่านเตรียมของขายที่บ้าน แต่ออกไปขายข้างนอกบ้าน ชุมชน						
2.ท่านทำงานหาเงินนอกบ้าน ไม่ได้ใช้พื้นที่ที่บ้านหารายได้เลย						
3.ท่านมีอาชีพเสริมหรือไม่						
4.อื่นๆ (*โปรดระบุ)						
5)อุปสรรคในการใช้พื้นที่ที่บ้านช่วยสร้างรายได้						
1.ท่านมีอุปสรรคในการใช้พื้นที่ที่บ้านหารายได้หรือไม่						
2.ขนาดของพื้นที่หารายได้ที่บ้านเล็กเกินไปไหม						
3.ต้องการขนาดพื้นที่หารายได้ที่บ้านเพิ่มไหม						
4.อื่นๆ (*โปรดระบุ)						

6)การจัดพื้นที่เพื่อการสร้างรายได้						**หน้าที่5/9**
1.อยากมีการต่อเติมบ้านไหม						
2.อยากมีการต่อเติมบ้านเพื่อการหารายได้ไหม						
3.อยากมีการตกแต่งบ้านไหม						
4.อยากมีการตกแต่งบ้านเพื่อการหารายได้ไหม						
5.ท่านมีการจัดพื้นที่บ้านเพื่อการหารายได้ไหม						
6.ท่านมีการต่อเติมบ้านของท่านหรือไม่						
7.ท่านมีการต่อเติมบ้านของท่านเพื่อการหารายได้หรือไม่						
8.ท่านมีการตกแต่งบ้านของท่านหรือไม่						
9.ท่านมีการตกแต่งบ้านของท่านเพื่อการหารายได้หรือไม่						
10.อื่นๆ (*โปรดระบุ)						
7)การจัดการการเงินกับพื้นที่สร้างรายได้						
1.ท่านต้องการทักษะหรือความรู้เสริมในการประกอบอาชีพโดยใช้พื้นที่สร้างรายได้ที่บ้านแค่ไหน						
2.ท่านต้องการเงินลงทุนในการประกอบอาชีพโดยใช้พื้นที่สร้างรายได้ที่บ้านแค่ไหน						
3.ท่านขาดแคลนทุนทรัพย์ในการประกอบอาชีพโดยใช้พื้นที่สร้างรายได้ที่บ้านแค่ไหน						
4.ท่านกู้เงินมาลงทุนประกอบอาชีพ						
5.ท่านกู้เงินมาลงทุนต่อเติม ซ่อมแซมบ้าน						
6.กู้เงินกับสหกรณ์ชุมชน						
7.กู้เงินกับญาติพี่น้อง						
8.กู้เงินกับเพื่อนบ้าน คนรู้จัก						
9.กู้เงินกับธนาคารนอกชุมชน						
10.กู้เงินนอกระบบ						
11.ดอกเบี้ยเป็นอย่างไร สูงไหม						
12.กู้เงินเดือนละครั้ง						
13.กู้เงินปีละครั้ง						
14.อื่นๆ (*โปรดระบุ)						
8)เพศกับการใช้พื้นที่สร้างรายได้						
1.**พ่อบ้าน**ใช้พื้นที่สร้างรายได้ที่บ้าน						
2.**แม่บ้าน**ใช้พื้นที่สร้างรายได้ที่บ้าน						
3.**ลูกชาย**ใช้พื้นที่สร้างรายได้ที่บ้าน						
4.**ลูกสาว**ใช้พื้นที่สร้างรายได้ที่บ้าน						
5.**ญาติพี่น้องเพศชาย**ใช้พื้นที่สร้างรายได้ที่บ้าน						
6.**ญาติพี่น้องเพศหญิง**ใช้พื้นที่สร้างรายได้ที่บ้าน						
7.**คุณตา**ใช้พื้นที่สร้างรายได้ที่บ้าน						
8.**คุณยาย**ใช้พื้นที่สร้างรายได้ที่บ้าน						
9.**คุณปู่**ใช้พื้นที่สร้างรายได้ที่บ้าน						
10.**คุณย่า**ใช้พื้นที่สร้างรายได้ที่บ้าน						
11.อื่นๆ (*โปรดระบุ)						
9)ความต้องการเครื่องมือ อุปกรณ์ กับการประกอบอาชีพในพื้นที่สร้างรายได้						
1.พื้นที่บ้านของท่านเหมาะกับการประกอบอาชีพที่บ้าน หารายได้ที่บ้าน						
2.พื้นที่บ้านเล็กเกินไปต่อการประกอบอาชีพที่บ้าน						
3.เครื่องมืออุปกรณ์ในการประกอบอาชีพของท่านครบถ้วนเพียงพอแค่ไหน						
4.ท่านต้องการเครื่องมืออุปกรณ์หารายได้เพิ่มไหม						
5.อื่นๆ (*โปรดระบุ)						

10)ความต้องการยานพาหนะ ระบบขนส่ง เพื่อการหารายได้						**หน้าที่6/9**
1.ความต้องการ**มอเตอร์ไซต์**เพื่อการประกอบอาชีพนอกบ้าน เช่น ขนของไปขาย						
2.ความต้องการ**มอเตอร์ไซต์มีพ่วงข้าง**เพื่อการประกอบอาชีพนอกบ้าน เช่น ขนของไปขาย						
3.ความต้องการ**รถเข็นขายของ**เพื่อการประกอบอาชีพนอกบ้าน เช่น ขนของไปขาย						
4.ความต้องการ**รถเข็นขายของติดจักรยานถีบ**เพื่อการประกอบอาชีพนอกบ้าน เช่น ขนของไปขาย						
5.ความต้องการ**รถยนต์**เพื่อการประกอบอาชีพนอกบ้าน เช่น ขนของไปขาย						
6.มีรถเมย์โดยสารสาธารณะผ่านชุมชนมากน้อยแค่ไหน						
7.อื่นๆ (*โปรดระบุ)						
11)ระยะเวลาและการใช้พื้นที่สร้างรายได้ที่บ้าน						
1.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **24:00น.-1:00น. (เที่ยงคืน-ตีหนึ่ง)**						
2.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **1:00น.-2:00น. (ตีหนึ่ง-ตีสอง)**						
3.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **2:00น.-3:00น. (ตีสอง-ตีสาม)**						
4.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **3:00น.-4:00น. (ตีสาม-ตีสี่)**						
5.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **4:00น.-5:00น. (ตีสี่-ตีห้า)**						
6.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **5:00น.-6:00น. (ตีห้า-หกโมงเช้า)**						
7.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **6:00น.-7:00น. (หกโมงเช้า-เจ็ดโมงเช้า)**						
8.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **7:00น.-8:00น. (เจ็ดโมงเช้า-แปดโมงเช้า)**						
9.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **8:00น.-9:00น. (แปดโมงเช้า-เก้าโมงเช้า)**						
10.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **9:00น.-10:00น. (เก้าโมงเช้า-สิบโมงเช้า)**						
11.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **10:00น.-11:00น. (สิบโมงเช้า-สิบเอ็ดโมง)**						
12.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **11:00น.-12:00น. (สิบเอ็ดโมง-เที่ยง)**						
13.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **12:00น.-13:00น. (เที่ยง-บ่ายโมง)**						
14.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **13:00น.-14:00น. (บ่ายโมง-บ่ายสอง)**						
15.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **14:00น.-15:00น. (บ่ายสอง-บ่ายสาม)**						
16.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **15:00น.-16:00น. (บ่ายสาม-บ่ายสี่)**						
17.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **16:00น.-17:00น. (บ่ายสี่-บ่ายห้า)**						
18.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **17:00น.-18:00น. (บ่ายห้า-หกโมงเย็น)**						
19.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **18:00น.-19:00น. (หกโมงเย็น-หนึ่งทุ่ม)**						
20.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **19:00น.-20:00น. (หนึ่งทุ่ม-สองทุ่ม)**						
21.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **20:00น.-21:00น. (สองทุ่ม-สามทุ่ม)**						
22.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **21:00น.-22:00น. (สามทุ่ม-สี่ทุ่ม)**						
23.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **22:00น.-23:00น. (สี่ทุ่ม-ห้าทุ่ม)**						
24.ท่านใช้พื้นที่สร้างรายได้สร้างงานหาเงินในบ้านช่วง **23:00น.-24:00น. (ห้าทุ่ม-เที่ยงคืน)**						
25.อื่นๆ (*โปรดระบุ)						

12)ระยะเวลาและการใช้พื้นที่สร้างรายได้ที่บ้านทำกิจกรรมอย่างอื่นนอกจากการหารายได้ เช่น พักผ่อน นั่งเล่น นอนเล่น ดูทีวี อ่านหนังสือ สังสรรค์						**หน้าที่7/9**
1.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **24:00น.-1:00น. (เที่ยงคืน-ตีหนึ่ง)**						
2.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **1:00น.-2:00น. (ตีหนึ่ง-ตีสอง)**						
3.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **2:00น.-3:00น. (ตีสอง-ตีสาม)**						
4.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **3:00น.-4:00น. (ตีสาม-ตีสี่)**						
5.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **4:00น.-5:00น. (ตีสี่-ตีห้า)**						
6.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **5:00น.-6:00น. (ตีห้า-หกโมงเช้า)**						
7.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **6:00น.-7:00น. (หกโมงเช้า-เจ็ดโมงเช้า)**						
8.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **7:00น.-8:00น. (เจ็ดโมงเช้า-แปดโมงเช้า)**						
9.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **8:00น.-9:00น. (แปดโมงเช้า-เก้าโมงเช้า)**						
10.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **9:00น.-10:00น. (เก้าโมงเช้า-สิบโมงเช้า)**						
11.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **10:00น.-11:00น. (สิบโมงเช้า-สิบเอ็ดโมง)**						
12.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **11:00น.-12:00น. (สิบเอ็ดโมง-เที่ยง)**						
13.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **12:00น.-13:00น. (เที่ยง-บ่ายโมง)**						
14.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **13:00น.-14:00น. (บ่ายโมง-บ่ายสอง)**						
15.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **14:00น.-15:00น. (บ่ายสอง-บ่ายสาม)**						
16.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **15:00น.-16:00น. (บ่ายสาม-บ่ายสี่)**						
17.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **16:00น.-17:00น. (บ่ายสี่-บ่ายห้า)**						
18.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **17:00น.-18:00น. (บ่ายห้า-หกโมงเย็น)**						
19.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **18:00น.-19:00น. (หกโมงเย็น-หนึ่งทุ่ม)**						
20.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **19:00น.-20:00น. (หนึ่งทุ่ม-สองทุ่ม)**						
21.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **20:00น.-21:00น. (สองทุ่ม-สามทุ่ม)**						
22.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **21:00น.-22:00น. (สามทุ่ม-สี่ทุ่ม)**						
23.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **22:00น.-23:00น. (สี่ทุ่ม-ห้าทุ่ม)**						
24.ท่านใช้**พื้นที่สร้างรายได้ทำกิจกรรมอย่างอื่น**ในบ้านช่วง **23:00น.-24:00น. (ห้าทุ่ม-เที่ยงคืน)**						
25.อื่นๆ (*โปรดระบุ)						
13)วัตถุประสงค์อื่นในการใช้พื้นที่สร้างรายได้ที่บ้าน						
1.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เพื่อพักผ่อน นั่งเล่น**						
2.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นห้องนอน**						
3.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่กินข้าว**						
4.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่ทำงาน**						
5.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่อ่านหนังสือ**						
6.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่แต่งตัว**						
7.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่เก็บของ**						
8.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่ประกอบอาหาร**						
9.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่จอดจักรยาน**						
10.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่จอดมอเตอร์ไซต์**						
11.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่รับแขก**						
12.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่พบปะสังสรรค์**						
13.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่จัดงานบุญเทศกาลต่างๆ**						
14.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่ซักผ้า**						
15.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่รีดผ้า**						
16.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นห้องอาบน้ำ**						
17.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่ออกกำลังกาย**						
18.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้เป็นที่เลี้ยงสัตว์**						
19.นอกจากใช้บ้านของท่านช่วยสร้างรายได้แล้ว ยังใช้พื้นที่ชั้นล่าง(ชั้นหนึ่ง) **ใช้ทำอื่นๆ (*โปรดระบุ)**						

<u>ส่วนที่ 3</u> ข้อเสนอแนะเกี่ยวกับการใช้พื้นที่ที่บ้านช่วยในการสร้างรายได้

ท่านคิดว่าการใช้พื้นที่ที่บ้านท่านช่วยในการสร้างรายได้นอกจากการอยู่อาศัย **ควรปรับปรุงอย่างไรบ้าง**

1.ความสำคัญของพื้นที่ช่วยสร้างรายได้ที่บ้าน **ควรปรับปรุงเพิ่มเติมด้านใดบ้าง (เช่น พื้นที่เล็กเกินไป อยากได้ขนาดใหญ่ขึ้น)** ?

ก. พื้นที่มีขนาดเล็กเกินไป อยากได้ที่เพิ่ม **ข.** อยากให้กฎหมายลดหย่อนลง **ค.** อื่นๆ (โปรดระบุ)_____

2.ตำแหน่งของพื้นที่ช่วยสร้างรายได้ที่บ้าน **มีส่วนสำคัญไหมในการทำงาน ใช้พื้นที่สร้างรายได้ (เช่น พื้นที่ชั้นล่าง, พื้นที่ชั้นบน, พื้นที่ภายนอกหน้าบ้าน, พื้นที่ภายในบ้านชั้นล่างส่วนหน้า, พื้นที่ภายในบ้านชั้นหน้าส่วนหลัง, พื้นที่ภายนอกหลังบ้าน ตำแหน่งใดเหมาะสมที่สุดสำหรับท่าน)** ?

ก. พื้นที่ชั้นล่าง **ข.** พื้นที่ชั้นบน **ค.** พื้นที่ภายนอกหน้าบ้าน **ง.** พื้นที่ภายในบ้านชั้นล่างส่วนหน้า

จ. พื้นที่ภายในบ้านชั้นล่างส่วนหลัง **ฉ.** พื้นที่ภายนอก หลังบ้าน **ช.** อื่นๆ (โปรดระบุ)_____

3.การขออนุญาตใช้พื้นที่บ้านในการช่วยสร้างรายได้ **ควรปรับปรุงเพิ่มเติม แก้ไขด้านใดบ้าง(เช่น อนุญาตให้สร้างพื้นที่ได้มากขึ้น ลดหย่อนกฎลง)** ?

ก. ความล่าช้าในการขออนุญาต อยากให้เร็วขึ้น **ข.** อยากได้พื้นที่มากขึ้นเพื่อการสร้างรายได้ **ค.** อยากได้พื้นที่เพิ่มเผื่อกรณีขยับขยาย

ง. อยากให้กฎหมายยืดหยุ่นขึ้น **จ.**อื่นๆ (โปรดระบุ)_____

4.ลักษณะการใช้พื้นที่บ้านช่วยสร้างรายได้ **ควรปรับปรุงเพิ่มเติม แก้ไขด้านใดบ้าง (เช่น ชอบเตรียมของทั้งหมดที่บ้าน หรือเตรียมบางส่วน)** ?

ก. ชอบเตรียมของทั้งหมดที่บ้าน **ข.** เตรียมของบางส่วนที่พื้นที่สร้างรายได้ที่บ้าน และเตรียมบางส่วนที่นอกบ้านที่ที่ขายของ

ค. อื่นๆ (โปรดระบุ)_____

5.อุปสรรคในการใช้พื้นที่ที่บ้านช่วยสร้างรายได้ **มีอะไรบ้าง ควรปรับปรุงเพิ่มเติมแก้ไข ด้านใดบ้าง** ?

ก. พื้นที่ช่วยสร้างรายได้มีขนาดเล็กเกินไป อยากได้พื้นที่เพิ่ม **ข.** ขาดแคลนด้านเงินลงทุนขยายกิจการ **ค.** ขาดแคลนอุปกรณ์ในการประกอบอาชีพนั้นๆ เช่น หม้อหุงข้าวขนาดใหญ่ หม้อขนาดใหญ่ ตู้แช่ของ **ง.** อื่นๆ (โปรดระบุ)_____

6.การจัดพื้นที่เพื่อการสร้างรายได้ **ควรปรับปรุงเพิ่มเติมแก้ไขอย่างไรบ้าง (เช่น การจัดเฟอร์นิเจอร์อุปกรณ์ หรือ การต่อเติมตกแต่ง)** ?

ก. ที่จำกัดในการซื้อเฟอร์นิเจอร์เพิ่มมาจัดวาง จึงต้องเลือกเฉพาะที่จำเป็น **ข.** ต้องการเฟอร์นิเจอร์เพิ่มในการประกอบอาชีพ เช่น ตู้แช่ ตู้เก็บของ **ค.** อยากให้มีแสงสว่างเพิ่มในพื้นที่ช่วยสร้างรายได้ มืดเกินไป **ง.** อยากมีการตกแต่งพื้นที่สร้างรายได้เพิ่ม เช่นปูกระเบื้อง เพื่อง่ายต่อการทำความสะอาด **จ.** อื่นๆ (โปรดระบุ)_____

7.การจัดการการเงินกับพื้นที่สร้างรายได้ **ควรปรับปรุงเพิ่มเติมแก้ไขอย่างไรบ้าง (เช่น อัตราดอกเบี้ยเงินกู้, ระยะเวลาส่งเงิน, แหล่งเงินกู้)** ?

ก. อยากได้แหล่งเงินกู้อัตราดอกเบี้ยต่ำ **ข.** อยากได้แหล่งเงินกู้ที่สามารถผ่อนชำระระยะยาวได้ **ค.** อยากได้แหล่งเงินกู้อัตราดอกเบี้ยต่ำ ผ่อนชำระระยะยาว **ง.** อยากให้มีการอบรมให้ความรู้ด้านการกู้เงิน **จ.** อยากให้มีการอบรมให้ความรู้ด้านการออมทรัพย์ จะได้ลดการเป็นหนี้ **ฉ.** อื่นๆ (โปรดระบุ)_____

8.เพศกับการใช้พื้นที่สร้างรายได้ **เพศมีส่วนต่อการใช้พื้นที่สร้างรายได้ที่บ้านหรือไม่ (เช่น เพศใดใช้พื้นที่สร้างรายได้มากกว่ากัน)** ?

ก. เพศชายใช้พื้นที่มากกว่าเพศหญิง **ข.** เพศหญิงใช้พื้นที่มากกว่าเพศชาย **ค.** เพศชายและเพศหญิงใช้พื้นที่เท่าๆกัน

ง. เพศไม่มีผลต่อการใช้พื้นที่สร้างรายได้ ใครก็ใช้ได้ **จ.** อื่นๆ (โปรดระบุ)_____

9.ความต้องการเครื่องมือ อุปกรณ์ กับการประกอบอาชีพในพื้นที่สร้างรายได้ **ควรปรับปรุงเพิ่มเติมแก้ไขด้านใดบ้าง ต้องการอะไรเพิ่มเติมบ้าง** ?

ก. ต้องการอุปกรณ์ในการประกอบอาชีพเพิ่ม เช่น (โปรดระบุ)_____

ข. ไม่ต้องการอุปกรณ์ใดๆเพิ่มเติม เพียงพอแล้ว **ค.** ต้องการยานพาหนะในการขนย้ายของไปขาย เช่น (โปรดระบุ)_____

ง. อื่นๆ (โปรดระบุ)_____

10.ความต้องการยานพาหนะ ระบบขนส่ง เพื่อการหารายได้ **ควรปรับปรุงเพิ่มเติมแก้ไขด้านใดบ้าง ต้องการอะไรเพิ่มเติมบ้าง** ?

ก. ต้องการรถเข็นแรงคน **ข.** ต้องการรถเข็นติดจักรยาน **ค.** ต้องการมอเตอร์ไซต์มีพ่วงข้าง **ง.** ต้องการรถกระบะ
จ. ต้องการรถเก๋ง **ฉ.** ต้องการรถซาเล้งมอเตอร์ไซต์ **ช.** ไม่ต้องการ มีแล้ว **ซ.** อื่นๆ (โปรดระบุ)_____

11.ระยะเวลาและการใช้พื้นที่สร้างรายได้ที่บ้าน **ควรปรับปรุงเพิ่มเติมด้านแก้ไขใดบ้าง ใช้งานเวลาใดบ้าง กี่โมงถึงกี่โมง** ?

ก. ชอบทำงานในพื้นที่สร้างรายได้ในช่วงเช้า **ข.** ชอบทำงานในพื้นที่สร้างรายได้ในช่วงบ่าย **ค.** ชอบทำงานในพื้นที่สร้างรายได้ในช่วงกลางคืน **ง.** อื่นๆ (โปรดระบุ)_____

12.ระยะเวลาและการใช้พื้นที่สร้างรายได้ที่บ้านทำกิจกรรมอย่างอื่นนอกจากการหารายได้ เช่น พักผ่อน นั่งเล่น นอนเล่น ดูทีวี อ่านหนังสือ สังสรรค์ **ควรปรับปรุงเพิ่มเติมแก้ไขด้านใดบ้าง ใช้งานเวลาใดบ้าง กี่โมงถึงกี่โมง** ?

ก. ชอบทำกิจกรรมอื่นในพื้นที่สร้างรายได้ในช่วงเช้า **ข.** ชอบทำกิจกรรมอื่นในพื้นที่สร้างรายได้ในช่วงบ่าย
ค. ชอบทำกิจกรรมอื่นในพื้นที่สร้างรายได้ในช่วงกลางคืน **ง.** สามารถทำกิจกรรมสร้างรายได้และกิจกรรมอื่นๆได้ในเวลาเดียวกัน
จ. อื่นๆ (โปรดระบุ)_____

13.วัตถุประสงค์อื่นในการใช้พื้นที่สร้างรายได้ที่บ้านนอกเหนือจากการหารายได้ **ท่านใช้พื้นที่บ้านท่านทำอะไรบ้าง เช่น นั่งเล่น ดูทีวี กินข้าว ?**

ก. นั่งเล่น **ข.** นอน **ค.** ดูทีวี **ง.** ฟังเพลง **จ.** ทำงาน **ฉ.** สอนการบ้านลูก
ช. ออกกำลังกาย **ซ.** แต่งตัว **ฌ.** รีดผ้า **ญ.** ตากผ้า **ฎ.** เก็บของ **ฏ.** จอดมอเตอร์ไซต์
ฐ. จอดจักรยาน **ฑ.** อื่นๆ (โปรดระบุ)_____

***** ขอขอบพระคุณท่านที่ได้สละเวลาให้ความอนุเคราะห์ใน *****
การตอบแบบสอบถามในครั้งนี้

ABOUT AUTHOR

Nayatat Tonmitr

Born on 7th July 1986, Thailand.

Academic Record

May 1993- March 1999 Elementary School Education, the Demonstration School KKU, Khon Kaen University.

May 1999- March 2002 Junior High School Education, the Demonstration School KKU, Khon Kaen University.

May 2002- March 2005 Senior High School Education, the Demonstration School KKU, Khon Kaen University.

May 2005- March 2010 Bachelor of Architecture (First Class Honours), Faculty of Architecture, Khon Kaen University.

October 2010- September 2012 Master of Engineering (Civil Engineering and Architecture) (Distinction & Outstanding, GPA 4.00), Faculty of Engineering, Department of Civil Engineering & Architecture, Graduate School of Engineering and Science, University of the Ryukyus, Japan. The Special Monbukagakusho Scholarship (MEXT, Japanese Government Scholarship) Student.
Special Graduate Program for International Students in Asia-Pacific Engineering Design Program.

October 2012- September 2015 Doctor of Philosophy (Architecture, Interdisciplinary Intelligent Systems Engineering) (Distinction & Outstanding, GPA 4.00), Graduate School of Engineering and Science, University of the Ryukyus, Japan. The Special Monbukagakusho Scholarship (MEXT, Japanese Government Scholarship) Student.
Interdisciplinary Intelligent Systems Engineering.

Vocational Record

October 2010- September 2012	TA (Teaching Assistance, Faculty of Engineering, Department of Civil Engineering & Architecture University of the Ryukyus, Japan).
March 2012- March 2013	Board of Administration (City Leader) of Thai Students' Association in Japan under the Royal Patronage (TSAJ 73rd generation, Okinawa Branch).
August 2012	Lecturer of Khon Kaen University.
October 2012- September 2013	TA (Teaching Assistance, Faculty of Engineering, Department of Civil Engineering & Architecture, University of the Ryukyus, Japan). With famous Okinawan architect; Masaru Kinjo (Kinjo sensei, Tin Architect)
October 2012- September 2015	RA (Research Assistance, Faculty of Engineering, Department of Civil Engineering & Architecture, University of the Ryukyus, Japan).
2014	Tutor of Foreign Overseas Student (University of the Ryukyus, Japan)
2014	Certificate of the Successful Completion of the Course of the International Year of Shelter for the Homeless (IYSH) Project (coalition of Japan Housing Association, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Foreign Affairs of Japan, Japan Housing Finance Agency, Urban Renaissance Agency, and The Building Center of Japan).
January 2014	Bonen Happyukai (Final Presentation/ Jury of Second and Third Year Architecture Student's Selected Works), Architectural Critique and Commentator.
January 2015	Bonen Happyukai (Final Presentation/ Jury of Second and Third Year Architecture Student's Selected Works), Architectural Critique and Commentator.
August 2015	Godo Happyukai (Final Presentation/ Jury of Second and Third Year Architecture Student's Selected Works), Architectural Critique and Commentator.
May 2015	Lecture Architecture Students, University of the Ryukyus, Japan: On Topic of Perspective Drawing and Illustrating Technique. (Both for Exterior and Interior Perspective)
December 2012	Interviewed by NHK Japan
December 2013	Interviewed by NHK Japan

Research Record

1. **Tonmitr, N.** and Ogura, N. (2013.11), Self-build Metamorphosis and Contribution of Income Generation Space to Sustaining Low-income Housing Strategy: The Case of Banpet District of Khon Kaen Province, Thailand, Journal of Architecture and Planning (Transaction of AIJ), Vol. 78, No. 693, pp. 2281-2289.
2. **Tonmitr, N.** and Ogura, N. (2014.9), Self-customization for Income Generation Space in the Baan Mankong Program: The Case of Tawanmai Community Housing in Khon Kaen Province, Thailand, Journal of Architecture and Planning (Transaction of AIJ), Vol. 79, No. 703, pp. 1871-1879.
3. **Tonmitr, N.** (2014), Materials for Extension Low-income Housing: The Case of Bang Bua Community in Bangkok, Thailand, Advanced Materials Research Journal, Vol.849, pp. 218-222, doi: 10.4028/www.scientific.net/AMR.849.218.
4. **Tonmitr, N.**, Ogura, N. and Irie, T. (2014), Sustainable Strategy for Governmental Urban Poor Housing Development in Thailand: Contribution of Self-customize Income Generation Space, Advanced Materials Research Journal, Vol. 931-932, pp. 598-602, doi: 10.4028/www.scientific.net/AMR.931-932.598.
5. **Tonmitr, N.**, Ogura, N. and Irie, T. (2012), Sustaining the Nationwide Low-income Habitat Strategy: The Lessons Learned since the 1970s, AIK/ ASC/ AIJ, The 9th International Symposium on Architectural Interchanges in Asia (ISAIA), Architectural Institute of Korea (AIK), A-14-3.
6. **Tonmitr, N.**, Ogura, N. and Irie, T. (2012), Fortifying Nationwide Low-income Habitat Strategy with Hybrid Prototype Actors, AIK/ ASC/ AIJ, The 9th International Symposium on Architectural Interchanges in Asia (ISAIA), Architectural Institute of Korea (AIK), A-10-8.
7. **Tonmitr, N.**, Ogura, N., Irie, T. and Kinjo, H. (2014), Integrating Income Generation Space into Sustainable Low-income Housing Planning Outlook in Thailand, ASC/ AIJ/ AIK, The 10th International Symposium on Architectural Interchanges in Asia (ISAIA), Architectural Society of China (ASC), pp. 166-169.
8. **Tonmitr, N.**, Ogura, N., Irie, T. and Kinjo, H. (2014), Low-income Lifestyle and Demand on Technologies and Facilities in Income Generation Space Utilizing Family in Khon Kaen Province, Thailand, ASC/ AIJ/ AIK, The 10th International Symposium on Architectural Interchanges in Asia (ISAIA), Architectural Society of China (ASC), pp. 175-179.
9. **Tonmitr, N.**, Ogura, N. (2012), Strengthening Community-based Rehabilitation: Practical Lesson Learned from the 2011 Unpredictable Tremendous Thailand Floods and Socio-Cultural Acclimatization of Properties Maneuver System, Asian Waterfront Settlements Contribution, The 1st International Conference on Habitat Engineering and Design (ISHED), International Society of Habitat Engineering and Design, Hazard Prevention: 13-4.

10. **Tonmitr, N.**, Nanta, P. and Ogura, N. (2012), Architectural Equational-Image Approach to the Scrutiny of Space Configuration on the Traditional Thailand-Japan Dwellings: Asian Coalition Habitat Contribution, The 5th Thailand-Japan International Academic Conference 2012 (TJIA 2012), pp. 195-196.
11. **Tonmitr, N.**, Ogura, N. and Irie, T. (2014), Sustainable Strategy for Governmental Urban Poor Housing Development in Thailand: Contribution of Self-customize Income Generation Space, The 5th KKU International Engineering Conference (KKU-IENC 2014), p. 243, F17_026 (in Abstract Collection Book). ***(Received the Best Presentation Award)***.
12. Toyosaki, T., **Tonmitr, N.**, Ogura, N., Mikami, K. and Kayumi, A. (2012), Activity of Bang Bua Community and the Housing Loan: Study on the Community Housing in Bangkok, Part 1, The 51st AIJ Kyushu Chapter Architectural Research Meeting, pp. 161-164 (in Japanese).
13. Toyosaki, T., **Tonmitr, N.**, Ogura, N., Kayumi, A. and Mikami, K. (2012), Activity of Bang Bua Community and the Housing Loan: House Planning for Bang Bua Community, Part 2, The 51st AIJ Kyushu Chapter Architectural Research Meeting, pp. 165-168 (in Japanese).
14. **Tonmitr, N.** and Ogura, N. (2013), Intermediary Sustainable Housing Strategy for Poor Community: The Case of 14 rai Community in Bangkok, Thailand, The 52nd AIJ Kyushu Chapter Architectural Research Meeting, pp. 133-136.
15. **Tonmitr, N.** and Ogura, N. (2014), Self-organized Community Mechanism to Sustain the Governmental Low-income Housing Project: A Study on Housing System, House Planning and Design Outlook of Tawanmai Community Housing in Khon Kaen Province, Thailand, The 53rd AIJ Kyushu Chapter Architectural Research Meeting, pp. 161-164.
16. **Tonmitr, N.** and Ogura, N. (2015), Requisiteness of Income Generation Space (IGS) in Non-IGS Family for Supporting Sustainable Income Generating Activities: The Case of Tawanmai Community Housing in Khon Kaen Province, Thailand, The 54th AIJ Kyushu Chapter Architectural Research Meeting, pp. 149-152.
17. **Tonmitr, N.** and Ogura, N. (2012), Empowering Sustainability of Nationwide Low-income Housing Strategy with Self-help Community Maneuver System in Thailand, Technical Paper of Architectural Institute of Japan (AIJ) All Japan Annual Architectural Research Meeting, pp. 335-336.
18. **Tonmitr, N.** and Ogura, N. (2013), Cooperative System for Enhancing Sustainable Low-income Community Housing Strategy in Bangkok, Thailand, Technical Paper of Architectural Institute of Japan (AIJ) All Japan Annual Architectural Research Meeting, pp. 1301-1302.
19. **Tonmitr, N.** and Ogura, N. (2014), Demand for Sustainable Urban Low-income Housing Development: Comparative Study on the Governmental Urban Low-income Housing Programme in Khon Kaen Province, Thailand, Technical Paper of Architectural Institute of Japan (AIJ) All Japan Annual Architectural Research Meeting, pp. 1015-1016.

20. **Tonmitr, N.** and Ogura, N. (2015), Generating Income by Utilizing Income Generation Space (IGS) for Sustainable Savings Management, Technical Paper of Architectural Institute of Japan (AIJ) All Japan Annual Architectural Research Meeting, pp. 1241-1242.
21. **Tonmitr, N.** and Ogura, N. (2011), Intention and Reality in Planning Low-cost Housing: A Case Study of Khon Kaen Province in Thailand, The 50th AIJ Kyushu Chapter Architectural Research Meeting, pp. 193-196.
22. **Tonmitr, N.** and Ogura, N. (2011), Low-cost Housing with a Green Building Aspect in Terms of Site and Landscape: The Case of Khon Kaen Province in Thailand, The 4th International Conference on Sustainable Energy and Environment (SEE 2011), pp. 376-380 and p. 72.
23. **Tonmitr, N.** and Ogura, N. (2011), Natural Energy Efficiency and Eco-friendly Evaluation in Low-cost Housing: The Case of Khon Kaen Province in Thailand, The 4th International Conference on Sustainable Energy and Environment (SEE 2011). pp. 381-386 and p. 72.
24. **Tonmitr, N.** and Ogura, N. (2011), Evaluation of Low-cost Housing through Overall Thermal Transfer Value (OTTV): The Case of Khon Kaen Province in Thailand, The 4th Thailand-Japan International Academic Conference (TJIA 2011), Tokyo, Japan, pp. 57-58 and p. 34.
25. **Tonmitr, N.** and Ogura, N. (2012), Low-cost Housing with Roof Thermal Transfer Value (RTTV) Aspect: The Case of Khon Kaen Province in Thailand, AIJ Kitakyushu, Kyushu Conference, Japan, pp. 177-180.
26. **Tonmitr, N.**, Ogura, N. and Nanta, P. (2012), Design Contribution of Two Major Nationwide Low-income Housing Approaches in Thailand. The 4th KKU International Engineering Conference (KKU-IENC 2012), pp. 594-599 and p. 133. ***(Received the Second Best Paper Award)***.

Awards and Honours

Kindergarten School Level

- First Prize Award Winner, Painting & Drawing Competition, Organized by Fairy Plaza.
- Well Behavior Prize , Kindergarten School Level.
- First Prize Award, Summer English for Children, Attending the Classes & Activities and Completion of Assignments, Organized by Native English Speakers.

Elementary School Level

- Well Behavior Prize, Unit F Level.

High School Level

- Prize for Student who has Honourable Prize and Fame in Arts Field.

- First Prize Winner of the Competition of Creativity in Creating the Picture & Imagination in Science Integrated into Arts (*Karn Prakuad Kangkan Sangpharb Kwarmkidsangsan Lae Jintanakarn Tang Wittayasart)*, Organized by Faculty of Science, Khon Kaen University (Thai National Science Day, be the Reprentative of the 9 Education Area.
- Second Prize Winner of the Competition of Creativity in Creating the Picture & Imagination in Science Integrated into Arts (*Karn Prakuad Kangkan Sangpharb Kwarmkidsangsan Lae Jintanakarn Tang Wittayasart)*, Organized by Faculty of Science, Khon Kaen University (Thai National Science Day, 1997).
- Excellent Prize for Lowe-secondary School Level for Arts Competition Organized be Faculty of Education, Khon Kaen University, Sil Peerasee's Day.
- Excellent Academic Record Prize GPA 4.00 (All A) Lower-Secondary School Level, (M2), 2000.
- Excellent Academic Record Prize GPA 4.00 (All A) Lower-Secondary School Level, (M3), 2001.
- Excellent Academic Record Prize, Second Place, Lower-Secondary School Level.
- Well Behavioral Prize, Lower-Secondary School Level, (M3), 2001.
- Excellent Academic Record Prize GPA 3.98 Upper-Secondary School Level, (M6).
- Well Behavior Student Prize, Upper-Secondary School Level, (M5).
- Received "**National Well Teenage Prize**" from The Buddhist Association of Thailand Under the Royal Patronage.

Bachelor's Degree Level

- Excellent Academic Record and Well Behavior Prize of Faculty of Architecture, Khon Kaen University.
- Received Fujimoto Scholarship, being as Fujimoto Scholarship's Student.
- Prize for Design Competition of Worra Resicence Project "I Love My Room, I Love My Dorm" Design Contest Collaboration with Khon Kaen University.
- Bachelor of Architecture **(First Class Honours)**, Faculty of Architecture, Khon Kaen University.

Master's Degree level

- Received the Special Monbukagakusho Scholarship (MEXT, Japanese Government Scholarship). Special Graduate Program for International Students in Asia-Pacific Engineering Design Program.
- Master of Engineering (Civil Engineering and Architecture) **(Distinction & Outstanding, GPA 4.00)**, Faculty of Engineering, Department of Civil Engineering & Architecture, Graduate School of Engineering and Science, University of the Ryukyus, Japan.
- **The Second Best Paper Award,** The 4th KKU International Engineering Conference (KKU-IENC 2012).
- PhD Candidate Accepted, The Special Monbukagakusho Scholarship (MEXT, Japanese Government Scholarship). Interdisciplinary Intelligent Systems Engineering Program.

Doctoral Degree level

- Received the Special Monbukagakusho Scholarship (MEXT, Japanese Government Scholarship). Interdisciplinary Intelligent Systems Engineering.
- Doctor of Philosophy (Architecture, Interdisciplinary Intelligent Systems Engineering) **(Distinction & Outstanding, GPA 4.00)**, Graduate School of Engineering and Science, University of the Ryukyus, Japan.
- **The Best Presentation Award,** The 5th KKU International Engineering Conference (KKU-IENC 2014).
- **KKU Award for Lecturer** who Received Awards at National & International Level (Trophy Award 2015), Khon Kaen University (KKU).
- **President Award,** University of the Ryukyus, Japan, (2015).