รายงานวิจัยฉบับสมบูรณ์ (Final Report)

โครงการ: การวางแผนเพื่อเมืองนิเวศน์และสภาพแวดล้อมที่ส่งเสริมความพลวัตของภูมิอากาศ: การเสริมสร้างขีดความสามารถเพื่อการวางแผนอย่างมีส่วนร่วมในกรุงเทพฯ และปริมณฑล

Planning for Eco-cities and Climate Resilient Environments: building capacity for inclusive planning in the Bangkok Metropolitan Region (PEACE-BMR)

โดย: ผศ. ดร.วิจิตรบุษบา มารมย์ และคณะ

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Planning for Eco-cities and Climate Resilient Environments: building capacity for inclusive planning in the Bangkok Metropolitan Region (PEACE-BMR)

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Abstract

The Planning for Eco-cities and Climate-resilient Environments: building capacity for inclusive planning in the Bangkok Metropolitan Region (PEACE-BMR) Project is collaborative project between the Urban Futures Research Unit and the International Institute for Environments and Development (IIED) to build knowledge and capacity for Thai researchers, urban communities and local governments in the Bangkok Metropolitan Region (BMR) to identify innovative plans, as well as implement strategies to promote sustainable development and enhance urban resilience to future unexpected crises. By examining the perception, along with the coping and adaptation mechanisms conducted at the individual household and community levels, this report presents the findings from three low-income urban and peri-urban communities of the BMR. The Urban Futures team conducted fieldwork was conducted from January 2018 to July 2018 at three research sites, with data collection methods comprise of documents analysis, household surveys, interviewing key informants, focus-group discussions, direct observation and the use of the *"Kin Dee You Dee"* toolkit.

Findings reveal that, even with some socio-cultural, political, historical and economic factors impeding the residents from being fully resilient, they have already undertaken several actions to cope with, and, to a smaller extent, adapt, using their assets in responding to future hazards. Nonetheless, most of these actions merely address the crises that they have faced. Respondents tended to dismiss other crises not having occurred at any time during the past few decades. Equally, respondents were inclined to focus more on the individual-level actions than the community-level ones, despite a history of collective actions through the *Baan Mankong* ('Secure Housing') Collective Housing programme, which them the right to safe and secure housing ownership. In this manner, there are a lot of opportunities for city-level or municipal-level government to engage with the locals to encourage collaborative efforts among people within the same community, in addition to promoting meaningful changes that encourage people to expect the unexpected. This collaboration will not only foster resilience but also endorse sustainable urban development.

Keywords: Urban Resilience, Sustainable Development, Sustainable Development Goals, Disaster Management, Public Participation, Pragmatism

บทคัดย่อ

โครงการการวางแผนเพื่อเมืองนิเวศน์และสภาพแวดล้อมที่ส่งเสริมความพลวัตของภูมิอากาศ: การเสริมสร้างขีดความสามารถเพื่อการวางแผนอย่างมีส่วนร่วมในกรุงเทพฯ และปริมณฑล (PEACE-BMR) เป็นความร่วมมือระหว่างหน่วยวิจัย Urban Futures คณะสถาปัตยกรรมศาสตร์และผังเมือง มหาวิทยาลัยธรรมศาสตร์ และ องค์กร International Institute for Environments and Development (IIED) ที่ได้ร่วมกันดำเนินการวิจัยผ่านกระบวนการทางวิชาการ และการใช้สื่อสร้างสรรค์เพื่อสร้างองค์ความรู้และเพิ่มความสามารถในการวางกลยุทธ์ในการปรับตัวกับวิกฤตการณ์ที่ไม่คาดคิดในอนาคตให้แก่ประชาชนที่อาศัยอยู่ในชุมชนรายได้ต่ำ หน่วยงานท้องถิ่น และนักวิจัยที่มีความสนใจเกี่ยวกับการพัฒนาพื้นที่กรุงเทพฯและปริมณฑลให้มีความยืดยุ่นและยั่งยืน คณะทำงานได้เลือกใช้พื้นที่ศึกษาสามพื้นที่ โดยทั้งหมดเป็นชุมชนรายได้น้อยที่เข้าร่วมโครงการบ้านมั่นคง ของสถาบันพัฒนาองค์กรชุมชน (พอช.) ในกรุงเทพฯ และปริมณฑล

คณะทำงานได้วางกลยุทธ์และดำเนินการลงพื้นที่ ชุมชนศิรินทร์และเพื่อน ชุมชนร้อยกรอง และชุมชนสร้างสรรค์นครรังสิต เมื่อเดือน มกราคม พ.ศ. 2561 ถึง กรกฎาคม พ.ศ.2561 โดยเก็บข้อมูลผ่านรูปแบบที่หลากหลาย ทั้งการสำรวจข้อมูลครัวเรือน การสัมภาษณ์เชิงลึกกึ่งโครงสร้าง การทบทวนเอกสารสำคัญ การสนทนากลุ่ม การสัมภาษณ์ผู้เชี่ยวชาญ และการใช้เครื่องมือ “กินดี... อยู่ดี...” ในการทำความเข้าใจกับความเข้าใจของผู้คนที่อาศัยในพื้นที่ศึกษาเกี่ยวกับวิกฤตการณ์ในอนาคต และความเต็มใจในการเปลี่ยนวิธีการใช้ทรัพยากรที่มีอยู่เพื่อให้เกิดความพลวัตกับเหตุการณ์ไม่คาดคิดในอนาคต พร้อมกับการเรียนรู้ว่าชุมชน ทั้งในระดับบุคคลและระดับชุมชนได้มีการจัดการและปรับตัวไปแล้วหรือไม่อย่างไร

ผลการวิจัยพบว่าถึงแม้ปัจจัยทางสังคม วัฒนธรรม การเมือง ประวัติศาสตร์ และเศรษฐกิจจะเป็นอุปสรรคต่อการปรับตัว แต่สมาชิกภายในชุมชนหลายคนได้ดำเนินการเพื่อรับมือและปรับวิธีการใช้สินทรัพย์ของพวกเขาในการตอบสนองต่อภยันอันตรายในอนาคตอยู่บ้างแล้ว อย่างไรก็ตามการดำเนินการเหล่านี้ส่วนใหญ่จะเป็นการจัดการกับวิกฤตที่เคยผชิญมาแล้ว โดยเฉพาะการรับมือต่ออุทกภัย ผู้ตอบแบบสอบถามและผู้เข้าร่วมโครงการส่วนใหญ่มักเลือกที่จะไม่สนใจกับวิกฤติอื่นๆ ที่ไม่ยังไม่เคยเกิดขึ้น (เช่น ภัยจากความแห้งแล้ง) หรือไม่ได้เกิดขึ้นในพื้นที่ของพวกเขาในหลาย ๆ ปีที่ผ่านมา (เช่น วิกฤตเศรษฐกิจ) ในขณะเดียวกัน ผู้ตอบแบบสอบถามรับรู้ได้ถึงความเสี่ยงที่เพิ่มมากขึ้นโดยเฉพาะจากการเปลี่ยนแปลงของภูมิอากาศ แต่ยังมองว่าเป็นเรื่องไกลตัวเมื่อเทียบกับปัญหาอื่น ๆ ในชีวิตและชุมชน ในด้านการปรับตัวและการเปลี่ยนแปลงการใช้ทรัพยากร ผู้ตอบแบบสอบถามมีแนวโน้มที่จะให้ความสำคัญกับการดำเนินการในระดับส่วนบุคคลมากกว่าการให้ความร่วมมือกับการปรับตัวร่วมกับผู้อื่นหรือในระดับชุมชน แม้ว่าผู้ตอบแบบสอบถามจะเคยให้ความร่วมมือกับชุมชนของตนเองในการผลักดันให้เกิดโครงการบ้านมั่นคง

จากที่ได้กล่าวมาทั้งหมด คณะทำงานเล็งเห็นว่าหน่วยงานภาครัฐโดยเฉพาะหน่วยงานเทศบาลควรที่จะมีส่วนร่วมกับคนในท้องถิ่นเพื่อส่งเสริมความพยายามในการร่วมมือกันระหว่างคนในชุมชน นอกเหนือจากนั้น ควรมีการส่งเสริมให้มีการปรับตัวในลักษณะที่กระตุ้นให้ผู้คนเตรียมพร้อมกับเหตุการณ์วิกฤตที่มีแนวโน้มว่าจะเกิดขึ้นสูง ความร่วมมือนี้จะไม่เพียงแต่ส่งเสริมความยืดหยุ่น แต่ยังสนับสนุนให้มีการพัฒนาเมืองอย่างยั่งยืนและแท้จริง

คำสำคัญ: เมืองที่รับมือกับการเปลี่ยนแปลงได้, การพัฒนาที่ยั่งยืน, เป้าหมายการพัฒนาที่ยั่งยืน, การจัดการภัยพิบัติ, การมีส่วนร่วม, ปฏิบัตินิยม

Executive Summary

Realising the importance of sustainable urban development to the changing physical, economic, social and political environments, and resilient adaptation to future crises, the International Institute for Environments and Development (IIED) joined force with the Urban Futures Research Unit, Department of Architecture and Planning (APTU), Thammasat University, to address this issue academically. Through the Planning for Eco-cities and Climate-resilient Environments: building capacity for inclusive planning in the Bangkok Metropolitan Region (PEACE-BMR) Project[1], which took effect from April 2017 to March 2019, the research team set out to understand: 1) what are existing adaptive mechanisms of households for crises?; 2) whether communities have collective resilience strategies and what role do community assets play?; and 3) what are the implications of multi-level governance towards urban resilience?

In this report, section 1 elaborates on the project's objective, research questions, activities timeline, as well as the significance of collaboration with other researchers and research assistants to the endeavour of this project. The next section, section 2, presents the key concepts and working definitions that the team has agreed upon and the literature review. Subsequently, section 3 reports the research design, case studies selection, finalised interview guide, and the development of the learning toolkit. The obstacles and limitations the team face while working on the project is also featured in this section. Section 4 presents the results from the in-depth and focus group interviews, as well as analysed findings. Section 5 presents the progress on publication and means to disseminate research findings. Finally, section 6, presents other outcomes of the projects, in addition to future works of the Urban Futures team after the end of this PEACE-BMR project.

The fieldwork was conducted at three research sites, namely Sirin and Friends (*Sirin Lae Puean*), Roi Krong and Sangsan Nakhon Rangsit, from January to July 2018 and data-collection methods include documents analyses, household surveys, focus-group discussions, direct observation and the use of innovative-learning toolkit, the *Kin Dee You Dee* toolkit, developed by Urban Futures and the OpenSpace design team.

[1] This Institutional links project is funded by Thailand Research Fund (TRF), as well as the Newton Fund, and managed financially by the British Council.

Findings reveal that, even with some socio-cultural, political, historical and economic factors impeding the residents from being fully resilient, they have already undertaken several actions to cope with, and, to a smaller extent, adapt, using their assets in responding to future hazards. Nonetheless, most of these actions merely address the crises that they have faced. Respondents tended to dismiss other crises not having occurred at any time during the past few decades and undermine the consequences of climate change. Regarding to the answer to question 1, most participants demonstrated that they were able to undertake short-term actions to cope with negative effects of crises. Regrettably, there was no clear adaptive mechanism at the household level. The summarised answer to question 2 is that collective actions appeared to be insignificant, mainly performed by older communities' committees. Even among these committees, collective actions were dwindling. There was also a lack of long-term communal planning in terms of how to use resources in the community, even in the case of crises that they had previously faced. Participants seemed to be more reliant on external support and networks. However, when households were asked about what actions they were willing to take to adapt their existing assets and resources to various crises, there seemed to be willingness to consider several actions. This willingness can be seen as a positive start. Nonetheless, communities still require strong incentive to turn this willingness into reality. Finally, concerning the answer to question 3, there are a lot of opportunities for city-level or municipal-level government to engage with the locals to encourage collaborative efforts among people within the same community, in addition to promoting meaningful changes that encourage people to expect the unexpected. Certainly, above and beyond the usual prescriptive measures, material and discursive elements that shape people's experience must be understood to promote resilience to future crises.

In addition to the academic endeavour, the team spent the last phase of the project to further analyse the collected data, draft policy recommendation, in Thai with English translation, and produce several academic journals. The development of *"Kin Dee You Dee*" to assist community-based resilience strategies have been finalised after several testing sessions with the participants of the three research sites, as well as residents of Bang Plong Community in Samut Prakan Province and residents of the Bang Kapi District in Bangkok. The toolkit was handed over to the Community Organisation Development Institute (CODI) in January 2019, who will be using it to help the communities under its care to better plan for resilient future.

The team has been working on disseminating information on the progress and some findings of this project, doing so through online magazines, Facebook and Urban Futures' website, as well as international conferences and symposium in Thailand, the United Kingdom and Spain. The researchers will not stop upon the project's end. Future academic research and the use of the *Kin Dee You Dee* toolkit in other areas have been planned and will be carried out.

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1. Introduction

Thailand's two extensive coastlines (along the Gulf of Thailand and the Andaman Sea) make large areas of the country susceptible to the impacts of climate change, such as sea-level rise and flooding, as has been documented by Marome (2013). In addition to the physical attribute, the country's newly-industralised status with relatively-unstable central governments also make the country susceptible to negative consequences of man-made crises. Even with massive investments in prevention and mitigation, the Bangkok Metropolitan Region (BMR)[2] (Figure 1), Thailand's political, social, economic, and cultural hub, has continued to face escalating vulnerability, with climate change further worsening the situation. Certainly, the region has already experienced momentous unexpected events, whether environment-centered, such as the 2011 Mega-Flood, or man-made, such as the 1997 "*Tom Yum Koong*" Economic Crisis. With the likelihood of crises, such as flooding, drought and an economic upheaval occurring/reoccurring in the region, it is important to ensure that residents can prepare for future potential shocks, and that no one gets left behind. Regrettably, this is not the case, as many people living in low-income communities within the urban areas, especially those who live along the canals, continue to be exposed and highly vulnerable, and rely heavily on external support. Consequently, it is important for the region to plan for resilience and inclusive participation for sustainable urban futures.

[2] Bangkok Metropolitan Region refers to the Bangkok's city limit and the five adjacent provinces, namely Nakhon Pathom, Pathum Thani, Nonthaburi, Samut Prakan, and Samut Sakhon.

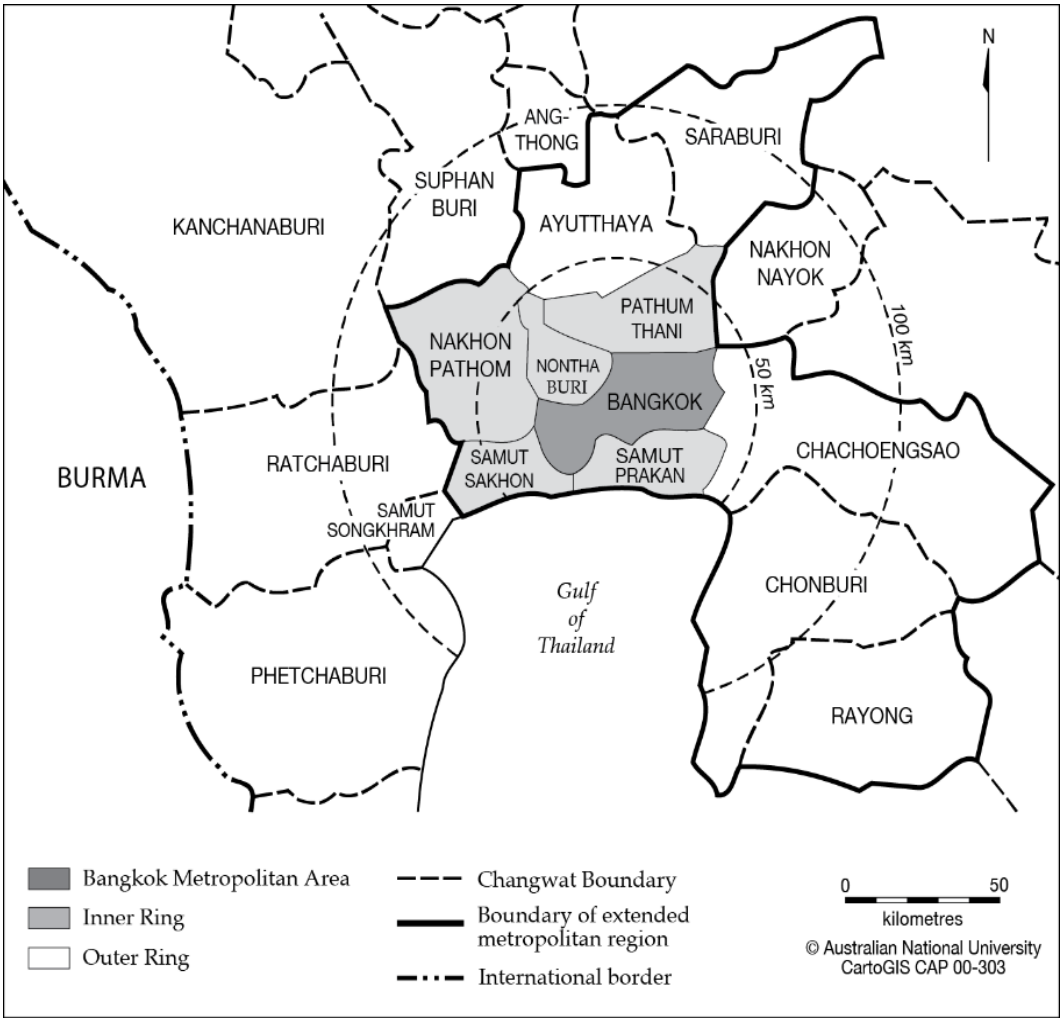


Figure 1: Bangkok in dark grey and the Bangkok Metro Region (BMR) in light grey (Australia National University, 2015)

Despite the relative lack of action in Thailand, there has been the increasing recognition accorded to the importance of developing resilience, the 'capacity to adjust and adapt for the better to threats and avoid harm from future events with minimal or no outside assistance' (Manyena, 2006, p.445; Pelling, 2003), in urban areas to withstand potential shocks and stresses, be they physical, social or economic. The Intergovernmental Panel on Climate Change (IPCC)'s fifth Assessment Report highlighted the climate-change risks facing urban centres, as well as the need for municipalities to act efficiently to address these risks. Various initiatives, such as the 100 Resilient Cities Programme, the Asian Cities Climate Change Resilience Network (ACCCRN), the Sendai Framework, and the Sustainable Development Goals (particularly Goal 11), also highlight the importance of integrated, multi-sectoral approaches whereby actors, institutions, and urban systems, like infrastructure, need to be considered together to ensure that all residents of the urban areas can better prepare for future potential shocks, and that no one gets left behind. For innovative planning to

materialise, urban governance must relate to the way in which public, private, and civil-society actors, as well as institutions, interact, influence, and manage urban planning and regulation implementation (Angueloveski & Carmin, 2011). Furthermore, the inclusion of vulnerable groups, which are often marginalized, needs to be in place to ensure that their voices are better heard and are included in the planning processes.

With the recognition of the mounting vulnerability and the relative lack of pioneering action in Thailand, which contrasts the global trend, the Urban Futures Research Unit (Urban Futures hereafter) at the Faculty of Architecture and Urban Planning, Thammasat University (APTU), has joined forces with the International Institute for Environments and Development (IIED) to initiate the PEACE-BMR Project. For this project, the team has been looking at the resilience characteristics of three urban communities in the BMR. These three communities are Sirin and Friends (*Sirin Lae Puean)* in Bang Chak District of Bangkok, Roi Krong in Bang Kaen District of Bangkok, and Sangsan Nakhon Rangsit in Rangsit District of Pathum Thani Province.

1.1. Report Organisation

The rest of this section, section 1, will elaborate on the project's objective, research questions, activities timeline, as well as the significance of collaboration with other researchers and research assistants to the endeavour of this project. The next section, Section 2, presents the key concepts and working definitions that the team has agreed upon and the literature review. Subsequently, Section 3 reports the research design, case studies selection, finalised interview guide, and the development of the learning "*Kin Dee You Dee"* toolkit. The obstacles and limitations the team face while working on the project is also featured in this section. Section 4 presents the results from the in-depth and focus group interviews, as well as analysed findings. Section 5 presents the progress on publication and means to disseminate research findings. Finally, Section 6, presents other outcomes of the projects, as well as how the Urban Futures team will conduct similar research in other parts of Thailand.

1.2. Objectives

With the goal of contributing to the building of better capacity for sustainable, inclusive, and resilient urban development, the objectives of this projects are:

1. To build knowledge and capacity of Thai researchers, urban communities and local governments to identify and implement innovative plans and strategies to increase inclusivity, besides enhance urban resilience;

2. To foster collaboration on urban resilience research, primarily between Thai and British researchers, particularly by promoting new personal and institutional relationships and through an applied research project focusing on Thailand;

3. To encourage government bodies to seek and inspire the engagement of non-state actors, including academia and civil society, in urban decision-making processes, for example by scaling up the use of innovative communication tools (e.g. toolkit); and

4. To deliver policy recommendations for planning resilient, inclusive eco-cities tailored to Thai planning processes and the needs of Bangkok Metropolitan Region (BMR)'s vulnerable communities.

1.3. Research Questions

To address the objective of this project effectively, the PEACE-BMR project needs to comprehend how low-income communities in the Bangkok Metropolitan Region (BMR) are planning for and responding to potential shocks, including flooding, drought, and economic crisis; which individual and collective assets –internal and external – are at risk, and which can be used to overcome those risks; and whether residents apply mechanisms of coping, adapting, or something new, and whether collective action applied. Particularly, this study seeks to answer the following research questions:

1. What are existing adaptive mechanisms of households for crises?

2. Do communities have *collective resilience strategies* and what role do community assets play?
3. What are the implications for multi-level governance towards urban resilience?

For this study, massive flooding was chosen as an example of the future crisis because an event of this sort has already occurred in Central Thailand, where the BMR is situated at. With the physical geography and climate, a severe flooding event can occur again in the BMR. In addition to flooding, the choice of severe drought was made due to the possibility of its happening in the BMR, with the description of this example being based on the real events in southern parts of the California State, the United States and Cape Town, South Africa. Likewise, an economic crisis had occurred in Thailand in 1997. Nonetheless, to create a more-up-to-date scenario, additional information based on real financial concerns in Greece (Greek government-debt crisis) and Venezuela were incorporated.

The research study also led to the testing and development of an innovative *Kin Dee You Dee* toolkit that can be used to foster community dialogue around what is required to achieve community-based resilience strategies. (More details can be found at Section 3.6.).

1.4. Activities Timeline

Before this report moves on to other materials, it is important to highlight what the team have done during the past one year and six months. From April 2017 to October 2017, or the first six months of the project, the team had done the following:

Month	Activities
April 2017	1. Project commenced 2. Selected and hire research associate and research assistances[3] 3. Planning for the workshop to identify participants and research structure[4] 4. Initial research and development of learning tool
May 2017	1. Literature review[5] 2. Develop conceptual framework[6] 3. Contacting and establishing contacts with stakeholders
June 2017	1. Literature review 2. Develop conceptual framework 3. Contacting and establishing contacts with stakeholders 4. Identifying research sites[7]
July 2017	1. Survey of potential research sites 2. Develop research question guide and questionnaire[8] based on the research conceptual framework. 3. Finalising research sites
August 2017	1. Ran the one-day capacity building workshop on research skills for Thai research assistants 2. Further develop research question guide
September 2017	1. Run the multi-stakeholder workshop for local officials, local community groups and researchers 2. Drafted policy briefings in Thai and English based on outcomes of the workshop

Table 1: PEACE-BMR Activities from April 2017 to September 2017.

[3] More information on research associate and research assistants can be found in section 1.7.

[4] More information on learning tool can be found in section 3.6.

[5] More information on literature review can be found in section 2.

[6] More information on conceptual framework can be found in section 2.

[7] More information on research sites can be found in section 3.4.

[8] More information on question guide and questionnaire can be found in section 3.5

From October 2017 to March 2018, which is the second phase of this project, the team had done the following:

Month	Activities
October 2017	1. Met with the Openspace[9] team to develop learning tool 2. Modified research question guide to suit the research sites using the insights gained from multi-stakeholder workshop.
November 2017	1. Tested research guide with communities' leaders 2. Analysed initial findings 3. Used the insights gained from the research guide to improve the question guide and questionnaire.
December 2017	1. Facilitator training for the use of learning tool 2. Used the feedbacks from the facilitator training to improve on the learning tool
January 2018	1. Conducted questionnaire survey[10] with the participants 2. Tested learning tool with communities' leaders
February 2018	1. Conducted questionnaire survey with the participants 2. Revised and modified learning tool
March 2018	1. Conducted focus group interview[11] with youth in all three research sites 2. Tested learning toolkit 3. Analysed research results[12] 4. Begin writing final report and publication

Table 2: PEACE-BMR Activities from October 2017 to March 2018.

The project was initially projected to complete at the end of September 2018. However, since the team has been working on the PEACE-BMR project alongside another project, "Mainstreaming Climate Change Adaptation (CCA) in Four Pilot Cities (Udon Thani City), the team felt that both projects should end at the same time, which is March 2019. The extension of the PEACE-BMR project would enable to researchers to work more resourcefully. Data and insights from the Mainstreaming CCA in Four Pilot Cities project can enhance the PEACE-BMR project, and *vice versa*.

[9] Our partner who specialises in designing and creating educational games and communication tools.

[10] More details on the questionnaire survey can be found in Section 3.5

[11] More information on the focus group interviews can be found in Section 3.5

[12] Preliminary results can be found in Section 4

From April 2018 to October 2018, which is the third phase of this project, the team had done the following:

Month	Activities
April 2018	1. Tested the *Kin Dee You Dee* Tool at a non-selected community with community leaders and key urban actors in Samut Prakarn province, Bang Prong Community
May 2018	1. Interviewed key informants from the three selected communities and their networks 2. Analysed household survey database
June 2018	1. Draft an abstract for two academic conferences 2. Visited IIED, UK and worked on a draft academic paper
July 2018	1. Tested the learning toolkit. 2. Interviewed the representative from Community Organisation Development Institute (CODI) to gain more academic insights.
August 2018	1. Enhanced the effectiveness of the learning tookit. 2. Drafted academic journals based on this project
September 2018	1. Presented a paper at the 2018 Southeast Asia Disaster Risk Governance Academic Seminar | 24-26 September 2018 | Bangkok, Thailand
October 2018	1. Had a meeting with an urban community network in Thailand and introduced *Kin Dee You Dee* toolkit to the network

Table 3: PEACE-BMR Activities from April 2018 to October 2018.

From November 2018 to the end of this project (March 2019), the team had done the following:

Month	Activities
November 2018	1. Tested the learning toolkit with officials from Community Organizations Development Institute (CODI)
December 2018	1. Tested the learning toolkit with local participants at CODI. 2. Presented a paper at the 11th International Forum on Urbanism (IFoU) Congress 2018 - Reframing Urban Resilience Implementation: Aligning Sustainability and Resilience in Barcelona, Spain
January 2019	1. Hosted a final workshop to engage with all the relevant stakeholders at Avani Atrium Hotel, Bangkok, Thailand
February 2019	1. Finalised the *Kin-dee-yuu-dee* toolkit 2. Presented a paper at the International Symposium on Disaster Resilience and Sustainable Development: Integrating Higher Education Institutions achieving SFDRR and SDGs at Asian Institution of Technology (AIT)
March 2019	1. Submitted the final report

Table 3: PEACE-BMR Activities from November 2018 to March 2019

1.5. Collaboration with the International Institute for Environments and Development (IIED) and other scholars

As one of the objectives of this project is to foster collaboration on resilience research in Thailand, particularly between the Thai and British researchers, APTU, through the Urban Futures Research Unit, spearheaded by Assistant Professor Wijitbusaba Marome and Assistant Professor Boonanan Natakun, has been working very closely with IIED's expert, Dr Diane Archer, since the beginning of this project. The project has progressed beyond just the collaboration between the Thai and British researchers. The IIED-Urban Futures partnership has also engaged with local government officials. The partnership has opened opportunities for partnership between local authorities, communities and researchers to effectively communicate, identify and address the risks, as well as more resilient adaptive measures.

Additionally, during the life-span of this project, two American graduate students, Anjali Kumar, from Stanford University, and Hayden Shelby, from the University of California at Berkeley, have participated and contributed most positively towards the realisation of the goal of this project. The team from the Urban Futures Research Unit also works very closely with a local organisation, Openspace, specialising in designing communication tools and creating educational games.

In term of experience, the three principal researchers, Dr Archer, Dr Marome, and Dr Natakun have extensive research experience in climate-related resilience, as well as low-income communities in the context of Thailand. Dr. Archer is a specialist in cities and climate change and is familiar with the Thai cultural and socio-political contexts due to her research background on human settlements in Thailand. She has also extensively engaged in the ACCCRN initiative, through which her initial partnership with Dr Marome emerged. Dr Marome has successfully led and participated in numerous internationally-funded research projects, most notably the CCaR project, which provides an excellent foundation to consolidate the concept of urban resilience in Thailand, building upon existing networks of practitioners. Dr Natakun is an expert in urban neighbourhood and community studies in Thailand. The most recent international research project that Dr Natakun takes part is the Southeast Asian Neighbourhood Network (SEANNET) funded by Henri Luce Foundation. SEANNET aims to create a cross-national urban pedagogy and build up a strong multi-

disciplinary network of urban researchers among Southeast Asian countries, including Indonesia, Myanmar, the Philippines, Thailand and Vietnam.

This Institutional links project is funded by the Thailand Research Fund (TRF), as well as the Newton Fund, managed by the British Council.

1.6. Research Associate and Research Assistant

Without doubt, it is impossible for merely three researchers to carry out the activities of the PEACE-BMR project successfully in sufficient measures. Hence, the Urban Future Research Unit has recruited highly-adept individuals teeming with the interest on climate change adaptation and the topic of resilient city. They are:

1. Dr Nuttavikhom Phanthuwongpakdee
2. Natthaphon Wongpeng
3. Patsu Norrakarnkumphon
4. Warute Udomrut

There were research assistants who were crucial to this project's progress but has left to pursue other endeavours before the end of the project. They are:

5. Orathai Gunatilaka, an undergraduate student at the Faculty of Architecture and Urban Planning, Thammasat University (at the time of this project); and
6. Kittisak Ruangmun, an undergraduate student at the Faculty of Architecture and Urban Planning, Thammasat University (at the time of this project).

Their contributions proved to be extremely significant for the positive progress of this project.

1.7. Training for Researchers and Stakeholders

In addition to producing high-quality academic works, it is important that the research teams, as well as relevant stakeholders, have all the relevant skills and knowledge. IIED

researchers, specialising in urban climate resilience and low carbon development, take the lead role in organising the training sessions for Urban Futures research staff and trainees.

Since the beginning of this project until the date of this report submission, the team has:

- One research skills workshop facilitated by IIED researchers, equipping Urban Futures research trainees with the language and skills necessary to conduct policy-relevant research on urban climate resilience and low carbon development;
- Capacity building of Urban Futures research assistants in workshop facilitation through participating in workshops.

The team has conducted training sessions focusing on the important skills that are related to fostering community of practice by:

- Having a 3-day workshop of Thai urban stakeholders (including local government and community groups) to identify and evaluate innovative, inclusive approaches to urban low-carbon resilience planning with UK experts;
- Modifying and updating on specific game as learning toolkit for multi-stakeholder to be more accustomed to the concept of resilience.

2. Key Concepts and Literature Review

The definitions, as well as their relationship, of the key concepts used in this research, specifically sustainable development, and resilience, are still under academic debates. Some concepts, especially resilience, have multiple definitions, depending on the academic discipline. Consequently, it is vital to elucidate the most appropriate definitions of the key concepts, in addition to their connections, that fit perfectly with the objectives of this research. Certainly, the clarification is compulsory to avoid possible ambiguity, confusion, and misunderstanding that can arise.

2.1. Sustainable Development

Sustainable development has been defined in many ways by different scholars. This research will use the most frequently cited definition, from *Our Common Future*, also known as the Bruntland Report, which is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Development and Environment, 1984). This definition steers towards realizing two essentialities, which can be applied to the context of sustainable development in the Bangkok Metropolitan Region (BMR). The first essentiality is to understand the needs of those who do not have access to the fruits of development. The second essentiality is being cautious of resource depletion and exceeding resource limitation, which will deny the authentic needs of the future generations. In Thailand, sustainable development has been intregated into the National Adaptation Plan (NAP), the Twelfth National Economic and Social Development Plan (NESDB, 2017) and the 20-Year National Strategic Plan.

To define the complete sustainability problem, it is vital to understand the three[13] pillars of sustainability. This consists of at least the social, economic, and environmental pillars. The social aspect of sustainability focuses on balancing the needs of the individual

[13] In September 2015, the United Nations (UN) and its member countries adopted the Sustainable Development Goals (SDGs), which took effect in January 2016 and is scheduled to run its full course until December 2030. In addition to the three pillars (called People, Prosperity, and Planet for social affairs, economics, and environment accordingly), the UN included Peace and Partnership as two additional pillars to the new sustainable development agenda within SDGs. Every one of the 17 Goals, while interrelated, fall into one of these 5 "Ps". This research, which based mostly on the three pillars, will consider the importance of these two additional pillars.

with the needs of the group. Economic sustainability promotes the use of resources in an efficient and responsible way so that they will provide long-term benefits and profitability. Environmental sustainability occurs when processes, systems and activities reduce negative impacts to the environment. If any one of these pillars is weak, then, the system will be unsustainable.

2.2. Resilience

The concept of (urban) resilience as applied by the collaboration will encompass not only physical resilience to the impacts of climate change, but also socioeconomic resilience, to ensure the inclusive and sustainable economic growth and urban development of the Bangkok Metropolitan Region, while ensuring that vulnerable groups are not left behind. Resilience is a relatively complex concept and this research does not intend to deal with the different definitions of resilience. While acknowledging these different definitions, resilience is defined in this paper as the 'capacity to adjust and adapt for the better to threats and avoid harm from future events with minimal or no outside assistance' (Manyena, 2006, p.445; Pelling, 2003).

Originally, the term is used mainly within the scientific field of ecology. Nevertheless, as the academic gap between the natural and social sciences began to narrow, resilience is increasingly becoming popular in the study of social-environment interactions. Although resilience is extensively observed as having the potential to support affected individuals and communities cope with risk and vulnerability, the issue of what exactly constitutes resilience continues to be ambiguous. Most of the early studies on resilience devote a great amount of their discussion to defining the term and offering theoretical insights (Folke, 2006; Manyena, 2006; Paton, 2006; Pelling & Manuel-Navarrete, 2011). Empirical research on social resilience have only begun in the twenty-first century.

Important works on resilience include the researches of Paton, Johnston, and Smith (2001) in Australia and New Zealand, in addition to Tobin and Whiteford (2002) in Ecuador. Since then, numerous decision-makers and academics prefer to associate resilience to the concept of 'living with risk' over the concept of 'controlling risk' (e.g. Jang & Wang, 2009; López Marrero, 2008; Phanthuwongpakdee, 2016). The concept of living with risk promotes

the notion of resilience, with the aim of identifying means by which exposed individuals and communities can better anticipate, alleviate and prepare for the manifestation of hazardous events. Indeed, Pelling (2003) suggests that, instead of the popular notion of 'bouncing back to normal', resilience should be viewed as the multiple ways that a system can adapt and transform itself into a less vulnerable state. These numerous ways include the system's capacity to absorb, learn from, adjust to, and recover from impacts. Additionally, since many experts predict that climate change will amplify both the frequency and the magnitude of several hazards and shocks (IPCC, 2012), solidifying the ability of individuals and communities to prepare and cope more efficiently with current and future hazards is crucial.

Building resilience as a concept is increasingly seen as the norm with regards to preparing for and responding to climate change impacts alongside other shocks and stresses. In this paper, the research team adopts the concept of urban resilience as something which emerges through the roles played by individuals and institutions, as opposed to a solely physical construct determined by physical infrastructure and the environment. As cities face uncertainty, city actors will need to adopt a diversity of approaches, to be flexible to respond to the changes that may arise (Bene *et. al.*, 2017). These diverse approaches can be termed 'adaptive governance', which builds on trends for more participatory, decentralised governance, to build capacity for learning, more flexible institutions and different types of knowledge (Baud and Hordijk, 2009). The work of Pelling and Mustafa (2010) further insists that the consideration of resilience at the local level can assist us in identifying development that aim for transformative change. This consideration can also help us to recognise the constraints that prevent individuals and communities from adapting resiliently; even though they may be aware of their risk, exposure, and vulnerability. Focusing on what will enable vulnerable people to achieve resilience, the recognition of the factors that promote resilience and constraints that hinder it is important. In this manner, local individuals are not seen as powerless victims, but as active agents whose inputs, thoughts and experience count in urban planning, as well as present and future development.

Local governments are significant actors in adaptive urban governance, as they define urban plans and infrastructure investment decisions, though their ability to act will to a certain extent be shaped by central government policies and plans. Thus, recognising that climate change is a challenge which cannot be solely addressed by a single organisation or governance institution, 'multilevel or multiscale governance' (Leck and Simon, 2012) is

necessary, which ‘implies a recognition of the multiple actors who intervene’ (Castan Broto, 2017, p.1) – a shift away from a top-down, state-led approach towards including actors from both the government and non-government sector, including community groups.

At the level of low-income local communities and households, there are many evidences to exemplify the actions that the residents take to cope with and adapt to climate change, and to minimise the impacts of climatic hazards. Coping mechanisms are distinguished by being reactive and geared towards survival, while adaptation involves planning with a longer-term outlook (CARE, 2009) and therefore should contribute to, rather than deplete, assets. Adaptive mechanisms can range from household-level measures such as retrofitting cyclone-proof roofing in Vietnam (Moench *et. al.*, 2017), growing vines on roofs for cooling in Bangladesh (Haque, Dodman and Hossain, 2014) to raising the plinth of homes against flooding, to community-level action such as improving storm drains and paving paths. The types of investments that households and communities are willing to make are in part determined by their land status – security of tenure, particularly ownership of homes, will increase the likelihood of willingness to invest in longer-term adaptive mechanisms.

Assets are essential to the livelihoods and financial security of low-income households, with asset accumulation contributing towards urban poverty reduction (Moser 2009). Regarding climate change adaptation, approaches to adaptation which support the assets of low-income households can therefore contribute to securing their longer-term future. However, there are limits to what adaptation can be done by individual households or low-income communities without also involving wider urban stakeholders – for example community-level drainage systems and paths need to be integrated to wider trunk infrastructure, and climate impacts locally will be determined by systems managed more widely, such as watersheds. Therefore, effective adaptation requires household and community planning and action be supported by local government, who need to be accountable and responsive to local needs (Satterthwaite *et. al.*, 2018).

2.3. The Nexus between Resilience and Sustainable Development

In the literature, many connections have been drawn between the concept of resilience and sustainable development, see Folke *et al.* (2004) and Mäler (2008). In some cases, like in

the works of Holling and Walker (2003), as well as Levin *et al.* (1998), the investigators have used both notions almost interchangeably. Nevertheless, in this research resilience (as discussed in Section 2.2) is a necessary component for sustainable development, and *vice versa*. Lebel *et al.* (2006) supports our epistemological position as they point out that "[to strengthen] the capacity of societies to manage resilience is critical to effectively pursuing sustainable development" (p. 2).

In term of urban planning, resilience needs to be linked to sustainability so that the resilience we are trying to achieve is helping us in moving towards desirable sustainable future. Today, resilience as a concept is the norm with regards to responding to climate-change impacts, together with other shocks and stresses. The United Nations International Strategy for Disaster Reduction (UNISDR) Global Assessment Report in 2007, 2009, 2011, 2013 and 2015 repeatedly recommend that it is imperative to contemplate the resilience in the communities that do not receive as much attention. According to UNISDR (2007), "disasters are first and foremost a 'local' phenomenon. Local communities are on the frontlines of both the immediate impact of a disaster and the initial, emergency response, which, experience has shown, is crucial for saving the most lives" (p. iii). Adaptation to disasters also featured explicitly in three Targets in three UN's Sustainable Development Goals (Goal 1, 11, and 13);

- Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters,
- Target 11.5: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations, and
- Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

This research argues that while nobody can precisely predict the future, people can equip themselves to adapt accordingly to future shocks. In this manner, resilience is the key to the concept of sustainability. However, current resilience planning and management efforts may

just be leading our urban future into undesirable trajectories, away from sustainability. For example, after the 2011 Mega-Flood in Thailand, there was many discussions about large technical infrastructure solutions, such as large-scale dam(s), flood ways, closable sea gates, and even additional canals, for dealing with expected future riverine and coastal flooding. These infrastructures add the capacity for the metropolitan to adjust and adapt to flooding and alleviate damages. However, many of these infrastructures also post threats to the "well-being" of the socio-economic and the ecological systems of the BMR, and the whole country. In addition to the potential negative ecological side-effects, such as the loss of precious upstream forest, and the destruction of coastal mangrove, if implemented, these infrastructures required a huge sum of money to maintain, thus hindering other important development, such as transportation. In term of social aspect, many people will have to be relocated to make way for several mega projects. Inappropriately, unsuitable new sites can lead to lost livelihoods, lost sense of community and social capital, cultural alienation, poverty, and people abandoning the new sites and returning to the location of their original community, causing conflicts with projects developers and local government. Undeniably, this kind of resilient development is not a sustainable development.

The discussion regarding the theoretical connection between these two concepts is beyond the scope of this research. More discussion can be found in the work of Derissen, Quaas and Baumgärtner (2009).

2.4. Conclusion

This chapter has clarified the definitions, as well as their relationship, of the key concepts used in this research, specifically sustainable development and resilience. In this research, sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs, while resilience is the capacity to adjust [and adapt for the better] to threats and mitigate or avoid harm.

In term of the relationship between these three concepts, it is hopeful that the research collaboration's emphasis on resilience will encourage more sustainable urban development in the longer term. The following chapters will explain, comprehensively, how the researchers plan to collect data and disseminate the research finding.

3. Research Development and Implementation

After several meetings, rigorous review of literature (Section 2), and brainstorming of ideas, the team felt that case studies research, with the mix of qualitative and quantitative techniques, is the most appropriate research methodology.

This section commences with the description of the epistemological assumption underpinning the study. It continues to describe the techniques that were utilised, the reasons for employing these techniques, and the ethical concerns of the research. It, then, elucidates why the three areas in the Bangkok Metropolitan Region are selected as the locations for the case studies and what actions have been done at each site. Finally, the final subsection elaborates on the development of the learning toolkit, the "*Kin Dee You Dee*" board game.

3.1. Case Study Research

This research can be classified as an action research, involving both quality and quantitative components. It seeks to respond to the emerging needs of the real-world problems within the Bangkok Metropolitan Region (BMR). The action research is centred on a case study approach as described by Robert Yin (2003, 2013) Yin (2013) defines the case study, with the constructivist[14] paradigm, as an empirical investigation that explores a contemporary phenomenon within its real-life context (p. 23). The case study approach is, without doubt, pragmatic in nature because it accepts that people arrive at decisions on a rational basis, using their individual criteria to assess information concerning the environment as they perceive and/or experience.

Certainly, to be realistic, the researchers realised the fact that for this research to be successful, it must seek collaboration with relevant stakeholders, who have interest in transforming the communities into sustainable eco-cities, and relevant participants and informants who are likely to be affected by the research.

[14] A viewpoint in education built on experimental learning or training through real-life experience to construct and condition knowledge.

3.2. Mixed method

To minimise the ambiguity, many researchers have employed a process called ‘ triangulation’ , or the use of multiple methods and sources that complement each other in order to provide a full understanding of the research topic and knowledge (Yin, 2013) . Undeniably, this research also aims to employ mixed research method to gather relevant data. The following sub-sections will explain these methods.

3.2.1. Mapping

Morphological and physical mappings are employed to help identify layers of built forms and physical elements in attempting to ecologically understand relationship between residents’ activities and their living environment.

Morphology is the study of form, and this comprises various factors that influence and govern form (Lozano, 1990, p.209). At a community level, morphology of built form is defined here as comprising two elements: the built objects, such as houses and public spaces, and the street patterns. Morphological mapping is proposed particularly for producing a basemap in each case-study community. Basemaps will be used to fill information into physical map that helps both researchers and residents define uses and behaviours taken within the communities.

Rapoport (1982) introduced the idea of fixed, semi-fixed and non-fixed elements into environment-behaviour studies. Hence, the fixed element can be mapped morphologically, while the last two elements should be captured by using physical mapping techniques. As stated by Lynch, “two major classes of physical things will always have to be mapped: persons acting and the physical facilities that support that action” (1984, p.351). Therefore, this research looks at residents’ acting in their living spaces through mapping physical setting in those spaces, aiming to draw out how much residents behave ecologically within their communities.

3.2.2. Observation

Behavioural observation is unobtrusive, so it is a time-consuming process, and it can be considered as a non-participant observation in ethnographic research. As noted by Zeisel (2006, p.191), observing human behaviours in physical settings can reveal the relationship between behaviours and physical features. It also yields what Zeisel calls *"*behavioural opportunities and constraints that environments provide*"* (2006, p.191). In addition, behavioural observation can help in observing unusual or peculiar behaviour that might not usually be seen, such as rule-breaking or trivial activities and transgressions (Zeisel, 2006). Discursive practices performed community members are also aimed to be recorded and analysed because they have the potential to reveal some significant points, underlying actions and behaviours.

Participant observation as a primary source of information. There are five attributes identified by Gobo (2008, p.5), which are (i) the researcher establishes a direct relationship with the social actors, (ii) staying in their natural environment, (iii) with the purpose of observing and describing their behaviour, (iv) by interacting with them and participating in their everyday ceremonials and rituals, and (v) learning their codes (or at least part of them) to understand the meaning of their actions. These help ethnographic researchers to yield hidden information in study areas.

Following Bernard (2002), 'trust' is collectively accumulated through 'hanging out'. Visiting the case studies regularly both on eventful and ordinary days and staying at the communities for a certain period are planned. This would help in building the trust of residents towards the researchers. It is noted that both mapping and observation are to triangulate data drawn out from interviews.

3.2.3. Interviews

Zeisel states that the function of interviews is to explore "what people think, feel, do, know, believe, and expect" (2006, p. 227). Interviews one is used for obtaining in-depth information, understanding and the feelings of people towards circumstances investigated, and seeking what is important about those circumstances as well as what kinds of effects are affecting them (Zeisel, 2006, p. 227).

Interviews as a research method in this research include not only semi-structured interview questions, but also informal conversations that can be spontaneously undertaken in any setting when appropriate. These two types of interview techniques are employed to: (i) capture diversity of opinions, (ii) gain personal opinions, and (iii) obtain in-depth information from respondents that could be converted into reasons underlying their attitudes and actions.

Semi-structured interview questions are proposed in this research to obtain three types of information: primary demographic and historic information related to households, situational experiences towards their hard times to see how resilient they are, and their lifestyles in daily basis to understand how much ecologically-concerned they are. There are two sets of interview questions, one is a semi-structured set of questions for questionnaire surveys, the other is an open-ended question guide for focus group interviews. More information regarding both

Informal conversation is proposed to fill gaps that interview questions may not cover. 'Naturally occurring' talk, as termed by Hammersley and Atkinson, is also one of a number of key techniques, revealing motives behind human actions. Naturally occurring oral accounts can be produced in many circumstances through gossip, which is inherent in human relations (2007, p.99). Such accounts are also "a useful source both of direct information about the setting and evidence about the perspectives, concerns, and discursive practices of the people who produce them**" (**Hammersley & Atkinson, 2007, p**.**99)**.**

3.3. Research Sites

The team set out the following criteria to select research sites where it would learn about the perceptions, adaptation practices, and disaster(s) experience(s) of the locals:

1. The site must situate in Bangkok Metropolitan Region (BMR);
2. The site must consist mainly of the lower-income residents;
3. The site must have active leaders or representatives who are willing share development and resilience-related experience with the researchers;
4. There is very few studies, or preferable no, research conducted on the site prior to this investigation;

5. The residents must be part of the stakeholders who will benefit from the result of this research endeavour.

With these five criteria, the team listed five potential research sites. They are:

1. Sirin and Friends (*Sirin lae Puean*) Community in Bangkok,
2. Roi Krong Community in Bangkok,
3. Klong Sawan Community in Pathum Thani Province,
4. a community at Bang Ko Bua in Samut Prakan Province,
5. Bang Prong Community in Samut Prakan Province, and
6. Sangsan Nakhon Rangsit Community in Pathum Thani Province.

The team's representatives initially visited Sirin and Friends Community, Roi Krong Community, Klong Sawan Community and a community in Bang Ko Bua to meet with the community leaders to learn about climate change action(s) within the communities, discuss logistics and perform initial surveys. Following the visits, the team decided to exclude a community in Bang Ko Bua from this study. This decision was arrived at because Bang Ko Bua is situated in Bang Kachao artificial island, which have been heavily researched by both Thai and international researchers. Unfortunately, many of these researches have not been translated into meaningful actions. Therefore, many of the residents and the community leaders are not keen on accommodating any more research activity.

During the first few months, the team decided on conducting research in Sirin and Friends, Roi Krong and Klong Sawan. The leaders and the representatives of these communities had been contacted and were invited to attend a workshop in September 2017. However, the team decided not to conduct any in-depth and focus group interview in Klong Sawan. While Khlong Sawan Community has attempted to become more sustainable[15] and environmental-friendly, the team has felt that merely a handful of the members of the communities are active. Moreover, these members are related by kinship, while other members of the communities have not present at all during many meetings and workshops. The lack of interest from other community member has prompted the Urban Futures team to

[15] Klong Sawan community solve their firsthand environmental problems from aside highly-polluted canal by joining the Pathum Thani City campaign namely Na Baan: Na Mong, literally front yard looks good. This campaign is to clean up their houses and control trashes dumped into the canal.

make the last-minute switch to Sangsan Nakhon Rangsit Community, which has appeared to have a pool of more-active community members.

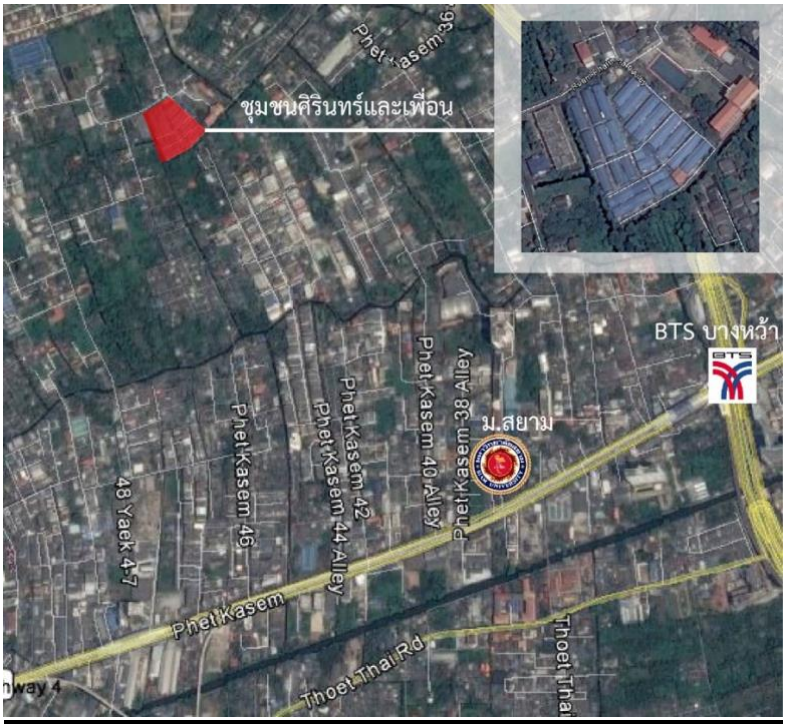
Communities	Number of Households	Average Income	Main Type of Employment	Established Year	Type of Tenure
Royklong	124	More than 20,000	Business, Self-employment, Farmer	-	*Baan Mankong* land lease
Sirin&Friend	153	5,000-10,000	Self-employment	2008	*Baan Mankong* land purchase
Rangsit	199	More than 20,000	Self-employment	2012	*Baan Mankong* land purchase

Table 4: Summary of case study communities

More information regarding the three selected sites are presented in the following sub-sections:

3.3.1. Sirin and Friends

Situated in Bang Chak district in the western part (Thonburi side) of Bangkok, Sirin and Friends (*Sirin Lae Puean*) canalside community consists of 290 men and 430 women living in 153 households. The community is founded under Baan Makong (BMK), a participatory low-income housing programme, in 2008 originally aggregated from several low-income community within four nearby areas. Sirin and Friends community falls in "Relocation" type of upgrading under BMK project which community residents sought the new location for their new community. Community members' jobs are both formal and informal. Some work for public and private companies such as Bankers, factory workers in nearby areas. Others work informally outside community, such as motorcycle taxi drivers and daily wage jobs. A considerable number of local households run income-generating activities at home. They are cloth sewing, leather purse and belt making. These households turn their living area on the ground floor at home to be a workshop where they live and make products.



Map 1: Location of Sirin and Friend Community

There are five working groups initiated by the community members which are recycle group, chili paste making group, soil making group, organic vegetable group, and cleaning liquids group. The community leading groups are very active in making locally made products, concerning with environment degradation occurring in the area. For instance, the recycle group attempt to educate community members to separate biodegradable, recyclable and non-recyclable trashes. Those biodegradable trashes become part of soil making group whereas other recyclable trashes such as instant coffee bundle, and colourful carbonated drink bottles and small pieces of cloths left over from the workshop are transformed to be handmade household products such as baskets, mobile and keyring holders. For the cleaning liquids group, one of the community leaders has done scientific research to produce specific-formula dish-washing and multi-purpose cleaners which preserve good microorganism preventing waste water to be more polluted.

3.3.2. Roi Krong

Situated in Bang Kaen disctrict in the northern part of Bangkok, Roi Krong community has a typical canal-side community's shape which is a narrow (20 meter) and long (620 meter) strip, lying along an east bank of Bangbua canal. Fifty years ago, the

community was a small rural-like village situating in a northern suburban Bangkok. Due to the course of urban expansion towards the north, Roi Krong and other nearby canal-side communities have become urbanised and they have faced various urban problems, such as overcrowded, environmental degradation and other social problems in slum-like communities.

Map 2: Location of Roi Krong Community

Today, the community consists of 356 men and 345 women, living in 124 households. Most community members work in informal sectors particularly in urban services, such as motorcycle taxi drivers, cleaners, and food vendors. The interesting figure of demographic patterns of the community is that of one-third members are elderly who are the most active among all members in running community works. Roi Krong has joined Baan Mankong (BMK) programme under re-blocking type of upgrading schemes for decade; however, it has recently engaged in the full-scale development under the BMK project. The community has also been part of the network of environmental development to tackle with severely polluted Bangbua canal in the past decade.

In 2011, the community has experienced a major flood event hitting Bangkok. Later in 2015, Thai government announced the flood prevention and mitigation scheme aiming to widen Bangbua canal as a pilot area to increase its amount capacity to receive floodwater in

the future. The government then assigned Ministry of Social Development and Human Security and Community Organisation Development Institute (CODI) to provide new housing under BMK project with retaining walls built along both canal banks in Roi Krong and its neighbouring canalside communities. The community meeting with helps from CODI under the newly engaged BMK program has identify 147 houses allocated within the new community master plan.

3.3.3. Sangsan Nakhon Rangsit

Sangsan Nakhon Rangsit is situated at the Klong Luang District of Pathum Thani Province. The story of this community is a fascinating one. It was officially created in 2012, with the arrival of people from four different slums that were illegally occupied on the land within the Rangsit Municipality's limit. As many people could not bear the pressure unleashed on them by the government, as well as the poor living conditions, loads lot of rubbishes and stifling network of filthy canals, leaders and representatives of these communities joined forces to establish Saving and Credit Cooperative to request credits from the Community Organisations Development Institute (CODI). The credit that had been granted to them was utilised to purchase land and build dwellings, with the allocation of permanent homes for the group's members, through the BMK programme.

In 2016, there are 199 families living in the community. An overwhelming majority of the community members are not native-by-birth to the Rangsit area of Pathum Thani provinces but were migrants from 20 different other provinces. Most residents can be classified as having either low or lower-middle incomes.

In terms of disaster adaptation, many residents experienced the 2011 flooding, while preparing to move to the community. Consequently, they have incorporated their experiences into the design of their dwellings.

The community has a powerful committee. There are many activities within the community, but the most significant one is the waste management strategy. Knowing that most community members do not wish to return to their past state of habitation, the community committee has pledged to take care of the waste-management issues. With the support from the Thai Health Promotion Foundation, they encourage everyone to participate

in the well-organised waste management. Almost every member of the community sorts out and, if possible, helps recycle their refuses. Many of these civic-minded people sell sellable wastes, such as plastic bottle and aluminium can, with the aim of helping themselves earn extra incomes. Food or wet-organic wastes are also recycled through bio-fermentation to produce Enzyme Ionic Plasma that can be used as plant fertilisers and toilet cleaners.

3.4. Development of Research Questionnaire and Focus Group Question Guide

Keeping the theme of sustainable development in mind, the team emphasises the three pillars of sustainability, namely environment, society, and economy, when formulating the questionnaire for questionnaire survey and focus group interview. The research guide aims towards:

1. Academic research purposes, which would widen the knowledge of sustainable development at the local level and the move towards becoming resilience cities within the Thai context;
2. Tool-development purposes, which would enable the researchers to disseminate information regarding sustainable development at the local level and the move towards becoming resilience cities to relevant stakeholders, as well as policy-makers.

After a few deliberations, as well as using important insights gained from the multi-stakeholder workshop (Image 1), the team came up with the first version of the research questionnaire (see Appendix 1 in Thai). It tested the first version of the questionnaire with the communities' leaders and found some flaws in the questionnaire. Also, many do not understand several technical terms. Moreover, upon being asked about the issues concerning resilience, such as coping and adaptation, we did not get as much information as that we had hoped for.

Image 1: Insights gained from the multi-stakeholder workshop

Following the test of the questionnaire, the team changed the approach by incorporating scenarios, such as what respondents would do upon their running out of money or how they would respond to a large amount of surplus water approaching them, into the questionnaire. The final questionnaire (Appendix II) is divided into four parts. The first part concentrates on gaining information regarding the usage of eight crucial assets, namely food, housing, water, recycle, finance, human resource, and community/city. The second part is about understanding their experience concerning how past crises/disasters affected their lives, in addition to the choice of prevention, coping and adaptation strategy/strategies employed. The third part is about future preparedness. This is also the part where scenarios are integrated. Lastly, the fourth part is about the interview information. The team hopes to find interesting correlation out of this survey to draft worthy policy recommendations.

Upon completing the questionnaire survey, the team found out that youth was underrepresented. Consequently, it prepared a set of questions (see Appendix III) to conduct focus group interviews concentrating on teenagers, youths, and young adults.

3.5. Interviews Dates and Research Participants

Following the identification of the three cases, the team proceed to contact the communities' leaders and representatives to initiate initial contact and to set the dates for the survey-questionnaire interviews. As mentioned in section 1.3, the team organised multi-stakeholder workshop for local officials, local community groups and researchers in September 2017. It used this opportunity to build closer relationship with the community leaders, as well as fully explain the details of this project so they would be able to assist us in getting suitable research participants.

With additional help from several APTU undergraduate students, the team had conducted the total of six survey questionnaire interviews with 71 participants from Sirin and Friends, 69 participants from Roi Krong (Image 2), and 50 participants from Sangsan Nakhon Rangsit (Image 3).

Image 2: APTU undergraduate students at Roi Krong Community

Image 3: Interviewing the participants in Sangsan Nakhon Rangsit

The table below (Table 3) details the amount of date, number of interviewers, and number of interviewees.

Interview Date	Community	No. of interviewers	No. of Participants
13 January 2018	Sirin and Friends	16	71
20 January 2018	Roi Krong	15	49
21 January 2018		8	20
27 January 2018	Sangsan Nakhon Rangsit	6	32
28 January 2018		5	18
Total Participants			**190**

Table 3: Number of Participants

All respondents have been living in the areas for a long time, with many of them having been doing so since the inception of the communities. By observing a code of ethically-correct conduct of this investigation, the team tried our best to protect the rights and the privacy of the individuals and the communities involved. All participants were verbally asked whether they were willing to take part in this investigation and/or have their photograph taken. All photographs will be used in this research in the manner that will not cause any harm to any of the participants.

The researcher was sufficiently aware that some of the participants were politically active. To prevent any confrontation, sensitive political questions were avoided. When this was inevitable, then, there would be no statement or comment on the participants' perspectives. Nevertheless, the interviewees would be informed that such information would be considered only if it proved to be vital for the research. Against all odds, it was also the researcher's responsibility to affirm that every participant remained anonymous.

After the interviews, the team observed that there were very low number of young people participating in the research. It, then, scheduled two additional focus group interviews with young people in Roi Krong and Sangsan Nakhon Rangsit on 11th March 2018.

In addition to the three research sites, the research teams also conducted several key informant interviews from March to August 2018, mainly with the representative from CODI to gain further insights regarding adaptation to future crises within the three sites and the BMR.

3.6. Limitations and Ethical Issues

3.6.1. Limitations

The progress of this research is mostly smooth; nevertheless, the researchers did face certain difficulties during the fieldwork, particularly around guaranteeing representation of as many groups of residents as possible. Since most of the community leaders, our first point of contacts, were overwhelmingly women, more women than men participated in our activities. Similarly, there was a lot of older participants (Table 3) since they were likely to be at home

during the day. The team had tried to resolve this drawback by conducting the survey and interview on the weekends, but the situation only improve slightly as we manage to engage with participants from other age groups. Similarly, for the focus group discussion, there was more participation by youths than adults, which created challenges for the team since these youths had less exposure and experience of community resilience, so they required more guidance from the field team when facilitating discussions.

3.6.2. Ethical Issues

Before every interview, participants were given a verbal objective of the research project, their rights to withdraw from participation at any moment, and were asked to give verbal consent. All data from the household survey was entered anonymously. Key informants were asked for their consents to be mentioned, and quoted, in the reports. The focus group discussions with minors were framed in a more informal, and "fun", manner, using narration and guidance to demonstrate academic information. The team considered how to relate the research study to what the youths and younger participants learnt in school or encountered in every life.

3.7. Development of the Learning Toolkit (*Kin Dee You Dee* toolkit)

As one of the objectives of this project is that of fostering meaningful collaboration between the researchers and the local stakeholders, IIED and Urban Futures are developing learning tools with the aim of translating knowledge into meaningful actions. Much efforts have been put into the development of the *Kin Dee You Dee* board game that can be used to gain insight information regarding eco-resilience. Urban Futures collaborated with Openspace to develop and use an interactive tool in another project, the Coastal Cities at Risk (CCaR), and found it to be beneficial in gaining research insights and disseminating research finding.

With the hope of getting the same as, or greater impact than the learning tool for the CCaR project, IIED and Urban Futures have been working very closely with the Openspace team since the start of this project to develop the learning toolkit (*Kin Dee You Dee* toolkit). The first version of the learning toolkit was tested during the first multi-stakeholder

workshop with participants in September 2017 (Image 4). While testing the toolkit, the team also collected relevant data from the participants.

Image 4: Testing the Learning Tool at the September 2017 Stakeholders Workshop

The second version of the learning toolkit was tested at Sirin and Friends (Image 5). It was, additionally, tested with the participants from Khlong Sawan, before the team switched to Sangsan Nakhon Rangsit. Just like the first-time round, while testing the toolkit, the team also collected important information from the participants.

Image 5: Testing the learning tool at Sirin and Friends Community

The team used the comments from the participants to make the learning toolkit more user-friendly and easier to understand (Image 6).

Image 6: Discussion to make the learning tool more user friendly

The third version of the learning toolkit, known as '*Kin Dee Yoi Dee'* (live well, eat well), focuses on seven types of assets used by community residents and their potential for building resilience: water, food, shelter and people, economic resources, community assets, and new resources made from old (for example, by recycling materials). The team has tested

the tool with the participants from Bang Prong District in Samut Prakan Province and receive positive feedbacks.

The fourth version of *Kin Dee You Dee* toolkit was completed in December 2019 and it was tested by the representatives of the Community Organisation Development Institute (CODI) (Image 7). The feedbacks were positive, and the critiques were mainly on the visualisation and time management.

Image 7: Testing the learning tool at CODI

With valuable comments, the more-user-friendly version of the toolkit was completed in January 2019 (Image 8). The research team unveiled the final version of the tool, with comprehensive manual, at the final workshop towards the end of January 2019. Representatives of the three communities (Sirin and Friends, Roi Krong and Sangsan Nakhon Rangsit), as well as other relevant stakeholders, were encouraged to try using the toolkit, especially without any help or guidance from the research teams. (More information regarding the final workshop can be found in Section 5.3.) The outcome was successful, as many of the participants of the workshop could use the toolkit without much assistance from the developers.

Image 8: Final version of the toolkit

The overall comments were largely positive (Image 9). One participant of the workshop, a key stakeholder commented that

"if all communities use the toolkit, they would be able to come together to identify the common problems and seek pragmatic solutions. The government agencies could step

in to effectively assist the people in the manner that would suit each community's need".

A district official from Phasi Chareon District stated that

> "the toolkit encourages communities to share and discuss issues. Activities and tools like this can help the community to move forward. However, the tool, like the Kin Dee You Dee, will only reveal views of those who participate. If only a few participate, it would not give the full picture of the risk and vulnerability of the community. The challenge now is how to encourage younger people to be involved".

In addition to boosting the preparedness of the communities, another key stakeholder suggested,

> "the toolkit can help the government develop the all-encompassing policies that promote resilience, rather than leaving it all up to the communities to deal with uncertain futures".

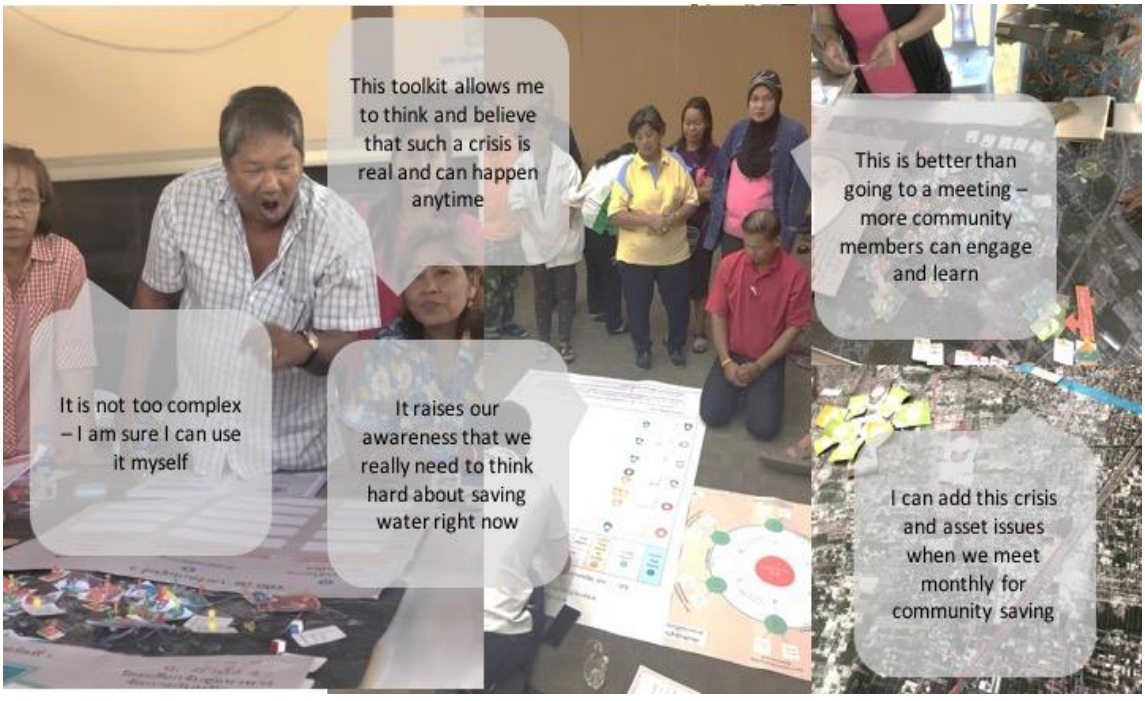


Image 9: Feedbacks from the toolkit users

Agreeing with the key-stakeholders and the district official, a participant, specified that

> "with the tool, he and his community would be able to understand what assets they already possessed. Assets can be everything from community leaders to hospitals, something that the community [had] never thought off when planning for any strategy. There are so many different views on the same [asset], especially, the public space. We need to find ways to solve the differences and seek a common goal".

A participant of Sirin and Friends also chipped in her thought,

> "when we were testing the tool, it demonstrated how many different issues there are to think about. I have never thought about some of the problems before. This tool helped us to think about these problems… The toolkit helps everyone understand what are important resources in or near our community. Every time we play we increase our understanding of the concept of being resilience to the future. However, the toolkit creator may have to adjust algorithm of the kit in the manner that it would encourage more user to speak more".

With such fruitful result as this, the Openspace team will work on the production of the toolkits, with minor customised adjustments to suit the needs of the community, and will distribute them to CODI and the National Union of Low Income Community Organisations (NULICO). This distribution will allow the existing scientific knowledge to be utilised in their operations, training, and planning activities. Officials from relevant organisations will be trained by the collaboration to ensure that the tool can be fully utilised, even after the lifetime of the grant. The Urban Futures team and IIED have published a briefing[16] , both in Thai and English, to support this toolkit. Also, the Urban Futures team will continue to support the toolkit users, should the need arise in the future.

[16] The briefing can be download at: http://pubs.iied.org/17495IIED/

4. Results and Findings

This chapter illustrates the findings based on the interviews, the questionnaires, as well as the insights gained from using the toolkit. The chapter is divided into three main sections. Section 4.1 illustrates the perception and the current state of the participants in each community. Section 4.2 explains the findings, highlighting on answering the research questions. Lastly, section 4.3 discusses the findings.

4.1. General Results

4.1.1. Sirin and Friends (*Sirin lae Puean*)

Sirin and Friends seemed to be a very strong community, with all the amenities for the residents to lead lives of higher quality and better meaning. Apart from having few public spaces for the residents to enjoy, the community largely appeared to be mostly united. Many older members got together to form a cooperative. They even went further by creating their own brand of goods to sell.

However, from the point of view of long-term planning for future crises, the interviewers observed that the interviewees found it extra difficult to discuss the topic related to the willingness to adapt to future crises. They seemed to be content with the coping mechanism for flooding. As for the other crises, most participants seemed to view energy crisis as something that would affect their incomes, with there being nothing beyond that. Drought, on the other hand, it seems, was viewed as something that would never occur in their locality and, therefore, the participants had spared no thought for planning of any drought event. Wealthier participants felt that they had enough money in time of crisis. Moreover, they strongly believed that if any crisis was going to happen, someone would arrive to help them.

Based on the concept of resilience used in this research (Section 2.2), respondents of Sirin and Friends were generally not resilient. Those whose occupations relied heavily on the economy at the national scale were extra vulnerable to future crises. There were many potential elements that could increase the level of resilience among the residents within the

community. For instance, disabled individuals could turn out to be priceless assets to the community. In fact, one of the active community-committee members was a disabled person having merely one arm. Unfortunately, this valuable human resource was rarely utilised.

Participants reported that they were worried about other problems of their lives instead of planning for something that might not even occur. As many participants belonged to the lower-income to lower-middle-income categories, they wanted to secure additional home-based jobs. Participants with minor (largely unobservable) physical and mental disabilities wanted to seek employment. Upon being asked about urban farming, as one of the ways of saving money, most participants responded by just mentioning about their not having sufficient space. Some participants who had grown some crops at home stated that their neighbours often turned up to take their crops without their permission, often damaging at least some of them during the process.

There seems to be a minor conflict of interest between the newer generation of community committee-members and the older ones. Some older participants are keen on working for the betterment of their community. However, they are seen by the younger generation as being too old to do anything useful. Older participants also want youths to be more active within the community, especially in engaging with younger children and teenagers within the community. Currently, only members of the personnel of the police and the army turn up to organise activities for children. However, being outsiders, they are often unable to reach out to every child.

Additionally, it was observed that while participants asserted that they were unable to answer some questions, it seemed that the participants preferred not to answer certain enquiries. Unfortunately, this research is not an ethnographic one. Hence, it is impossible to pin-point exactly what conflicts that might exist within the community.

4.1.2. Roi Krong

We found Roi Krong to be the most impoverished community out of the three sites. There were many teen mothers and smoking children. The community also appeared to be fragmented, as some residents did not wish to join the *Baan Munkong* (secure housing) scheme. Many younger people were also at odds with the community committee. In addition,

some participants did not like the community leader, as he was extremely hostile towards those who did not wish to join the secure housing scheme. The residents that do not wish to join the *Baan Mankong* scheme usually owned bigger homes and had higher-paying occupations and were quite influential within the community. To overpower these wealthier residents, the community leader even got the army personnel into the community to force certain members to join the scheme. Some participants commented that if one was not part of the community committee, he/she might not receive benefits from most of the community's activities.

In the case of responding to disaster and crisis, the participants of the Roi Krong community stated that they did not have to prepare much for possible disaster or crisis in the future because of their sufficient incomes and experiences. Some participants even asserted that their well-to-do positions would render them better able to purchase solar cells to generate electricity, should the energy crisis occur. As opposed to the participants of Sirin and Friends, some residents of Roi Krong held more than three jobs, at the time of the interview. Also, several residents stated that they always stocked rice and drinking water, so it would not matter whether the disaster occurred or not. In addition, several participants specified that if disasters were beyond the capacity to cope, they would not be worried, since their locality, being very close to the Chaeng Watthana Government Centre, would ensure that help would arrive accordingly. If they had to move, they would move to one of many buildings at Phranakhon Rajabhat University, which situated right next to the community.

The interviewers noticed that although the residents in Roi Krong claimed that they have enough incomes, their livelihood and living conditions did not prove to be the case. Regardless, there is are some positive aspects in term of preparing for the unknown crisis. For instance, many residents in Roi Krong continuously look for work opportunities, such as rearing frogs, drive motorcycle taxi, or sewing clothes for big companies.

As the issue of housing is a hot topic within the community, as many families' homes are under construction following the admission to the *Baan Mankong* scheme, it appears to be logical that most respondents would, at least, mention about this matter. The team has gathered all the information and found that participants prefer to hire builders from outside the community. They feel that the builders within the community are not responsible and often abandon their works before completing the process. Some people did not wish to join

the *Baan Mankong* scheme because although they would get to own their houses, the lands that their houses would be resting still be locked in the ownership of the landowners. This complicated arrangement might cause additional problems in the future

4.1.3. Sangsan Nakhon Rangsit

Sangsan Nakhon Rangsit seems to be the eco-friendliest and wealthiest of the three communities. Houses are well-organised, and the roads of the community are very clean. Indeed, the history behind the creation of this community plays a massive role. The community appears to be united with its residents virtually collaborating in the community's projects, even though occasional minor conflicts occur from time to time. However, interestingly, there has been no community products, which is unlike Sirin and Friends

In term of earning money, a clear majority of the residents work outside the community. They, therefore, are more sensitive to the country's economy, as well as petrol price. Many older respondents still commute to work outside the community.

As for resource management, the community has a community garden; however, most residents do not view it as public space. Some residents used the land next to their houses, that were designated by the government as "set back" land, to grow vegetables and herbs. While the spaces that supposed to be used to grow crops were used for dumping trashes. However, space also seemed to be an issue in this locality. In the past, the community used to have a youth soccer team. However, since the municipality chief director refused to let the team used the public field to practice, the soccer team disbanded.

Regarding the coping and adaptation to crises, most residents were not concerned about preparing for the future crisis. Most of their answers regarding responding to a disaster are more of coping strategies, rather than becoming more resilience. For instance, if surplus water was to come again, the residents stated that they would move to the second floor of their house. In 2011, when the flood disaster occurred, the construction of most houses was not completed, and the scale of destruction within the community was massive.

The researchers interviewed an elderly lady with a granddaughter suffering from thalassemia. Her family, apart from her father and her grandmother, was not very supportive.

This made her very vulnerable to crisis and future disaster. This case sparks our interest in developing the policy recommendation that also addresses the health and well-being of the vulnerable. Unlike Sirin and Friends community, where students from the Department of Pharmacy at the nearby Siam University would come to provide medicines and healthcare services, residents of Sangsan Nakhon Rangsit relied on minimal social welfare. We were made aware of the existence of the Village Health Volunteer. We also found out that there were not many incentives to encourage more doctors, nurses and other health practitioners to participate in this programme to help poor and vulnerable people. Also, the community committee supposed to provide its members with essential medicines. However, some respondents reported that this was not always the case.

4.2. Findings: Answering the Research Questions

The results presented in earlier sections provide us with interesting insights. While being 'aware' that unexpected events, like the 2011 flood, can potentially cause massive damage and destruction to the communities, most participants generally do not feel the urgent need to adapt their lifestyles. According to the respondents, if they must plan for future crises, some crises are considered worthier of planning. These crises tend to be those that have previously been experienced by the residents, particularly flooding. Furthermore, crisis-response mechanisms tend to be more at the individual-household level than the collective, community-level, even though all three communities had a history of collective action through the *Baan Mankong* (secure housing) initiative, suggesting that there is scope for planning approaches to build on and sustain this collective resource.

4.2.1. Research Question One: What Are Existing Adaptive Mechanisms of Households for Crises?

The respondents who took the household questionnaires, although did not believe that the severe crises will occur in their areas, demonstrated that they were able to take short-term actions to cope with the negative effects. There were fewer examples that exemplified longer-term adaptive mechanism. Additionally, most of the coping strategies consisted largely on trying to reduce the consumption of non-necessities and being stricter in controlling the spending. For instance, in response to flooding events, which most of respondents in all three

communities have experienced, residents were able to respond by temporarily relocating to other areas, or to upper floors of their homes in the case of Roy Klong. However, there was also a clear reliance on outside supports, such as donations of food and drinking water. Through outside supports, residents in Roy Klong and Sirin and Friends managed their expenses by reducing their spending. Residents in Sangsan Nakhon Rangsit, on the other hand, were more likely to use their saving to respond to crisis. Nevertheless, none considered saving money specifically for responding to unexpected future crisis.

From the focus group discussion in Sangsan Nakhon Rangsit, participants stated that residents did not have plans for dealing with future crises essentially because it is something that they did not expect to transpire and, therefore, never worry about. Participants associated future crisis to another flooding event, and they stated that they could by moving to the second floor of their homes. Many participants reasoned that they had prepared enough, particularly the construction of two storey *Baan Mankong* homes after the 2011 flooding event. If the surplus water posted too much burdens, residents can return to their home villages, just like what they did in 2011.

Regarding water usage during a hypothetical drought, participants of all three communities, insisted that they would try to save water through various means, such as re-using grey water to water their plants, store water in large earth tanks. These coping strategies were not new but something that many participants of had already employed to save water, and, consequently their water bills. At Sangsan Nakhon Rangsit, 39 out of 69 participants reported that they reused grey water. At Sirin and Friends, there were 25 out of 47 participants, and at Roy Klong, there were 32 out of 66 participants employing the same method.

Many respondents of Sirin and Friends community suggested that better solid waste management and selling of recyclable, and upcycle, refuses could generate extra income from existing resources, to help cope with hypothetical financial crises. They also recognised that better solid waste management could help to reduce the negative impacts from flooding by improving the drainage of water. However, the community leaders we interviewed stated that they were still struggling to get the whole community to participating in the recycling scheme. Notwithstanding, most households were aware of the need for better income to be more resilience to unexpected crises. In addition to selling upcycle products, many

participants wanted to find a second job to 'save for a rainy day'. Whether such awareness translated into real actions is beyond the scope of this research.

In Roy Klong, participants responded that in the past, they did not feel the need to prepare for crises, as they had sufficient income to manage, and they were already stocking food and sleeping on upper floors of their homes. Based on experience, they feel that they can always rely on the government, the private sector, or the nearby university for support during flooding events. Unfortunately, this reliance on external resources may be a disincentive for taking more longer-term preparatory steps ahead of crises. Such action also go against the notion of being resilience.

4.2.2. Research Question Two: Do Communities Have Collective Resilience Strategies and What Role(s) Do Community Assets Play?

Sirin and Friends and Sangsan Nakhon Rangsit had participated in the *Baan Mankong* (secure housing) programme, and, therefore, had a history of collective, participatory actions. Roy Klong, on the other hand, was in the middle of the house upgrading scheme under the *Baan Mankong* programme. Unlike the other two communities, the house upgrading in Roy Klong took place on the original location where participating members[17] did not have to relocate. The status of secure housing can affect collective action. Participants of Roy Klong community focused on completing the house upgrade rather than other issues such as building flood resilience or environmental management. Meanwhile, in Sirin and Friends and Sangsang Nakhon Rangsit, where the upgrading was completed, public participation for most projects appeared to dwindle.

In Roy Klong, there were conflicts between residents who are undergoing the *Baan Mankong* upgrading and those that chose not to participate. Some households felt that they were pressured by the community leader in demolishing and upgrading their homes. Additionally, there was a clear generation gap in the community structure, as the community committee was predominantly composed of older members, while younger generations were less active. Due to this gap, the tension in Roy Klong is not unexpected. Unfortunately, this

[17] Not all members of the Roy Klong community participated in the *Baan Mankong* programme.

also meant that it would be difficult to foster collaborative actions between members of each community.

Focusing only on the existing collective responses to crises, Sirin and Friends appeared to have the most structured approach. During flooding events, community leaders played an active role in the flood responses. They also advocated for the setting up of disaster centre in the community. During past severe flooding events, the community set up a collective kitchen to cook using food supplied by government assistance, while households with more resources bought in additional supplies to cook in the communal kitchen. This is an example of collective responses that participants of Sirin and Friends plan to use in any future crises. This suggests that external actors, such as donors or municipalities, could support such an initiative to foster the community's social capital.

In Sangsan Nakorn Rangsit, there were evident of collective actions as well. Upon entering the community, the researchers found that the community was very clean and green. It was later revealed that the community leader had experience working on environmental issues, particularly on pollution control of the canal water. In this manner, the residents were well-informed about several environmental issues. However, in term of crisis, residents only suggested coping strategy rather than adapting to crises. Additionally, it was notable that the residents whose jobs were outside of the community had a different perspective on flooding crises. They were more proactive in planning for unexpected events. For instance, if crisis, such as flooding would occur, these residents would not be able to commute to work and, thus, lost their source of income.

The research team also keen to understand the view on communal public space. Indeed, communal public space is important to this research because it is one of the assets that are shared by and accessible to a local population. In many places, communal space emerges as a nurturing ground for public participation However, the researchers asked the participants about the use of communal public space, many felt that there was adequate space in their communities, though there was significant variation in terms of how much households used this public space. Notably, most of the public spaces they identified were outside of the settlements (Table 5).

Community	Public Communal Space	Usage
Roy Klong	1. Convenience store 2. Playground 3. University 4. Sport field 5. Public park	1. Shopping 2. Recreation 3. Exercise
Sirin and Friend	1. Public park 2. Buddhist temple 3. School 4. Hospital 5. Playground	1. Recreation 2. Exercise
Rangsit	1. Buddhist temple 2. School 3. Sport field 4. Red bridge	1. Recreation 2. Exercise 3. Shopping

Table 5: Public Communal Space

What exactly a public communal space is was not always clear to different households. Table 5 listed the most common responds by the respondents in each community. However, there were array of different answers to this question. Some answers are very interesting. For example, a small, fenced public garden in Sirin and Friends was not considered by all respondents to be 'public'. Indeed, conflict over such space could affect how this collective resource can be used for the benefit of all residents. Similarly, a football pitch in a neighbouring school, which was previously accessible to children and youths outside of school hours was seen communal space by several participants. The principal and some residents, however, did not share similar opinion. They feared that some people might use the pitch inappropriately and had shut the access to this football pitch. The shutting down of the access to the football pitch created mistrust between residents of the community and degraded the sense of community. This suggests that public space can be considered as important factor to boost communal actions, including collaborative actions that would improve the community's resilience. Community-level conflicts, on the contrary, can hamper collective action, so having clear guidelines on what is s public space for all, would help to avoid this.

Despite some adaptation taking place, the responses from the surveys suggested a lack of long-term communal planning in terms of how to use resources in the community, even in the case of crises that they had previously faced. There seemed to be more reliance on

external support and networks – demonstrating an assumption that there will be external support, which will likely depend on the scale of the crisis. This raises the question about households' ability to plan for smaller scale disasters or slow onset disasters which might not lead to crisis response from external actors.

When households were asked about what actions they were willing to take to adapt their existing assets and resources to various crises (Table 6), there seemed to be the willingness to consider several actions. Growing vegetables was most frequently mentioned in Sirin and Friends to boost food resources, perhaps because this settlement is already quite green in terms of the plans households have outside their homes. In terms of investments in the houses, raising the plinths and putting in energy saving measures was the most popular option, while recycling and reusing water was seen as the easiest measure for conserving this resource. In terms of financial assets, there was a clear indication that many households wished for more of better jobs, and for training in skills to enable this happen, particularly opportunities for the elderly. Finally, there was limited interest in investing further financially in the community built environment, but a higher willingness to invest time towards this.

Asset	**In the future, there are possibilities of several different crises. Do you want to invest or adapt in the management of each asset?** **How?**	**Frequency**		
		Roy Klong Community	**Sirin and Friend Community**	**Sangsan Nakhon Rangsit Community**
Food	Plant Vegetable	39	81	30
	Change the planting way	40	25	29
	Plant and change planting way	0	18	3
	No preparation	0	4	0
Total		**79**	**128**	**62**
Housing[18]	Lift the house higher	23	18	4

[18] Due to the implication of the Thai language, both the interviewers and interviewees were not clear about home restoration. In Thai, *somsam* (ซ่อมแซม) can mean both restoration, repair, and recondition. Therefore, both the interviewers and the interviewees were not clear whether the questionnaire meant home continuous repair and restoration, or home repair and reconditioning when participants moved to the community.

	Use energy-saving material	10	18	7
	Renovate into more energy-saving house	39	27	15
	Build/renovate the house my themselves	6	27	22
	Use energy-saving material and build/renovate by themselves	0	1	
	Use energy-saving material and renovate to be more energy-saving	0	1	7
	Use energy-saving material and lift the house higher	1	0	0
	lift the house higher and renovate to be more energy-saving	1	0	0
	Build the house by themselves to reduce cost	0	2	0
	Renovate into more energy-saving house and build the house by themselves to reduce cost	2	1	3
Total		**99**	**172**	**99**
Water	Recycle water	27	33	5
	Buy water container	11	9	4
	Collect rain water	12	5	5
	Use less water	25	42	19
	Recycle water and buy water container	2	5	6
	Recycle water, buy water container, and use less water	1	6	0
	Recycle water and use less water	2	8	6
	Buy water container and collect rain water	0	0	1
	Collect rain water and use less water	2	1	0
	Buy water container, collect rain water and use less water	0	0	2
	Buy water container, collect rain water and use less water	0	0	2
	Recycle water and collect rain water	0	0	1
	All the above actions	0	3	1
Total		**78**	**116**	**52**
Recycle	Separate the litters	65	73	39

	Use community product	15	24	11
	Separate the litter and use community product	1	14	8
Total		**81**	**111**	**55**
Finance	Need extra job	77	83	42
	Did not need extra job	32	42	26
	Specified the needs: self-employ/ order-based job	Most of them want to be a vendor, flower maker, sewer, handcraft worker, hair dresser, farmer and disability people specialist. Most of them need a job training and want to be a vendor.	Most of them want to be a vendor, flower maker, tailor, farmer. Most of them need a job training and opportunity in market	Most of them want to be a vendor, handcraft worker, tailor, self-employment Most of them want an increase in elderly grants, financial improvement, job training and market opportunities
Total		**109**	**125**	**68**
Human resource	Participation of the youth	44	57	36
	Developing of the job for elderly	36	36	23
	Participation of the youth and developing of the job for elderly	3	11	11
Total		**81**	**104**	**70**
Urban and Community	Interest to invest	78	85	60
	No interest to invest	23	34	11
	Total	**111**	**119**	**91**
	Amount of money they are willing to invest (Thai Baht)			
	Lower than 100	37	6	9
	101-200	3	5	6
	201-300	0	3	0
	301-400	0	1	0
	401-500	6	15	10
	More than 500	9	14	4
	Depend on individual financial status	0	1	0
	Total	**55**	**44**	**29**
	Amount of time they are willing to invest			
	Less than 1 hour/day	3	0	0
	1-5 hours/day	22	18	17
	5-12 hours/day	0	10	4

	All day	0	0	0
	2 times/week Ex. weekend	6	3	0
	All day in every week	2	7	0
	When they have free time	0	2	0
	Total	**35**	**40**	**21**

Table 6: Households' willingness to adapt to deal with future crises

4.2.3. What are the implications for multi-level governance towards urban resilience?

Local communities can benefit immensely from the initiatives taken by the city-level or the municipal-level government. The benefits can increase tremendously when the authorities collaborate closely with the local communities. For instance, the leader of the social services promotion division the Rangsit Municipality, where Sangsan Nakhon Rangsit is situated, explained that by educating and informing the public about the Municipality's Green Building Initiative, the people can follow the Municipality's example and use this knowledge to sort garbage, treat water, save energy, and filter fat out of the household's waste water to avoid the blockage in the piping system. These practices are not difficult and can save a lot of the people's money. With more saving, people can concentrate on improving other aspects of their livelihood, including long-term planning for disaster.

In similar fashion, the environmental division of the Phasi Chareon, where Sirin and Friends community is situated at, offers numerous training programmes to the residents of the communities within the district. These programmes include the knowledge on how to defend oneself against the negative effects of the natural environment. The officer of this division specified that to create a good environment, people should reuse as much as they can. For instance, people can use "not-so-dirty" water to water plants, make fertilizers from food waste and bio-diesel from used cooking oil. He also emphasised that the introduction of a recycling market to the communities was very successful to the point that a television network turned up to film and document the recycling market.

In Bang Kaen District, where Roy Klong community is situated at, the local government can also play an active part in fostering public participation. Even though the district authorities have focused on providing the residents with necessities for agriculture-

related and urban-farming activities, an official explained that such activities can also promote public participation, which can be beneficial in the long run.

Apart from government agencies, local universities and other educational institutions can play a robust role in supporting community-driven initiatives. Indeed, a professor of the Research Centre for Community Development at Siam University, which is situated very close to Sirin and Friends, explained that learning space can be created by using local communities as study areas for the students. He had spearheaded the "Healthy Space Project" funded by the Thai Promotion Foundation, which had led to the improvement of the communities and the understanding of the people's needs. This project received positive responses from communities of Phasi Chareon Distrcit and eventually became a policy at the district level.

While, the responses from key informants have, basically, been positive, there appears to be a new challenge. It is that of ensuring that initiatives developed by external organisations and institutions can be integrated harmoniously into the communities' existing initiatives and ways of doing things. They should also be adapted to the context of each community. For instance, initiatives for ensuring healthy environment for Sirin and Friends cannot be the same as those for Roy Klong. This is because Roy Klong is in the middle of home-upgrading process and the residents see environment-centred issues as a top priority, while the residents of Sirin and Friends, whose houses have been fully upgraded, may see such campaigns as opportunities to sustain community participation.

As mentioned in earlier sub-sections, the challenge that many communities' committees faced while promoting public participation was that of engaging the younger generations. Without them in the picture, the community cannot be sustainable. A further-disconcerting issue is that centred on providing the necessities for the growing number of elderly residents. It is obvious that the committees would want to address these worries before other issues, such as adapting to future events. Therefore, to have successful engagement with the communities, the relevant authorities or agencies must prioritise the people's worries while promoting the sustainable and resilience way of life.

While interviewing the participants, we noticed, in addition, that, as the *Baan Mankong* Programme reached completion, community leaders involved in that process are

beginning to step back, with some leaders expressing there being a shift away from residents coming together to resolve problems to more of a beneficiary-style approach, whereby residents preferred to wait for external support. Indeed, to make the residents more resilient, there is a clear role for external organisations to offer incentives for continued participatory approaches within the community, and to convince people to recognise the benefits that collective action can bring in responding to crises. As a CODI official explained, *"CODI tries to push civil society mechanisms which encourages the community itself to address and cope with the problem by themselves"*. This mechanism includes the building of asset base, such as financial, physical and social capitals. Having asset base is critical and as many studies, such as Mustafa (2013), Phanthuwongpakdee (2016), and Wisner (2004), have demonstrated, the most-marginalised members of society are the most vulnerable. Additionally, there remains the need to include the studies of power relations and contestations regarding the management of crises, and to explore the potential of building the social-asset base in the form of social capital with actors outside of the community.

4.3. Discussion

It is fascinating to learn that the participants' responses concerning the perception of being resilient to future crises are similar across the three communities. Participants associated crisis to flood disaster and largely nothing else. Based on this perception, our fieldwork demonstrates that at the individual, and household levels, participants felt that they were capable of coping with this "crisis", and that there are some autonomous adaptations taking place (Section 4.2). Collective actions appeared to be insignificant, mainly performed by older communities' committees. Even among these committees, collective actions were dwindling. This scenario is ironic, since it was the communal efforts that had enabled these low-income communities to gain the secure accommodation that they had yearned for, in the first place. Such an individualistic scenario has for some time already been apparent in Sirin and Friends, as well as Sangsan Nakhon Rangsit communities. Efforts had been put in to encourage more communal actions. Discussions with the community leaders highlighted some of the upcoming challenges in promoting participatory approaches – particularly around engaging younger generations, to ensure the sustainability of the community. The researchers learn that degrading sense of community that led to a lack of collective actions, indisputably, interfere with the sustainability of the *Baan Mankong* programme. Secure housing does not simply mean the right of home ownership. The programme also emphases on having a

healthy living environment, as well as an overall wholesome atmosphere to promote good quality of life. The residents cannot achieve the latter two if they continue to possess high vulnerability to future crises and are ill-informed about the policies within their communities and localities. Certainly, the Community Organisations Development Institute (CODI) stressed that "community members are the primary actors and are ultimately responsible for the success and sustainability of the project" (n.d.). In this manner, maintaining and enhancing community engagement, though challenging, is a must and should be treated as the top development priority.

In terms of planning for the crisis of the sort that the participants had never experienced at all, but that has the possibility to occur in the BMR, like drought, and the crisis that did occur a relatively-long time ago, like the economic crisis, participants did not see the urgent need for planning for longer-term responses. While this sort of responses seems worrying for us as researchers, to understand, a research by Trope and Liberman (2010) provides us with some explanations behind this remark. According to them, while people are capable of conceptualise the scenarios of future crises, they conceptualise them more 'abstractly' than things that are psychologically close (Trope and Liberman, 2010). In other words, participants are 'aware' of future crises and how climate change would aggravate the negative effects of these crises. They were even able to suggest a range of choice to be more resilience (Table 6). Nonetheless, the awareness of these 'abstract' events does not convincingly motivate them into pursuing meaningful.

Since awareness will not automatically transform into actions, different communities can, and must, work with one another, and together with the experts, especially to bring the future psychologically close, so one could begin to feel the specifics of a daily life disrupted by possible crises. Researchers, like Marome *et al*. (2017), for instance, developed and used a board game for urban and social resilience and flood management planning in the BMR as a tool to promote knowledge exchange and transformative learning, while trying to help participants visualise flood disaster and bring future uncertainty mentally closer. Indeed, resilience is a process, and it requires continual effort across an uneven landscape of beliefs and perceptions.

Additionally, agreeing further with Loewenstein and Prelac (1992), participants prefer to solve short-term problems and overlook the significance of planning for the long-term

ones. The future is more ambiguous than the present, and according to the study by Gollier (2002), people value the present more strongly. Certainly, if one spends the hard-earn cash on preparing for something like drought (e.g. Table 6), there is no guarantee that such an event would ultimately happen. It is not right to blame people for not planning when they are surrounded by countless obligations concerning the present. Likewise, by living in a society with the growing influence of capitalism, earning more incomes has turned out to be a more-pressing concern. It is important to address other 'everyday' social risks, such as debt and the lack of job opportunity alongside promoting resilient thinking. In accordance with the SDGs, everything is connected, and, if we look deeper, every problem is indivisible. For instance, we cannot achieve sustainable-resilience cities (Goal 11) without tackling poverty (Goal 1), poor healthcare (Goal 3), economic slowdown (Goal 8), unreliable infrastructure (Goal 9), climate change (Goal 13) and the lack of good partnership (Goal 17). Concentrating on several risks would provide the prospect to comprehend the immediate threat and future risk at the same time. Accounting for risks that are relevant to people would provide the incentive required for engaging in approaches towards reducing both environmental and daily risks.

Actions towards urban resilience within lower-income settlements in the BMR should focus on both internal community structures and external institutions. Actions with external actors includes enhancing cooperation with non-local institutions and community organisations, to address the power imbalances. Professionals, such as planners and disaster specialists, can work closely with residents and community organisations to share information and mediate decision-making, not only through community meetings, but also through informal chats with residents, to cross-check the validity of solutions proposed and ensure power imbalances within the community itself do not exclude anyone (Usavagovitwong and Posriprasert, 2006, p. 536). The relevant authorities must integrate community views and the perception of resilience into city-level plans. Such integration can reduce the sense of disconnection between the official approaches and the community and individual approaches to cope with and to adapt to crises in future. In this study, participants were aware of the possibility of flooding recurring in their localities, but the awareness does not translate into action. To create a more resilience BMR, relevant stakeholders must adopt a more-strategic methodology to boost public engagements and preparing for better for future crises and expecting the expected. Communities, themselves, can make use of their past collective actions, such as drain unblocking, canal maintenance, recycling and water collection, as a means of reducing the risk of future crises while generating new resources to

be used economically in future. Another social issue that must be tackled is how to encourage more youths to participate in the community. This issue requires more time, resources, and intentionality, making it extra challenging to achieve. Collaboration with skilled practitioners and social researchers are needed. Positively, the *Baan Mankong* programme could ensure that flood-proof designs are integrated in all their house and neighbourhood designs, as well as other forms of climate proofing such as natural ventilation. Again, there is a role here for CODI to provide these technical assistances.

Lastly, while not discounting the fact that external supports are essential in the time of crisis, we cannot deny the fact that the communities can never be resilient if they keep on relying on outsiders. There is a role here for external organisations to offer incentives for continued participatory approaches, recognising the benefits that collective action can bring in response to crises situations.

5. Publication and Dissemination of Research Findings

During the life of the project, the dissemination of research findings through workshops, as well as the drafting of policy recommendations are primary means of engagement with stakeholders. The collaboration's applied research will be disseminated in a targeted manner to local planning authorities, providing an invaluable foundation upon which local researchers can continue to contribute knowledge of inclusive sustainable planning**.** The collaboration aims to help mainstream the issue of social and spatial justice into the developing discourse of urban sustainability, making sure that they will not be forgotten in Thailand's future cities**.**

The team has been publicising research findings and insights through short articles in magazines, as well as through online contents. The rest of this section will elaborate on the publication and dissemination of research findings.

5.1. General Publication, Academic Publication and Policy Briefings

Since the start of the project, the team members have disseminated several research findings to various academics and the public in many occasions. Dr Wijitbusaba Marome, for instance, has contributed to the content of a short article on city planning and flood management in "a day" magazine[19]. Similarly, Dr Nuttavikhom Phanthuwongpakdee has written an article on the preparation to flooding in Thailand, with elements from this project, for The Standard, an online news website, The Standard[20]. Additionally, insights gained from analysing collected data were also international audiences attending the conference organised by the Global Shapers Community (World Economic Forum) on 18th October 2018 in Bangkok, Thailand.

To meet the project's objective of building the knowledge and the capacity of Thai researchers, the team has published a briefing to support this toolkit (as mentioned in section

[19] The article can be found at www.adaymagazine.com/articles/river-city-plan.
[20] The article can be found at https://thestandard.co/thailand-flood-management.

3.7). The briefing aims at supporting inclusive urban-climate governance at the local level. This has been uploaded on the IIEDs server and is available to download[21]. Additionally, a conference proceeding, entitled "The Value of Collective and Individual Assets in Building Urban Community Resilience[22]" has been published through Sciforum, following Dr Wijitbusaba Marome's presentation at the 11th International Forum on Urbanism (IFoU) Congress 2018 - Reframing Urban Resilience Implementation: Aligning Sustainability and Resilience at Barcelona, Spain between 10th and 12th December 2018. Dr Diane Archer has submitted an article, entitled "The Role of Collective and Individual Assets in Building Urban Community Resilience" via IJUSDR. Additionally, Dr Nuttavikhom Phanthuwongpakdee played his further-positive part by participating in the International Symposium on Disaster Resilience and Sustainable Development at the Asian Institution of Technology (AIT), Pathum Thani, Thailand. The paper associated with this event, entitled "Expect the Unexpected: Planning for Urban Resilience to Future Crises" will be published in an academic journal.

The submission of the three papers, as well as the participation in various symposiums and conferences provide an opportunity for the team to share with other scholars and stakeholders the cross-cutting issues on resilience and sustainable development, besides helping promote the understanding of challenges that result from complex problems generated by environmental hazards and human-induced threats.

5.2. Online platform

The team has published several contents via the team's website, as well as the team facebook page. The URL to the website is: http://www.urbanfuturestu.com, and the team's Facebook page is @urbanfutures.tu.

The team was approached by several researchers, both Thai and international, to publish online more information about the research and, particularly, the learning toolkit online. Indeed, to promote the continuing usage of the academic information, the team will

[21] The briefing can be download at: http://pubs.iied.org/17495IIED.
[22] The conference proceeding can be download at https://www.researchgate.net/profile/Nuttavikhom_Phanthuwongpakdee/publication/329782600_The_Value_of_Collective_and_Individual_Assets_in_Building_Urban_Community_Resilience/links/5c1a5cc5299bf12be38b29be/The-Value-of-Collective-and-Individual-Assets-in-Building-Urban-Community-Resilience.pdf.

upload the results of the project, as well as information regarding the learning toolkit, along with the instruction video, onto the website. This will help ensure that our dedicated work to promote sustainable cities and resilience can continue to be discussed and acted upon by the various stakeholders, especially beyond the project's lifetime.

6. Other Outcomes and Future Works

As mentioned in section 5, the research has garnered interests from several stakeholders, government officials, as well as researchers from both within Thailand and overseas. Positively, in accordance with the aim of Thailand Research Fund, which encourages researchers to think beyond the end of the project's funding period, the Urban Futures team will continue to disseminate the results and the data gathered from this research endeavour to the public, scholars and officials through interactive toolkit, infographic, policy briefing, future collaboration and international conferences. Additionally, all the researchers of the Urban Futures team have been using the results of this research in their other projects to promote resilient city planning and Sustainable Development Goals (SDGs) in Thailand.

The team also would, in addition, like to highlight the success of the *Kin Dee You Dee* toolkit. We received positive feedback from the users (highlighted in section 3.7). The team will continue to work with OpenSpace and CODI to make and distribute the toolkit, and support its use. Furthermore, Dr Wijitbusaba Marome and Dr Nuttavikhom Phanthuwongpakdee had did present the toolkit at two different conferences, arousing much interests from international scholars, especially from China[23], India, Malaysia, Nepal, and the United Kingdom. The Urban Futures team will work closely with OpenSpace to generate the English version of the tool and may make it available online after getting a patent.

In term of future research, the team has planned to use the methodology of this research endeavour to investigate resilience to future crises in other parts of Thailand. These two new research sites are Bung Senat, an informal settlement in the wetland area of Nakhon Sawan Province, and Nong Dae, a designated resilient district of Udon Thani Province. These two areas have very different physical features and development characteristics. It would be interesting how different parts of Thailand perceive the importance of preparing for future crises and expect the unexpected.

[23] Lancaster University China Centre

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Appendix I: Household Survey Questionnaire (In Thai)

เลขที่แบบสอบถาม.....
ผู้สำรวจ.....
วันที่เก็บแบบสอบถาม.....

แบบสอบถามข้อมูลครัวเรือน.....
โครงการวิจัยการวางแผนเพื่อเมืองนิเวศน์ และสภาพแวดล้อมที่ส่งเสริมความพลวัตของภูมิอากาศ
หรือ โครงการ PEACE-BMR

แบบสอบถามฉบับนี้เป็นการเก็บข้อมูลรายครัวเรือน เพื่อนำไปใช้เป็นข้อมูลในงานวิจัยภายใต้โครงการ “การวางแผนเพื่อเมืองนิเวศน์และสภาพแวดล้อมที่ส่งเสริมความพลวัตของภูมิอากาศ” หรือ โครงการ PEACE-BMR โดยจะเป็นการสอบถามข้อมูลทั่วไปในชีวิตประจำวัน ข้อมูลที่เกี่ยวข้องกับการจัดการสิ่งแวดล้อมภายในครัวเรือน และข้อมูลการป้องกันและรับมือหากเกิดภาวะวิกฤตภายในชุมชน แบบสอบถามฉบับนี้ประกอบไปด้วย 4 ส่วน ดังนี้

ส่วนที่ 1 ข้อมูลการใช้ทรัพยากรในครัวเรือน
ส่วนที่ 2 ข้อมูลการป้องกันและรับมือกับภาวะวิกฤต
ส่วนที่ 3 ข้อมูลการเตรียมพร้อมในอนาคต
ส่วนที่ 4 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

กรุณากาเครื่องหมาย √ ลงใน □ หรือเติมความลงในช่องว่างให้ชัดเจนและตรงกับความเป็นจริงมากที่สุด

ส่วนที่ 1 ข้อมูลการใช้ทรัพยากรในครัวเรือน

1.1 การใช้ทรัพยากรอาหาร (เช่น ร้านค้าชุมชน / รถเข็นขายของ / ร้านสะดวกซื้อ / ผักสวนครัว)

1.ครัวเรือนของท่านใช้ทรัพยากร หรือวัตถุดิบในชุมชนจากที่ใดเพื่อประกอบอาหาร?

☐ ร้านค้าในชุมชน ☐ รถเข็นในชุมชน ☐ อื่น ๆ โปรดระบุ.....

2. ท่านทำกิจกรรมใดเพื่อการประกอบอาหารในครัวเรือนของท่าน? (ตอบได้มากกว่า 1 ข้อ)

☐ ปลูกผักสวนครัว หากมีโปรดระบุ ..... ☐ เลี้ยงสัตว์ หากมีโปรดระบุ .....

☐ อื่น ๆ โปรดระบุ.....

3. จากข้อ 2 ท่านสร้างรายได้จากกิจกรรมดังกล่าวได้หรือไม่? อย่างไร?

☐ ได้ โปรดระบุกิจกรรม .....และ รายได้.....บาท/เดือน

☐ ไม่ได้ (ใช้ประกอบอาหารในครัวเรือนของท่านเพียงอย่างเดียว)

4.ท่านเดินทางออกไปจับจ่ายใช้สอยวัตถุดิบเพื่อการประกอบอาหารนอกชุมชนที่ใดบ้าง? (ตอบได้มากกว่า 1 ข้อ)

☐ ตลาดนอกชุมชน ☐ ร้านค้านอกชุมชน ☐ ห้างสรรพสินค้า ☐ อื่น ๆ โปรดระบุ.....

5. จากข้อ 4 ท่านเดินทางออกไป .....วัน/สัปดาห์ และมีระยะเวลา.....นาที และค่าใช้จ่ายในการเดินทาง.....บาท/เที่ยว

1.2 การใช้ทรัพยากรที่อยู่อาศัย (เช่น บ้าน / บ้านเช่า / ห้องเช่า / บริเวณหน้าบ้าน / บริเวณหลังบ้าน)

6. พื้นที่ใช้สอยในที่อยู่อาศัยของท่านหรือบริเวณรอบๆที่อยู่อาศัยของท่าน เพียงพอกับคนในครัวเรือนหรือไม่?

☐ เพียงพอ ☐ ไม่เพียงพอ ระบุสาเหตุ.....

7. ท่านใช้ที่อยู่อาศัยในการสร้างรายได้ในครัวเรือนหรือไม่? ☐ ใช้ ☐ ไม่ใช้

หากใช้ ท่านใช้พื้นที่บริเวณไหน?..... และใช้ทำอะไร? .....

8. ที่อยู่อาศัยของท่านที่ กำลังจะสร้าง หรือสร้างเสร็จไปแล้วนั้น ได้ใช้วัสดุจากอาคารเดิมหรืออาคารเก่าหรือไม่?

☐ ใช้ หากท่านใช้วัสดุนั้นคือวัสดุอะไร โปรดระบุ.....

☐ ไม่ใช้ หากไม่ใช้ท่านซื้อวัสดุที่ใด โปรดระบุ.....

9.จากข้อ 8 ใครเป็นผู้ก่อสร้าง หรือเป็นผู้ที่จะมาก่อสร้างบ้านของท่าน?

☐ ช่างในชุมชน ☐ ช่างจากนอกชุมชน ☐ หน่วยงานภาครัฐ ☐ อื่น ๆ โปรดระบุ.....

1.3 การใช้ทรัพยากรน้ำ (เช่น น้ำประปา / น้ำคลอง / น้ำฝน / น้ำทิ้งที่สามารถนำกลับมาใช้ใหม่)

10.ครัวเรือนของท่านมีการใช้แหล่งน้ำในชุมชนหรือไม่? ☐ ไม่ใช้ ☐ ใช้

หากใช้ จากแหล่งใด? ☐ แม่น้ำ ☐ คลอง ☐ น้ำฝน ☐ อื่น ๆ โปรดระบุ.....

11. คุณภาพของน้ำในแหล่งน้ำที่เลือกตอบในข้อ 10 มีลักษณะอย่างไร?

☐ **ดี** ใช้ได้ทันที ☐ **ปานกลาง** ใช้ได้บางกิจกรรม เช่น ใช้ในการซักผ้าแต่ไม่ใช้ในการบริโภค

☐ **ไม่ดี** ต้องผ่านการกรองหรือแขวนสารส้ม

12. ท่านใช้น้ำในการประกอบอาชีพหรือไม่?

☐ ไม่ใช้ ☐ ใช้ และท่านใช้น้ำดังกล่าวทำอะไร? ……..... และสร้างรายได้เท่าไหร่?.....

13. ครัวเรือนของท่านใช้น้ำประปาในการอุปโภคบริโภคเพียงพอหรือไม่? ☐ พอ ☐ ไม่เพียงพอ

หากไม่พอ ท่านใช้น้ำอุปโภค บริโภคจากแหล่งน้ำใด? โปรดระบุ.....

14. คุณภาพของน้ำประปามีลักษณะอย่างไร?

☐ **ดี** ใช้ได้ทันที ☐ **ปานกลาง** ใช้ได้บางกิจกรรม เช่น ใช้ในการซักผ้าแต่ไม่ใช้ในการบริโภค

☐ **ไม่ดี** ต้องผ่านการกรองหรือแขวนสารส้ม

15. ท่านมีการสำรองน้ำไว้ใช้ในครัวเรือนของท่านหรือไม่? ☐ ไม่มี ☐ มี ถ้ามี สำรองน้ำด้วยวิธีใด? โปรดระบุ…….....

16. ท่านมีการใช้ น้ำทิ้ง เพื่อนำกลับมาใช้ใหม่ (Recycle) หรือไม่? ☐ ไม่มี ☐ มี หากมี ท่านมีวิธีการ Recycle น้ำ อย่างไร?

☐ นำน้ำอาบมาใช้ถูพื้น ☐ ต่อท่อระบายน้ำจากในบ้านไปรดน้ำต้นไม้ ☐ อื่นๆ โปรดระบุ.....

17. ท่านมีวิธีการในการจัดการน้ำเสียในครัวเรือนของท่านอย่างไร? โปรดระบุ.....

1.4 การสร้างทรัพยากรใหม่ (เช่น การนำขยะมาใช้ประโยชน์ / การทำผลิตภัณฑ์ชุมชนจากขยะแปรรูป)

18.ครัวเรือนของท่านมีขยะกี่ถุง (พลาสติก) โดยประมาณต่อวัน? .....ถุง

19. ท่านได้ใช้ประโยชน์จากขยะบ้างหรือไม่?

☐ ไม่ใช้ ☐ ใช้ และท่านใช้ประโยชน์อย่างไร?.....

และเกิดรายได้ให้แก่ท่านได้หรือไม่? ☐ ไม่เกิดรายได้ ☐ เกิดรายได้ คิดเป็นจำนวนเงินเท่าไหร่?.....บาท/เดือน

20. ครัวเรือนของท่านมีการนำวัสดุจากภายนอกชุมชน มาผลิตเป็นผลิตภัณฑ์ในครัวเรือนหรือไม่?

☐ ไม่มี ☐ มี ถ้ามี ท่านทำผลิตภัณฑ์ใด?.....

และสร้างรายได้ให้แก่ท่านได้หรือไม่ ☐ ไม่สร้างรายได้ ☐ สร้างรายได้ คิดเป็นจำนวนเงินเท่าไหร่.....บาท/เดือน

1.5 ทรัพยากรทางการเงิน (เช่น เงินออม / เงินกู้ / รายได้เสริม)

21. ในปัจจุบันรายได้ในครัวเรือนของท่านเพียงพอกับรายจ่ายหรือไม่? ☐ เพียงพอ ☐ ไม่เพียงพอ

22. จากข้อ 21. หากไม่เพียงพอ ท่านมีแหล่งเงินสำรองหรือไม่? ☐ ไม่มีแหล่งเงินสำรอง ☐ มีแหล่งเงินสำรอง

หากมีแหล่งเงินสำรอง มีอะไรบ้าง ☐ รายได้จากอาชีพเสริม ระบุอาชีพเสริมและเงินที่ได้.....

☐ ลูกส่งเงินมาให้ ☐ ยืมจากญาติ ☐ อื่นๆ โปรดระบุ.....

23. ท่านมีเงินออมครัวเรือนหรือไม่? ☐ ไม่มี ☐ มี หากมี มีการออมเงิน เดือนละเท่าไหร่.....บาท

24. ท่านสามารถแจกแจงค่าใช้จ่ายโดยประมาณของท่านได้หรือไม่ ว่ามีอะไรบ้าง (ตอบได้มากกว่า 1 ข้อ)

รายการค่าใช้จ่าย	จำนวนเงิน (บาท/ วัน, สัปดาห์, เดือน)
☐ ค่าใช้จ่ายด้านอาหาร	.....(บาท/.....)
☐ ค่าใช้จ่ายที่เกี่ยวกับที่อยู่อาศัย	.....(บาท/.....)
☐ ค่าใช้จ่ายด้านสาธารณูปโภค(น้ำ,ไฟ)	.....(บาท/.....)
☐ ค่าใช้จ่ายด้านการรักษาพยาบาล	.....(บาท/.....)
☐ ค่าใช้จ่ายในการดูแลผู้ป่วยในบ้านของท่าน	.....(บาท/.....)
☐ ค่าใช้จ่ายในการเดินทางไปทำงาน	.....(บาท/.....)
☐ ค่าใช้จ่ายอื่น ๆ โปรดระบุ.....	.....(บาท/.....)
☐ ค่าใช้จ่ายอื่น ๆ โปรดระบุ.....	.....(บาท/.....)
☐ ค่าใช้จ่ายอื่น ๆ โปรดระบุ.....	.....(บาท/.....)

1.6 ทรัพยากรบุคคล (เช่น ผู้นำชุมชน / ผู้ประสานงานชุมชน / ผู้ต้องการความช่วยเหลือในชุมชน)

25. ผู้นำชุมชนของท่านคือใคร?.....มีหน้าที่อะไรในชุมชน?.....

26. ท่านและครอบครัวของท่าน เป็นสมาชิกของกลุ่มใดในชุมชนหรือไม่? กลุ่มใดบ้าง? (ตอบได้มากกว่า 1 ข้อ)

☐ กลุ่มสหกรณ์ออมทรัพย์ ☐ กลุ่มผู้สูงอายุ ☐ กลุ่มแม่บ้าน ☐ กลุ่มสิ่งแวดล้อม

☐ กลุ่มฌาปนกิจ ☐ กลุ่มกองทุนการศึกษา ☐ อื่นๆ โปรดระบุ.....

27. (คำถามข้อนี้**ถามเฉพาะ** ผู้ที่เป็นเยาวชน หรือ ผู้ที่ไม่ใช่ผู้นำชุมชน) ท่านมีความต้องการ ในการทำงานให้กับชุมชน หรือร่วมเป็นคณะทำงานของชุมชน หรือไม่ เพราะเหตุใด

☐ ต้องการ ☐ไม่ต้องการ โปรดระบุเหตุผล.....

28. ครอบครัวของท่านมีผู้ที่ต้องการความช่วยเหลือหรือไม่? ☐ ไม่มี ☐ มี

หากมีโปรดระบุ ☐ ผู้พิการ ☐ ผู้ป่วยติดเตียง ☐ เด็กเล็กที่ยังไม่สามารถช่วยเหลือตัวเองได้

☐ คนชรา ☐ อื่นๆ โปรดระบุ.....

1.7 ทรัพยากรชุมชน/เมือง (เช่น ศูนย์ชุมชน / สนามเด็กเล่นในชุมชน / โรงพยาบาล / สถานีตำรวจ / โครงสร้างพื้นฐานต่างๆ)

29. ชุมชนของท่านมีพื้นที่ส่วนกลางหรือไม่? ☐ ไม่มี ☐ มี หมายเหตุ.....

หากมีโปรดระบุ (ตอบได้มากกว่า 1 ข้อ)☐ ศูนย์ชุมชน ☐ ศูนย์อนุบาลเด็กเล็ก ☐ ศูนย์ฝึกอาชีพ

☐ ศูนย์พัฒนาผลิตภัณฑ์ชุมชน ☐ สนามเด็กเล่น

☐ สวนผักของชุมชน ☐ อื่นๆ โปรดระบุ.....

30. ท่านเคยใช้พื้นที่ส่วนกลางในชุมชนของท่านหรือไม่? ☐ ไม่เคยใช้ ☐ เคยใช้ ความถี่ในการใช้.....(วัน/อาทิตย์)

31. ภายในชุมชนของท่านมีพื้นที่ส่วนกลางเพียงพอหรือไม่? ☐ เพียงพอ ☐ ไม่เพียงพอ

32. ท่านใช้พื้นที่ส่วนกลางภายนอกชุมชนของท่านหรือไม่ ☐ เคยใช้ ☐ ไม่เคยใช้

โปรดระบุสถานที่ที่เคยใช้ ..... โปรดระบุความถี่ในการใช้..... (วัน/อาทิตย์)

33. พื้นที่ส่วนกลางภายนอกชุมชนของท่านมีอยู่เพียงพอหรือไม่ ☐ เพียงพอ ☐ ไม่เพียงพอ

หากไม่เพียงพอชุมชนของท่านท่านคิดว่าชุมชนของท่านขาดพื้นที่อะไร? โปรดระบุ.....

34. ท่านเคยใช้ของใช้ส่วนกลางในชุมชนของท่านหรือไม่ เช่น ยาสามัญประจำบ้าน เต็นท์ของชุมชน ☐ ไม่เคย ☐ เคย

โปรดระบุสิ่งที่ท่านเคยใช้.....โปรดระบุความถี่ในการใช้.....(วัน)

35. ในความคิดของท่าน ท่านคิดว่าทรัพยากรภายนอกชุมชนอะไรที่สำคัญที่สุดสำหรับท่าน (โดยเรียงลำดับความสำคัญ 3 ลำดับ ดังนี้ สำคัญที่สุด =1, สำคัญรองลงมา = 2, สำคัญน้อยที่สุด =3)

☐ โรงพยาบาล ☐ โรงเรียน ☐ สถานีตำรวจ ☐ สถานีดับเพลิง ☐ สถานีขนส่ง

☐ สำนักงานเขต/ สถานที่ราชการ ☐ การไฟฟ้า ☐ การประปา ☐ อื่นๆ โปรดระบุ.....

1.8 ความสำคัญของทรัพยากร

36. ในความคิดของท่านทรัพยากรทั้ง 7 ประเภท ทรัพยากรประเภทใดมีความสำคัญที่สุด (โดยเรียงลำดับความสำคัญมากที่สุด 3 ลำดับ ดังนี้ สำคัญมากที่สุด =1, สำคัญรองลงมา = 2, สำคัญมาก =3)

☐ ทรัพยากรอาหาร ☐ ทรัพยากรที่อยู่อาศัย☐ ทรัพยากรน้ำ ☐ ทรัพยากรใหม่

☐ ทรัพยากรทางการเงิน ☐ ทรัพยากรบุคคล ☐ ทรัพยากรชุมชน/เมือง

37. ในความคิดของท่าน ทรัพยากรประเภทใด ใน 7 ประเภทข้างต้น มีความสำคัญน้อยที่สุด พร้อมระบุเหตุผล (โดยเรียงลำดับความสำคัญน้อยที่สุด 3 ลำดับ ดังนี้ สำคัญน้อยที่สุด =1, สำคัญรองลงมา = 2, สำคัญน้อย =3)

☐ ทรัพยากรอาหาร ☐ ทรัพยากรที่อยู่อาศัย☐ ทรัพยากรน้ำ ☐ ทรัพยากรใหม่

☐ ทรัพยากรทางการเงิน ☐ ทรัพยากรบุคคล ☐ ทรัพยากรชุมชน/เมือง

โปรดระบุเหตุผล

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ส่วนที่ 2 ข้อมูลการป้องกันและรับมือกับภาวะวิกฤตในอดีต

38. เมื่อเกิดภาวะวิกฤติ ท่านและครอบครัวของท่านมีวิธีจัดการทรัพยากรในแต่ละด้านอย่างไร? โปรดระบุ (ตอบได้มากกว่า 1 ข้อ)

ภาวะวิกฤติ	วิธีการจัดการในแต่ละทรัพยากร
1. วิกฤติน้ำ (เช่น น้ำท่วม/น้ำแล้ง) ท่านเคยประสบวิกฤติดังกล่าวหรือไม่? ☐ เคย ☐ ไม่เคย อย่างไร……	1.1 หากเคยประสบ ท่านจัดการกับทรัพยากรที่ใช้ในชีวิตประจำวันอย่างไร อาหาร..... ที่อยู่อาศัย..... น้ำดื่ม/น้ำใช้..... 1.2 และทรัพยากรอื่น ๆ ที่ท่านต้องจัดการคืออะไร และมีวิธีอย่างไร ☐ ทรัพยากรใหม่..... ☐ ทรัพยากรทางการเงิน..... ☐ ทรัพยากรบุคคล..... ☐ ทรัพยากรชุมชน/เมือง..... ☐ ทรัพยากรอื่นๆ (ถ้ามี) โปรดระบุ..... ☐ ทรัพยากรอื่นๆ (ถ้ามี) โปรดระบุ.....
2.วิกฤติพลังงาน (เช่น น้ำมันแพง) ท่านเคยประสบวิกฤติดังกล่าวหรือไม่ ☐ เคย ☐ ไม่เคย อย่างไร ……	2.1 หากเคยประสบ ท่านจัดการกับทรัพยากรที่ใช้ในชีวิตประจำวันอย่างไร อาหาร..... ที่อยู่อาศัย..... น้ำดื่ม/น้ำใช้..... 2.2 และทรัพยากรอื่น ๆ ที่ท่านต้องจัดการคืออะไร และมีวิธีอย่างไร ☐ ทรัพยากรใหม่..... ☐ ทรัพยากรทางการเงิน..... ☐ ทรัพยากรบุคคล..... ☐ ทรัพยากรชุมชน/เมือง..... ☐ ทรัพยากรอื่นๆ (ถ้ามี) โปรดระบุ..... ☐ ทรัพยากรอื่นๆ (ถ้ามี) โปรดระบุ.....
3.วิกฤติเศรษฐกิจ (เช่น ไม่มีงานทำ) ท่านเคยประสบวิกฤติดังกล่าวหรือไม่? ☐ เคย ☐ ไม่เคย อย่างไร.....	3.1 หากเคยประสบ ท่านจัดการกับทรัพยากรที่ใช้ในชีวิตประจำวันอย่างไร อาหาร..... ที่อยู่อาศัย..... น้ำดื่ม/น้ำใช้..... 3.2 และทรัพยากรอื่น ๆ ที่ท่านต้องจัดการคืออะไร และมีวิธีอย่างไร ☐ ทรัพยากรใหม่..... ☐ ทรัพยากรทางการเงิน..... ☐ ทรัพยากรบุคคล..... ☐ ทรัพยากรชุมชน/เมือง..... ☐ ทรัพยากรอื่นๆ (ถ้ามี) โปรดระบุ..... ☐ ทรัพยากรอื่นๆ (ถ้ามี) โปรดระบุ.....

39. เมื่อเกิดภาวะวิกฤติ ท่านมีค่าใช้จ่ายต่างๆ เพิ่มขึ้นเท่าไหร่? โปรดระบุ (ตอบได้มากกว่า 1 ข้อ)

รายการค่าใช้จ่าย	วิกฤติน้ำ (เช่น น้ำท่วม/น้ำแล้ง)	วิกฤติพลังงาน (เช่น น้ำมันแพง)	วิกฤติเศรษฐกิจ (เช่น ไม่มีงานทำ)
☐ ค่าใช้จ่ายด้านอาหาร	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)
☐ ค่าใช้จ่ายที่เกี่ยวกับที่อยู่อาศัย	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)
☐ ค่าใช้จ่ายด้านสาธารณูปโภค(น้ำ,ไฟ)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)
☐ ค่าใช้จ่ายด้านการรักษาพยาบาล	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)
☐ ค่าใช้จ่ายในการดูแลผู้ป่วยในบ้านของท่าน	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)
☐ ค่าใช้จ่ายในการเดินทางไปทำงาน	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)	.....บาท(วัน/เดือน)
☐ ค่าใช้จ่ายอื่นๆโปรดระบุ	.....บาท(วัน/เดือน) .....บาท(วัน/เดือน)	.....บาท(วัน/เดือน) .....บาท(วัน/เดือน)	.....บาท(วัน/เดือน) .....บาท(วัน/เดือน)

40. เมื่อเกิดภาวะวิกฤติ บุคคลใดในครอบครัวของท่านที่ต้องการความช่วยเหลือ? และกลุ่มคนเหล่านั้นต้องการความช่วยเหลือใดบ้าง? โปรดระบุ (ตอบได้มากกว่า 1 ข้อ)

ผู้ที่ต้องการความช่วยเหลือ	สถานการณ์วิกฤติ	คำตอบ
1 ผู้พิการทางร่างกาย 2 ผู้พิการทางจิตใจ 3 ผู้ป่วยติดเตียง 4 เด็กเล็ก 5 คนชรา 6 ..... 7.....	ก วิกฤติน้ำ (เช่น น้ำท่วม/น้ำแล้ง) ข วิกฤติพลังงาน (เช่น น้ำมันแพง) ค วิกฤติเศรษฐกิจ (เช่น ไม่มีงานทำ)	*ตัวอย่างคำตอบ เช่น 3 ก, ค หมายถึง ผู้ป่วยติดเตียง ต้องการความช่วยเหลือ ในสภาวะวิกฤตน้ำ และวิกฤตเศรษฐกิจ*

41. จากข้อ 40 ใครมีบทบาทในการช่วยเหลือบุคคลในครอบครัวของท่าน?

☐ ผู้นำชุมชน ☐ อสม. ☐ ตำรวจบ้าน ☐ อื่น ๆ โปรดระบุ.....

ส่วนที่ 3 ข้อมูลการเตรียมพร้อมในอนาคต

42. หากในอนาคตอันใกล้ เกิดภาวะวิกฤติต่างๆขึ้น ท่านมีความเต็มใจในการลงทุน หรือปรับตัวในการจัดการแต่ละทรัพยากรอย่างไร
(ตอบได้มากกว่า 1 ข้อ)

ภาวะวิกฤต	ความเต็มใจในการลงทุนในแต่ละทรัพยากร
ภาวะวิกฤติน้ำ (เช่น น้ำท่วม /น้ำแล้ง)	**ทรัพยากรอาหาร :** ☐ ปลูกผัก/เลี้ยงสัตว์บางชนิดเพื่อประกอบอาหารกินเอง ☐ ปรับเปลี่ยนวิธีการปลูก เช่น ปลูกผักโดยไม่ใช้ดิน **ทรัพยากรที่อยู่อาศัย :** ☐ สร้างบ้านยกใต้ถุนสูง ☐ ใช้วัสดุในการก่อสร้างที่ช่วยในการประหยัดพลังงาน ☐ ปรับปรุงที่อยู่อาศัยให้ประหยัดพลังงาน เช่น เพิ่มหน้าต่างเพื่อให้ลมเข้าบ้านง่ายขึ้น ปลูกต้นไม้เพื่อลดความร้อนรอบบ้าน ลดการใช้ไฟฟ้า ☐ ก่อสร้างหรือปรับปรุงที่อยู่อาศัยด้วยตนเองหรือช่างในชุมชนเพื่อลดค่าใช้จ่าย **ทรัพยากรน้ำ :** ☐ Recycle น้ำใช้ เช่น นำน้ำอาบ ไปถูพื้น ☐ ซื้อโอ่งหรืออุปกรณ์กักเก็บน้ำประปา,น้ำฝน ☐ กักเก็บน้ำฝนไว้ใช้ในการอุปโภคโดยเฉพาะ เช่น ใช้ล้างรถ ซักผ้า รดน้ำต้นไม้ ☐ ประหยัดน้ำ เช่น ปรับพฤติกรรมเพื่อลดปริมาณการใช้น้ำ ปรับลูกลอยในโถส้วมเพื่อให้ใช้น้ำน้อยลง **การสร้างทรัพยากรใหม่ :** ☐ แยกขยะเพื่อนำไปขายสร้างรายได้เพิ่มขึ้น ☐ ใช้ผลิตภัณฑ์ของชุมชน **ทรัพยากรทางการเงิน :** ☐ หาอาชีพเสริม หากต้องการหาอาชีพเสริม ท่านต้องการความช่วยเหลือจากภาครัฐหรือไม่อย่างไร ☐ ต้องการ ☐ ไม่ต้องการ โปรดระบุความต้องการ..... **ทรัพยากรบุคคล :** ☐ ให้เด็กรุ่นใหม่ช่วยในการทำงานชุมชนมากขึ้น ☐ พัฒนากิจกรรมเพื่อสร้างอาชีพให้กับคนชรา **ทรัพยากรชุมชน/เมือง** : ท่านมีความสมัครใจในการร่วมลงทุนหรือลงแรงในการปรับตัวหรือไม่ ☐ สมัครใจ ☐ ไม่สมัครใจ หากต้องลงทุนท่านมีความต้องการจะลงทุนจะลงทุนเท่าไหร่ โปรดระบุจำนวนเงิน.....บาท และหากต้องการร่วมลงแรง ท่านยอมเสียเวลาได้เท่าไหร่ โปรดระบุเวลา.....
วิกฤติพลังงาน (เช่น น้ำมันแพง)	**ทรัพยากรอาหาร :** ☐ ปลูกผัก/เลี้ยงสัตว์บางชนิดเพื่อประกอบอาหารกินเอง ☐ ปรับเปลี่ยนวิธีการปลูก เช่น ปลูกผักโดยไม่ใช้ดิน **ทรัพยากรที่อยู่อาศัย :** ☐ สร้างบ้านยกใต้ถุนสูง ☐ ใช้วัสดุในการก่อสร้างที่ช่วยในการประหยัดพลังงาน ☐ ปรับปรุงที่อยู่อาศัยให้ประหยัดพลังงาน เช่น เพิ่มหน้าต่างเพื่อให้ลมเข้าบ้านง่ายขึ้น ปลูกต้นไม้เพื่อลดความร้อนรอบบ้าน ลดการใช้ไฟฟ้า ☐ ก่อสร้างหรือปรับปรุงที่อยู่อาศัยด้วยตนเองหรือช่างในชุมชนเพื่อลดค่าใช้จ่าย **ทรัพยากรน้ำ :** ☐ Recycle น้ำใช้ เช่น นำน้ำอาบ ไปถูพื้น ☐ ซื้อโอ่งหรืออุปกรณ์กักเก็บน้ำประปา,น้ำฝน ☐ กักเก็บน้ำฝนไว้ใช้ในการอุปโภคโดยเฉพาะ เช่น ใช้ล้างรถ ซักผ้า รดน้ำต้นไม้ ☐ ประหยัดน้ำ เช่น ปรับพฤติกรรมเพื่อลดปริมาณการใช้น้ำ ปรับลูกลอยในโถส้วมเพื่อให้ใช้น้ำน้อยลง **การสร้างทรัพยากรใหม่ :**

	□ แยกขยะเพื่อนำไปขายสร้างรายได้เพิ่มขึ้น □ ใช้ผลิตภัณฑ์ของชุมชน **ทรัพยากรทางการเงิน :** □ หาอาชีพเสริม หากต้องการหาอาชีพเสริม ท่านต้องการความช่วยเหลือจากภาครัฐหรือไม่อย่างไร □ ต้องการ □ ไม่ต้องการ โปรดระบุความต้องการ..... **ทรัพยากรบุคคล :** □ ให้เด็กรุ่นใหม่ช่วยในการทำงานชุมชนมากขึ้น □ พัฒนากิจกรรมเพื่อสร้างอาชีพให้กับคนชรา **ทรัพยากรชุมชน/เมือง** : ท่านมีความสมัครใจในการร่วมลงทุนหรือลงแรงในการปรับตัวหรือไม่ □ สมัครใจ □ ไม่สมัครใจ หากต้องลงทุนท่านมีความต้องการจะลงทุนจะลงทุนเท่าไหร่ โปรดระบุจำนวนเงิน.....บาท และหากต้องการร่วมลงแรง ท่านยอมเสียเวลาได้เท่าไหร่ โปรดระบุเวลา.....
วิกฤติเศรษฐกิจ (เช่น ไม่มีงานทำ)	**ทรัพยากรอาหาร :** □ ปลูกผัก/เลี้ยงสัตว์บางชนิดเพื่อประกอบอาหารกินเอง □ ปรับเปลี่ยนวิธีการปลูก เช่น ปลูกผักโดยไม่ใช้ดิน **ทรัพยากรที่อยู่อาศัย :** □ สร้างบ้านยกใต้ถุนสูง □ ใช้วัสดุในการก่อสร้างที่ช่วยในการประหยัดพลังงาน □ ปรับปรุงที่อยู่อาศัยให้ประหยัดพลังงาน เช่น เพิ่มหน้าต่างเพื่อให้ลมเข้าบ้านง่ายขึ้น ปลูกต้นไม้เพื่อลดความร้อนรอบบ้าน ลดการใช้ไฟฟ้า □ ก่อสร้างหรือปรับปรุงที่อยู่อาศัยด้วยตนเองหรือช่างในชุมชนเพื่อลดค่าใช้จ่าย **ทรัพยากรน้ำ :** □ Recycle น้ำใช้ เช่น นำน้ำอาบ ไปถูพื้น □ ซื้อโอ่งหรืออุปกรณ์กักเก็บน้ำประปา,น้ำฝน □ กักเก็บน้ำฝนไว้ใช้ในการอุปโภคโดยเฉพาะ เช่น ใช้ล้างรถ ซักผ้า รดน้ำต้นไม้ □ ประหยัดน้ำ เช่น ปรับพฤติกรรมเพื่อลดปริมาณการใช้น้ำ ปรับลูกลอยในโถส้วมเพื่อให้ใช้น้ำน้อยลง **การสร้างทรัพยากรใหม่ :** □ แยกขยะเพื่อนำไปขายสร้างรายได้เพิ่มขึ้น □ ใช้ผลิตภัณฑ์ของชุมชน **ทรัพยากรทางการเงิน :** □ หาอาชีพเสริม หากต้องการหาอาชีพเสริม ท่านต้องการความช่วยเหลือจากภาครัฐหรือไม่อย่างไร □ ต้องการ □ ไม่ต้องการ โปรดระบุความต้องการ..... **ทรัพยากรบุคคล :** □ ให้เด็กรุ่นใหม่ช่วยในการทำงานชุมชนมากขึ้น □ พัฒนากิจกรรมเพื่อสร้างอาชีพให้กับคนชรา **ทรัพยากรชุมชน/เมือง** : ท่านมีความสมัครใจในการร่วมลงทุนหรือลงแรงในการปรับตัวหรือไม่ □ สมัครใจ □ ไม่สมัครใจ หากต้องลงทุนท่านมีความต้องการจะลงทุนจะลงทุนเท่าไหร่ โปรดระบุจำนวนเงิน.....บาท และหากต้องการร่วมลงแรง ท่านยอมเสียเวลาได้เท่าไหร่ โปรดระบุเวลา.....

ส่วนที่ 4 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

43. เพศ ☐ ชาย ☐ หญิง

43. อายุ ……....……ปี

45. ศาสนา ☐ พุทธ ☐ อิสลาม ☐ คริสต์ ☐ อื่น ๆ ระบุ.....

46. อาชีพหลัก ☐ ข้าราชการ/รัฐวิสาหกิจ ☐ พนักงานบริษัท/ห้าง/ร้าน ☐ธุรกิจส่วนตัว/ค้าขาย ☐ รับจ้างทั่ว

☐ เกษตรกร ☐ พ่อบ้าน/แม่บ้าน ☐ นักเรียน/นักศึกษา ☐ เกษียณอายุ

☐ ว่างงาน ☐ อื่นๆ ระบุ.....

47. ที่ทำงานของท่านของท่านอยู่ที่ใด โปรดระบุ (ชื่อที่ทำงาน / เขต /จังหวัด).....

48. ครัวเรือนของท่านมีรายได้เฉลี่ย ประมาณเท่าไหร่

☐ ต่ำกว่า 5,000 บาท/เดือน ☐ 5,001-10,000 บาท/เดือน ☐10,001-15,000 บาท/เดือน

☐ 15,001-20,000 บาท/เดือน ☐ มากกว่า 20,000 บาท/เดือน ☐ อื่นๆ โปรดระบุ.....

49. ท่านอยู่อาศัยในพื้นที่มาเป็นเวลา.....ปี

50 จำนวนสมาชิกในครัวเรือนของท่านมีจำนวน.....คน

51. ครอบครัวของท่านมีผู้ที่หารายได้ให้ครอบครัวมีจำนวนทั้งหมด.....คน

คณะผู้จัดทำโครงการขอบพระคุณที่ท่านให้ความร่วมมือเป็นอย่างดี
และหวังว่าจะได้รับความกรุณาจากท่านอีกในโอกาสต่อไป

Appendix II: Partially Translated Focus Group Interview Questions

ประเด็นหลักในคำถาม Focus Group

- **Perception** การรับรู้ของคนในการทำงานเพื่อเตรียมความพร้อมในอนาคตบทบาทของตนเองเป็นอย่างไร
- **Social and Political Climate** เคยทำกิจกรรมอะไรในชุมชน และอุปสรรคในการเข้าร่วม
- **Awareness** การทำให้รู้ถึง Awareness ในภาพรวมของทั้งชุมชนที่กลุ่มคนต้องตระหนักเหมือน ๆ กัน
- **Collective action** การวางแผนที่สามารถแก้ไขได้จริงในชุมชนตัวเอง

คำถาม

1. ท่านคิดว่าอะไรเป็นปัญหาที่สำคัญที่สุดภายในชุมชนของท่าน?

What do you think is the most important issue in your community?

2. ท่านคิดว่าปัญหาดังกล่าว มีวิธีการแก้ไขอย่างไร ? และท่านสามารถเป็นส่วนหนึ่งในการแก้ไขได้หรือไม่?

How do you fine the solution for that problem and can you be a part of the solution?

3. ท่านรับรู้หน้าที่ของผู้นำชุมชนหรือไม่ อย่างไร?

Do you recognise the role of community leaders?

4. ท่านมีความสนใจในการทำงานในชุมชนหรือไม่ อย่างไร?

Are you interested in working for your community?

5. ท่านเคยเข้าร่วมกิจกรรมในชุมชนหรือไม่ กิจกรรมอะไร?

Have you ever participated in community activities? What activities?

6. ท่านเข้าร่วมหรือไม่เข้าร่วมกิจกรรมในชุมชนมีสาเหตุเพราะอะไร?

Why do you choose to join or choose not to participate in community activities?

7. จากข้อ 6 หากท่านไม่เข้าร่วมกิจกรรมในชุมชนมีวิธีการใดที่จะลดอุปสรรคในการเข้าร่วมกิจกรรมในชุมชนได้บ้าง อย่างไร?

If you do not participate in community activities, how can you reduce barriers to participation in community activities?

8. ท่านคิดว่าเหตุการณ์ใดที่จะทำให้คนในชุมชนสนใจเข้าร่วมกิจกรรมภายในชุมชน? เช่น รวมตัวกันเพื่อต่อต้านทุจริตในชุมชน หรือ เกิดภัยพิบัติต้องพึ่งพากัน เป็นต้น

What do you think the incidence that people will have interested to join the community activity? For example, gathering to fight corruption in the community or a disaster must depend on each other.

9. ท่านคิดว่าแผนงานด้านใดเป็นเรื่องที่จำเป็นต่อชุมชนของท่านเพื่อการกินอยู่ที่ดีในชุมชน? เช่น แผนรับมือน้ำท่วม หรือ แผนดูแลรักษาสิ่งแวดล้อม เป็นต้น

What do you think is a good programme for your community to be livelihood in the community? For example, a flood control plan or an environmental plan.

10. จากข้อ 9 ท่านคิดว่าแผนงานดังกล่าวจะเกิดขึ้นได้อย่างไร อธิบายเป็นแนวทางในการทำแผนงาน? เช่น ประชุมร่วมกัน หรือ ส่งความคิดเห็นของแต่ละบ้าน เป็นต้น

How do you think such a plan will happen? Explain as a guideline for making plans. For instance, meeting together or sending feedback to each house.

11. หากเกิดภาวะวิกฤติท่านคิดว่าชุมชนของท่านต้องการความช่วยเหลืออะไร และจากที่ใด ?

If there is a crisis, what do you think your community needs to help and where?

12. หากเกิดภาวะวิกฤติท่านสามารถช่วยอะไรในครอบครัวของท่านได้บ้างอย่างไร?

If there is a crisis, how can you help your family?

13. หากเกิดภาวะวิกฤติท่านสามารถช่วยอะไรในชุมชนของท่านได้บ้างอย่างไร?

If there is a crisis, how can you help your community?

14. ท่านคิดว่าการแก้ไขภาวะวิกฤติดังกล่าวในชุมชนของท่าน จะส่งผลกระทบทางลบในสิ่งแวดล้อมใน ชุมชนของท่าน หรือไม่ อย่างไร ?

Do you think that the solution to the crisis in your community will affect the environment in your community?

15. ผลกระทบสิ่งแวดล้อมดังกล่าวสามารถเยียวยาได้หรือไม่ อย่างไร

Can the environmental impact be remedied?

Appendix III: Key Informant Interview Questions

คำถามที่จะถาม Key Informant เช่น เขต, เครือข่าย

1. หน่วยงานของท่านมีมาตรการ/นโยบายที่เกี่ยวข้องกับการพัฒนาเมือง/ชุมชน/พื้นที่เครือข่ายอย่างไร ตัวอย่างเครือข่ายชุมชม เช่น เครือข่ายมหาวิทยาลัยสยาม โครงการพื้นที่เมืองสุขภาวะในเขตภาษีเจริญกับชุมชนศิรินทร์และเพื่อน เครือข่ายสายคลองลาดพร้าวกับชุมชนร้อยกรอง เครือข่ายเมืองน่าอยู่กับชุมชนสร้างสรรค์นครรังสิต
2. หน่วยงานของท่านมีความเข้าใจต่อการพัฒนา(แบบ eco-resilience)เมือง/ชุมชน/พื้นที่เครือข่ายอย่างไร
3. หน่วยงานของท่านรับรู้ถึงปัญหาของชุมชน/พื้นที่เครือข่ายหรือไม่ อะไรบ้าง
4. จากปัญหาที่ท่านรับรู้ หน่วยงานของท่านมี/เคยมีการช่วยเหลือ สนับสนุน แก้ไข ปัญหาเหล่านี้อย่างไร
5. ในช่วงสถานการณ์วิกฤติ เช่น น้ำท่วม น้ำแล้ง เศรษฐกิจตกต่ำ พลังงานขาดแคลน หน่วยงานของท่านมี/เคยมีวิธีช่วยเหลือชุมชน/พื้นที่เครือข่ายอย่างไร

Key Informant Questions (Including District Office and Network)

1. Do your agency/network have measures or policies that related to urban or community development? If yes, can you identify the measures/policies? (Examples of network, Healthy Space, Siam University with Sirin and Friends community, Lad Prao Canal Network with Roi Krong community and Livable City Network with Sangsan Nakorn Rangsit Community)

2. How do your agency or network understand or perceive the notion of Eco-resilience in terms of city or community development?

3. Does your agency or network know the problems of the community or not. If yes, what are the problems of the community?

4. From the problem of the communities, how do your agency/network help, support or solve the problems in the communities?

5. During the crisis, such as flooding, drought, economic crisis and energy crisis, how does your agency/network help the communities?