RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

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RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

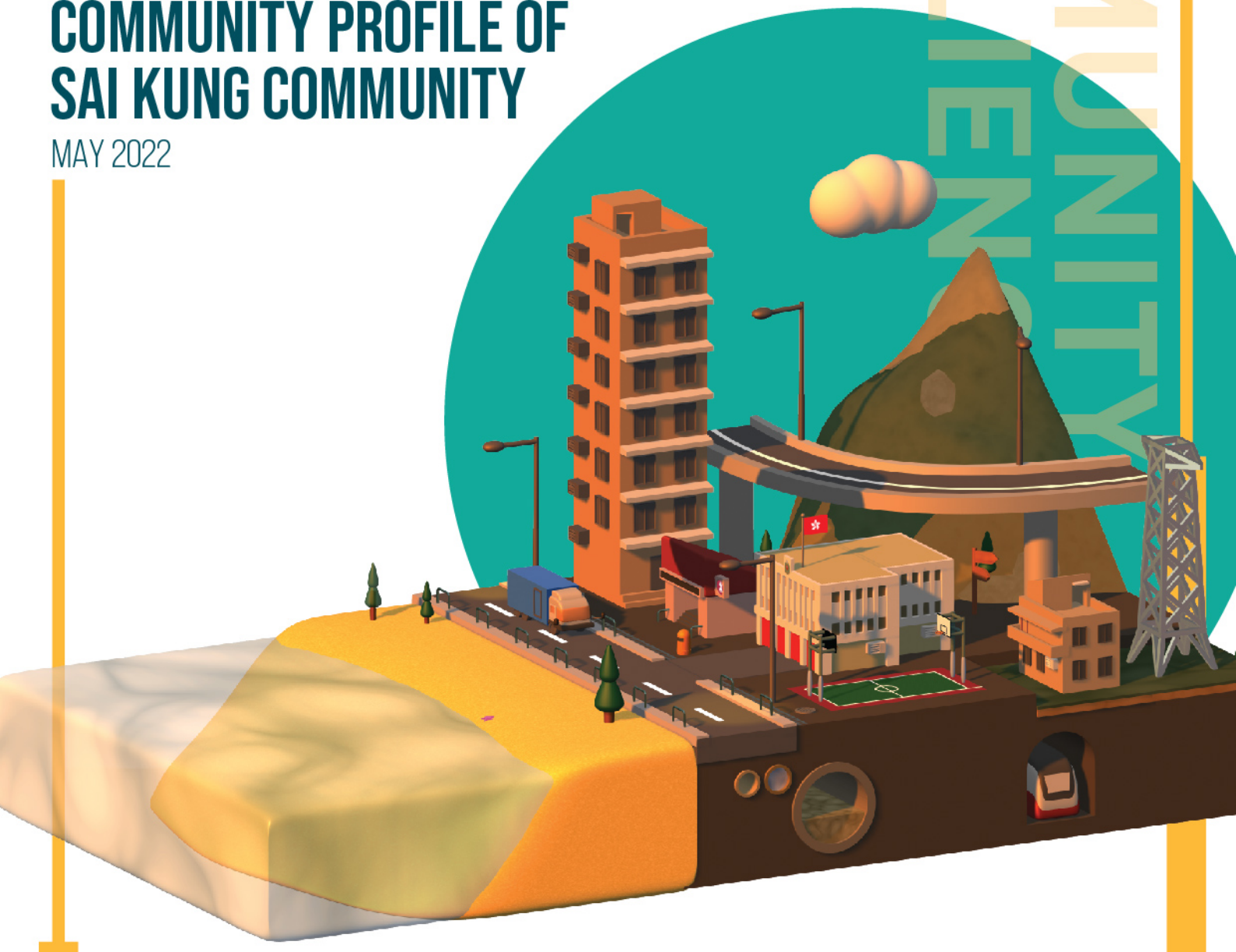
Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX I

COMMUNITY PROFILE OF SAI KUNG COMMUNITY

MAY 2022



Organiser

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Community Profile of Sai Kung Community

Community Profiling Study

for the Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung) by Hong Kong Jockey Club Disaster Preparedness and Response Institute

Date: 27 June 2022

Version: Final

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樂在製造有限公司
Making on Loft Limited

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Abbreviations and Acronyms

AMO	Antiquities and Monuments Office
AFCD	Agriculture, Fisheries and Conservation Department
"CA"	"Conservation Area" zone
CEDD	Civil Engineering and Development Department
DC	District Council
DSD	Drainage Services Department
FEHD	Food and Environmental Hygiene Department
FSAs	Focused Study Areas
"GB"	"Government, Institution or Community" zone
"G/IC"	"Government, Institution or Community" zone
GIC facilities	Government, Institution and Community facilities
HKJCDPRI	Hong Kong Jockey Club Disaster Preparedness and Response Institute
MOL	Making On Loft Limited
NGOs	Non-Governmental Organizations
"OU"	"Other Specific Use" zone
OZP	Outline Zoning Plan
"REC"	"Recreation" zone
"R(A)"	"Residential (Group A)" zone
"R(B)"	"Residential (Group B)" zone
"R(C)"	"Residential (Group C)" zone
The Research Project	Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)
TPU	Tertiary Planning Unit
WGPD	Working Group on Population Distribution Projections

1 Introduction

1.1 Study Background

On late February 2022, the Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) appointed Making On Loft Limited (MOL) to provide research and evaluation services for "Research and Model Development on Community Disaster Resilience based on HKJCDPRI's "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"" (the Research Project). The goal of this Research Project is to establish a "blueprint" for future development of strategy, approach(es), measure(s) and tool(s) that bring about effective development of community disaster resilience. The Research Project will be designed and executed by the research team of MOL as agreed by the Client.

Sai Kung is located at the south-eastern of New Territories in Hong Kong, where a typically rural township setting with diverse communities, it is connected to major traffic routes of urban areas within half an hour. The well-established rural township in New Territories East is comparing the changes in terms of partnerships enhancement, empowerment of individuals as well as communities for self-awareness and self-initiations to risk of disaster, and capability of making uses of local networks as well as local resources. The players (local communities) will be the key for Team to understand the changes in the Project.

The Research Project is to 1) conduct a project archive for project overall evaluation on what and how the project partners including local NGOs, relevant professional collaborators applying professional and practical educational process to contribute to the knowledge, skillsets, well-being practices, micro-collaboration and its network connection to the selected Sai Kung community. Those means will be but not limited to first aid knowledge and skills trainings, disaster preparedness trainings and relevant knowledge transfers, co-creations as well as resources allocation; 2) establish a "blueprint" for future development of strategy, approach(es), measure(s) and tool(s) that bring about effectiveness of community disaster resilience, as well as to carry out a full understanding on the HKJCDPRI capacity building interventions of planned community resilience approaches and

implementation in Sai Kung community; and 3) propose a service development framework / direction towards for HKJCDPRI as well as other potential stakeholders in the future.

In accordance with the Inception Report submitted on March 2022, the Research and Model Development on Community Disaster Resilience is conducted in stages. The submission of this Community Profile of Sai Kung Community serves as a deliverable of the stage 1, as described under Table 1.1 below.

Table 1. 1 Stages and deliverables of the Community Profiling Study

Deliverable	Anticipated Delivery Month	Tentative Date of Delivery
0 – Inception Stage	**M0**	
• Inception Report	M0	March 2022
1 – Community Profiling Stage	**M3-M4**	
• Community Profile of Sai Kung Community	M3	May 2022
• Assets Mapping of Sai Kung Community	M4	June 2022
2 – Research Stage	**M3 – M4**	
• 2a	M3	May 2022
• 2b	M3	June 2022
3 – Stakeholder Engagement Stage	**M3 – M5**	
• Profile of Community Player (1st round)	M4	June 2022
• Profile of Community Player (2nd round)	M5	July 2022
• Focused Group Meetings	M6	August 2022
• Quantitative Questionnaire	M6	August 2022
4 – Final Report	**M7**	September 2022
5 – Project PowerPoint and Pamphlet	**M8**	October 2022

1.2 Background to Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)

Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) was launched in 2014, with a mission to establish Hong Kong as a regional and international leader in disaster preparedness and response training, and to promote community resilience.

Based on the significant gap in awareness, knowledge and engagement in disaster risks management and response planning at the community level, a "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)" has been developed by the HKJCDPRI, aiming to enhance awareness, knowledge and engagement in disaster risks management and response planning of Sai Kung (excluding Tseung Kwan O area) community members. By conducting a programme-based research, it is hoped to develop a community resilience framework or model based on the evidence and lessons derived from the design, delivery and outputs of HKJCDPRI's programme, serving as a "blueprint" for future effective development of strategy, approach(es), measure(s) and tool(s) of community disaster resilience.

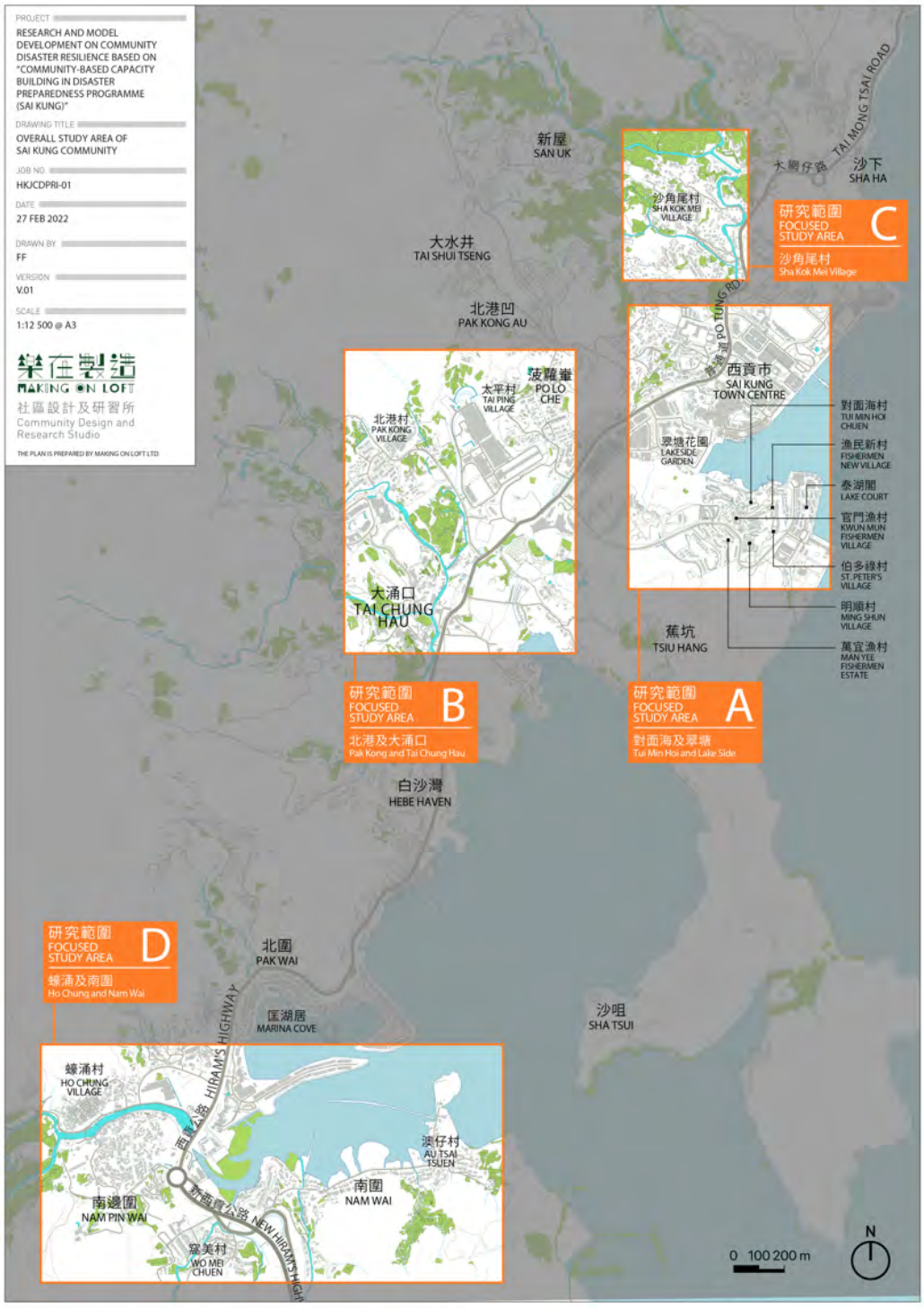
1.3 Study Area

The Study Area of this Community Profiling Study is delineated with reference to the boundaries of Street Block, which is the smallest geographic unit of Hong Kong adopted in the Population Census administered by the Census and Statistics Department. It is set to cover the four Focus Study Areas (FSAs) in Sai Kung.

The Study Area of Sai Kung falls wholly under the Tertiary Planning Unit (TPU) Nos. 8.2.0, 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, 8.2.7, 8.2.9. In particular, the area covers the Street Blocks Nos. 2-7, 9-18 of the TPU 8.2.0, No. 9 of the TPU 8.2.2, Nos. 1, 2, 4 of the TPU 8.2.3, Nos. 1-11 of the TPU 8.2.4, Nos. 2-9 of the TPU 8.2.5, Nos. 1-3 of the TPU 8.2.6, Nos. 1-4 of the TPU 8.2.7, Nos. 1, 2 of the TPU 8.2.8, and Nos. 1-6 of the TPU 8.2.9. Geographically, the Study Area covers an area of approximately hectares 2689.3 hectares (ha), which is bounded by Hebe Knoll to the south, Long Mei to the north, Tsiu Hang to the east, and Pyramid Hill and Fu Yung Pit to the west.

In terms of District Council (DC) constituency boundaries, the Study Area falls mainly under the Provident Constituency of the Sai Kung District, while Sai Kung Central Constituency, Pak Sha Wan Constituency and Sai Kung Island Constituency covered the Study Area.

Four Focused Study Areas (FSAs), targeted for the in-depth analysis of villages and activity nodes in Sai Kung, are categorized based on their geographical locations and characteristics. **FSA A** includes areas around Sai Kung Town Centre and Tui Min Hoi. **FSA B** includes areas around Pak Kong and Po Lo Che. **FSA C** includes area around Sha Kok Mei. **FSA D** includes areas around Ho Chung, Nam Pin Wai, and Nam Wai.



Plan 1. 1 Overall study area of Sai Kung Community

1.4 Study Objectives of Community Profiling

Community Profile Study of Sai Kung community is as a baseline research to map out full picture of the site(s), HKJCDPRI collaborators, NGOs as well as the locals in Sai Kung, A community profile is necessary to provide baseline data about the community for understanding its past, present and future, its strength, potential and needs.

The Community Profile includes demographic analysis, review of relevant government reports and plans, and identifying existing key stakeholders anchor in the community. The research will provide a comprehensive background understanding on the compositions and potential dynamics of the existing community in Sai Kung. It establishes a strong research foundation for the subsequent engagement and collaboration processes that are committed in the Research Project.

Key objectives of the Sai Kung Community Profile:

- Desktop review on demographical characteristics;
- To delineate the study boundaries (4 Focused Study Areas) at designated Sai Kung community;
- Map out the current characteristics of designated Sai Kung villages and its surrounding areas;
- To identify the development opportunities and concerns of Sai Kung relate development (private property development is excluded);
- Figure out the list of active NGOs and social groups with their connections with various groups of local; and
- To identify and examine any implication in Sai Kung and other existing land uses by future development (changes) in terms of possible risk of disaster (flood for example)

1.5 Study Approach and Methodology for Community Profiling

1.5.1 Study Approach

In response to the aim of HKJCDPRI's "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)" to develop a community resilience framework, the community profile serves to provide a comprehensive understanding of the needs and resources within the local community, which will facilitate the understanding of the capacity of the community in terms of disaster resilience. In the profiling exercise, it is fully aware that a community is not only a physical place to live but also settings of social, economic and political aspects. In addition, it is also important to appreciate the diversity of the community, as well as the identity of distinct villages and that of Sai Kung. This contributed to a holistic approach to community profiling, covering both tangible (spatial) and intangible (social, economic and cultural) settings of the community.

1.5.2 Research Methodology

The baseline review mainly adopts desktop research for the comprehension of the community profile. Desktop research, including identification of geographical characteristics of Sai Kung villages, analysis of demographic and socio-economic profile of local residents, review of relevant government reports and planning / policy / place-making initiatives, provides a comprehensive contextual understanding on the composition and potential dynamics of the existing community Sai Kung. It also establishes a strong research foundation for engagement processes. Data reliability is assured as most information was gathered from government sources, such as Population Census and Legislative Council.

1.6 Structure of the Report

This report involves three main chapters in addition to this introductory chapter:

- **Chapter 2** denotes the historical background and the future development of Sai Kung, as well as to identify the current status of the site.
- **Chapter 3** provides the contexts related to the natural environment by identifying the distinctive risk of disaster facing by diverse areas.

- **Chapter 4** provides a baseline review of the entire Study Area on the following aspects – socio economics characteristics, community facilities, economic activities, traffic review, and community assets.

2 Development of the Study Area

2.1 Historical Background

In the late seventeenth century, three old villages appeared on the San On Gazetteer published by the Xin'an County government, including the Punti-speaking villages of Ho Chung, Pak Kong, and Sha Kok Mei[1]. They located on the flatland near the mainstream with sufficient water resource, and they were close to the footpaths leading to the South to Kowloon and to the West to Sha Tin. In the next edition of gazetteer recorded in 1819, several Hakka villages were found, which indicated the immigration of the Hakka into Hong Kong throughout the eighteenth century. The Hakka people mainly practiced fishing and farming for living, which suggested that agriculture and fisheries were the earliest local economic activities found during the eighteenth and the nineteenth centuries.

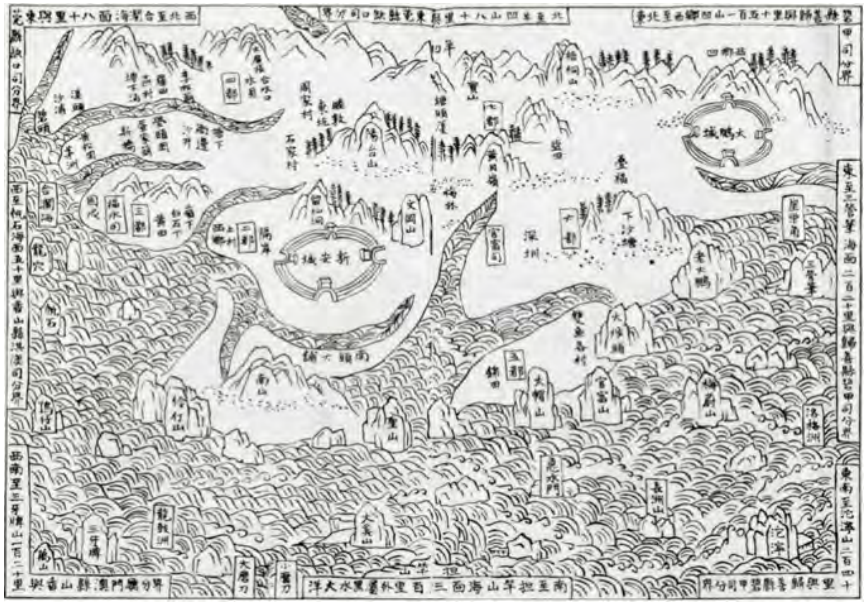


Figure 2. 1 The 1819 gazetteer published by the Xin'an County government[2]

[1] David Fature. (1982). Faure, D. (1982). Saikung, the Making of the District and its Experience during World War II. *Journal of the Hong Kong Branch of the Royal Asiatic Society*, 161-216.

[2] Lau. (1999). Simple History of New Territories (1st edition) [新界簡史]. Joint Publishing Company Limited, Hong Kong. As cited in Delang. (2018). Local livelihoods and global process: complex causalities in Hong Kong's Sai Kung Peninsula. *Miscellanes Geographica, 22*(1), 31-39. http://doi.org/10.2478/mgrsd-2018-0003

Economic Reformations

During the late nineteenth century, fishing industry were flourishing. The development of Hong Kong as a port from the mid nineteenth century and the British expansion into the New Territories in 1898 contributed to the economic growth, raising the general population in Hong Kong. The rise of population increased the demand for rural products. The industries related to food, fuel and construction materials benefited from the rising demand of trade, creating much economic opportunities for the villagers. In the early twentieth century, pig raising became an important source of income[3]. Much of the meats was consumed locally but some were brought into the city for trade.

The farming and fishing activities were declined gradually during the Post-War period in the mid twentieth century. The civil war in China between Nationalists and Communists sent large numbers of refugees fleeing to Hong Kong. The extremely high rate of population growth not only forced the rapid development of the urban areas, but adversely affected the rural activities. The local agricultural production was failure to meet the growing demand, which gave opportunity to imported products to dominate the food market in Hong Kong. While Hong Kong grew, the proportion of locally grown food supply declined significantly. The lack of transport infrastructure limited the expansion of the local farming industry, and the immigration of rich villagers further reduced the viability of agricultural production in Sai Kung. Furthermore, the post-war education policy of the colony established rural schools for the prevalence of primary education for young villagers. Most of the working force in villages withdrew from agricultural activities.

The reforestation introduced by the Botanical and Forestry Department (now under the management of the Agriculture, Fishery and Conservation Department, AFCD) created potential to the new form of economic opportunities. The British government reforest the hill slopes destroyed during the Japanese Occupation by promoting a country park system. The conservation effort enabled Sai Kung to shift their economic focus on the tertiary industry. Ecotourism and country park were popular among residents; therefore, the government constructed various educational and recreational facilities to cater the need of the visitors.

[3] David Fature. (1982). Faure, D. (1982). Saikung, the Making of the District and its Experience during World War II. *Journal of the Hong Kong Branch of the Royal Asiatic Society*, 161-216.

Development of Settlement

The construction of the High Island Reservoir brought villages to the areas in the 1960s. The indigenous villages, namely Lan Nai Wan Village and Sha Tsui Village, were forced to resettle in Man Yee Wan New Village and Sha Tsui New Village in the town centre. Under the introduction of the Emergency (Resettlement Areas) Regulations under the Emergency Regulations Ordinance in 1952[4], charity groups and religious groups were encouraged to build houses in the Cottage Resettlement Area to re-house villagers and the fishermen affected by the construction of the Reservoir. Some villages in Tui Min Hoi were as the results, including Kwun Mun Fishermen Village, Man Tee Fishermen Village, Tui Min Hoi Fishermen's Village, St. Peter Village, Ming Shun Village, and Tai Ping Village in Po Lo Che[5]. At the same time, the Housing Society built the two Rural Public Housing in Sai Kung, namely Tui Min Hoi Chuen and Lakeside Garden, to resettle the indigenous villagers and the fishermen in the neighbourhood by reclamation. The listing of settlement might not be completed, but the relocation of fishermen implied the mix neighbourhood of indigenous and non-indigenous villagers along the coastal areas, which further proved the development and the expansion of the rural cluster.

The establishment of the Small House Policy in 1972 allowed indigenous villagers to build on the form of three-storey Spanish-styled houses. The desirable living environment attracted outsiders, including both locals and non-locals, to rent houses, resulting in a mixture of nationalities and backgrounds.

Table 2. 1 Population composition by ethnicity (2016)

	Chinese	Filipino	Indonesian	White	Others
Study Area	78.13%	6.52%	3.89%	6.85%	4.62%
Sai Kung District	91.45%	2.91%	2.46%	1.15%	2.04%
Hong Kong	92.04%	2.51%	2.09%	0.79%	2.57%

[4] Housing Bureau. (2000, Octocber). Policy on Clearance of Cottage Areas. Retrieved from https://www.legco.gov.hk/yr00-01/english/panels/hg/papers/a79e02.pdf

[5] Legislative Council. (2006, March 22). Existing Fishermen Villages. Official Record of Proceedings. Retrieved from https://www.legco.gov.hk/yr05-06/chinese/counmtg/floor/cm0322ti-confirm-c.pdf

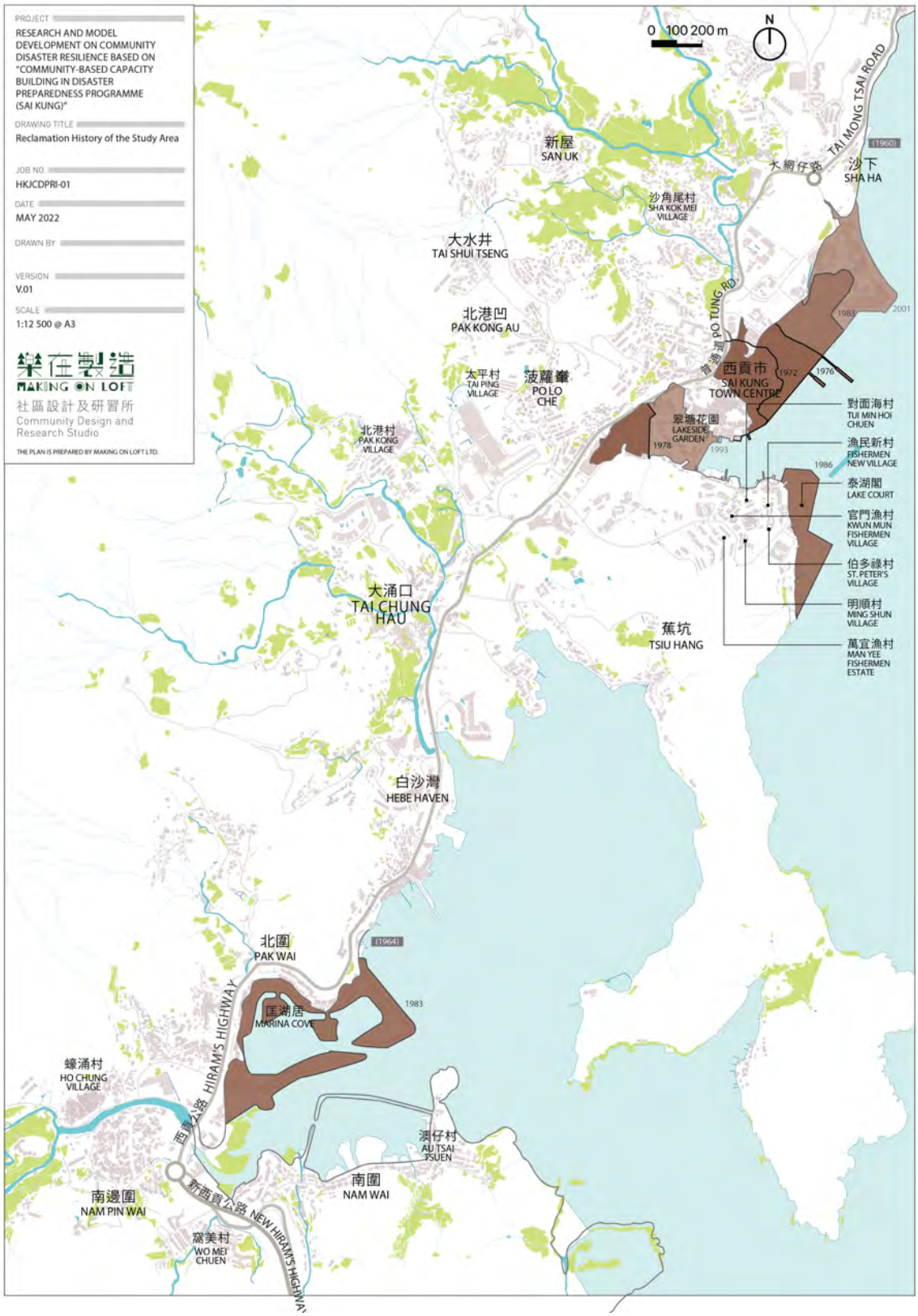
2.1.1 Reclamation History

The coastline developed over time to create more land resources for urbanization (see **Plan 2.1**), which was one of the catalysts driving the development of rural development in Sai Kung. The earliest plans of the coastline found were published in 1960 (including areas around Sai Kung Town Centre) and in 1964 (including areas around Ho Chung).

The original coastline was closer to the Hiram's Road with the protruded area on the east of the Road, which was the cluster of "Tong Lau" houses near Sai Kung Main Street and Sai Kung Tai Street. In 1972, reclamation began around nowadays Sai Kung Town Centre for the building of Man Yee Wan New Village and Sha Tsui New Village. The construction of the High Island Reservoir led to the relocation of the ancient villages; therefore, the British government created lands for the resettlement. After four years, in 1976, the shoreline was extended to the nowadays bus terminal and public piers. In 1978, a piece of land near Po Lo Che across the Hiram's Road was created, which is occupied by industrial buildings recently.

In 1983, the coastline near the Sai Kung Public Pier was extended to nowadays Mei Tak Street with the implementation of various Government, Institution or Community (GIC) facilities and public work projects. In the same year in the area near Ho Chung, Marina Cove was developed by reclamation, which replaced the original fishponds. In 1986, reclamation works were done for the development of Lake Court and the implement of the Sai Kung Sewage Treatment Works at the waterfront site. The construction of the Rural Public Housing estate of the Housing Society required extra land for the resettlement of the fishermen in the neighborhood. Reclamation, done in 1993, brought new land and bridged the gap of inner bay area between Sai Kung Town Centre and Tui Min Hoi Village, which increased the accessibility of villages in Tui Min Hoi. The recent reclamation work further extended the coastline near the Sai Kung Public Pier, which provided a long waterfront between the Town Centre and the Sha Ha Beach.

Reclamation facilitated the development of Sai Kung areas, providing enough land for resettlement, residential use, GIC facilities, and a better transport network.



Plan 2. 1 Reclamation history of the Study Area

2.1.2 Historic Buildings

With long historical background, some villages in Sai Kung developed rich cultural contexts. The rural development brought about different historic buildings, symbolizing the cultural identity and continuity and carrying various kinds of academic and aesthetic value. Some buildings with high historical significance were worth protected and graded. The latest (as in March 2022) graded and significant non-graded historical building structures by Antiquities and Monuments Office (AMO) within the Study Area and its adjoining areas are listed in the **Table 2.2** below,

Table 2. 2 List of graded and significant non-graded historical building structures

No.	Name and Address	名稱及地址	Proposed Grading	Ownership	Year of Construction / Restoration	Remarks
37	Che Kung Temple, Ho Chung Road, Sai Kung, N.T.	新界西貢蠔涌道車公古廟	1	Private	Built before 1904	Grade 1 confirmed on 18 Dec 2009
70	Tin Hau Temple, Joss House Bay, Sai Kung, N.T.	新界西貢大廟灣天后廟	1	CTC	Probably built in 1266	Grade 1 confirmed on 17 May 2010
368	St. Joseph's Chapel, Yim Tin Tsai, Sai Kung, N.T.	N.T. 新界西貢鹽田仔聖若瑟堂	2	Private	Probably built in 1890	Grade 2 confirmed on 21 Dec 2010
398	Tin Hau Temple & Hip Tin Temple, Po Tung Road, Sai Kung, N.T.	新界西貢普通道天后古廟及 協天大帝廟	2	Private	Built in the 1910s-1920s	Grade 2 confirmed on 18 Dec 2009
501	Ham Tin Tsuen, Sai Kung, N.T.	新界西貢鹹田村	2	Private	Established over 150 years ago	N/A
N96	Sai Kung Lok Yuk Kindergarten, No. 19E Po Tung Road, Sai Kung, N.T.	新界西貢普通道 19E 號西貢樂育幼稚園	2	Partly private, partly gov't	N/A	Grade 2 confirmed on 4 Mar 2015

645	Chan Ancestral Hall, No. 25 Ho Chung First Lane, Sai Kung, N.T.	新界西貢蠔涌 1 巷 25 號陳氏 家祠	3	Private	Probably built in 1850s	Grade 3 confirmed on 31 Aug 2010
N97	Yuk Yin Study Hall, No.1A Sha Kok Mei Second Lane, Sai Kung, N.T.	新界西貢沙角尾村二巷 1A 號 育賢書室	3	Private	N/A	Grade 3 confirmed on 4 Dec 2014
655	Rosary Mission Centre, No. 1 Wong Mo Ying, Sai Kung, N.T.	新界西貢黃毛應 1 號玫瑰小 堂	2	Private	Built in 1940	Grade 2 confirmed on 17 Apr 2013
1243	Nos. 6, 7, 8 (Po Shue Ancestral Hall), 9 & 10 Nam Pin Wai, Sai Kung, N.T.	新界西貢南邊 圍 6, 7, 8(寶樹家祠), 9 及 10 號	Nil grade	Private	Probably built in the early 20th century	Nil grade confirmed on 4 Feb 2010
1286	Nos. 3, 4, 5 Nam Pin Wai Tsuen, Sai Kung, N.T.	新界西貢南邊圍村 3, 4 及 5 號	Nil grade	Private	Built in the 1930s	Nil grade confirmed on 4 Feb 2010
1348	Tse Ancestral Hall, Nos. 26-28 Kap Pin Long, Sai Kung, N.T.	新界西貢甲邊朗 26 至 28 號謝 氏祠堂	Nil grade	Private	Probably built in the late 19th century	Nil grade confirmed on 4 Feb 2010
1370	Nos. 5-6 Tui Min Hoi, Sai Kung, N.T.	新界西貢對面海 5 至 6 號	Nil grade	Private	Built in 1933	Nil grade confirmed on 4 Feb 2010

Source: List of 1,444 Historic Buildings with Assessment Results (as at 10 Mar 2022)

Figure 2. 2 Tin Hau Temple, Joss House Bay, Sai Kung
Source: University of Hong Kong Libraries. Special Collections

2.2 Sai Kung Geographical Context

Sai Kung is dubbed the 'Back garden of Hong Kong' with much conserved natural environment and village type development in rural setting. The majority of land in the Study Area is reserved as protected natural environment for natural conservation and natural recreation (e.g. campsite, natural trail). Many rural settlements occupied the flatlands near mountains and areas along the coastline. Those villages enjoyed various natural resources, while threatened by the higher risk of natural disaster in different geographical settings.

2.2.1 Statutory Land Use Zoning

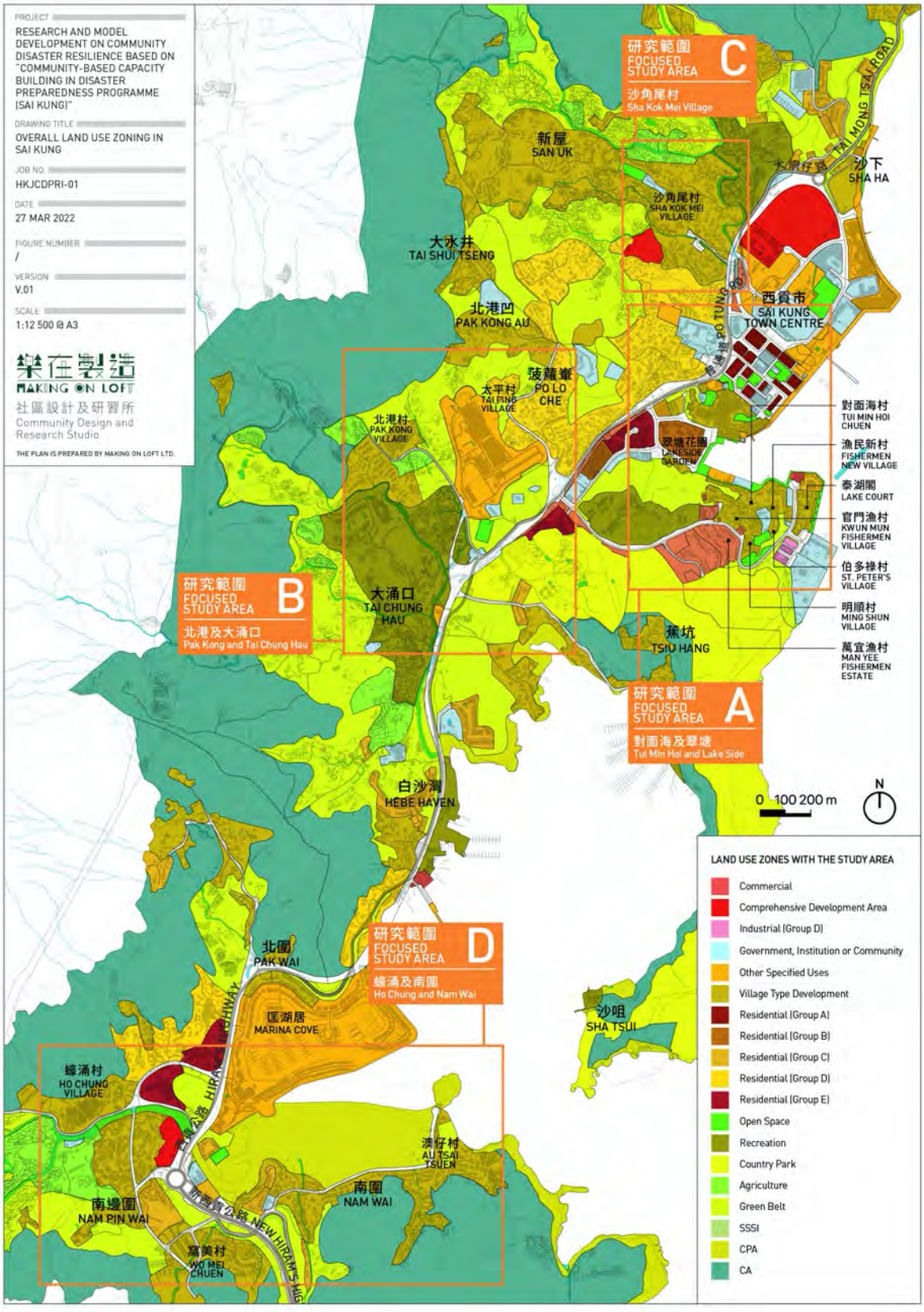
Statutory plan, I.e. Outline Zoning Plan (OZP), indicates the land use zones, development restrictions and planning intention of a planning area. It also helps understand the current as well as future developments in the area, since any new development must comply with the requitements stipulated on the OZP.

The whole Study Area is covered by the Sai Kung Town Outline Zoning Plan No. S/SK-SKT/6 approved by the Chief Executive in Council under Planning Ordinance on 14/06/2013, the Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/11 approved on 27/10/2006, the Hebe Haven Outline Zoning Plan No. S/SK-HH/8 approved on 12/06/2020, and the Ho Chung Outline Zoning Plan No. S.SK-HC/11 approved on 21/03/2014. The planning intention of the four Approved Outline Zoning Plans are listed in **Table 2.3**.

Table 2. 3 General Planning Intentions of the relevant Outline Zoning Plans

Approved Outline Zoning Plan	General Planning Intention
Sai Kung Town Outline Zoning Plan No. S/SK-SKT/6	Intended to promote the area as a "Tourism Gateway" and a centre for commercial recreational and Government, Institution or Community ("G/IC") facilities for local residents; to improve environmental quality; and to conserve landscape and heritage significant features.
Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/1	Intended to consolidate existing village type development and to provide adequate land for village expansion and low-rise and low-density residential development; to conserve significant landscape features of Ho Chung Valley; to promote agricultural and recreational activities in the valley floor; and to phase out undesirable industrial uses.
Hebe Haven Outline Zoning Plan No. S/SK-HH/8	Primarily for natural and rural conservation; to promote marine-related recreational uses along the coastal front of Hebe Haven.
Ho Chung Outline Zoning Plan No. S.SK-HC/11	Primarily for conserving the intrinsic natural character of the scenic hilly landscape; to promote recreation and agriculture on the valley floors of Pak Kong and Sha Kok Mei.

Source: Approved Sai Kung Town Outline Zoning Plan No. S/SK-SKT/6, approved Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/11, approved Hebe Haven Outline Zoning Plan No. S/SK-HH/8, approved Ho Chung Outline Zoning Plan No. S.SK-HC/11


PROJECT
RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE BASED ON "COMMUNITY-BASED CAPACITY BUILDING IN DISASTER PREPAREDNESS PROGRAMME (SAI KUNG)"
DRAWING TITLE
OVERALL LAND USE ZONING IN SAI KUNG
JOB NO.
HKJCDPRI-01
DATE
27 MAR 2022
FIGURE NUMBER
/
VERSION
V.01
SCALE
1:12 500 @ A3
樂在製造 MAKING ON LOFT
社區設計及研習所
Community Design and Research Studio
THE PLAN IS PREPARED BY MAKING ON LOFT LTD.
研究範圍 FOCUSED STUDY AREA C
沙角尾村 Sha Kok Mei Village
研究範圍 FOCUSED STUDY AREA B
北港及大涌口 Pak Kong and Tai Chung Hau
研究範圍 FOCUSED STUDY AREA A
對面海及翠塘 Tui Min Hoi and Lake Side
研究範圍 FOCUSED STUDY AREA D
蠔涌及南圍 Ho Chung and Nam Wai
新屋 SAN UK
大水井 TAI SHUI TSENG
北港凹 PAK KONG AU
沙角尾村 SHA KOK MEI VILLAGE
大網仔路 TAI MONG TSAI ROAD
沙下 SHA HA
西貢市 SAI KUNG TOWN CENTRE
菠蘿輋 PO LO CHE
太平村 TAI PING VILLAGE
北港村 PAK KONG VILLAGE
翠塘花園 LAKESIDE GARDEN
對面海村 TUI MIN HOI CHUEN
漁民新村 FISHERMEN NEW VILLAGE
泰湖閣 LAKE COURT
官門漁村 KWUN MUN FISHERMEN VILLAGE
伯多祿村 ST. PETER'S VILLAGE
明順村 MING SHUN VILLAGE
萬宜漁村 MAN YEE FISHERMEN ESTATE
大涌口 TAI CHUNG HAU
蕉坑 TSIU HANG
白沙灣 HEBE HAVEN
北圍 PAK WAI
匡湖居 MARINA COVE
蠔涌村 HO CHUNG VILLAGE
澳仔村 AU TSAI TSUEN
南圍 NAM WAI
南邊圍 NAM PIN WAI
窩美村 WO MEI CHUEN
沙咀 SHA TSUI
0 100 200 m
N
LAND USE ZONES WITH THE STUDY AREA
Commercial
Comprehensive Development Area
Industrial (Group D)
Government, Institution or Community
Other Specified Uses
Village Type Development
Residential (Group A)
Residential (Group B)
Residential (Group C)
Residential (Group D)
Residential (Group E)
Open Space
Recreation
Country Park
Agriculture
Green Belt
SSSI
CPA
CA

Plan 2. 2 Overall land use zoning in Sai Kung

As shown in **Plan 2.2**, the Study Area is mainly zoned as "Conservation Area" ("CA") with 38% of land and "Green Belt" ("GB") with 16% of land. Over 65% of the Study Area is zoned for the purpose of natural conservation against development. Over 10% of the land is zoned as "Village Type Development", which implied the large cluster of villages. Their planning intentions are shown in **Table 2.4**.

Table 2. 4 Planning Intentions of the relevant Statutory Zones

Statutory Zone	Planning Intention
Conservation Area	Against development. Intended to protect and retain the existing natural landscape, ecological or topographical features, and to separate sensitive natural environment such as Country Park from development. Only developments supporting the conservation are permitted.
Green Belt	Against development. Primarily for defining the limits of urban and sub-urban development areas by natural features, to contain urban sprawl, and to provide passive recreational outlets. Agricultural Use, natural recreational use (e.g. nature trail and picnic area), wild animals protection area are always permitted.
Country Park	Against development. Primarily for natural conservation, countryside recreation and outdoor education. Designated under the Country Parks Ordinance.
Village Type Development	Primarily for existing recognized villages and village expansion. Agricultural use, New Territories exempted house, ancestral hall, On-farm domestic structure, and rural committee, village office are always permitted.

Source: Approved Sai Kung Town Outline Zoning Plan No. S/SK-SKT/6, approved Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/11, approved Hebe Haven Outline Zoning Plan No. S/SK-HH/8, approved Ho Chung Outline Zoning Plan No. S.SK-HC/11, and Country Park Ordinance (Cap. 208)

Four Focused Study Areas are targeted in the research. Zone A is mainly covered by Sai Kung Town Outline Zoning Plan No. S/SK-SKT/6, including areas around Tui Min Hoi and Sai Kwun

Town Centre. Zone B is mainly covered by Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/11, consist of Pak Kong and Po Lo Che. Zone C is mainly covered by Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/11, including Sha Kok Mei. Zone D is mainly covered by Hebe Haven Outline Zoning Plan No. S/SK-HH/8 and Ho Chung Outline Zoning Plan No. S.SK-HC/11, including Ho Chung, Nam Pin Wai, Wo Mei and Nam Wai.

2.2.2 Population Distribution of the Study Area

As mentioned in the previous section, areas zoned as village type development occupied large amount of land, which suggests the large clusters of villages and rural settlements. Therefore, it is essential to firstly find out the population composition of the Study Area to facilitate the understanding of the development of the villages.

The study area are separated into small focused study areas according to the Small Street Block Groups under the Tertiary Planning Units. The number on the coloured areas indicates the population of the relevant areas in 2016, based on 2016 Population By-census of Hong Kong. Darker colouring indicates larger population.

As shown in **Figure 2.3**, it is observed that the areas along the coastline have relatively high population, especially in Sai Kung Town Centre (3,111), Lakeside Garden (2,606), and Marina Cove (2,564), which possibly attributes to the relatively high and dense residential buildings (areas zoned R(A), R(B), OU" Residential cum Marina Development"). Some ancient villages, namely Sha Kok Mei (1,756), Ho Chung (1,424), have high population, while their neighbouring villages, Ho Chung New Village (1,942) and Kap Pin Long (1,547) share similar features. Another ancient village, Pak Kong (1,146), has higher population compared to the neighbouring areas. Overall, the largest cluster of population appears in the large estates along the coastal. In terms of village type development, the ancient villages obtain larger cluster of rural settlement and the distribution scatters over inner areas and the shores.

It is worth noting that the population composition does not directly reflect the detailed distribution of population and the population density, which would be examined in the later section.

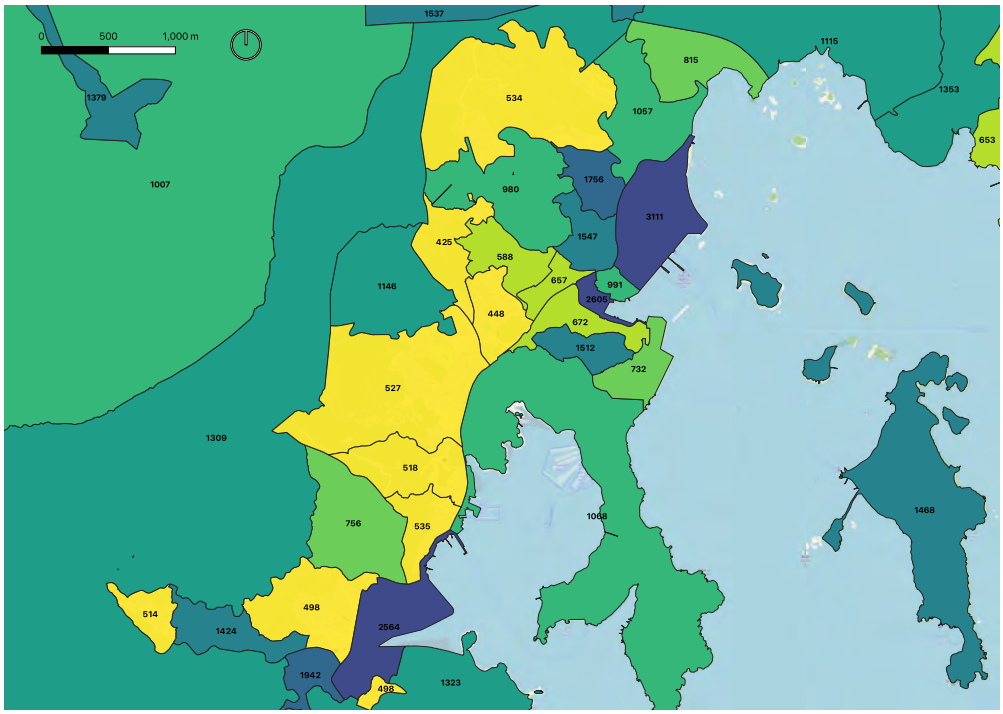


Figure 2. 3 Overall Population in Study Area (2016)

Projection of Population Distribution

Population projections provide a common basis for Government programme planning, while the projections imply the expected change of demographic by the Government with their planning intentions and future.

The projections of population distribution for 2021-2029 published by the Working Group on Population Distribution Projections (WGPD) adopted the latest Census and Statistics Department's projections of territorial population, "Hong Kong Population Projections 2020-2069", released in September 2020 as the control totals. The set of population projections covering from 2020 to 2069 used the mid-2019 population estimate as the base.

The projected population distribution might not reflect the real situation (see **Table 2.5** and **Table 2.6**). It is observed that the population of the Study Area dropped significantly from 2011 to 2016 with over 10%. The projected population distribution suggested that the population of the Study Area (from 2016 to 2025) would rise, which does not align with the trend. It is understandable that the estimated population of the Study Area might be highly affected by that of Sai Kung District and Hong Kong, which was expected to rise progressively in the coming years. At the same time, it took reference to the trend in the previous 5 years,

which caused that the percentage increase of the projected population of the Study Area is significantly smaller than that of Sai Kung District.

Table 2. 5 Projected Population by Tertiary Planning Unit (TPU), 2021-2025

TPU	2019	2020	***2021***	2022	2023	2024	2025
820	7000	6800	***6900***	6800	6800	6900	6900
822	6500	6300	***6400***	6400	6300	6300	6300
823	4300	4200	***4200***	4200	4100	4100	4100
824 & 829	2800	2700	***2700***	2700	2700	2700	2600
825	3600	3500	***3500***	3400	3400	3300	3300
826 & 828	7400	7400	***7400***	7300	7200	7200	7100
827	3500	3700	***3700***	3700	3700	3700	3600
Study Area	35100	34600	***34800***	34500	34200	34200	33900
Sai Kung District	475300	475500	***489600***	498000	501900	504200	521800
Hong Kong	7506200	7480700	***7579100***	7648900	7696600	7737300	7773700

Source: Projected Population by Tertiary Planning Unit, 2021-2025[6]

(Figures of 2019 and 2020 are base year estimates)

Table 2. 6 Population change from 2011 to 2016, projected population change from 2016 to 2025

	Actual Change			**Projected Change**				
TPU	2011	2016	**Change in 5 years (between 2011 & 2016)**	2016	2021	**Estimated Change in 5 years**	2025	**Estimated Change in 10 years****
820	6285	6443	**-3.14%**	6443	6900	**7.09%**	6900	**7.09%**
824		2726		2726	2700	**0.95%**	2600	**-4.62%**
829	3181							
822	6704	6257	**-6.67%**	6257	6400	**2.29%**	6300	**0.69%**

[6] PlanD https://www.pland.gov.hk/pland_en/info_serv/statistic/wgpd21.html

823	4417	4385	**-0.72%**	4385	4200	**-4.22%**	4100	**-6.50%**
825	4556	3665	**-19.56%**	3665	3400	**-4.50%**	3300	**-9.96%**
826 & 828	7941	6707	**-15.54%**	6707	7300	**10.33%**	7100	**5.86%**
827	3986	2916	**-26.84%**	2916	3700	**26.89%**	3600	**23.46%**
Study Area	37070	33099	**-10.71%**	33099	34800	**5.14%**	33900	**2.42%**
Sai Kung District	436627	461864	**5.78%**	461864	489037*	**5.88%***	521800	**12.98%**
Land Total	7070388	7336585	**3.76%**	7336585	7413070*	**1.04%***	7773700	**5.96%**

Source: 2021 Population Census, Projected Population by Tertiary Planning Unit, 2021-2025

*Population of Sai Kung District and Land Total in 2021 and their percentage change in 5 years are actual figures.

**Estimated Change in 10 years under Projected Change is the percentage change from the actual population of 2016 to the estimated population of 2025.

2.2.3 Proposed and Planned Development in Sai Kung/ Related Governmental Policies

Housing Development

High ended residential buildings were built and more could be expected in the Study Area. For instance, ten low rise residential buildings were established along Hong Kin Road in Tui Min Hoi in 2021. Meanwhile, a site near Heung Chung Road in Ho Chung, zoned as "Residential (Group C)" ("R(C)") site, was awarded to a developer in 2020[7]. Eleven low to mid rise high-ended residential buildings, occupied about 0.53ha of land, are planned. A luxurious residential estate is expected in the coming years.

Recreational Development

A hotel (guesthouse) is proposed in the "Recreation" ("Rec") site in Ho Chung, supporting the development of a recreation centre for recreation, sports and culture. Meanwhile, a recreational development with associated filling and excavation of land is proposed in

[7] Development Bureau. (2020, August). Tender awarded for site in Sai Kung. Retrieved from https://www.devb.gov.hk/en/publications_and_press_releases/press/index_id_10681.html

"Green Belt" ("GB") site in Ho Chung, supporting the development in the adjacent "Residential (Group C)1" ("R(C)") site.

Road Work

Highways Department commenced the Hiram's Highway Improvement Stage 1 to enhance a section of Hiram's Highway from Clear Water Bay Road to Marina Cove and planned the Hiram's Highway Improvement Stage 2 to improve the section of Hiram's Highway from Marina Cove to Sai Kung Town, which strengthen the connectivity between Sai Kung and the urban areas[8].

Sewage Treatment

The Drainage Services Department (DSD) completed the construction of sewers and truck sewers in eight villages and areas in the west of Sai Kung in 2018. The construction works of the sewerage collection, treatment and disposal system in another seven villages and areas in Sai Kung, including Wo Mei, Heung Chung, and etc., are expected to be completed by the end of 2025[9]. Meanwhile, the sewerage systems for other 22 villages and 11 areas are under planning and design.

Flood Prevention

The Drainage Services Department (DSD) reviewed completed the Drainage Master Plan Review Study of Sai Kung in 2017, leading to the planning on the enhancement on drainage management and flood control through 'Blue-Green Infrastructure' Concept[10].

Shoreline Enhancement

[8] Meinhardt Infrastructure and Environment Limited. (n.d.). Overview of Hiram's Highway Improvement Stage 2. Retrieved from http://hirams-highway-stage2.com.hk/overview_hhis2.html

[9] Drainage Services Department. (2020, November). Work of the Drainage Services Department in Sai Kung District. Retrieved from https://www.districtcouncils.gov.hk/sk/doc/2020_2023/en/dc_meetings_doc/18057/SK_2020_283_EN.pdf

[10] Environment Bureau. (2017, January). Hong Kong's Climate Action Plan 2030+. Retrieved from https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf

Working towards the UN 2030 Sustainable Development Goals, the Civil Engineering and Development Department (CEDD), collaborating with the University of Hong Kong, is studying on the implementation of "eco-shoreline" features at seawalls in Sai Kung[11].

[11] KPMG. (2020, April). Future Hong Kong 2030 Public and private sector insights for smart city development. Retrieved from https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2020/04/future-hong-kong-2030.pdf

3 Natural Environment of the Study Area

Sai Kung is an area bounded by the high ground of Ma On Shan, Buffalo Hill, and Kowloon Peak. With various topography, surface runoff flows across the area, including village clusters, through several watercourses into Port Shelter. The unique natural environment creates diverse geographical characteristics of villages and rural settlements, which puts villages into distinctive risks when facing disasters.

3.1 Geographical Characteristics

Coastal, riverside and hillside areas are concerned under the consideration of the geographical characteristics of the Study Area.

Coastline: low-lying coastal areas

The Study Area is a coastal area neighbouring Hebe Haven and Inner Port Shelter. Various low-lying coastal areas are found, where are high-risk areas regarding sea-level rise. Meanwhile, some villages and rural settlements are located in those areas, as shown in **Figure 3.1** below.

According to the Study of Coastal Hazards under Climate Change and Extreme Weather and Formulation of Improvement Measures – Feasibility Study (Coastal Hazards Study), Sai Kung Town Centre, Tui Min Hoi and Nam Wai are identified as coastal low-lying residential areas with higher risks, especially for Nam Wai also being one of the existing storm surge spots[12].

[12] Drainage Services Department. (2022, April). Executive Summary. Study of Coastal Hazards under Climate Change and Extreme Weather and Formulation of Improvement Measures – Feasibility Study.

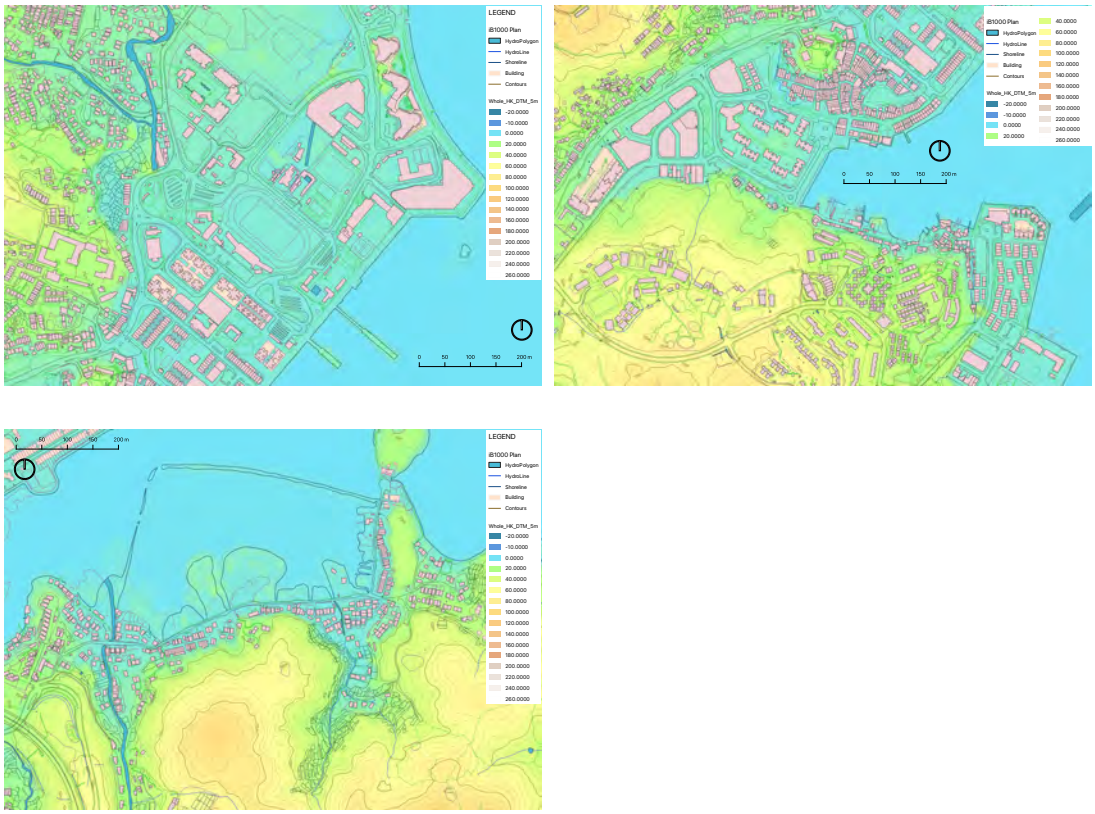


Figure 3. 1 Villages and rural settlements along the coastline (Sai Kung Town Centre, "Tong Lau" buildings along Sai Kung Tai Street and Tui Min Hoi Village, and Nam Wai)

Rivers: low-lying riverside areas

Sai Kung River, Pak Kong River and Ho Chung River are the major watercourses across the Study Area. It is worth noting that several villages and rural settlements are located close to those main water streams (see **Figure 3.2**). Sai Kung River is located at the north of Sai Kung Town. It originates from upstream grassland in Ma On Shan and Pyramid Hill and runs through the village areas of Sai Kung before entering into the Inner Port Shelter in Sai Kung Sea. The total length of the river is approximately 1.3km. Sai Kung Town Centre and Sha Kok Mei are at the downstream of the Sai Kung River.

Pak Kong River is located at the southwest of Sai Kung Town. It originates from and runs alongside with the Hiram's Highway before crossing under the Hiram's Highway, eventually discharging to Hebe Haven. The total length of the river is approximately 1.32km. Several nurseries and houses settled along the downstream of Pak Kong River at the northeast of Tai Chung Hau, which associates with Tai Chung Hau Stream along the Hiram's Highway.

Ho Chung River is located between Ho Chung Village and Ho Chung New Village. It originates from area near Buffalo Hill and Tung Yeung Shan and runs alongside with Ho Chung Road before passing under the Hiram's Highway, finally discharging to Hebe Haven in the south. The total length of the river is approximately 1.6km. Ho Chung Village is located at the immediate downstream.

As shown in **Figure 3.2**, some areas near the riverside are also low-lying areas (shaped in blue and green). With the combination of riverside and low elevation, most of the villages and rural settlements near the four watercourses (such as Sai Kung Town Centre, Sha Kok Mei, Pak Kong and Ho Chung) associate with flooding problems, which require effective drainage system and contingency plans to alleviate the impacts brought by associated disasters.

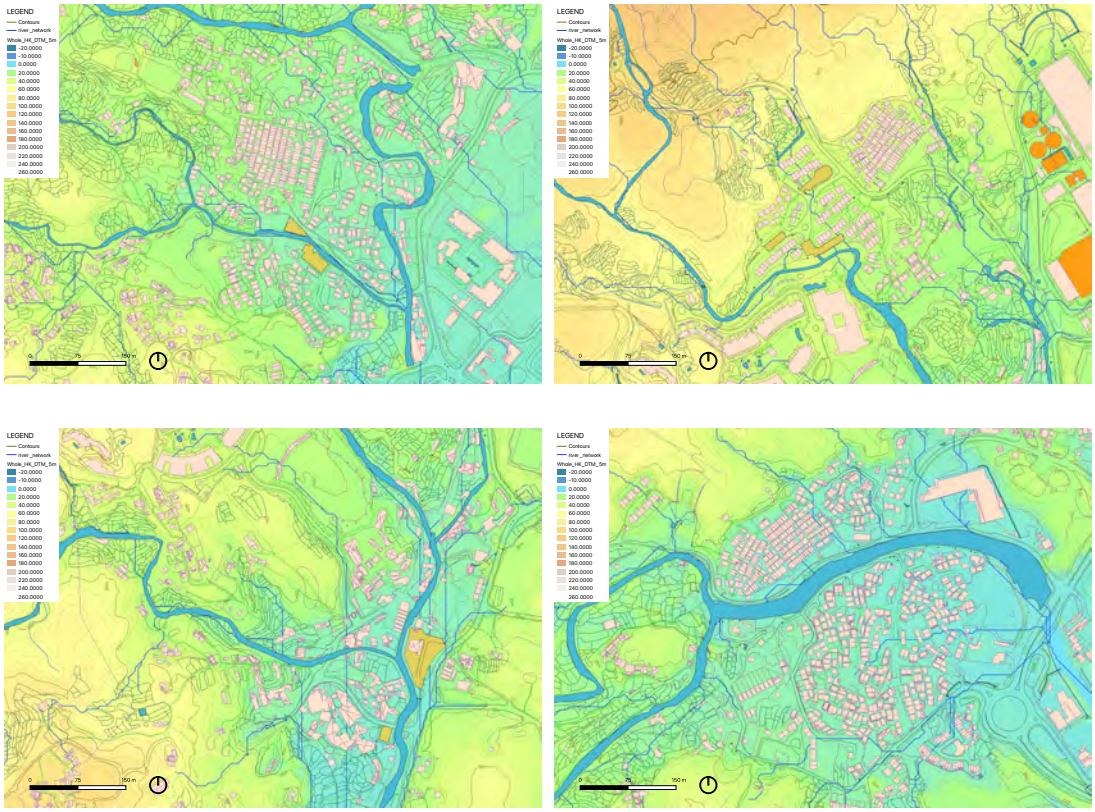


Figure 3. 2 Villages and rural settlements clustering in low-lying, riverside areas (Sai Kung River, Pak Kong River, Tai Chung Hau Stream, and Ho Chung River respectively)

Hills: hillside areas

The surrounding high grounds creates hilly terrain in Sai Kung. The development of new rural clusters and the expansion of the original clusters requires lands, leading to the buildings built along hillside. The dense development results in a number of steep man-made slopes, resulted in the association of another common natural hazards in Hong Kong, landslide.

As shown in **Figure 3.3**, some villages and rural settlements cluster along the hillside (shaped in yellow and orange) along Po Lo Che Road, while some are found adjacent to sloping hill, such as Luk Mei Tsuen.

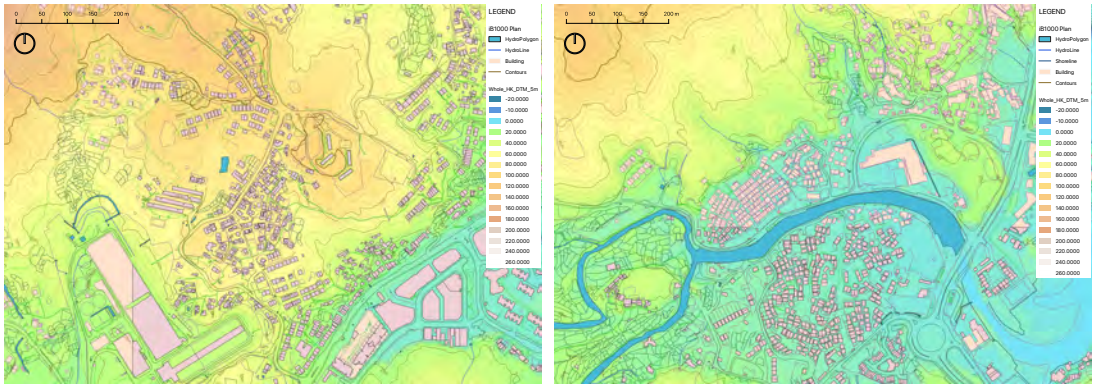


Figure 3. 3 Villages and rural settlements clustering in hillside areas (settlements along Po Lo Che Road (e.g. Tai Ping Village), and Luk Mei Tsuen)

3.2 Past Climate-related Incidents in Sai Kung

Climate-related incidents including landslide, flooding, fallen trees and storm surge occurred in different parts of Sai Kung during adverse weather conditions. Some notable incidents are listed below. It is worth noting that the recent incident of falling trees in August 2017 demonstrated the community's self-initiated response.

Table 3. 1 Notable past climate-related incidents in Sai Kung

Sites of Incident	Natures of Incident	Remark	Year
Po Lo Che Service Reservior (Within Study Area)	Landslide: Major failure of soil cut/ natural slope resulting in the closure of the public access road		Jan 1990

Kei Ling Ha Lo Wai (Within Study Area)	Landslide: Major failure of soil cut slope resulting in the closure of a road		Jul 1994
Hope Villa, Tai Mong Tsai Road	Landslide: Major failure of soil cut/ natural slope resulting in the closure of a road		Jul 1994
Ah Kung Wan Road	Landslide: Major failure of a soil cut slope resulting in the evacuation of 4 houses and the blockage of a road		Aug 1994
Sai Wan Road, Sai Kung	Landslide: Major failure of soil cut slope resulting in the closure of the public access road		May 2015
Hopes Villa, Tai Mong Tsai Road	Landslide: Major failure of soil cut and natural slope resulting in the closure a road		Oct 2015
Sai Wan Tsuen	Landslide: Major failure of soil cut/ natural slope resulting in the closure of a road and 12 people trapped under Amber Rainstorm Warning Signal		May 2016
Sai Kung Road (Within Study Area)	Flood: Rising sea level resulting in flooding in low-lying coastal area under No.10 Typhoon Hato		Aug 2017
Hiram's Highway near Marina Cove (Within Study Area)	Falling Trees: Resulting in the closure of a section of Hiram's Highway under No.10 Typhoon Hato	Local residents self-handling the fallen trees and broken branches	Aug 2017

Sai Kung Pier (within Study Area) and Hebe Haven	Storm surge: The high-speed wind pushing water towards the coast resulting in serious damage of over 10 vessels near the pier under No.10 Typhoon Mangkhut		Sep 2018
Pak Wai	Flood: Heavy rain and poor drainage system resulting in the serious flooding under Black Rainstorm Warning Signal	Flood water reaching 2 metres, followed by power outage for a month	Jun 2020
Ho Chung (Within Study Area)	Flood: Heavy rain and poor drainage system resulting in floored houses and immersed vehicles under Black Rainstorm Warning Signal		Jun 2020

4 Baseline Review of the Study Area

The following section will present the community profile of the Study Area in five major areas - demographic characteristics, educational background, economic characteristics, household characteristics and housing characteristics. The report will also present those statistics of Hong Kong and Sai Kung District for comparison, therefore highlighting the unique characteristics of the Study Area.[13]

4.1 Demographic Characteristics

Population changes: As shown in **Table 4.1**, there are about 26800 people residing as in year 2016 in the Study Area. The population of the Study Area drops significantly from 2011 to 2016, which was over 10% from 30107 to 26789. The decrease in population of the Study Area differs from the overall population growth in Hong Kong (Sai Kung District: 5.78%; Hong Kong: 3.75%). This phenomenon is significant in Tui Min Hoi, where the population drops nearly 45%. In contract, some ancient villages, namely Ho Chung, rises over 25% of its population, followed by Ho Chung New Village and Sha Kok Mei, which implies that the characteristics of those villages are distinctive.

Table 4. 1 Change in population from 2011 to 2016

Small Street Block Group	Name (Given by the Author)	Population in 2011	Population in 2016	Population Change in 5 Years
820/02-05	Luk Mei Tsuen	644	498	-22.67%
820/06-08	Ho Chung	1535	1938	26.25%
820/09	Ho Chung New Village	1606	1942	20.92%
820/10-18 and 824/01-11	Wo Mei	1672	1309	-21.71%
822/09	Sha Kok Mei Village	1729	1756	1.56%

[13] Data presented in this section are retrieved from the result of 2011 Population Census and the result of 2016 Population By-Census conducted by Census and Statistics Department. Hence, the demographic changes after 2016 is not reflected in this section.

823/01-02	Nam Wai	1755	1323	-24.62%
823/04	Heung Chung and Maina Cove	2662	3062	15.03%
825/02	Kap Pin Long	2137	1547	-27.61%
825/03-05	Sun On Tsuen	851	657	-22.80%
825/06-09	Po Lo Che and Pak Kong Au	1568	1461	-6.82%
826/01 and 828/01-02	Man Yee Wan New Village	3698	3111	-15.87%
826/02	Sai Kung Tai Street	1354	991	-26.81%
826/03	Lakeside Garden	2889	2605	-9.83%
827/01-02	Tui Min Hoi Chuen	1202	672	-44.09%
827/03	Man Yee Fishermen Estate	1941	1512	-22.10%
827/04	Lake Court	843	732	-13.17%
829/01	Pak Kong	1269	1146	-9.69%
829/02-06	Tai Chung Hau	752	527	-29.92%
	Study Area	**30107**	**26789**	**-11.02%**
	Sai Kung District	436627	461864	5.78%
	Hong Kong	7070388	7335384	3.75%

Household changes: The number of domestic households of the Study Area drops over 5%, while that of Hong Kong and Sai Kung District increase, as shown in **Table 4.2**. Referring to the change in population, it is observed that the number of domestic households drops with population in general, while the percentage decrease in population of some villages, including Luk Mei Tsuen, Po Lo Che, Tui Min Hoi Village and Tai Chung Hau, exceeds over 15% of the percentage decrease in number of households. The phenomenon is attributed to the significant change in household composition of the areas (see **Figure 4.1**), where the percentages of other households (figures including households with only one person and households comprising unrelated persons) significantly rise from 2011 to 2016. It implies that the household composition of domestic households shifted heavily from nuclear family

households to one-person households and unrelated-person households (e.g. co-living with friends, shared flats).

As shown in **Table 4.3**, the number of occupied quarters drops 6 % from 2011 to 2016, which is align with the decrease in the number of domestic household change in 5 years.

Table 4. 2 Change in number of domestic households from 2011 to 2016

Small Street Block Group	Name (Given by the Author)	Domestic Household in 2011	Domestic Household in 2016	Domestic Household Change in 5 Years	Population Change in 5 Years
820/02-05	**Luk Mei Tsuen**	162	162	**0.00%**	**-22.67%**
820/06-08	Ho Chung	572	677	18.36%	26.25%
820/09	Ho Chung New Village	479	584	21.92%	20.92%
820/10-18 and 824/01-11	Wo Mei	479	440	-8.14%	-21.71%
822/09	Sha Kok Mei Village	635	620	-2.36%	1.56%
823/01-02	Nam Wai	544	390	-28.31%	-24.62%
823/04	Heung Chung and Maina Cove	720	780	8.33%	15.03%
825/02	Kap Pin Long	679	474	-31.20%	-27.61%
825/03-05	Sun On Tsuen	286	234	-18.18%	-22.80%
825/06-09	**Po Lo Che and Pak Kong Au**	462	503	**8.87%**	**-6.82%**
826/01 and 828/01-02	Man Yee Wan New Village	1286	1195	-7.08%	-15.87%
826/02	Sai Kung Tai Street	514	384	-25.29%	-26.81%
826/03	Lakeside Garden	968	976	0.83%	-9.83%
827/01-02	**Tui Min Hoi Chuen**	377	295	**-21.75%**	**-44.09%**
827/03	Man Yee Fishermen Estate	570	502	-11.93%	-22.10%

827/04	Lake Court	252	241	-4.37%	-13.17%
829/01	Pak Kong	466	384	-17.60%	-9.69%
829/02-06	**Tai Chung Hau**	221	191	**-13.57%%**	**-29.92%**
	Study Area	9682	9032	-6.71%	-11.02%
	Sai Kung District	138209	147945	7.04%	5.78%
	Hong Kong	2368362	2509337	5.95%	3.75%

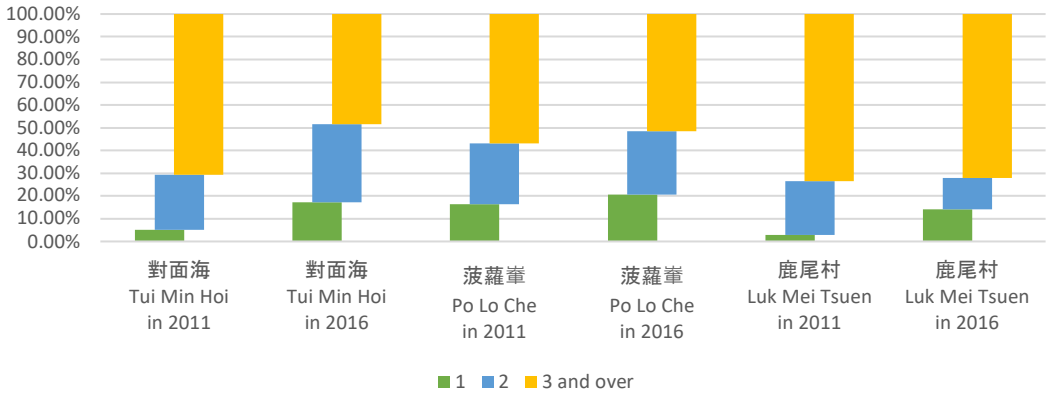


Figure 4. 1 Percentage of domestic households by household size in 2011 and 2016

Table 4. 3 Change in number of occupied quarters from 2011 to 2016

Small Street Block Group	Name (Given by the Author)	Occupied Quarter in 2011	Occupied Quarter in 2016	Occupied Quarter Change in 5 Years	Domestic Household Change in 5 Years
820/02-05	Luk Mei Tsuen	162	162	0.00%	0.00%
820/06-08	Ho Chung	572	677	18.36%	18.36%
820/09	Ho Chung New Village	477	584	22.43%	21.92%
820/10-18 and 824/01-11	Wo Mei	479	440	-8.14%	-8.14%
822/09	Sha Kok Mei Village	635	627	-1.26%	-2.36%
823/01-02	Nam Wai	544	390	-28.54%	-28.31%
823/04	Heung Chung and Maina Cove	714	775	8.54%	8.33%

825/02	Kap Pin Long	675	472	-30.07%	-31.20%
825/03-05	Sun On Tsuen	286	234	-18.18%	-18.18%
825/06-09	Po Lo Che and Pak Kong Au	463	507	9.50%	8.87%
826/01 and 828/01-02	Man Yee Wan New Village	1287	1195	-7.15%	-7.08%
826/02	Sai Kung Tai Street	519	384	-26.01%	-25.29%
826/03	Lakeside Garden	968	976	0.83%	0.83%
827/01-02	Tui Min Hoi Chuen	377	295	-21.75%	-21.75%
827/03	Man Yee Fishermen Estate	570	502	-11.93%	-11.93%
827/04	Lake Court	252	241	-4.73%	-4.37%
829/01	Pak Kong	466	384	-17.60%	-17.60%
829/02-06	Tai Chung Hau	221	191	-13.57%	-13.57%%
	Study Area	**9667**	**9036**	**-6.53%**	**-6.71%**
	Sai Kung District	1395066	149203	6.95%	7.04%
	Hong Kong	2380686	2525629	6.09%	5.95%

Sex ratio: As shown in **Figure 4.2**, the Study Area (756 males: 1000 females) has more unbalanced sex ratio than that of Sai Kung District (850:1000) and that of Hong Kong (852:1000). Among all rural areas, Wo Mei is the most significant with 60% of females to 40% of males. For the marital status (see **Figure 4.3**), some ancient villages, namely Ho Chung and Pak Kong, have more than 75% of ever married population, which exceeds that of Sai Kung District (71.26%), while some fishermen villages, for example, Tui Mei Hoi and Sai Kung Town Centre, have the lowest percentage of ever married population.

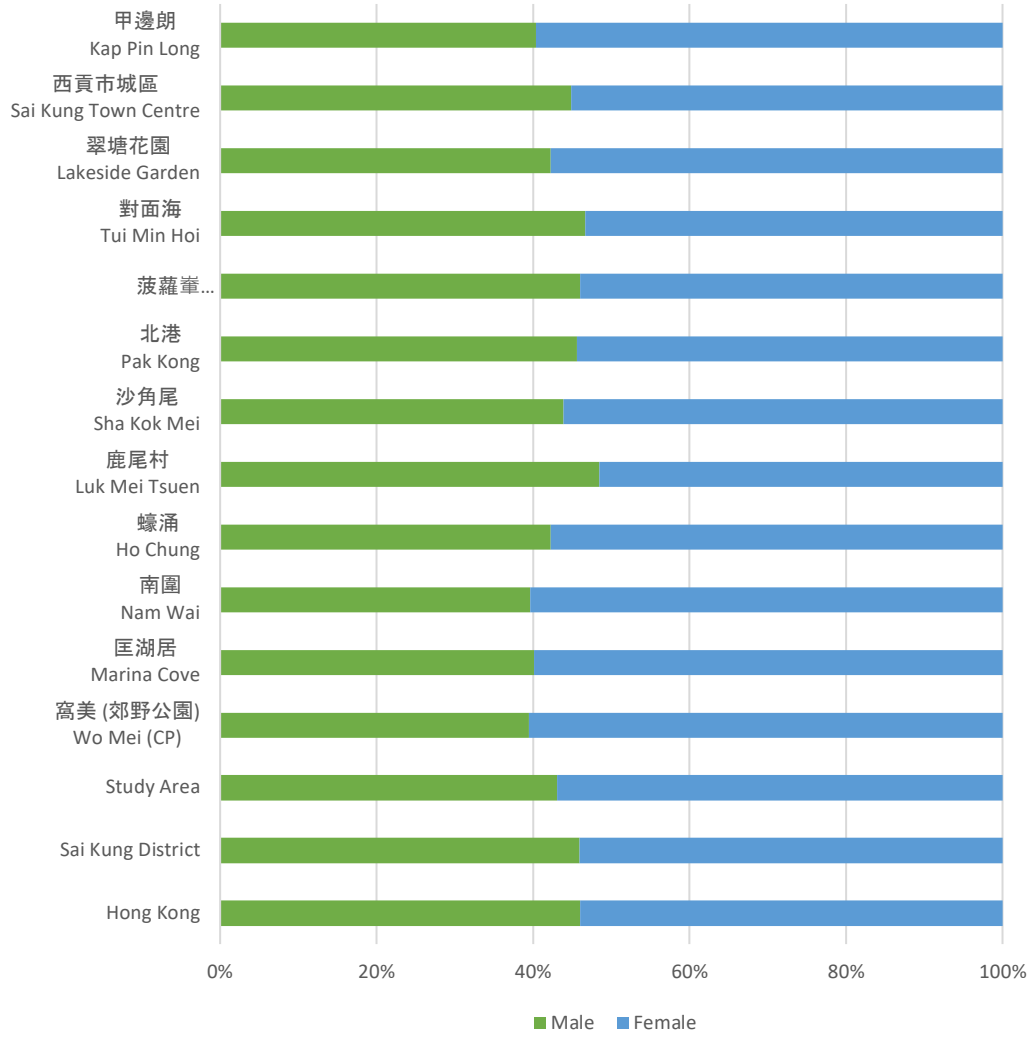


Figure 4. 2 Sex Ratio (2016)

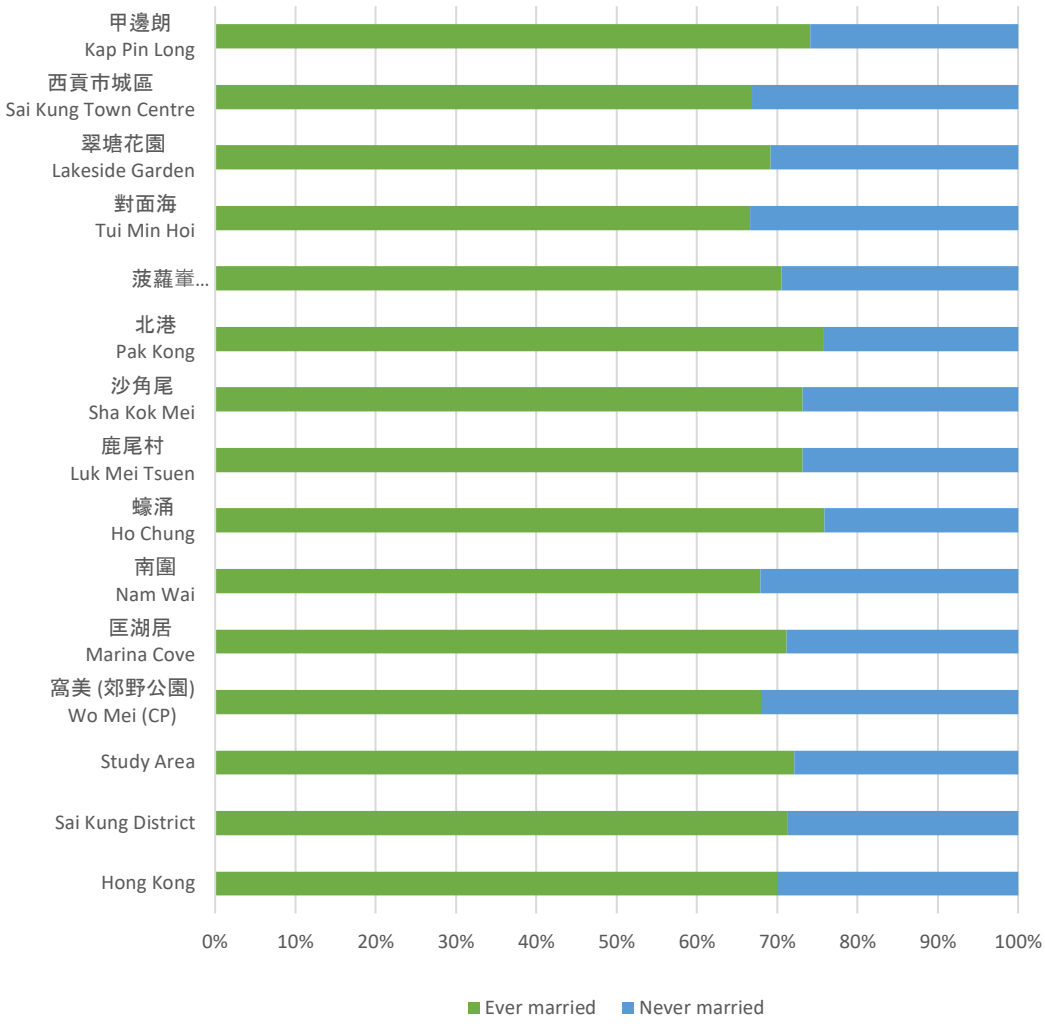


Figure 4. 3 Composition of residents aged 15 in marital status (2016)

Median age: As shown in **Figure 4.4**, Po Lo Che has the highest median age (50.3), followed by Lakeside Garden (48.6) and Tui Min Hoi (47.4), which are significantly higher than that of Sai Kung District (42.8). Lakeside Garden and Pak Kok have relatively high percentage of population agen 65+, as shown in **Figure 4.5**. The youngest area is Sha Kok Mei with the median age of 37.8. at the same time, Sha Kok Mei and Ho Chung have relatively high percentage of population aged 25-44. It implies that some ancient villages gather younger population, while population in some fishermen villages are relatively old.

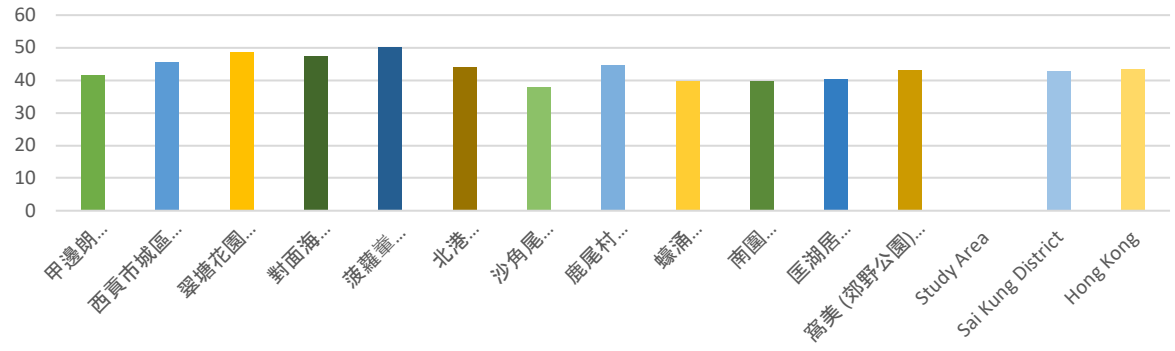


Figure 4. 4 Median age (2016)[14]

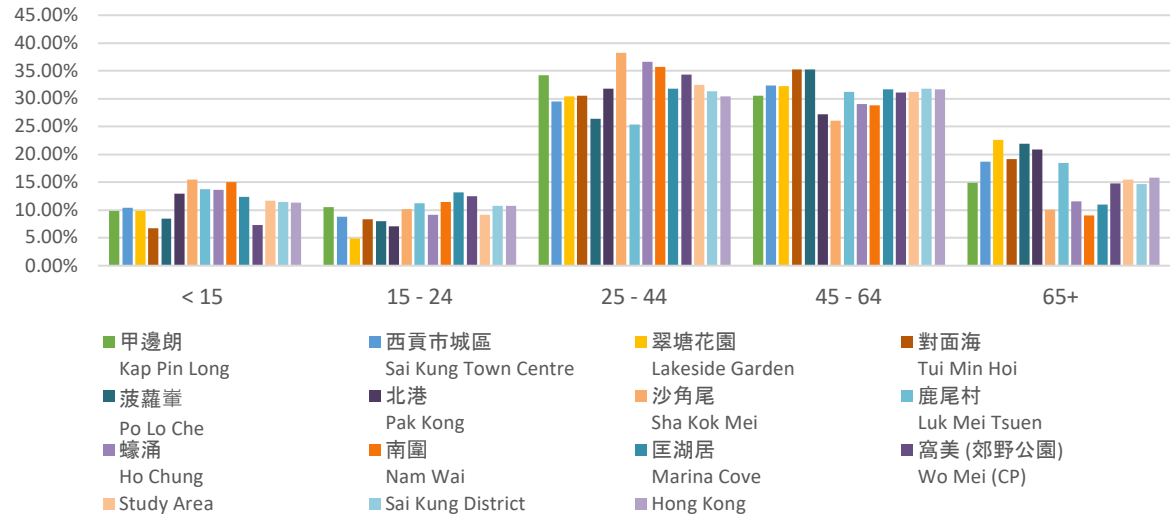


Figure 4. 5 Resident Composition in Age (2016)

Place of birth: As shown in **Figure 4.6**, the Study Area has significantly high percentage (19.51%) of elsewhere (non-Hong Kong and non-China) than that of Sai Kung District (9.02%), in which Ho Chung and Nam Wai are the significant areas with non-local born population. In contrast, some fishermen villages, such as Tui Min Hoi, has significantly higher percentage (80.45%) of Hong Kong as the place of birth, followed by Sai Kung Town Centre (76.89%) and Lakeside Garden (72.72%). The place of birth associates with the usual spoken language (see **Figure 4.7**), which Nam Wai, Ho Chung and Po Lo Che have higher percentage of people selecting English as their usual spoken language. In general, as shown in **Figure 4.8**, the Study Area is a mixed neigborhood with significantly higher percentage of Filipino, Indonesian, and

[14] The absence of chart of the Study Area indicates the missing data of the Study Area.

White population, in which Nam Wai is notably with relatively high number of White population.

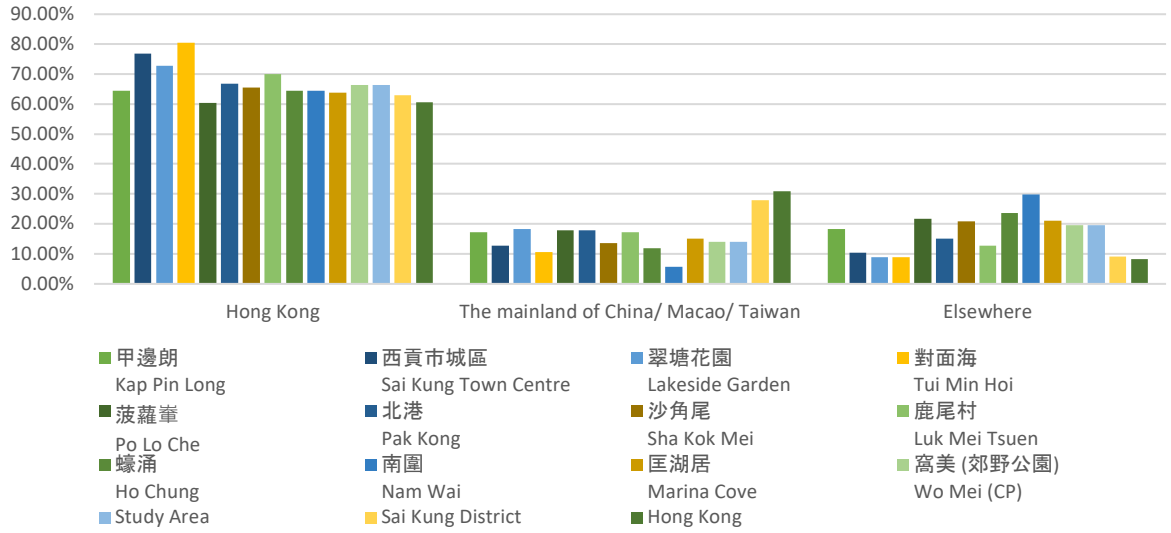


Figure 4. 6 Resident composition in place of birth (2016)

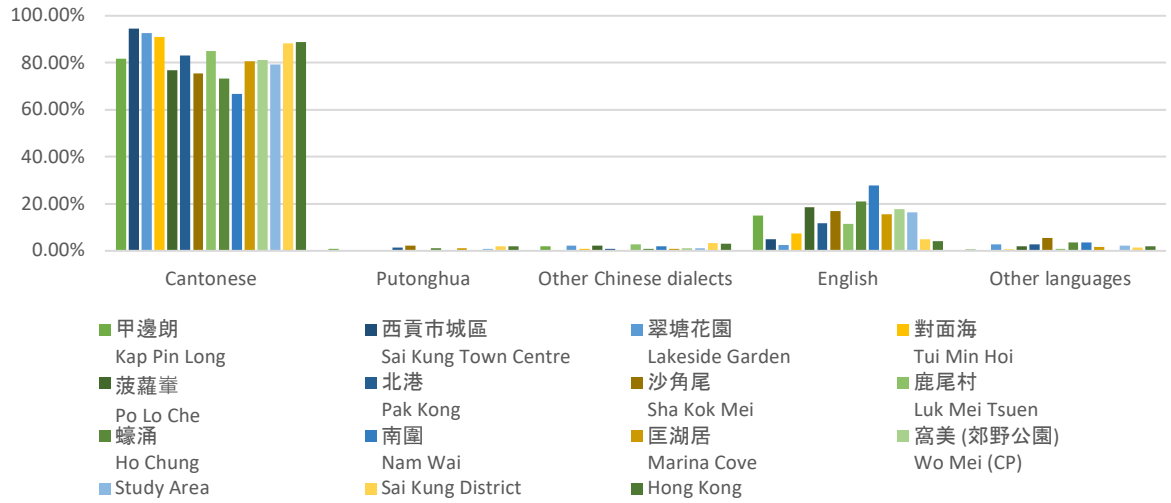


Figure 4. 7 Composition of residents aged 5+ in usual spoken language (2016)

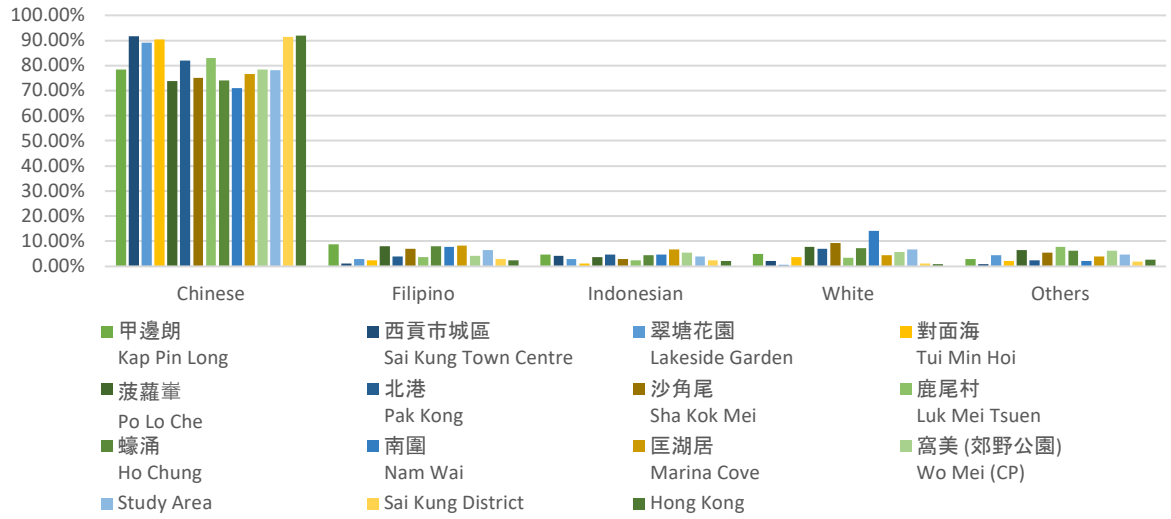


Figure 4. 8 Resident composition in ethnicity (2016)

Overall, the Study Area experienced a drop in population. **Ancient villages** (mainly Ho Chung, Sha Kok Mei and Nam Wai) tended to have younger and mixed neighbourhood with rising population and expanding village areas, while **Fishermen-concentrated areas** (mainly Tui Min Hoi, Lakeside Garden and Sai Kung Town Centre) tended to have older and local (homogenous in terms of ethnicity) neighbourhood with dropping population. Attributing to the various historical background and geographical conditions, the demographical characteristics of villages and rural settlements were diverse.

4.2 Educational Characteristics

As shown in **Figure 4.9**, the education attainment rate of the Study Area population is primarily similar to that of Sai Kung District average and Hong Kong average, with over one-third of population receiving post-secondary education. Sha Kok Mei is the most educated area, with significantly high percentage in post-secondary education attainment, while significant higher number of people in some fishermen villages, such as Sai Kung Town Centre, Lakeside Garden and Tui Min Hoi, only receive primary or below level of schooling.

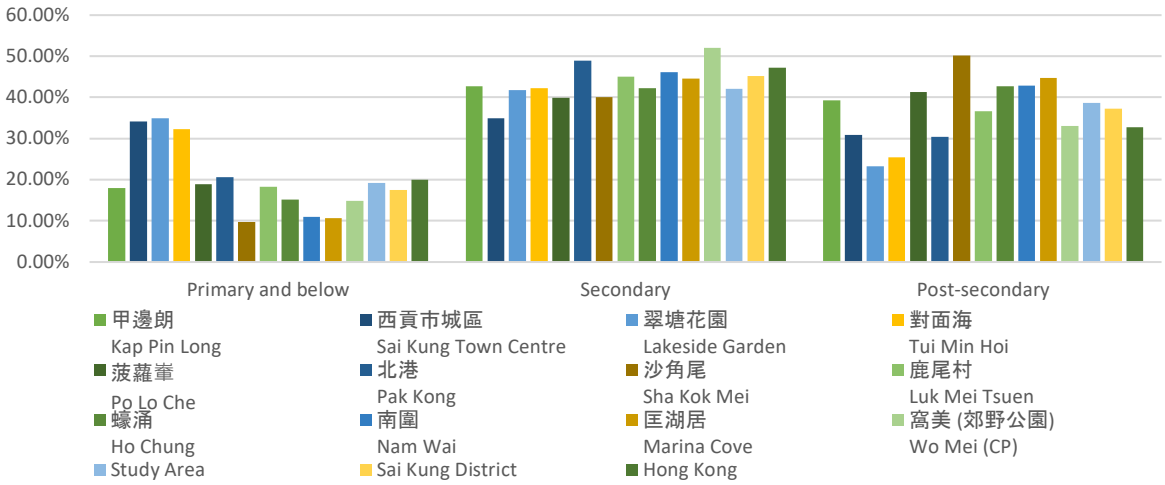


Figure 4. 9 Composition of residents aged 15+ in education attainment (2016)

4.3 Economics Characteristics

As shown in **Figure 4.10**, the percentage of working population of the Study Area is similar to that of Sai Kung District average and slightly higher than that of Hong Kong average. Wo Mei has the highest, with 59% of working population, followed by Ho Chung (56%), while their neighbouring village, Luk Mei Tsuen (46%), has the lowest. As shown in **Figure 4.11**, within the working population, some villages with younger population, such as Sha Kok Mei, has the significantly high percentage of professionals, followed by Nam Wai, which exceed that of Marina Cove. It is worth noting that the Study Area has remarkably higher percentage of skilled agricultural and fishery workers (0.37%) than that of Sai Kung District (0.11%) and that of Hong Kong (0.13%); they are only found in some fishermen villages: Lakeside Garden, Tui Min Hoi and Sai Kung Town Centre.

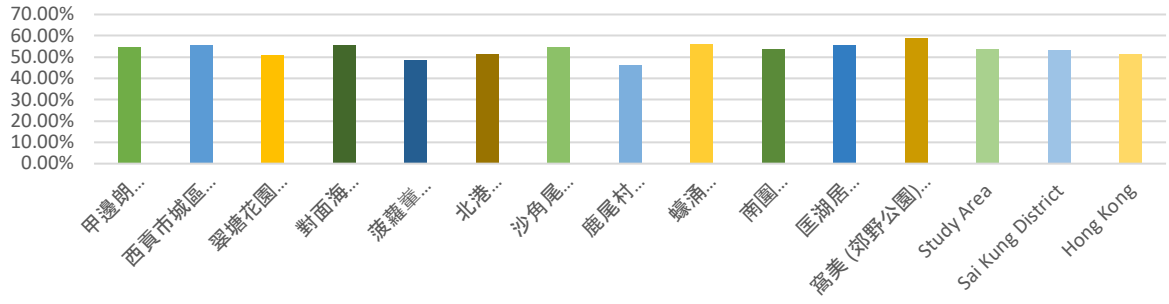


Figure 4. 10 Working population (2016)

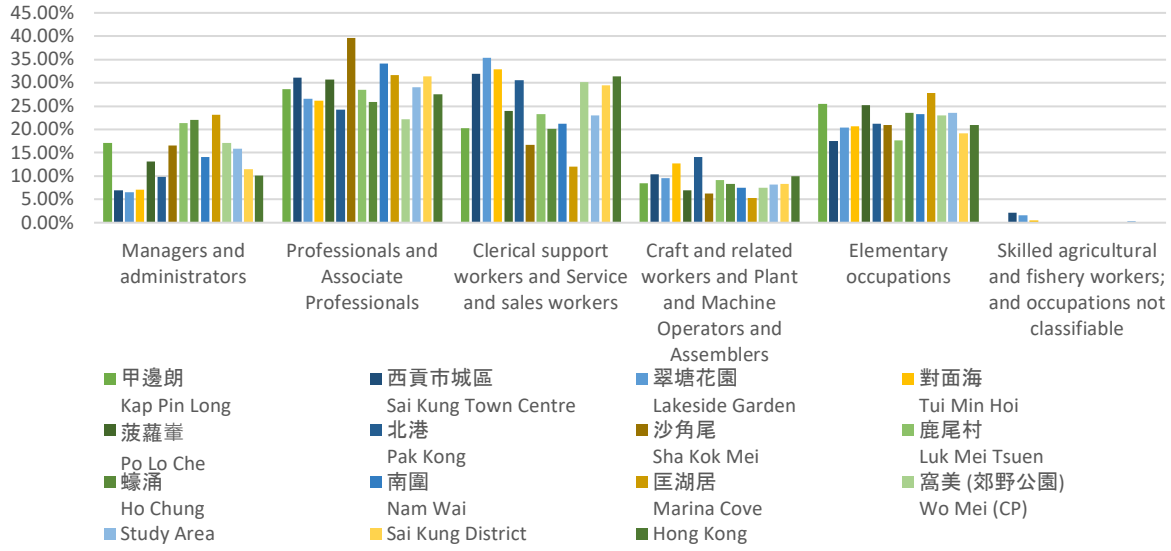


Figure 4. 11 Occupation (2016)

As shown in **Figure 4.12**, the Study Area has higher percentage of employers and self-employed than that of Sai Kung District (89%) and Hong Kong (88%), in which Marina Cove has significantly higher percentage of employers. As shown in **Figure 4.13**, population in the Study Area tends to work in non-fixed places, marine, home, or places outside Hong Kong, with consisting of over one-third of working population. Some fishermen villages (Sai Kung Town Centre, Tui Min Hoi and Lakeside Garden) and Sha Kok Mei have significantly higher percentage of New Territories as their place of work.

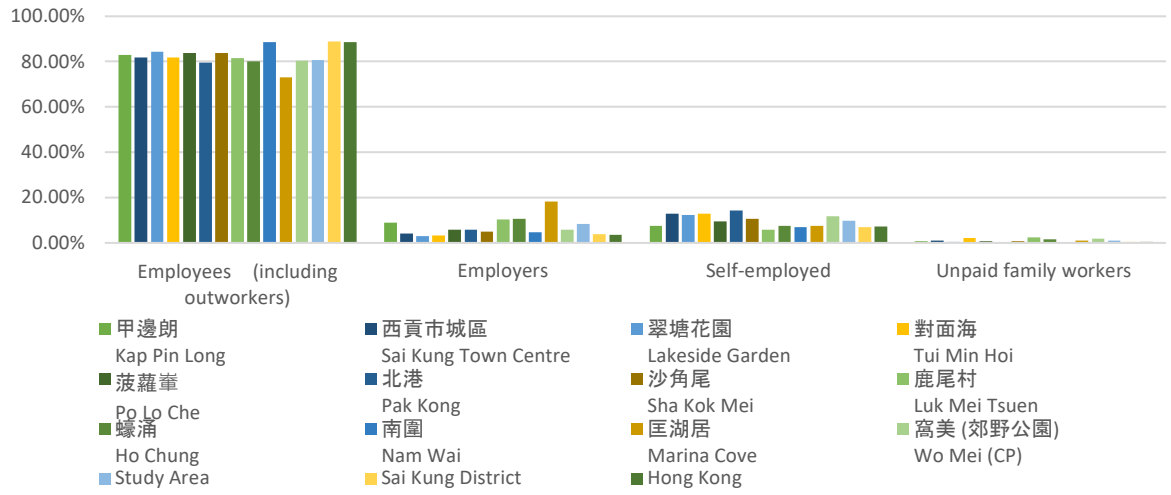


Figure 4. 12 Employment status (2016)

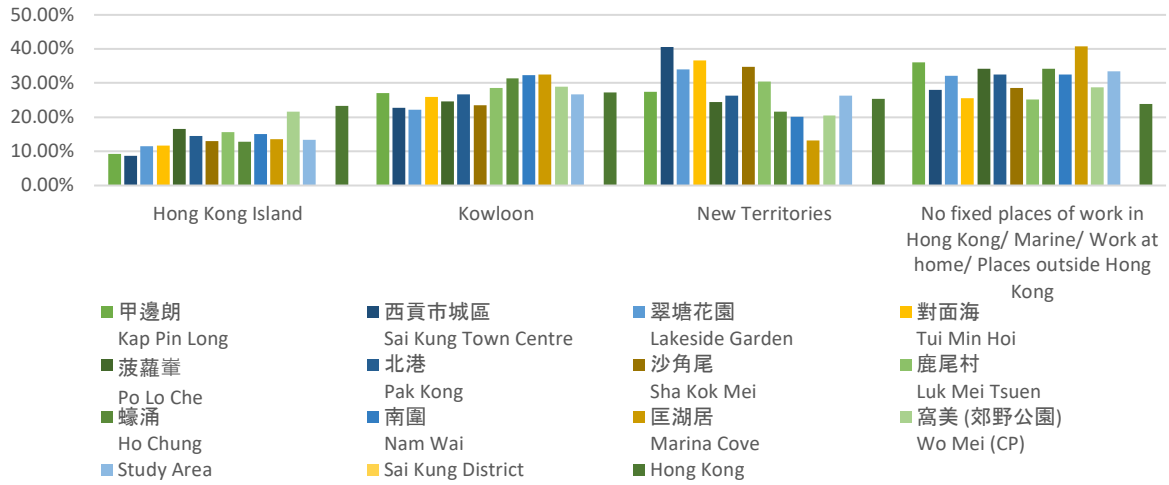


Figure 4. 13 Place of work (2016)[15]

Overall, it is worth noting that some residents in fishermen villages still depend on agriculture and fishery for living. In general, occupation of population aligns with their educational attainment and people in the Study Area tend not to have fixed working place.

4.4 Household Characteristics

As shown in **Figure 4.14**, the household composition of the Study Area is similar to that of Hong Kong and slightly different with that of Sai Kung District, with lower percentage of nuclear family households (Study Area: 62%; Sai Kung District: 68%). Nuclear family household is the dominant household composition, and Marina Cove and Kap Pin Long have higher percentages of nuclear family among all areas, which exhibit the typical nuclear family character with 3 or above family members.

It is worth noting that the Study Area consists nearly a quarter of households with only one person, which is also reflected on the higher percentage of one-person households of the Study Area shown in **Figure 4.15**. The phenomenon occurs significantly in Sai Kung Town Centre and Sha Kok Mei, with over a quarter of household with only one person, which implies residents in the two areas are more independent. However, when referring to the median age and the population composition in age, it is concluded that Sha Kok Mei and Sai

[15] The absence of charts of Sai Kung District indicates the missing data of the relevant areas.

Kung Town Centre are in different situations, which Sha Kok Mei have more young one-man households while Sai Kung Town Centre have more old one-man households.

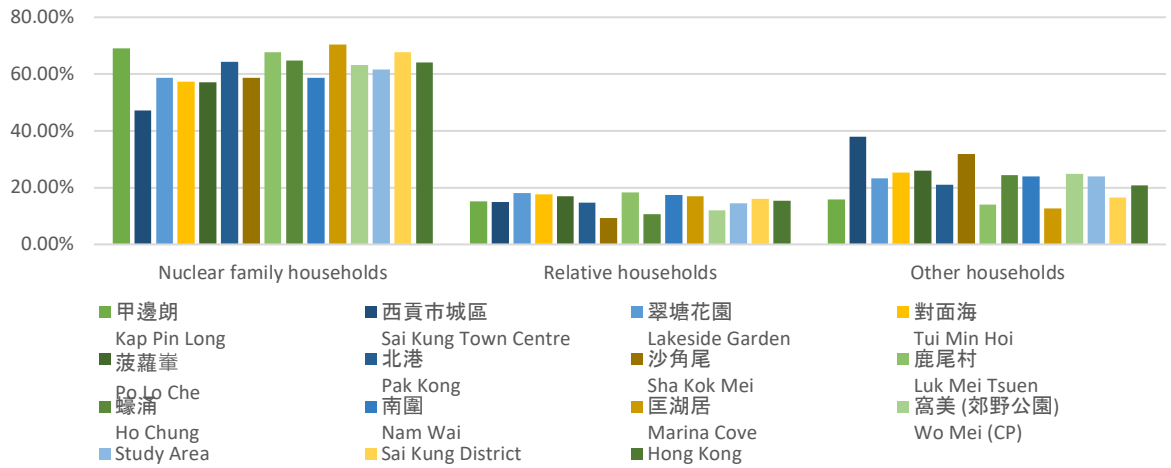


Figure 4. 14 Household composition (2016)[16]

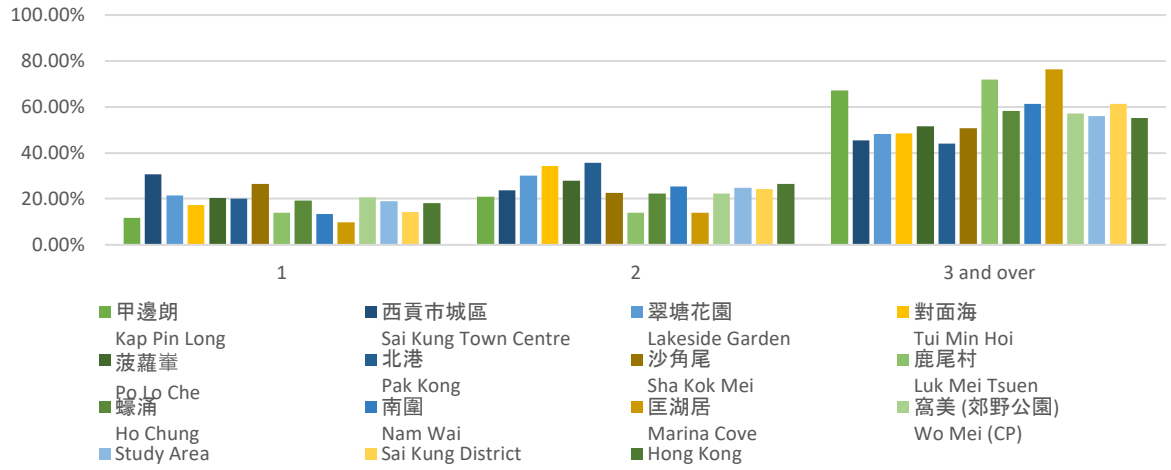


Figure 4. 15 Household size (2016)

As shown in **Figure 4.16**, Marina Cove has the highest median (HK$55,500) of household income, followed by Nam Wai (HK$51,160). Over half of the Study Area have higher median monthly domestic household incomes than that of Sai Kung District (HK$32,470); yet, some

[16] Figures of Other households include households with one person and households comprising unrelated person(s).

fishermen villages (Sai Kung Town Centre, Lakeside Garden and Tui Min Hoi) and villages in FSA B (Po Lo Che and Pak Kong) have relatively low monthly household income.

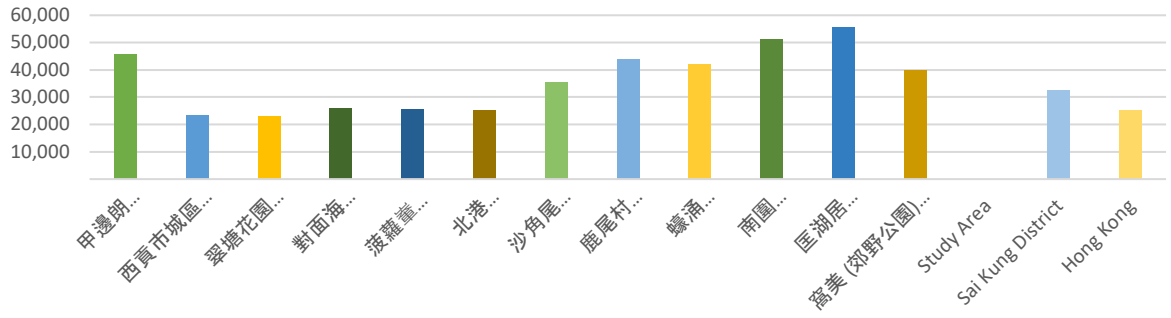


Figure 4. 16 Median monthly domestic household income (HK$) (2016)[17]

4.5 Housing Characteristics

As shown in **Figure 4.17**, median monthly rents in most of the areas exceed that of Sai Kung District, which suggests that most of the areas have significantly higher housing prices than other areas in Sai Kung District. Among all, median monthly rent of Marina Cove (HK$15,500) is the highest, followed by Nam Wai and Po Lo Che. Lakeside Garden and Tui Min Hoi have relatively low median monthly rent, which attributes to their component of the subsidising means of housing type. As shown in **Figure 4.18**, public housing is only found in Lakeside Garden and Tui Min Hoi.

As shown in **Figure 4.19**, the median monthly rent to income ratio is significantly higher than that of overall Sai Kung District. Rents are relatively unaffordable, especially in Sai Kung Town Centre and Marina Cove. Referring to **Figure 4.20**, it is observed that Marina Cove has the highest median flat area among all areas, which implies that Marina Cove is relatively luxurious.

[17] The absence of charts of Sai Kung District indicates the missing data of the relevant areas.

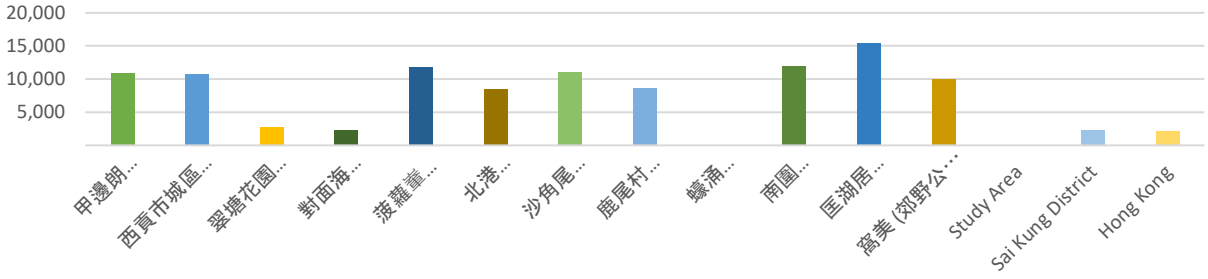


Figure 4. 17 Median monthly domestic household rent (HK$) (2016)[18]

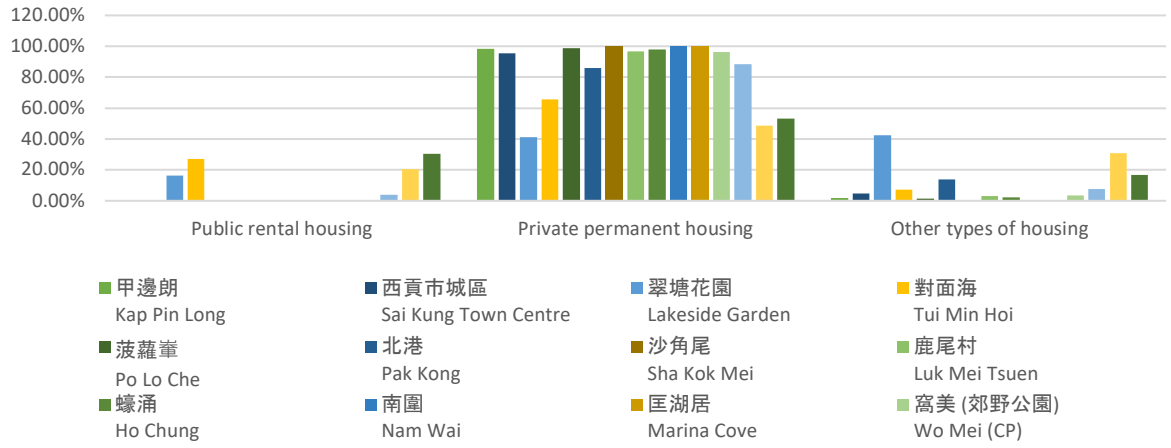


Figure 4. 18 Domestic households by type of housing (2016)

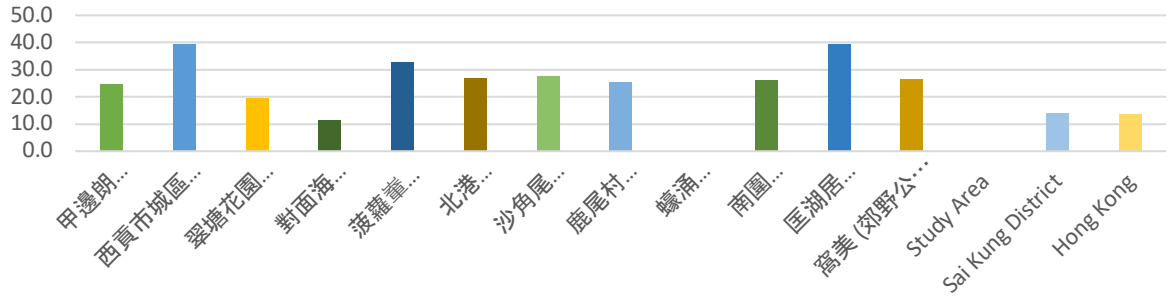


Figure 4. 19 Median monthly domestic household rent to income ratio (2016)[19]

[18] The absence of charts of Sai Kung District and Ho Chung indicates the missing data of the relevant areas.
[19] The absence of charts of Sai Kung District and Ho Chung indicates the missing data of the relevant areas.

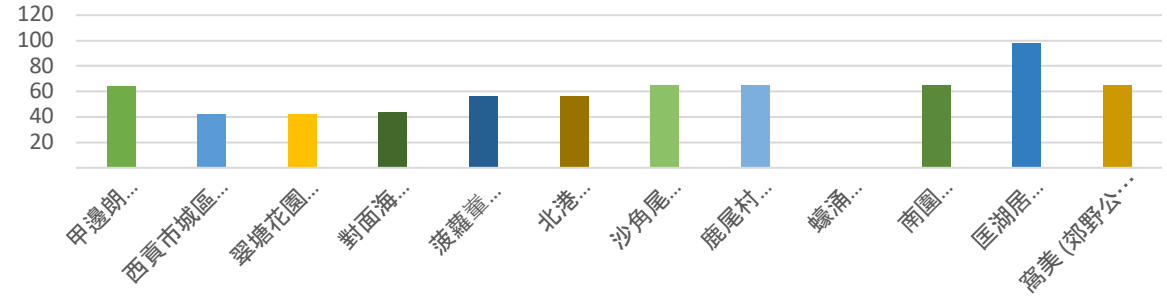


Figure 4. 20 Median flat area of accommodation of domestic households (sqm) (2016)[20]

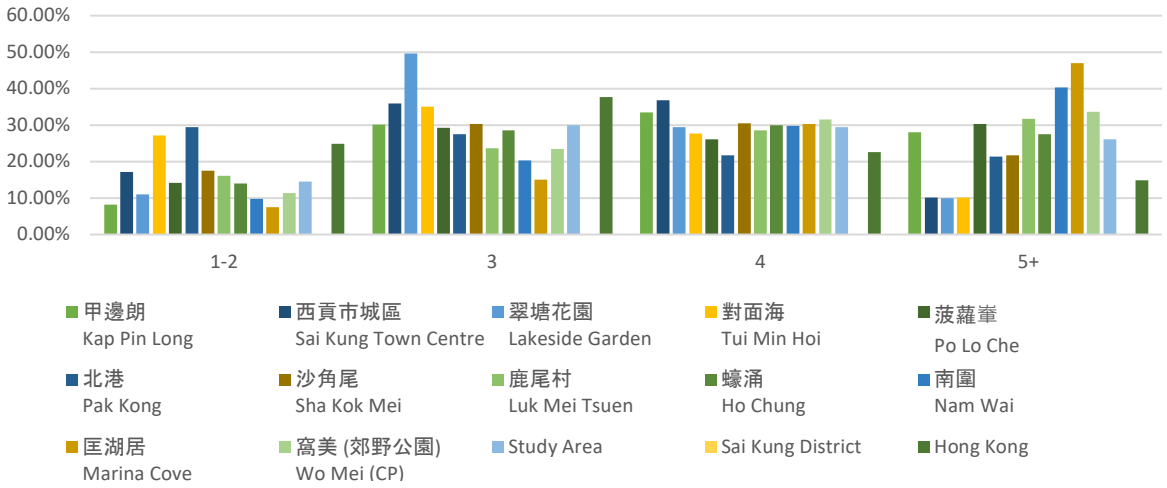


Figure 4. 21 Domestic households by number of rooms (2016)[21]

As shown in **Figure 4.22**, compared with the percentage of owner-occupiers (49%) and sole tenants (47%) of Hong Kong, most of the FSAs have higher percentage of owner-occupiers (59%) and lower percentage of sole tenants (33%), in which the community in the Study Area is expected to be more stable than Hong Kong average. Among all, Luk Mei Tsuen has the significantly highest percentage (76%) of owner-occupiers and the lowest (17%) of sole tenants, while Sha Kok Mei has over 50% of sole tenants.

As shown in **Figure 4.23**, more stable communities (over 80% residence remaining in same areas over past 5 years) are in Po Lo Che, Tui Min Hoi, Lakeside Garden, Luk Mei Tsuen and Pak Kong. In contrast, communities with less stability are two of the ancient villages, Sha Kok Mei and Ho Chung, with less than 60% of residence remaining in same areas over past 5 years.

[20] The absence of charts of Ho Chung indicates the missing data of the relevant areas.
[21] The absence of charts of Sai Kung District indicates the missing data of the relevant areas.

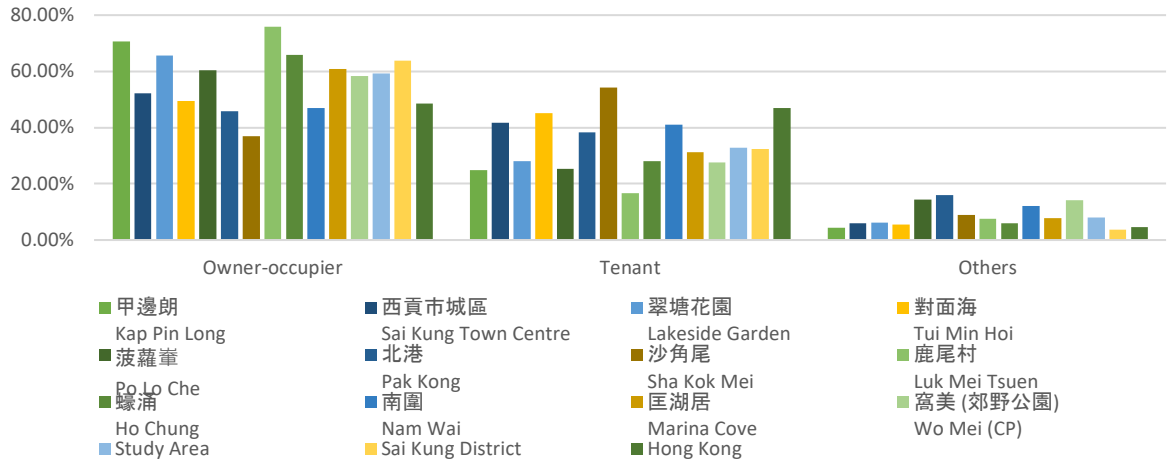


Figure 4. 22 Domestic households by tenure of accommodation (2016)

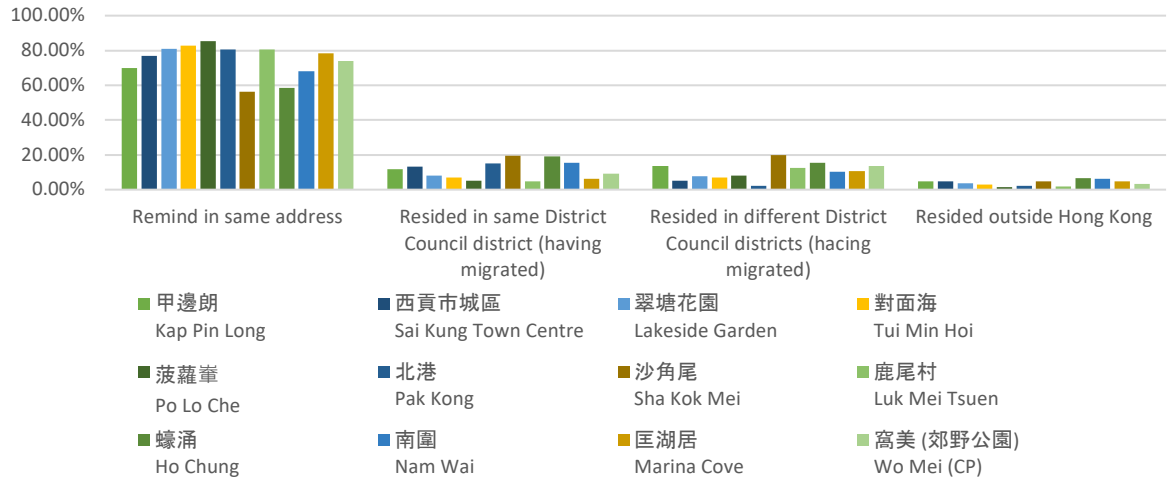


Figure 4. 23 Domestic households by area of residence 5 years ago of domestic households with single household head (2016)

4.6 Existing Community Facilities

A wide range of community facilities are the essentials to maintain an appropriate standard of living. The allocation of various facilities directly affects the residents' daily routines and the fulfilment of their essential needs, suggesting the distinctive living patterns of residents in different areas. With different distance between the facilities and their settlements, the four FSAs have distinct characteristics in terms of the community support.

The following sections would elaborate on the allocation of community facilities by five categories: (1) public infrastructures, (2) daily necessities, (3) social networking, (4) religious

facilities, and (5) vacant land. By listing out the community facilities with their relevant zones, this section tries to find out the distinct features of the four FSAs in terms of community support.

4.6.1 Public Infrastructures

Public infrastructures provide fundamental facilities and services for a sustainable community, such as water supply, roads, sewers, electrical grids. They are the physical components of interrelated systems to enable, sustain, or improve the living standard and maintain the surrounding environment. Some core infrastructures are found in the Study Area and they are shown in **Table 4.4**. Most of the public infrastructures are concentrated in FSAs A and B, but infrastructures in FSA B consumes large percentage of land. For instance, Pak Kong Treatment Works occupies nearly 10% of the land of FSA B.

Pak Kong Treatment Works:

First operated in 1989, Pak Kong Treatment Works is the largest utility service facility in the Study Area. It is located in Pak Kong to the east of Pak Kong Road, consuming round 10.5 hectares(ha) of land. Covered by the approved Pak Kong and Sha Kok Mei Outline Zoning Plan No. S/SK-PK/11, the Retreatment Works is on the land zoned “Other Specified Uses” (“OU”), which is primarily for serving the needs of the community. It forms part of the water treatment system in the New Territories and treats water from Plover Cove and High Island Reservoirs before supplying it to Tseung Kwan O New Town, Sai Kung District, East Kowloon and Hong Kong North[22].

Sai Kung Sewage Treatment Works:

Sai Kung Sewage Treatment Works is a secondary sewage treatment works at the waterfront site near Tui Min Hoi. It is the second largest utility service facility in the Study Area, consuming about 2.2 hectares of land. Covered by the approved Sai Kung Town Outline Zoning Plan No. S/SK-SKT/6, the Treatment works is in the “Government, Institution or Community” (“GI/C”), which is primarily for the provision of serving the needs of the local

[22] Water Supplies Department. (n.d.). Pak Kong Water Treatment Works. Retrieved from https://www.wsd.gov.hk/filemanager/en/share/pdf/PakKongTW-e.pdf

residents and/or a wider district, region or the territory. It was constructed by reclamation and operated in 1988, serving a population of 20,000 in Sai Kung District[23].

Table 4. 4 Core infrastructures in the Study Area

FAS	Core Infrastructures	Address
A	Marine Police East Divisional Headquarters	8 Wa Fuk Street, Tui Min Hoi, Sai Kung
A	Sai Kung Police Office	1 Po Tung Road, Sai Kung
A	Sai Kung Sewage Treatment Works	Wa Fuk Street, Tui Min Hoi, Sai Kung
B	High Island Water Scheme Po Lo Che Staff Quarters	Po Lo Che, Sai Kung
B	Pak Kong Treatment Works	Pak Kong Road, Sai Kung
B	Sai Kung Fire Station	Hong Kin Road, Sai Kung
D	Ho Chung Lowland Pumping Station	Ho Chung Road, Sai Kung

4.6.2 Daily Necessities

Public infrastructures form the system of a sustainable community by providing essential elements, but residents might only receive the products or services without reaching the treatment plants or stations. On the other hand, daily necessities focus more on residents' daily routine, which includes amenities, educational institutions, recreational facilities, and community and social welfare services. Amenities provide convenience and comfort to the residents in the area, such as markets for food, post offices for post service, and clinics for medical needs listed in **Table 4.5**. Educational Institutions are schools for young people for receiving pre-school, primary and secondary education under the curriculum, which is shown in **Table 4.6**. Recreational facilities provided by the government or the private companies are places for leisure use, including several open space and sport ground listed in **Table 4.7**. Community and social welfare services managed by the government or some charity groups supports specific communities in the area and they are listed in **Table 4.8**, which mainly serves the minorities or some disadvantaged groups. Ancestral shrine, village

[23] Drainage Services Department. (2019). Existing Sai Kung Sewage Treatment Facilities. Retrieved from https://www.dsd.gov.hk/others/saikungstwtocaverns/en/existing-sai-kung-sewage-treatment-facilities.html

halls, community halls and district office serve as social and community space for gathering and exchanging information of the communities, which are listed in **Table 4.9**.

Most of the amenities provided by the government department are centralized in FSA A, which reflects that the residents in Zone A are more accessible to obtain their daily needs, while residents out of FSA A are distanced from their necessities. A shopping centre is spotted in FSA D near Marina Cove, the largest privately owned estate, along the shore in the Study Area, which implies that the estate development tends to fulfil the daily needs of their residents, trying to build a small neighbourhood with sufficient resources. The shopping centre might be exclusive to the surrounding neighbourhoods with high-priced products. However, it is worth noting that some informal markets or private clinics might be hidden in the villages, which lacks official information in the current study.

Besides, all formal educational institutions and most of the community and social welfare services are located in FSA A. Yet, recreational facilities are partly concentrated in FSA A. By listing out the parks and sports grounds provided by the government department, it is observed that FSA A have a wide range of sport facilities while some single-functioned (non-complex) sport facilities and parks are found in the other FSAs.

As shown in **Table 4.9**, since the Study Area consists mainly village type development, both community halls for urban areas, and village halls for rural areas are found in the area. The Sai Kung District Hall and the Sai Kung Jockey Club Town Hall are located at Sai Kung Town Centre in FSA A. Several ancestral shrine and village halls are in various villages in FSAs B, C and D. The lists of ancestral shrine and village halls might not be completed due to the lack of information, but it is noting that social spaces are scattered over different rural settlements and clusters.

Table 4. 5 Amenities in the Study Area

FAS	Amenities	Address
A	Sai Kung Market	67 Yi Chun Street, Sai Kung
A	Sai Kung Wholesale Fish Market	18-20 Sai Pong Street, Sai Kung
A	Sai Kung Post Office	G/F, Sai Kung Government Offices Bldg., 34 Chan Man Street, Sai Kung

A	Sai Kung Public Library	5/F, Sai Kung Government Offices Bldg., 34 Chan Man Street, Sai Kung
A	Sai Kung Chest Clinic	G/F, Mona Fong Clinic, Man Nin Street, Sai Kung
D	Marina Cove Shopping Centre	Hong Kin Road, Sai Kung

Table 4. 6 Educational Institutions in the Study Area

FAS	Educational Institutions	Address
Pre-school/ Kindergartens		
A	Hong Kong Academy	33 Wai Man Road, Sai Kung
A	Sai Kung Lok-yuk Kindergarten	19E Po Tung Road, Sai Kung
A	Sai Kung Montessori Kindergarten	Unit SB, G/F, 787 Tan Cheung, Sai Kung
A	Hong Kong Sheng Kung Hui St Simon's Sai Kung Nursery School	DD215 Tan Cheung Village, Sai Kung
A	Nord Anglia International Pre-school (Sai Kung)	G/F & 1/F, 285 Hong Kin Road, Sai Kung
Primary School		
A	Hong Kong Academy	33 Wai Man Road, Sai Kung
A	Sai Kung Central Lee Siu Yam Memorial School	18 Wai Man Road, Sai Kung
A	Sai Kung Sung Tsun Catholic School (Primary Section)	Blk F&G, Ancillary Block, Po Tung Road, Sai Kung
Secondary School		
A	Hong Kong Academy	33 Wai Man Road, Sai Kung
A	Sai Kung Sung Tsun Catholic School (Secondary Section)	Blk A-E, Ancillary Block, Po Tung Road, Sai Kung

Table 4. 7 Recreational facilities in the Study Area

FAS	Recreational Facilities	Address
Sports Facilities		
A	Sai Kung Swimming Pool	Wai Man Road, Sai Kung
A	Sai Kung Waterfront Park	Wai Man Road, Sai Kung

A	Wai Man Road Playground	Wai Man Road, Sai Kung
A	Sai Kung Squash Courts	Wai Man Road, Sai Kung
A	Sai Kung Tennis Courts	Wai Man Road, Sai Kung
A	Sai Kung Tang Shiu Kin Sports Ground	Fuk Man Road, Sai Kung
B	Pak Kong Soccer Pitch	Pak Kong, Sai Kung
D	Ho Chung Soccer Pitch	Ho Chung , Sai Kung
Playground/ Open Space		
A	Man Yee Playground	Man Nin Street, Sai Kung
A	Fuk Man Garden	Fuk Man Road, Sai Kung
B	Tai Ping Village Playground	Po Lo Che Road, Sai Kung
C	Sha Kok Mei Playground and Garden	Sha Kok Mei Village, Sai Kung
D	Wo Mei Rest Garden	Wo Mei Village, Sai Kung
Licensed Club-houses		
D	Club Marina Cove Limited	DD210 Lot 526, Sai Kung

Table 4. 8 Community and social welfare services in the Study Area

FSA	Community and Social Welfare Services	Address
Children and Youth Services		
A	Hong Kong Sheng Kung Hui St. Simon's Sai Kung Nursery School	D.D. 215, Tan Cheung Village, Sai Kung
A	Sai Kung District Committee Centre Limited Sai Kung District Community Centre Jockey Club Integrated Services Centre	8 Mei Yuen Street
Elderly Services		
A	Caritas Elderly Centre – Sai Kung	G/F, Nos. 69, 71, 73 & 75 Man Nin Street, Sai Kung
Integrated Services		
A	Social Welfare Department Sai Kung IFSC	5/F & 6/F, Sai Kung Government Offices Building, 34 Chan Man Street, Sai Kung
Planned		

D	A Social Welfare Services Complex	The south of Marina Cove, the ex-Sai Kung Central Primary School

Table 4. 9 Ancestral Shrine, village halls, community halls and district office in the Study Area

FSA	Ancestral Shrine/ Village Hall/ Community Hall/ District Office	Address
Ancestral Shrine		
C	Tse Ancestral Hall	Kap Pin Long, Sai Kung
D	Po Shue Ancestral Hall	Nam Pin Wai Tsuen, Sai Kung
D	Chan Ancestral Hall	Ho Chung First Lane, Sai Kung
Village Hall		
B	Pak Kong Village Hall (北港村公所)	Pak Kong Road, Sai Kung
Community Hall		
A	The Sai Kung Jockey Club Town Hall	8 Chan Man Street, Sai Kung
District Office		
A	Sai Kung Office, Sai Kung District Office	2/F, Sai Kung Government Offices Building, 34 Chan Man Street, Sai Kung

4.6.3 Religious Sites and Facilities

Several religious sites and facilities are found and they are listed in **Table 4.10** below,

Table 4. 10 Religious site and facilities in the Study Area

FAS	Religious Site/ Facilities	Address
Church		
A	Sacred Heart Church	Lot 1762, DD221, Yau Ma Po Street, Sai Kung Town
A	Pentecostal Holiness Church Hong Kong Conference - Sai Kung Pentecostal Holiness Church	Sai Kung Tai Street, Sai Kung
A	The Chinese Full Gospel Sai Kung Church	Tui Min Hoi, Sai Kung

B	Sai Kung Baptist Church	Po Lo Che, Sai Kung
D	Immaculate Conception Chapel	Wo Mei Village, Sai Kung
D	Tsung Tain Mission Of Hong Kong Wo Mei Church	9 Nam Wai Road, Sai Kung
Temple		
A	Hip Tin Temple	Po Tung Road, Sai Kung
A	Tin Hau Temple	Po Tung Road, Sai Kung
B	Tin Hau Temple (天后宮)	Pak Kong, Sai Kung
D	Tai Yuen Temple (大元帥廟)	Luk Mei Tsuen, Sai Kung
D	Che Kung Temple (車公古廟)	Ho Chung, Sai Kung
D	Tin Hau Temple (天后古廟)	Au Tsai Tsuen (Nam Wai), Sai Kung

4.6.4 Vacant Land

Vacant government sites for short term uses are the temporary vacant sites available for better utility of land resources. Applications can be submitted by non-governmental organisations of social enterprises to rent for community, institutional or non-profit making uses on a short-term basis.

Some formal vacant government sites are located in the Study Area, including lands with diverse sizes, topography and vegetation. They are listed in **Table 4.11** below. For instance, Near Po Lo Che Path (052) in FSA B are the largest vacant site with 1,020 sq. metre of flat land, consisting of trees and dense or even overgrown vegetation. In general, the estimated available period of the listed vacant government sites are about 3 years.

Table 4. 11 Vacant government sites for green or GIC in the Study Area

FAS	Vacant Government Sites for Green or GIC	Area (sq. metre)
A	055 Near House 70 Kap Pin Long Village	93
A	063 Near House No. 21A, Tan Cheung Village	47
A	069 Near House 17 Sun King Terrace, Po Lo Che	33
A	167 G.L. near Sai Kung Jockey Club Town Hall, Po Tung Road, Sai Kung	109
B	051 Po Lo Che near Lot 971 in DD215	188

B	052 Near Po Lo Che Path, Sai Kung	1020
B	057 Near House 23, O Long Village	183
B	080 Tai Chung Hau Hiram's Highway near junction with Che Keng Tuk Road	69
D	085 Near House No 98 Luk Mei Tsuen	78

Some informal vacant sites are spotted. The common feature of the lands are their flexibilities, i.e. their availability varies with time. The spotted sites provide spaces for alternative uses when their original functions are not in use. They are mainly vacant spaces near and entries of the core infrastructures, and in large roadside car parks.

Figure 4. 24 Informal vacant sites in FSA B

Source: Images from Google map and Google Street View

Figure 4. 25 Informal vacant site in FSA C

Source: Images from Google map and Google Street View

Figure 4. 26 Informal vacant sites in FSA D

Source: Images from Google map and Google Street View

4.7 Economic Activities

According to the Hong Kong Tourism Board, Sai Kung is classified as 'back garden of Hong Kong'. With its fishing villages, seafood, hiking trails and scenery, beaches and islands etc., it is positioned as a tourism spot for locals. As most of the area is covered in country parks, Sai Kung remained unaffected by massive urbanization, creating opportunities in developing local tourism. Various schemes are implemented for promoting Sai Kung as a tourist district. For instance, the District Office of Sai Kung District completed the improvement works at Sai Kung Hoi Pong Street (the Street) including erection of a Pai Lau and repaving the promenade beyond the Pai Lau, which supported the implementation of the scheme for Alfresco Dining along the Street of the Food and Environmental Hygiene Department (FEHD)[24].

4.8 Traffic Review

Traffic flow indicates the mobilities of the residents, which implies the connection between local communities/ villages and the other areas in Sai Kung. Stable and diverse access ensures residents to obtain their necessities, especially for residents living in the areas which lack amenities provided by the Government.

4.8.1 Vehicular Traffic Network

Hiram's Highway, Po Tung Road and Tai Mong Tsai Road are the major distributor running north-south, linking the area with Kowloon via Clear Water Bar Road. Numbers of local roads

[24] Tourism Commission. (2002, Jun). Implementation of the Pilot Scheme for Alfresco Dining along Sai Kung Hoi Pong Street. Retrieved from https://www.tourism.gov.hk/resources/english/paperreport_doc/council/2002-06-11/SKDC_Paper_-_Alfresco_Dining_in_Sai_Kung_Eng.pdf

branching off from these main access roads expanding vehicular access to residential area and rural development.

In FSA A, several locals roads branch off from Po Tung Road and Hiram's Highway, including Fuk Man Road and Man Nin Street, bringing residents from the inner area to the coastal. Some local roads further lead people to individual spots. Chui Tong Road bridges Lakeside Garden with the major distributor, while Hong Kin Road connects the Town Centre with Tui Min Hoi.

In FSA B, Po Lo Che Road and Pak Kong Road are the two local roads up to the villages, namely Pak Kong Village and Tai Ping Village. Pak Kong Road is up to standard, having adequate capacity to satisfy the need of the residents with flexibility.

In FSA C, Sha Kok Mei Road is the only vehicular access connecting Sha Kok Mei, the largest rural community in the Focused Study Area, with Tai Mong Tsai Road, one of the major distributors along the Study Area.

In FSA D, Ho Chung North Road, Ho Chung Road, Nam Pin Wan Road, and Nam Wai Road are the major local roads connecting villages in the inner areas and along the coastal with the principal road. The improvement to local access to Ho Chung strength the capacity of the road. Yet, the road is narrow in Nam Wai, for which the accessibility in the Nam Wai area needs to be improved.

4.8.2 Maritime Transport

Kaito Ferry Services are available at the Sai Kung Public Pier. Regular services are to Fo Tau Fan Chau (The Dawn Island Pier), which the Dawn Island Drug Addiction Treatment Centre by Operation Dawn is located. Services to the following locations are subject to demand: Chong Hung Water Sports Centre, Ham Tin, Hap Mun Bay, Kau Sai, Kiu Tsui, Leung Shuen Wan, Nam Fung Wan, Pak A, Pak Sha Wan, Sam Sing Wan, Tai Tau Chau, Wong Yi Chau, Yim Tim Tsai.

4.9 Community Assets

The following section would elaborate on the community assets of the Sai Kung community, including organisations, associations and individuals.

4.9.1 Villages

Several villages are included in the Study Area and they are listed in **Table 4.12** below. The Study Area consists of both Existing Villages and Indigenous Villages according to the list of villages in Cap. 576 Rural Representative Election Ordinance. Indigenous Village is a village existing in 1898 and Indigenous Villager is a person who was in 1898 a resident of the Village or a person who is descended through the male line from an Indigenous Villager.

Table 4. 12 Existing Villages and Indigenous Villages in the Study Area

FAS	Name of Village	Indigenous Village
A	Hoi Pong Street 海傍街	
	Main Street (East) 正街(東)	
	Main Street (West) 正街(西)	
	Man Yee Wan New Village 萬宜灣新村	✓
	Po Tung Road (East) 普通道(東)	
	Po Tung Road (West) 普通道(西)	
	Sai Kung Road (North) 西貢道(北)	
	Sai Kung Road (South) 西貢道(南)	
	See Cheung Street 市場街	
	Sha Tsui New Village 沙咀新村	✓
	Tai Street (East) 大街(東)	
	Tai Street (West) 大街(西)	
	Tak Lung Back Street 德隆後街	
	Tak Lung Front Street 德隆前街	
	Tui Min Hoi 對面海	✓
B	O Long 澳朗	
	Pak Kong 北港	✓
	Pak Kong Au 北港𥕢	✓
C	Sha Kok Mei 沙角尾	✓

D	Ho Chung 蠔涌	✓
	Nam Mei 南圍	✓
	Wo Mei 窩美	✓

Source: Sai Kung Rural Committee

4.9.2 Rural Representatives and Rural Committee

Rural Committee is a body representing the welfare of indigenous inhabitant and residents in Rural Communities. Rural Representative consists of Village Representative and Kaifong Representative, in which Village Representative consists of Indigenous Inhabitant Representative and Resident Representative. The function of Indigenous Inhabitant Representative, returned by electors of Indigenous or Composite Indigenous Village, is to reflect views on the affairs of an indigenous village on behalf of the indigenous inhabitants of that villages, and to deal with all affairs relating to the lawful traditional way of life, of those indigenous inhabitants. The function of Resident Representative, returned by electors of Existing Village, is to reflect views on the affairs of a village on behalf of the residents of that village, and shall not to deal with any affairs relating to the lawful traditional rights and interests of indigenous inhabitants.

Villages in the Study Area are covered under Sai Kung Rural Committee, consisting of both Indigenous Villages and Existing Villages. Indigenous Villages consist of both Indigenous Inhabitant Representative and Resident Representative, while Existing Villages only consist of Resident Representative.

4.9.3 NGOs

There are two major non-governmental organizations (NGOs) serving the Sai Kung community, namely Sai Kung District Community Centre and Caritas Sai Kung Community Development Project under Cartas Hong Kong.

4.9.4 Religious Groups

As Catholic and Christian churches are found in the area, religious supporting network is expected within the village.

RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX II

RESEARCH REPORT 2A

CASE STUDIES ON INTERNATIONAL EXPERIENCES IN BUILDING COMMUNITY DISASTER RESILIENCE

JUNE 2022

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Research Report 2a
Case studies on International Experiences in Building Community Disaster Resilience

Research and Model Development on Community Disaster Resilience Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

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1 Introduction

This desktop research report aims to study experiences in establishing frameworks and actions for building community disaster resilience through international case studies. In response to emerging risks of disasters, induced by causes including, but not limited to, climate change, communities ranging from local groups, city-wide and nation-wide institutions to transnational bodies, have been advocating frameworks and implementing actions such as policies, tangible and intangible infrastructures, to enhance resilience. Analysing these experiences, this desktop research attempts (1) to lay the foundation for understanding the current global trend in building community-based capacity for disaster preparedness, and (2) to facilitate the further study to compare and contrast these cases with those in Sai Kung, and identify potential and/or limitations in applying overseas frameworks and actions.

The cases are selected from international experiences in disaster prevention, mitigation, preparedness and recovery, with regard to resilience in respective societies, in the following aspects in (1) ***environment*** - diversity of ecosystem and natural resources, (2) ***society and community*** - interconnectedness of local networks, skillsets and capability, and (3) ***city planning (of rural / suburban setting)*** - sustainability and inclusivity of land use policies, and framework-to-action experiences.

The first three cases focus on general responses to disaster to whose risks Sai Kung is most likely to be exposed, mainly brought by typhoon or storm surge / tsunami, particularly due to its proximity to the coast. Each of the cases here share some contextual similarity with Sai Kung, in terms of their communities, societal or economical background. Meanwhile, the later three cases are selected to discuss more specific themes, for example, cultural heritage, in particular disasters such as nuclear incidents and crowd crisis, which are also worth our attention. A discussion on each case's value to building disaster preparedness and community resilience is conducted.

2 Case 1: Kaohsiung and its surroundings, South Taiwan in response to Typhoon Morakot, 2009

2.1 Background

Typhoon Morakot, known in the Philippines as Typhoon Kiko, stroke Taiwan in 2009 and heavily impacted Kaohsiung and its surroundings, in South Taiwan. Formed on August 2 and dissipated on August 13, Morakot reached its peak intensity on August 7, with a minimum central pressure of 945 millibars (27.9 inHg), maximum 10-minute sustained winds of 140 km/h (85 mph), and maximum 1-minute sustained winds of 150 km/h (90 mph). The storm produced copious amounts of rainfall, peaking at 2,777 mm (109.3 in), triggering enormous mudflows and severe flooding throughout southern Taiwan. One landslide (and subsequent flood) destroyed the entire town of Siaolin, in Kaohsiung county, killing over 400 people. Moreover, there were reports of power outages, disrupted telecommunication and traffic, isolating certain areas and making rescue work difficult. After the disaster, Regional Master Plan for Reconstruction and the Conservation of National Land was advocated by the Executive Yuan, intended to facilitate cooperation between large non-profit organisations and major enterprises in their disaster relief efforts, apart from works implemented by government agencies[1].

The case is selected because Hong Kong is also prone to disasters brought by typhoon especially during summer. Strong gusts and heavy rains also bring casualties and loss when mudflows and flooding are triggered. The selected areas in Sai Kung are especially at risk when they are proximate to the coast on one hand, and to the slopes along catchment areas of rivers on the other hand. Therefore, how Taiwan implemented disaster intervention is worth investigating. This research mainly draws information provided by the exhibition, titled “Stories of Recovery and Reconstruction after Morakot” (莫拉克風災紀念館), at the National Science and Technology Museum, Kaohsiung, and its related publication in 2019, commemorating the disaster 10 years before, titled “Light up the Future” (莫拉克風災教會我們的事), by the Water Resources Agency, Taiwan, and the Museum.

The exhibition stated the establishment of a disaster-ready community, which largely corresponds to the concept of a resilient community, in response to the frequent natural disasters in a sustainable way, by enhancing the awareness and capabilities of the people, instead of relying solely on the government and professionals. It goes in line with our investigation on disaster prevention, mitigation and recovery, rendered in the exhibition as (1) before a disaster: reducing its probability, (2) during a disaster: handling its impact and reducing losses, and (3) after a disaster: rapid rebuilding for future redevelopment.

[1] Lin, J. J., & Lin, W. I. (2016). Cultural issues in post-disaster reconstruction: the case of Typhoon Morakot in Taiwan. *Disasters*, *40*(4), 668-692.

Figure 1. Distribution of landslide dam induced by excessive rain brought by Typhoon Morakot in South Taiwan[2]

2.2 Prevention, Mitigation and Preparedness

Among the communities, Kaohsiung aims to establish disaster-readiness by promoting the following goals and practices: (1) "together" (collaboration, 做伙) in the "promotion of disaster-ready communities", (2) environment checks - risk evaluation by experts and residents together, (3) voice of the community - open discussion of disaster prevention and solutions, (4) disaster prevention club - organisation and action plans for disaster prevention, (5) community exercises - conduct emergency response skill training and disaster drills, (6) further participation - showcasing results to attract more participation.

Education

To promote the above goals and practices, Kaohsiung has been promoting disaster education at schools, by incorporating situational thinking, emergency mindset and disaster psychology, into five major aspects: (1) environment control, (2) increasing capabilities, (3) constructing a disaster prevention map, (4) introducing (5) relevant resources and (6) developing a curriculum.

The education system has been assigned clear roles and division of labour in what to educate, according to students' capability, from basics (such as safety awareness in kindergartens) to developing and implementing plans for disaster prevention in universities, as shown in the above **Figure 2** image.

[2] Source: *United Daily* News, 18 August, 2009

Schools are also conceptualised as a "disaster-ready community": each campus will (1) evaluate threats of disaster, the societal situation and disaster history; (2) acquire equipment and construct a disaster prevention environment; (3) survey existing resources such as manpower, budget, and equipment; and (4) integrate the campus environment to evaluate the school's capability for performing emergency response tasks.

Figure 2. Disaster readiness in education system[3]

Administration

Kaohsiung has established initiatives across governmental bodies in enhancing disaster-preparedness for local communities, with 4 major approaches:

- Autonomous (自主) disaster prevention promotion in the community

  National Fire Agency, National Science and Technology Center for Disaster Reduction, Soil and Water Conservation Bureau, and Water Resource Agency are involved. This initiative mobilises over 1000 volunteers to timely report on-site situations in cases of flooding, receiving training from specialists from and reporting to the departments. The government agencies are also proactively promoting, as well as collaborating with NGOs such as the Red Cross for disaster prevention in local communities.

- Enhancement of Evacuation Preparedness

  National Fire Agency, Soil and Water Conservation Bureau, and Ministry of National Defense are involved. This initiative aims to establish evacuation procedures specially designed for vulnerable groups (such as high risk areas and people with special needs), to run situational drills annually with local communities, to evaluate and designate areas for emergency shelter, and to strengthen promotion of evacuation strategies.

- Strengthening the capacity to shelter individuals

  The Ministry of Education, National Fire Agency, the Ministry of the Interior and the Construction and Planning Agency are involved in this initiative. It executes

[3] Photograph taken by author in 2019, at "Stories of Recovery and Reconstruction after Morakot", the National Science and Technology Museum, Kaohsiung

evaluation on safety of shelters and assists in establishing shelters with local governments, especially implementing spatial planning for people with special needs. It also signed memorandums of understanding with local accommodation providers, religious spaces and logistics companies, negotiating possible collaborative plans in cases of emergency.

- Natural Disaster Management for long-term care facilities

  The initiative involves the Ministry of the Interior, National Science and Technology Center for Disaster Reduction, Water Resource Agency and the Ministry of Health and Welfare. It implements timely and effective warning during disaster, especially developing convenient communication mechanism through commonly used phone applications such as Line. It also renders disaster risk mapping, coordinates drills for disaster prevention and response, and establishes a long-term care website to provide information for local care facilities.

Figure 3. Disaster Potential Map[4]

Smart Disaster Prevention

The Taiwan government has developed a series of application and websites, with information provided by various departments, to render timely and efffective warning, monitoring, forecasting of disaster risks, accessible by all local residents.

[4] Developed by National Science and Technology Center for Disaster Reduction, https://dmap.ncdr.nat.gov.tw/1109/map/

Figure 4. Application and websites for early warning and disaster information developed by Taiwan authorities[5]

Contents in Figure 4

Smart Disaster Prevention		
Description	The first step to disaster prevention is paying attention to warning announcements. Many government institutions constantly monitor foreseeable disasters and issue alerts. Disaster prevention information is also available on their websites and through mobile apps. Download disaster prevention information and warnings on your cell phone now!	
Relevant applications and link	Smart Real-time Highway Information System of Directorate General of Highways	Highway Disaster Information System
		"Happiness Highway" App
		"Safe Taiwan" App
	Central Weather Bureau	Taiwan Weather App
		QPESUMS App
	NCDR LINE Official Account and Integrated App	
	Debris Flow Disaster Prevention Information	246-Debris Flow Disaster Prevention Integrated App LINE@
		Debris Flow Disaster Prevention Information Facebook
	Central Emergency Operation Center	
	Taiwan Water Disaster Information Web	Flood Prevention and Drought Resistance Facebook
		Mobile Water Information App

Drones are also ready for deployment in case of damage or blockage of road and telecommunications. It saves manpower and ensures safety, as an alternative for sending

[5] Photograph taken by author in 2019, at "Stories of Recovery and Reconstruction after Morakot", the National Science and Technology Museum, Kaohsiung.

rescue teams in person, to evaluate and monitor situations in remote areas. Moreover, speed and visibility area are greatly increased in inspection[6]. If rescue actions are needed, drones can also aid the mapping of the concerned area and spot locations of targets, especially in pre-arranging priorities in rescue, especially for those with special needs.

Infrastructure

Figure 5. Warning system for falling rocks on roads[7]

Road safety is enhanced with three-tier measure to minimise the damage of road users in landsliding. The first tier is prevention - to strengthen slopes on roadsides with better drainage and engineering structures. The second is to lower the force of falling rocks by setting up a net to catch the rocks. The third is to install sensors as warning system in the high-risk section of the roads. Warning lights at both ends will be triggered, to alert on the risks and allow drivers or pedestrians to evaluate before entering.[8]

Figure 6. Emergency bed set and water purification device sponsored by Buddhist Compassion Relief Tzu Chi Foundation[9]

Essential emergency relief items are provided to communities prone to disasters by charitable organisations. For instance, Buddhist Compassion Relief Tzu Chi Foundation

[6] Wu, P. H. and Guo, S. W. (eds.)2019. 希望．未來 莫拉克風災教會我們的事. Taiwan: Water Resources Agency and National Science and Technology Museum, p. 121.

[7] Source: Wu and Guo 2019, p. 120
[8] Ibid, p. 120.
[9] Source: Wu and Guo 2019, p. 120

provides multi-functional sleeping sets with beds and blankets for unsheltered people or rescue teams to survive in remote areas for days, as shown in **Figure 6 (left)**. O-water (purification device shown in **Figure 6 (right)**) is provided as emergency water source when the supply is suspended and the cleanliness of natural water sources is not ensured. Ready-to-eat food and mobile kitchen area also made readily available in case local food sources are scarce.[10]

There are other large-scale infrastructures but these might not be quite applicable to the concerned areas in Sai Kung. Therefore, they will only be briefly listed below:

- **Geographical monitoring and planning**: Multidimensional scaling monitoring, compound disaster impact simulation
- **Engineering**: sediment bypass tunnels, dredging, bridges with deeper foundations, higher and longer spans, river embankments, retention ponds, detention basins

Community-based Projects[11]

The coastal community of Xingang Village (新港里) often suffers from flooding, let alone being heavily struck by Typhoon Mokarot. With the joint effort of the Kaohsiung government and the National University of Kaohsiung, as well as the community members, disaster preparedness programmes are well-established. As there are many coastal fish ponds run by fisher folks, they can act as detention basins if water is pumped out before flooding. Thus, the authority has collaborated with schools to educate fisher folks about disaster preparedness by lowering water level in their ponds before flooding. As the village is also a tourist spot, the authority has also designed a community disaster prevention map, which indicates lowland areas (with higher risk of flooding) and evacuation routes to higher lands, for both local residents and tourists.

Figure 7. Disaster prevention tourist map of Xingang Village12

2.3 Recovery

Shelters

The provision of shelter is one of the actions to facilitate the rehabilitation in local communities where people can regain their access to accommodation. The first phase is to clean up mud and sludges in drown areas and restore the original settings, given that the structure of architecture is safe. Otherwise, in case dwellings are severely damaged or risking

[10] Ibid, p. 152.
[11] Ibid, p. 155-157.
[12] Source: Wu and Guo 2019, p. 157

high cost or safety in the process of restoration, emergency shelters are provided by temples / churches, community centres, or schools. The second phase is mid-term settlement: prefabricated housings, as temporary accommodations, are offered to unsheltered people. The third phase is to assist people in need to access permanent housing by simplifying administrative procedures and design more disaster-proof settlement plans for communities heavily damaged.

Restoration of Livelihood[13]

In newly built permanent housing settlement areas, such as Shanli, Rinari and Ulaljuc, the authority has advocated frameworks in planning for the restoration of the community, which suffered from the loss of homes. The basic principles are to be people-oriented and livelihood-oriented. As the communities in area mentioned are largely composed of indigenous population, the framework upholds diverse culture, along with community participation, security and safety, and natural conservation. Strategies include three main aspects as follows:

- **Ecology**: to provide safe living space, minimise government intervention in planning public space, retain ecological landscape, construction of green buildings, invite and encourage eco-friendly industries
- **Productivity**: to initiate sustainable business such as cultural and ecological tourism and growing specialty farm products, provide counselling for career planning, encourage low carbon and smart industries
- **Livelihood**: to restore and sustain cultural practices, maintain education, public health, communal and religious facilities and services

Meanwhile, to enhance the mental well-being of the community, especially after suffering from great loss or change of livelihood due to disasters, the authority has also been cautious to ensure respecting of the culture daily practices, language and religion of communities. Strategies are established to address their established routines, for example, to deploy support personnel that could communicate in language (e.g. indigenous languages) the community speaks, to provide space and assistance to religious groups (Catholic / Protestant) such as permanent site for gathering and performing rituals, and to provide localised services.

Commemorations are also performed or materialised in the form of memorials - for example, the Xiaolin Village memorial park. The memorial park includes an ancestral hall, bridge, memorial square, monument and viewing platform. There are 181 mountain cherry trees planted at the park, representing 181 families who were lost during the natural disaster. It features a 9-meter monument which was made from stones falling down during the landslide.[14]

[13] Wu and Guo 2019, p. 25-69

[14] Wang, Chris (21 April 2012). "Lee mourns people who perished in Siaolin village". Taipei Times. https://www.taipeitimes.com/News/taiwan/archives/2012/04/21/2003530892

Figure 8. Xiaolin Village memorial park[15]

Still, the resettlement of indigenous communities has not been free of controversies. Lin and Lin (2016) point out 4 major issues resulting from the reconstruction:

- Disaster victims have been resettled far from their ancestral homes
- The resettlement housing does not accord with the collective lifestyle of Taiwan's indigenous peoples
- The reconstruction process has not made adequate use of the traditional skills and knowledge of the indigenous people it was meant to help
- Cultural conflict and protest

Reflection and Utilization of Experiences

The exhibition at the National Science and Technology Museum and its publication in memory of the destructions brought by Typhoon Morakot are summarising and reflecting on the experiences in disaster prevention, mitigation, preparedness and recovery. By staging the experiences on platforms for public education (such as the Museum), the knowledge is shared on a national, or even international, level to promote disaster preparedness and the building of resilient communities.

2.4 Discussion

The case of Kaohsiung in the face of Morakot is comprehensively presented by the exhibition and its publication, which include disaster prevention, mitigation and recovery, and encompasses aspects in environment, society and city planning. There are a few key points worth highlighting:

- Regarding disaster prevention and mitigation, Kaohsiung's case demonstrates their concern over people with special needs such as elderlies, people with chronic diseases and children, who are more vulnerable to disasters. It can dedicate limited resources during disaster response and relief to people who are more affected and should be prioritised. Therefore, it may be useful to collaborate with local care service providers and to focus on local residents with special needs when enhancing disaster preparedness capacities in communities.

[15] Source: Wu et al 2019, p. 54

- Kaohsiung's case sheds light on the application of technology in facilitating disaster prevention and mitigation. Drones and sensor systems for falling rocks are not very expensive infrastructures that may enhance efficiency in emergency rescue and minimise casualties.
- In building a resilient community, the flood monitoring volunteer initiative in Kaohsiung's case is also worth referencing, as a possible means in organising and empowering local residents themselves to be the protector and first responders of their living space, with knowledge gained from related professionals.
- Regarding disaster recovery, Kaohsiung's case demonstrates the concern for particularities in local communities. For example, particular cultural practices, language and religion are prevalent. Thus, in the building of a resilient community, field knowledge of the community is important. It is applicable to Sai Kung since there are indigenous communities as well and they might practice traditions or speak dialects. Interventions are to be respecting and accommodating these aspects of the communities.

Still, it is to be aware that there are very few available scholarly works which critically review the implementation and effectiveness of the aforementioned strategies, and some approaches are relying on charitable organisations, whose generosity may not necessarily be expected in other context.

3 New Orleans in response to Hurricane Katrina, 2005

The case of New Orleans in U.S. is selected because it is comparable to the context of Hong Kong in the sense of their relative abundance of resources and infrastructure, dense and well-educated urban population. New Orleans, similar to Hong Kong, is also quite well aware of its proneness to disaster and there are existing disaster prevention, mitigation and recovery mechanisms to protect its people from severe human life loss and property damage. Still, Katrina has in fact brought unprecedented destruction and loss to New Orleans and innovative initiatives in recovery and building resilience were carried out afterwards.

3.1 Background[16]

For three centuries, New Orleans sought to lessen the impacts of its recurrent floods and hurricanes by providing marginal increases in safety. In its 288-year history, New Orleans has had 27 major river or hurricane-induced disasters at a rate of one about every 11 years[17]. After each event, the city rebuilt and often expanded, small differences in elevation determined the location of the well-to-do and the poor, and levees were rebuilt and often raised. Responsibility for levee construction gradually shifted from land owners, to the state, and ultimately to the federal government. However, as the designed protection was based on the last storm, each increase in storm severity and heightening of the levee thus led to a succession of catastrophic failures, since many areas are left in drained swamps upon which the communities, especially those less well-off[18], have been built lie at more than 10 feet below sea level, surrounded by levees and served by aging drainage pumps.

In keeping with other disasters, this long history of marginal increases in safety that encouraged new development made New Orleans a catastrophe waiting to happen. In the 4 years preceding Katrina, there were extensive and repeated warnings from both scientists and the media that the ‘‘big one’’ would eventually hit the city. These included specific concerns for the evacuation of an estimated 130,000 residents without vehicles, homebound, or in hospitals and in-care facilities. Beginning on the morning of August 29th, 2005, Katrina brought severe but not catastrophic winds, record rainfalls, and stormwater damage as the city’s pumping system failed to keep up with the rain. Then, within hours of the initial impact, major floodwalls along the major urban areas failed, allowing water to surge into over 80% of the city and essentially fill the lowland areas to depths ranging from 5 cm to 5 m. Days later, parts of New Orleans were flooded by intensive rains accompanying Hurricane Rita.

About a million residents in the metropolitan area might have responded to public calls for evacuation on August 27th and 28th while there were an estimated one-quarter of New Orleans residents unable or unwilling to leave. These residents took refuge or died before having the chance. The evacuated residents travelled or were moved to other cities. Within a month, refugees from New Orleans could be found in every state in USA. Extensive media coverage shared the failure of complete evacuation, the plight of those remaining in the city, and the subsequent out- migration with a global audience. The burden of these failures fell

[16] Kates et al 2006:14654

[17] US Army Corps of Engineers, New Orleans District (1972), *History of Hurricane Occurrence along Coastal Louisiana*.

[18] Whereas some people with higher income moved to new suburbs. See Colten, C. E., & Metropolis, A. U. (2005). *Wresting New Orleans From Nature*, Baton Rouge.

heaviest on the African-American, poor, aged, and infirm members of the population. Four months after Katrina, the population was estimated at 158,353, only 37% of the pre-Katrina number.

Kates et al (2006:14655) estimate an aggregate monetary loss of around US$40–50 billion in Orleans Parish including direct property losses, economic losses, and expenses on emergency assistance. The human and social disruption has also been extraordinary given these losses, the out-migration, the trauma of experiences, and the breakup of the community. Only the environmental losses have been somewhat less than expected as high levels of toxic materials found in the environment were primarily products of industrial development before Katrina.

New Orleans entered an emergency period of over 6 weeks. This endpoint was determined by the dewatering of New Orleans, defined as the point when flood waters were pumped and drained from the city. However, because of the extraordinary damage and dispersal of the population, an alternative length for the emergency period could be as long as 14 weeks, when the end of emergency shelter on December 3, 2005, is used as its conclusion.

3.2 Immediate Responses

Administration

At both the state and city levels, parallel and competing planning processes were launched by the Louisiana Recovery Authority, appointed by the governor, and the Bring New Orleans Back Commission, appointed by the mayor of New Orleans. The initial plan was a brief ''starting point'' plan developed by the Louisiana Recovery and Rebuilding Conference[19] and included features that were similar to the city plans developed by the Urban Land Institute with proposals for light rail, parks, and playgrounds; and selective neighborhood rebuilding[20].

A more detailed set of reconstruction plans came from the Bring New Orleans Back Commission, whose Urban Planning Committee envisioned a smaller city of 250,000 as a sustainable, environmentally safe, socially equitable community with a vibrant economy. Its neighborhoods would be connected to jobs and the region. Each will preserve and celebrate the heritage of culture, landscape, and architecture. More than 38,000 building permits have been issued for rebuilding to residents, ostensibly with <50% damage. The ground elevation of up to 3 feet is required for buildings. Other long-term urban planning initiatives after the disaster will be further discussed in the next section.

However, as a city-wide programme, it has taken 10 months for the mayor, city council, and civic leaders to agree on a unified planning process with professional assistance for 73 neighborhoods and on the preparation of a city-wide infrastructure plan.

Actions for Disaster Mitigation

The U.S. Army Corps of Engineers fulfilled their promise to rebuild and strengthen the current levee system, with improved earth materials, better anchored flood walls, and armoring, by June, 2006, prior to the beginning of the hurricane season. Supplementing these

[19] American Institute of Architects (2006) Starting Point: Report from the Louisiana Recovery and Rebuilding Conference.

[20] Urban Land Institute (2005) Executive Summary of Key Recommendations—A Strategy for Rebuilding New Orleans, Louisiana, November 12–18, 2005.

improvements are the installation of gates to close off three of the canals and improved pumps and energy supplies for management of interior stormwater or flooding.

In New Orleans, some individual home and business owners had sought their own protection by elevating structures on piers, often using the space below the structure for open or enclosed garages (e.g., Times-Picayune newspaper), additional storage, or shady workspaces. Nonetheless, there is considerable reluctance to elevate damaged buildings, because of appearance, cost, and the technical limits for elevating concrete slab homes.

Issue of Equity

Historical reconstruction experiences, as well as New Orleans history, consistently report on inequitable patterns of social vulnerability and outcomes of reconstruction. 75% of the damaged-area population was African-American and 29% poor, areas with little or no flooding had 46% African-American and 25% poor. A little over half of the flood deaths were African-Americans, and deaths occurred primarily among the infirm and aged.[21]

There were clearer racial and class differences in the ability to cope with the flood, to return, and to rebuild. Those with personal transport were able to seek refuge with family, with friends, or in public shelters of their choosing out of the storm's path. After the storm, many evacuees who had to rely on emergency transport out of the city were scattered to totally unfamiliar locations with some family members taken to separate locations.[22]

Despite the initial attempt of recovery in the Bring New Orleans Back Plan, actions were perceived as insensitive, reactionary, and racist, barring any further consideration of the plan's other aspects. In a time of crisis when thousands of families—mostly African American—still could not return home. Public demanded greater participation in the recovery plans. In 2007, the Unified New Orleans Plan (UNOP) attempted to bring together various divided groups with regards to the Bring New Orleans Back Plan, details of which will be discussed in the following section.

3.3 Post-disaster Urban Planning

The failed plan: Bring New Orleans Back Plan

In 2006, according to the Bring New Orleans Back Plan, there are three visions for rebuilding a better city identified by Kates et al (2006) as follows:

- The planned city with revitalized older neighborhoods and restored portions of badly flooded neighborhoods selected by residents. This is clearly listed in the Bring New Orleans Back Plan with the advocacy of a Neighborhood Center Model in future land use planning, designating several types as follows:
    - Immediate Opportunity Areas included those that suffered little or no flood damage and that people have already moved back and started repair activities in these areas.
    - Neighborhood Planning Areas were those heavily damaged and required to be restored by the residents committed to return, given that sufficient

[21] Logan JR (2006) *The Impact of Katrina: Race and Class in Storm-Damaged Neighborhoods.*
[22] Pastor M, Bullard RD, Boyce JK, Fothergill A, Morello-Frosch R, Wright B (2006) *In the Wake of the Storm: Environment, Disaster, and Race After Katrina*.

population and active involvement of the community were necessary to support facilities and services. Plannings were to ensure structural and environmental safety both in individual buildings and the environment at large, and took neighborhood history and culture into account.

    - The third type of neighborhood rebuilding areas contain places that offer the opportunity for infill development and regenerate those areas. They include land that is privately and publicly owned, blighted and adjudicated properties, brownfields, underutilized sites on high ground, or those requiring demolition and clearance.

- The improved city focuses on reversing the past by creating a new and advanced school system, an honest city government that is an efficient provider of services and protection, a more multiracial and integrated city that can reverse population loss, and a city safer from crime as well as disaster. Joint efforts are encouraged as listed in the Bring New Orleans Back Plan, listed as follows[23]:
    - Standard base maps with common data layers
    - Data file for common use including socio-economic, physical, and policy elements
    - Information coordination and management
    - Flood protection and storm water management plan
    - Transit plan
    - Parks and open space plan
    - Interim city-wide development guidelines leading to a focused update of the zoning ordinance
    - Assistance structuring the Design Review Committee, its guidelines and procedures
    - Public relations shared with neighborhood teams
    - Management and finance expertise
- The investment city focuses on the new economy, creatively using significant public and private funds to rebuild and invest in previous areas of strength: tourism, culture, medicine, education, and the ports. A comprehensive development plan for transit and transportation, including intra-city light rail and inter-city commuter railways, is illustrated in the Bring Orleans Back Plan. The Louisiana Recovery Authority developed a program to purchase heavily flooded and damaged homes at a price of their pre-Katrina market value, with less insurance recovery proceeds and mortgage.

[23] Urban Planning Committee: Action Plan for New Orleans Executive Summary (2006)

Figure 9. Map illustrating areas designated for rebuilding, parks and greenspace, and areas assigned with building moratorium[24]

However, due to widespread discontentment over the plan's insensitivity to public concerns and low level of public involvement, for example, the designation of certain areas prohibiting rebuilding for city planning without public consent as shown in the above map, the mayor asked the associated parties to step down from the assignment.

Unified New Orleans Plan[25]

In 2007, the Unified New Orleans Plan was implemented after the failure of the Bring New Orleans Back Plan. For organizational purposes, the UNOP was broken into two levels of planning: District Plans and a Citywide Recovery Plan. District Plans are stand-alone documents, intended to be used as a guide for city officials and citizens, regarding subsets of the city such as individual neighborhoods and districts. The Citywide Plan focuses on projects that are important beyond a single neighborhood or district. The District Plans helped to build up the Citywide Plan, and are encompassed within the Citywide Plan.

At one level, teams of nationally recognized architects and urban planners worked with neighborhood residents to create thirteen Planning District Recovery Plans. At another level, a Citywide Team of local urban planners and engineers analyzed citywide systems and issues, and also informed and guided the District Planners in their efforts. The Citywide Team and the District Planners held weekly meetings to coordinate activities and exchange information. Other events such as the three Community Congresses were open to the public and organizers made a significant effort to reach as many residents as possible using satellite technology, online consultation, call-centers, and surveys.

The districts are assessed with the level of disaster risk and ability of recovery so as to address the distinct needs for specific resources, as shown in the map below:

[24] Source: Paidakaki, A., & Moulaert, F. (2018). Disaster resilience into which direction (s)? Competing discursive and material practices in Post-Katrina New Orleans. *Housing, Theory and Society*, *35*(4), 440.
[25] New Orleans Plan Database. https://nolaplans.com/

Figure 10. Map indicating levels of disaster risk and ability of recovery of various districts in New Orleans[26]

Such an organisational structure allows city and state officials to coordinate post-disaster recovery more efficiently and effectively and enables New Orleans to comply with necessary federal mandates. The plan also identifies critical investment needs, so private and public entities know how to best provide help in New Orleans.

New Orleans 2030[27]

The New Orleans 2030 was a land use planning initiative, which the City Charter referendum vote gave the plan "the force of law" for land use decisions in 2009, and was adopted by the City Planning Commission and the City Council in 2010. The plan renders design and development for "living with water" including a multiple-lines-of-defense resilience strategy founded on public understanding and city leadership. It also includes multiple aspects concerning resilience and growth after disaster, as listed below:

- A vision of livability to build vibrant neighbourhoods: by public and private improvements tailored to character, conditions and needs of specific neighborhoods; a blight-eradication program, accountable to the mayor's office, coordinating all agencies and balancing enforcement and incentives to speed redevelopment; walkable, mixed-use corridors and commercial centers to serve neighborhoods; decent housing for residents of all incomes in neighborhood settings; a one-stop shop for homeownership and housing assistance.
- A vision for opportunity to build a prosperous city with an entrepreneurial edge: expansion of established industries, including tourism, culture, port/maritime, advanced manufacturing, oil/ gas; investment in arts and culture with facilities, business training, and neighborhood-based activities; new systems to transform life-science research results into commercial products; facilities and support services for film, TV and music production, and for digital media; market analyses, training, incentives and appropriate regulations to nurture new industries: coastal restoration, green energy, sustainable building design and technology.
- A vision for sustainability to build a resilient city: multiple-lines-of-defense strategy; a city office of Coastal and Environmental Affairs to coordinate strategy—including

[26] Source: https://www.goodyclancy.com/projects/unified-new-orleans-plan/

[27] Goody Clancy (2010) Plan for the 21st Century, New Orleans 2030, Vol. 2 Strategies and Actions

policy, mitigation, advocacy, liaison; a range of protection levels, from a 1-in-400-year event to a 1-in-1,000-year event, as appropriate to conditions; public education about risk and federal funding to elevate, relocate and storm-proof buildings; exploration of polder and canal systems to manage water; natural drainage and stormwater-management strategies; a Climate Change Policy Group to plan for adaptation to climate change.

- Historical and cultural preservation that supports community: preservation and enhancement of the character and quality of every neighborhood; broadening the historic-preservation constituency through assistance with affordable preservation and heritage trails to connect cultural history sites.
- Other aspects are more general development vision of the city, including initiatives with the aims in the alignment of job training and jobs for all skill levels, a connected city of transportation choice, green infrastructure, parks and greenways for neighbourhoods and the whole city, 24-hour activity to support downtown's role as an economic driver, and a city of excellent, cost-effective facilities and services.

Greater New Orleans Urban Water Plan

The Greater New Orleans Urban Water Plan was also published in 2013. It outlines a 50-year program of system retrofits and urban design opportunities for achieving a safer and more sustainable balance between land and water systems in the city. By creating an integrated living water system, the GNO Urban Water Plan will allow natural infiltration of stormwater to balance groundwater levels and slow subsidence and provide improved aquatic habitat for wildlife, and will also integrate water into public space. For example, the development of water-based public space, such as canal-side parks or publicly accessible wetlands, can be used to shift the public's perception and relationship with water while simultaneously providing environmental and adaptation benefits.

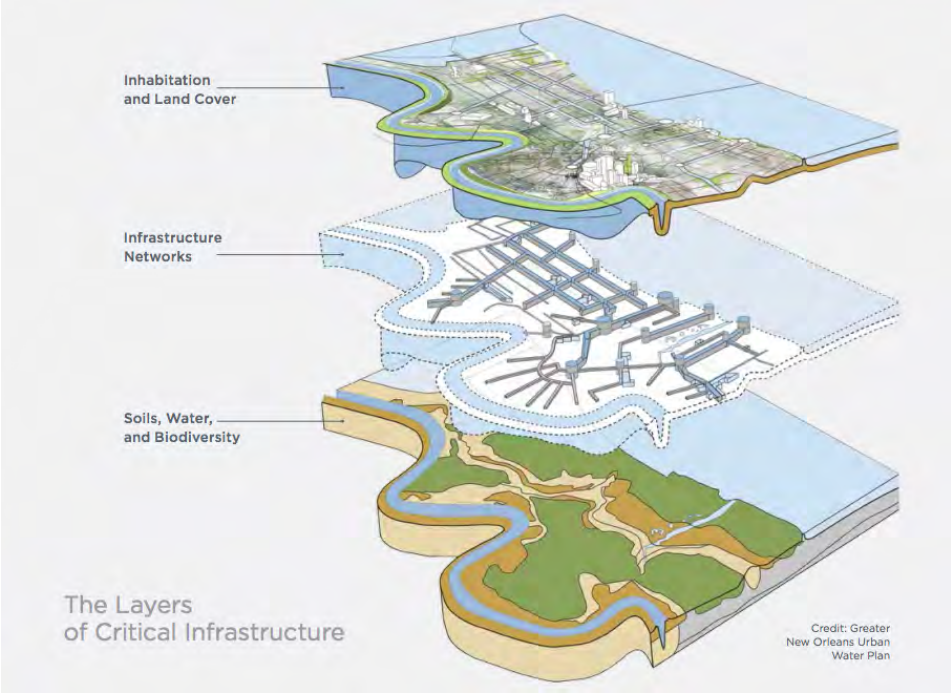

Figure 11. The key planning layers of critical infrastructure[28]

Resilient New Orleans[29]

Resilient New Orleans, was launched in 2015, comprising 41 actions that addressed environmental, socioeconomic, and operational resilience together for the first time. Using the 100 Resilient Cities City Resilience Framework for guidance, New Orleans researched the many post-Katrina planning processes found among its communities to identify common themes. The city then consulted with stakeholders across the public, private, nonprofit, civil society, and philanthropic sectors to identify short-term actions for long-term resilience. There are three major directions of the initiative, listed as follows:

- **Adapt to thrive**: advancing the restoration of coastal wetlands, which protect communities and support the economy; implementing regional; Urban Water Plan to reduce flood risk, mitigate soil subsidence, and beautify communities; providing incentives to property owners to retrofit their homes to be more resilient to storms; furthering environmental stewardship programs to create a culture of environmental awareness.
- **Connect to opportunity**: actions are to build equity, by investing in the financial stability of our low-income households, by narrowing the digital divide to lower the barrier to workforce participation, by investing in homicide reduction, public safety, and social cohesion, by improving the health of communities and expanding access to affordable housing through integrated policy and investment.
- **Transform city systems**: redesigning regional transit systems to connect people, employment, and essential services; promoting sustainability as a growth strategy, seeking ways to increase energy efficiency and renewable energy sources; calling for investment to increase the redundancy and reliability of energy infrastructure, by assessing the risks of energy outages to critical infrastructure systems and conducting feasibility studies for backup generation, or microgrids - small backup electrical generation and distribution systems that can disconnect from the traditional grid to operate autonomously and help mitigate the effects of outages; establishing the Mayor's Office of Resilience and Sustainability to integrate resilience-driven decision making across public agencies and the Center for Resilience to deliver the outreach and education components of building community resilience; developing a pre-disaster plan for post-disaster recovery that prepares the city to rebound quickly and emerge stronger, one of whose action is to identify the most advanced insurance coverage models to reduce exposure in the face of risk; launching small business resilience initiative to develop the preparedness of our business owners and entrepreneurs.

3.4 Discussion

The case of New Orleans in response to disasters brought by Hurricane Katrina is worth studying for the years of experiences in building disaster preparedness and community resilience, particularly in the context of well-developed cities like Hong Kong, with relatively

[28] The figure outlines the key planning layers of critical infrastructure illustrating the urban planning strategy concerning inhabitation and land cover, infrastructure networks, soil, water and biodiversity (City of New Orleans 2015:42)

[29] City of New Orleans (2015) Resilient New Orleans

abundant resources and past records of dealing with natural hazards. The study points to several insights when facilitating disaster preparedness and community resilience as follows:

- The availability of past records is important. They should be thoroughly studied and policies should be renewed from time to time to keep up with the changing natural environment, illustrated by the failure of existing mechanisms during the strike of Hurricane Katrina. The renewing urban planning initiatives in post-Katrina New Orleans are illustrative of the importance and necessity of up-to-date review of disaster preparedness and community resilience to best fit the communities' situation. The failure of the Bring New Orleans Back Plan and the attempt of the later initiatives demonstrates the need for reflection of existing plans and innovativeness to come up with better plans.
- The awareness of the risk and capability, and the involvement of local communities has been essential in implementing plans for building disaster preparedness and community resilience. It is applicable to the case of Sai Kung, where plannings mostly are made on the level of district administration while the particularity of local villages may not be taken into account. Even this project is working on micro-scale areas, among which some are with similar contexts, they may be situated in contexts with different levels of risks and potential. It is also important to establish communication channels to address the voices of local residents, especially particular vulnerable groups who are prone to disasters.
- Fougère & Meriläinen (2021) raised the concern over the recovery approaches of adopting social innovation in post-disaster contexts. Social innovations and new resilience initiatives may transform rather than help people reclaim what they lost such as their housing and livelihood, without truly identifying what people need. Though social innovations address vulnerabilities by making people more productive, for example in New Orleans, using entrepreneurship to tackle inequalities, there is a risk of policies driving mainly elite interests of capital accumulation, legitimated through appeals to the discursive power of social innovation, without truly empowering the vulnerable.

4 Case 3: Tarangambadi, Tamil Nadu, Southeast India in response to the Asian Tsunami, 2004

4.1 Background

The 2004 Indian Ocean earthquake and tsunami (also known as the Boxing Day Tsunami and the Sumatra–Andaman earthquake) occurred on 26 December, with an epicentre off the west coast of northern Sumatra, Indonesia. The tsunami disaster had struck the countries in Southeast Asia and South Asia, which included India and Sri Lanka. In India it hit the Andaman and Nicobar islands, the three coastal states of Andhra Pradesh, Kerala and Tamil Nadu and the Union Territory of Pondicherry, leaving 13,500 dead. Among these areas, the case study will delve into the disaster preparedness work after the Tsunami in the state of Tamil Nadu, and the reception of the aid and plans from the government and other agencies, particularly in the town of Tharangambadi, in the Nagapattinam district.[30]

Figure 12. Tamil Nadu District Map[31]

The town of Tharangambadi is selected because of its proximity to the coast and susceptibility to coastal disasters. Apart from its geographical location, its population size is also comparable to villages in Sai Kung, with particular occupation as fisherfolks, though many have ceased such an occupation in Sai Kung. Tharangambadi is inhabited by 1725 households. Fishermen constitute the majority of the population, with 1112 households and 208 Scheduled castes (referred to a particular social group) inhabiting the fishing village. Besides, it is also a tourist spot, though not primely popular, hosting the Danish Fort and

[30] Achuthan, N. S. (2009). Four years beyond tsunami: Contours of a roadmap for a coordinated "multi-hazard (including tsunami) risk management action plan for tsunami-affected villages in Tamil Nadu": overview of ongoing/projected initiatives. *Disaster Prevention and Management: An International Journal*, vol 18, no. 3, pp. 249-269.

[31] Source: mapsofindia.com

some colonial architecture. In the recent 2004 Tsunami, 266 houses were partially damaged and 904 houses fully destroyed and 304 lives were lost according to data from the panchayat (fishing village committee). The most severely affected areas were the fishing villages proximate to the coast, hosting mostly pre-colonial housing.[32]

Figure 13. Map illustrating the impact of the Tsunami to various areas of Tharangambadi[33]

There are also sufficient studies on the community response to the disaster and disaster-recovery work, among which this study is mainly referencing an anthropological study by Frida Hastrup (2011), *Weathering the world: recovery in the wake of the tsunami in a Tamil fishing village*, and Ram Sateesh Pasupuleti's (2011) PhD thesis at the School of Architecture and the Built Environment, University of Westminster, *Understanding the role of culture in the post disaster reconstruction process: the case of tsunami reconstruction in Tamilnadu, Southern India*.

The case study aims to layout the responses and plans for disaster preparedness and recovery after the Tsunami on both state and local levels, and then summarise what Hastrup observed during her field study on how local communities receive them and reconcile the disaster and everyday life.

[32] Pasupuleti, R. S. (2011). *Understanding the role of culture in the post disaster reconstruction process: the case of tsunami reconstruction in Tamilnadu, Southern India* (Doctoral dissertation, University of Westminster), p 145.
[33] Ibid, p. 152.

4.2 State-level Responses

Legislation

Achuthan's (2009) paper has quite comprehensively summed up the state-level initiatives and plans in response to the disaster-struck areas in Tamil Nadu. The Disaster Management Act was passed by the Government of India on December 23, 2005, which envisaged the creation of the National Disaster Management Authority (NDMA).

Strategies

Prior to the Tsunami, the State Government officials in the Relief and Rehabilitation, Revenue Administration, Disaster Management and Mitigation Department of the Government of Tamil Nadu, in collaboration with UNDP, ongoing programmes on Disaster Risk Management (2002-2007) have been conducted, at the District, Block and Village-levels, particularly focusing on the tsunami–affected coastal districts after 2004. The Report of the "High Powered Commission" on Disaster Management, submitted to the Government of India in 2000, indicating a blueprint, and Strategic Action Plans - their highlights are illustrated as follows:

- "Institutional mechanisms" the setting up of District "Disaster Management Committees" (DMCs) by 2000-2001
- "Culture of Preparedness": the setting up of forecasting, warning and alert systems, modernizing forecasting control rooms and improving communication links (including district level) in three phases – 2001, 2015 and by 2020.
- "Culture of quick response": it includes response mechanism, trigger mechanism, networking/coordination, to be achieved by 2000-2001.
- "Culture of strategic thinking", it refers to information networking, information technology/disaster information system.

Community Mobilisation

Apart from the aforementioned "cultures" to be promoted or strategic approaches, mobilisation and organisation of local residents were also seen in the government rendering "specific training component for village volunteers, as its core activities to be completed by December 2007". Besides, a "Training of Trainers" concept was adopted by the State Government's Anna Institute of Management, Chennai, for developing and refining existing training modules for evacuation, and mock exercises and drills involving community leaders and officials of local self-government in the villages.

"State of art emergency operational centres" at the district level were set up with the aims of training for community preparedness, and executing detailed guidelines on district level-inter agency coordination in the event of emergencies. "Multi hazard-ready" information system on early hazard warning was also relayed by the District-level Emergency Control Room (EOC). They would hence serve as a nucleus for "multi-hazard-knowledge" (on cyclones, high tides, storm surges and now tsunami) and alongside as sites for relevant training programmes at the village level.

International Collaboration

In the days following the tsunami, on December 30, 2004, GoI had announced its decision to set up in the next two years the "National Early Warning System for Tsunami and Storm Surges in the Indian Ocean". Meanwhile, an Interim Tsunami Warning Centre, operational by mid-2005, began to receive information from the India Meteorological Department, Japan Meteorological Agency and the Pacific Tsunami Warning Centre; a regional centre at Hyderabad was designated to receive this information, with back up at the Chennai centre.

NGOs

In 2005, MS Swaminathan Research Foundation, an NGO aiming at promoting rural welfare based in Tamil Nadu, initiated the setting up of Village Knowledge Centres (earlier called Rural Knowledge Centres) and Village Resource Centres, in partnership with the Indian Space Research Organization, providing "single window information" and also intended to "serve as an integral part of the National Early Warning system". Another NGO, the Dhan Foundation (not Chennai-based though) too was setting up Village Information Centres in the 254 villages in Tamil Nadu, among which 112 were along the coast. It has a comprehensive account of the ICT-related structure, including a public address system for early warning, linked to mobile phones of fishermen, weather stations in the hubs, computer literacy and e-governance, and training through involvement of the community and Village Council officials.

A Post-Tsunami Central Recovery Research Center was set up to coordinate resources and local groups, given that there were no visible institutional linkages between NGOs and the Village-level Committees or Gram Panchayats (Village Councils), even though there were provisions for NGO representation to the local members in some of these bodies.

4.3 Local-level Responses

In the fishing village immediately after the Tsunami, people who lost their houses were given accommodation in temporary shelters. The government and the NGOs provided temporary shelters in a vacant space near the Buckingham canal and adjacent to the existing Meenavar colony, an area with a distance from the heavily disaster-struck district.

After settling the emergency condition, in the main part of Tharangambadi village (excluding the dalit hamlets), the government constructed 276 shelters and many with non-government organisations to relocate destructed houses of villagers. By 2005, Tamil Nadu State Government announced 130000 new houses constructed in the State, in order 'to bring back the lives of the affected people to normalcy'.

Among the NGOs working in Tharangambadi, the South Indian Federation of Fishermen's Societies (SIFFS) was delegated to construct 262 shelters, in public-private partnership, whereas the government took up the responsibility to provide basic infrastructure such as electricity, water, drainage, roads. With international donations, many shelters were also built by various NGOs, for example, ROSA-50 shelters, OXFAM-72 shelters, and World Vision-190 shelters. The fishermen's traditional panchayat allocated the dwellings using a random method.[34]

Following the government regulations on land use in disaster-prone areas, based on 1991 Coastal Regulation Zones Act which prohibits construction within designated buffer zone

[34] Ibid, p. 170.

measured from high-tide line, some people in the village became aware of safety and requested that their new houses be constructed behind the ice factory, which is about 600 to 700m from the seashore.

The newly built houses were rendered with disaster-resistant engineering such as elevating ground level, and applying soil and sand before construction. Though there were criticisms concerning the reinforced concrete cement houses, over their environmental and cultural appropriateness (different from traditional building materials)[35], Hastrup (2011) found villagers mostly welcome, or at least did not deny, the use of modern building material for its durability, given that some of the new houses built prior to the Tsunami used the same material as well, whose strength was also a symbol of wealth and prestige to use.

It is worth mentioning the highly participatory process during the planning and construction of the relocation houses with SIFFS. Seven different optional design prototypes were presented to villagers. The designs mirrored house layouts traditionally found in Tamil fishing villages - including various spatial partitions for different functions such as space for Hindu worship (*puja*). The aim of such an approach to include villagers in the construction process was to ensure they feel their ownership, by selecting colours, making individual changes such as adding extra doors and shelves, moving room-dividing walls, changing planned functions of room, preparing for petty business. They were allowed to perform pujas on auspicious days of laying the first cornerstone at the new house before moving in, for warding off evil and envious eyes.

Reinhabitation: Old vs New House

While the fishermen affected by the tsunami were willing to relocate to safer areas, they did not want to give up possession of the location where their houses were situated before the tsunami. In the initial agreement, the villagers had to give up their original plot if they agreed to relocate. They even protested to retain their ownership of their original houses. Finally, it was flexibly resolved by granting them the permission to remain also in their original houses.

Despite the risk of coastal disasters, the reluctance of moving away from the original houses was attributed to practical reasons concerning the fisher folk communities, for example, the convenience of getting into the sea whenever required, the convenience of storing the nets and boats close to the sea and the possibility of seeing the movement of fish easily.

Hastrup (2011:44) also offers an observation that local villagers did not frame disaster risk as a non-localised force that they were possibly exposed to, just as they did not simply adopt the official definitions by the authorities of hazardous and safe zones. She interpreted the tension between relocating to the new houses and retaining the original houses as a process of reinhabitation after the Tsunami - which made the original houses and lifestyle uninhabitable: regardless of formal labels such as disaster-prone and safe, reinhabitation is a process stretching way beyond the official re-housing policy. Instead, it is a cultural adaptation after misfortune, appropriating a sense of home after the disaster.

Recovery through spatial relocation to ostensibly safer areas was only an ideal. Reinhabitation, concerning the sense of safety and home in relation to housing, is experientially perceived and does not derive from technically defined precautions against

[35] Barenstein, J. D., & Pittet, D. (2007). Post disaster housing reconstruction Current trends and sustainable alternatives for tsunami-affected communities in coastal Tamil Nadu. *Institute for Applied Sustainability to the Built Environment, University of Applied Sciences of Southern Switzerland, Canobbio*, p. 3.

natural hazards. More importantly, protecting and creating experiential familiarity with a place can overrule concerns about the risk it may entail for its inhabitants.

What she observed was that some survivors would actively engage in furnishing their new homes or their old ones if these stood a chance of repair. They were perceiving a future engagement with the houses when they were planning or indeed actualising the extension or enlargement of the house - that they decided to move on and continue their lives in their new houses. Meanwhile, some villagers, otherwise, though relocated, seemingly refused to appropriate the new home in response to personal bereavement - that the new house was to them a reminder of their loss due to the Tsunami by the displacement from their original sites of living. In Hastrup's words, they were staying rather than living in their new houses, where no signs of decorating or altering of the houses were seen. Instead, they may be more attached to their old houses, if repairable, as the old houses were a more familiar site, embodied by the composite of all experiences of the owners.

Hastrup (2011) further explains, that the traditional dwelling or original sites of living were connected to practical skills and livelihood, which constitute the notion of home - our identity is performed and mediated by our daily life, or conceptualised in the term, taskscape, the activity of our daily engagement with the environment[36]. This can be referenced with Pasupuleti's (2011:167, 184) mapping of the fishing communities' spatial linkage in performing different daily practices, before and after relocation. The relocated houses were distant from the sites of work, education and commerce. Therefore, villagers would have to adapt to new routes of conducting their daily tasks. Relocation, thus, should be seen not only as moving to a safer and better place for accommodation, it entails a fundamental change in the taskscape in life.

[36] Ingold, T. (2000). *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. Psychology Press, p. 189.

Figure 14. Connectivity patterns in fishing settlement of Tharangambai: before tsunami[37]

[37] Pasupuleti, p. 167.

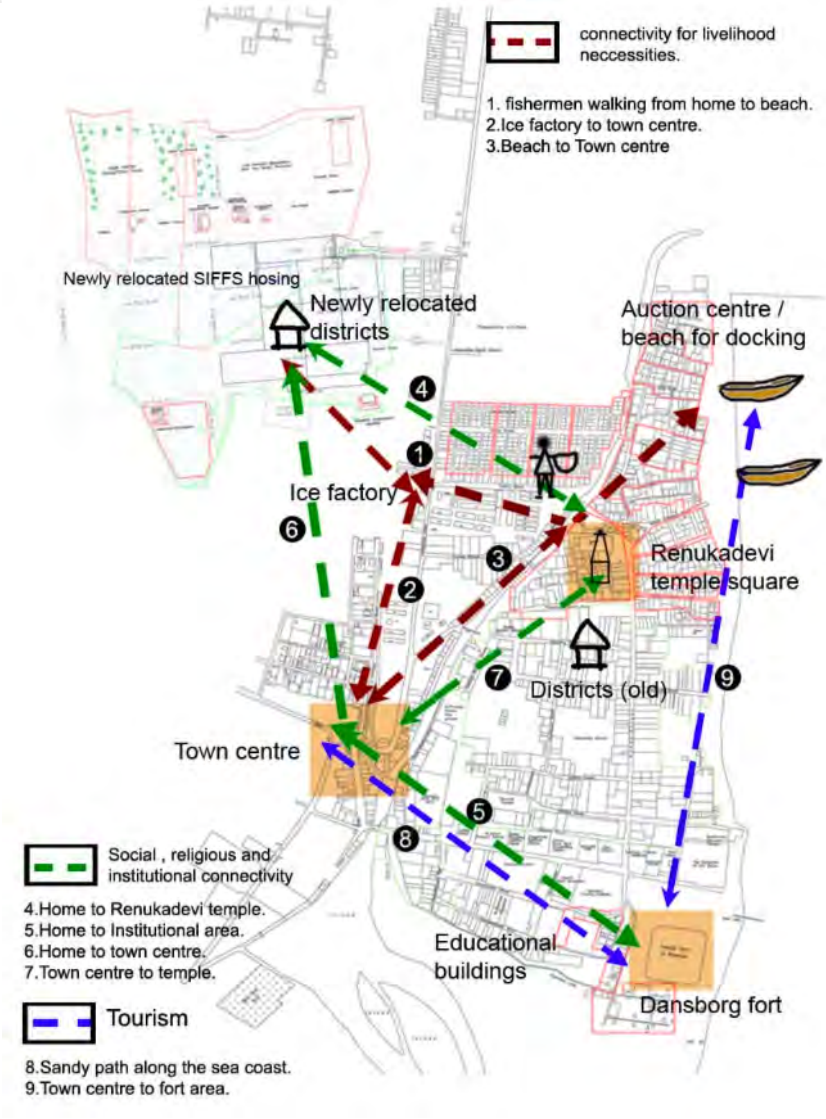

Figure 15. Connectivity networks in fishing settlement: After Tsunami[38]

Thus, regarding the relocation in this case, it sheds light on resilience building that the process of recovery is not only about hardwares providing the needs of daily life but an understanding of one's own taskscape as well as building a sense of belonging. Most importantly, what is needed to be recovered is not only the physical environment but the ability to reinhabit in the community.

Changes / Readaptation of fishing practice

In 2006, to enhance the safety during fishing, sea safety kit booklets advising fishermen on proper conduct when at sea were designed and distributed by the government. According to the guidelines, a boat should comprise lifebelts, extra water jars, a battery-driven torch, a first aid kit, biscuits, multipurpose pocket-knife, a compass, a mirror like device to be tracked by radar and used for signaling to rescue teams in cases of emergency.[39]

[38] Ibid, p. 184.
[39] Hastrup, p. 72.

In Hastrup's (2011) observation, fisher folks welcome the booklets and the advocacy of sea safety, and acknowledge the life-saving quality of these extra safety items. However, they never practiced - no fisher folks would bring the items on board. This is, according to Hastrup, due to the conceptualisation of disaster of fisher folks. In their practice, fisher folks do recognise the danger in working out in the seas, but they externalised and rationalised the danger as a result of particular seasons when weather condition is hostile and fisherfolks would limit their fishing activities, whereas the Tsunami considered an abnormal occasion but still intelligible since its happening fell under the periodisation of the dangerous seasons. When in calm seasons, there would be no need to have extra safety measures.

What the Tsunami really brought was a temporal halt of activity of fishing, a mistrust of sea and the doubt on the fisher folk's ability to manage the situation and the trustworthiness of forecast, weather, and seasonal changes. Though we learn that Tsunami was triggered by tectonic movements instead of meteorological conditions, what Hastrup's (2011) observation is insightful is that the management of disaster risk, adaptation and resilience reside with actual people who on a daily basis make sense of changing tides in a concerted and creative effort to make nature a pawn in their game rather than vice versa. The main concern to facilitate the recovery, in such an understanding, would not only be tangible tools or policies to aid the affected people, but to recover a taskscape in which they could act subjectively and according to the impetus of community belonging.

Such a process in Tharangambadi's case was quite self-initiated by the community itself - instead of conceding to the idea that tsunami is totally unpredictable, fisher folks were able to return to their fishing practice by shifting perspectives on environment, incorporating disaster into pattern of seasonality that externalised changes the disaster ostensibly brought about, and thus recovering their ability to forecast and rebuilding their confidence in reinhabiting their taskscapes.

4.4 Discussion

The case of Tharangambadi sheds light on the experience of building disaster preparedness and facilitating recovering, in the context of a town with less local resources / more reliant on outside assistance. There are a few key points worth highlighting:

- With less local resources, in terms of enhancing disaster preparedness, Tharangambadi is reliant on state-level governmental or agential support in building disaster warning system. This is not to say that abundant resources are a prerequisite for disaster preparedness, but when working on local cases with a similar context, we can plot what kind of higher-level resources can be acquired for local use.
- Though international monetary support was available (certainly not to be dependable in long term), organisations to coordinate the distribution of resources are important. Humanitarian agencies will benefit from guidance and cooperation of local persons and institutions to distribute the humanitarian support to the given community. Therefore, it may be beneficial to build resilience to reinforce the linkage of local institutions and households and to have a certain extent of understanding of local communities when coordination work is needed.
- The process of recovery can be understood not only as material aid or initiatives supported by outsiders. It can be a process of reinhabitation of the community

after changes brought by disasters. Community can be the owners of relief responses and recovery process. If outsiders are to facilitate such a process of reinhabitation, understanding taskscapes of local communities would be essential. Recovery is not about restoring everything back to what they were before the disaster, but a sense of accomplishment in having adjusted to the environment, acknowledging the transformation the disaster has brought on. More importantly, the community should not be reinforced its passive role in receiving help but reminded they are the major actors of change.

5 Case 4: Northeast Japan, in response to earthquake, tsunami and nuclear plant accident, 2011

This case focuses particularly on the response to the compound disasters of earthquake, tsunami and nuclear plant accident with regards to cultural heritage in Fukushima and its surroundings in Northeast Japan in 2011. It is selected because Sai Kung is also rich in local heritage among rural villages and town (for fisher folk communities), similarly facing risks from the coast. Though there is no nuclear power plants in Hong Kong, several plants are distributed along the coast of Guangdong province, the closest being in Daya Bay, east of Hong Kong where Sai Kung is located and exposed to nuclear risks. Even the HKSAR government has prepared the Daya Bay Contingency Plan[40], in collaboration with various departments and the government of Guangdong province, cultural heritage is not included in their plans so it is worth to study how heritage is rescued and protected under such circumstances.

5.1 Background

Earthquake

The epicentre of the earthquake (commonly called 'The Great East Japan Earthquake,' and officially the 'Tohoku-chiho Taiheiyo Oki Jishin' took place on 11 March 2011, on the Pacific Ocean floor, offshore from Miyagi prefecture. It

had a magnitude of 9.0, the largest yet recorded in Japan. While the tremor was felt

over a wide area of the Japanese archipelago, the coastal area of the Tōhoku and Kantō regions experienced the most powerful tremors, causing much damage, liquefaction of earth and other destructive phenomena.[41]

Tsunami

A huge tsunami hit the Pacific coast of the Tōhoku to Kantō regions after the earthquake. At some locations, the height of the tsunami waves reached ten metres or

more. The deeply indented coastlines of the Sanriku coastal region of the Iwate and

Miyagi prefectures enhanced the scale and force of tsunami waves which reached more than forty metres in some areas, thus exacerbating the damage. The tsunami also reached two to four kilometres inland in some coastal plains (e.g. Sendai municipality of Miyagi prefecture). The tsunami caused far more numerous casualties than the collapse of buildings or other destruction caused by the tremors. Of the approximated 20000 dead and missing following the earthquake, more than 90% were victims of the tsunami.[42]

Nuclear accident

[40] https://www.dbcp.gov.hk/eng/info/index.html

[41] Kikuchi, Y. (2015). Archaeology and cultural heritage in Fukushima today: four years since the Great East Japan Earthquake. *Japanese Journal of Archaeology*, *3*, 29.

[42] Ibid.

The Tokyo Electric Power Company (TEPCO) Fukushima Daiichi (No. 1) Nuclear

Power Plant, located in the Futaba and Okuma townships in Fukushima prefecture, lost all power due to the earthquake and subsequent tsunami, and four out of its six nuclear reactors either exploded or caught fire between 12 and 16 March. A significant amount of radioactive substances was released into the atmosphere and the ocean, resulting in severe, widespread contamination of land and sea across a wide area of eastern Japan, with Fukushima prefecture at the centre.[43]

The resulting reactor meltdown released substantial projections of radioactive elements such as iodine-131, caesium-134 and caesium-137. These elements contaminated the immediate surroundings of the plant, but also reached far more distant locations. By the summer of 2011, a more complex '3-zone system' was established, including also, beyond the 20km perimeter already evacuated, the areas sprayed by easterly winds along the Vale of Iitate, a mountainous corridor linking the Pacific coast to the city of Fukushima some 60km inland.[44]

About 200000 people were evacuated following the compound disasters, particularly when containment, decontamination and reconstruction were designated over an area of some 2000 square kilometres in the Tohoku prefectures of Fukushima, Miyagi and Iwate.

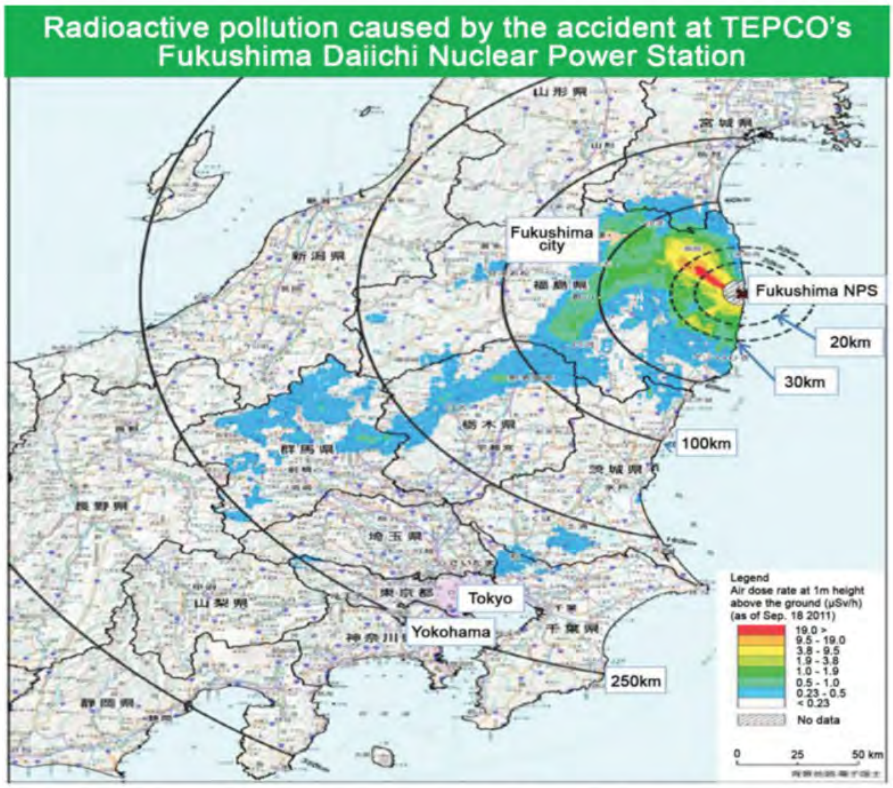

Figure 16. Map of the spread and intensity of radioactive pollution from the Fukushima Daiichi nuclear plant, 18 September 2011[45]

[43] Ibid.
[44] Schlanger, N., Nespoulous, L., & Demoule, J. P. (2016). Year 5 at Fukushima: a 'disaster-led'archaeology of the contemporary future. *Antiquity*, *90*(350), 409-424.
[45] Ibid, p 415.

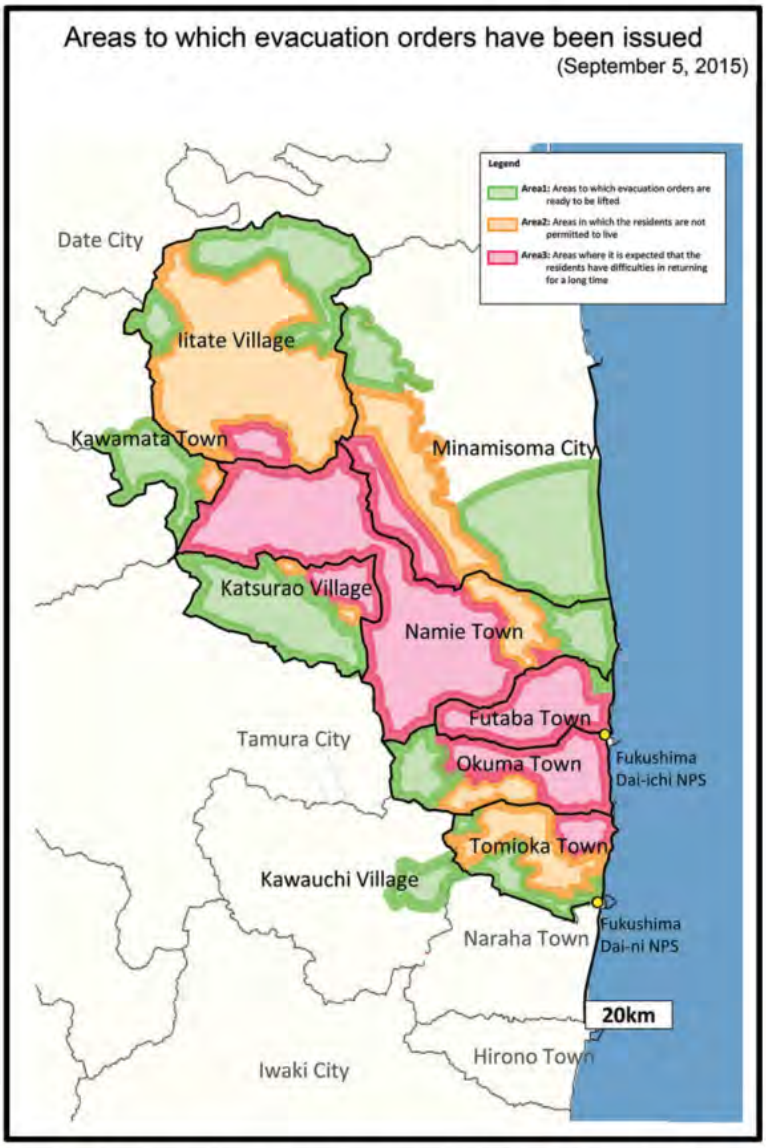

Figure 17. Map of exclusion and restricted access zones around Fukushima Daiichi nuclear plant, 5 September 2015[46]

Damage and threats to cultural heritage

The ensuing damage to the physical and historical environments included a wide range of heritage resources—buildings, fortifications, shrines and archaeological sites, as well as museums, repositories and storage areas—many of which were destroyed, contaminated or rendered inaccessible.

In the Fukushima prefecture alone, some 295 such 'cultural properties' (labelled at national, departmental or local levels) have been damaged or destroyed[47]. The total repair bill—for those elements that can actually be quantified and compensated — reaches over 5.3 billion yen (40 million Euros). Far more ominous is the 'collateral damage' now facing those 'buried

[46] Ibid, p. 416.
[47] Okamura, K., Fujisawa, A., Kondo, Y., Fujimoto, Y., Uozu, T., Ogawa, Y., Kaner, S., & Mizoguchi, K. (2013). The Great East Japan Earthquake and cultural heritage: towards an archaeology of disaster. *Antiquity*, *87*(335), 260; Kikuchi, p. 30.

cultural properties' (i.e. archaeological sites) that have hitherto lain underground, unrecorded, unprotected and also undisturbed.

Category		Nationally designated	Prefecture designated	Municipality designated	Total
National treasures	Buildings	1			91
Important cultural properties	Buildings	12	24	54	
	Paintings	0	1	1	2
	Sculptures	5	15	33	53
	Crafts	0	1	1	2
	Archaeological resources	2	4	12	18
	Tangible folk cultural properties	1	1	7	9
	Historic sites	19	12	34	65
	Historical sites and scenic beauties	1	3	3	7
	Scenic beauty	2	0	0	2
	Scenic beauties and natural monuments	0	2	0	2
	Natural monuments	3	3	2	8
Important preservation districts for groups of traditional buildings		1			Buidings total
Designated cultural properties	Designated tangible cultural properties	35			127
Subtotal		82	66	147	
Sum total		148			
Overall total		295			

Figure 18. Damaged designated cultural resources in Fukushima prefecture by category48

Over the whole affected area in Northeast Japan, more than 754 items are confirmed to have been damaged, including five national treasures, 160 important cultural properties, ninety historic sites and buildings as well as hundreds of paintings, carvings, craft goods, ancient documents, and ethnological and archaeological artefacts.[49]

5.2 Immediate Responses

Coordination

Immediate response was taken on 21 March 2011, when the Consortium for Earthquake-Damaged Cultural Heritage was conducted, offering expert support for documentation and restoration of endangered cultural heritage. It also directed the formation of several initiatives:

- Consolidating the social network of experts

[48] Kikuchi, p. 30.

[49] Agency for Cultural Affairs. 2012. Damages to cultural properties in the 'Great East Japan Earthquake'. Available at: http://www.bunka.go.jp/english/pdf/2011_Tohoku_ver14.pdf (accessed 18 July 2012). (accessed 30 November 2014).

- Geospatial information infrastructure (internet based), for on-site damage assessments and investigations for local groups
- A theoretical framework of disaster heritage studies: methods of conservation, risk management and education about heritage damaged by past disaster are systematised.

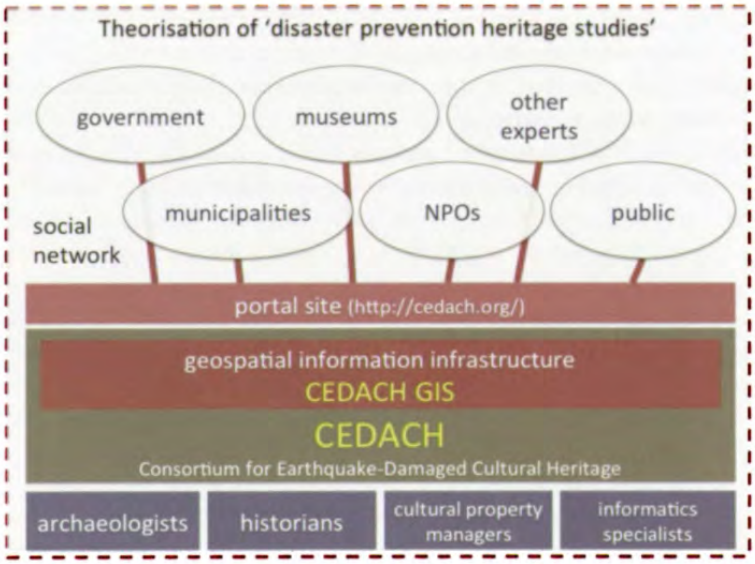

Figure 19. Consortium for Earthquake-Damaged Cultural Heritage: Schematic framework50

The Agency for Cultural Affairs has organized an extraordinary committee for the rescue of damaged and endangered cultural properties, launching the Cultural Property Rescue Project in April 2011[51]. In Miyagi prefecture, the headquarters were set up at the Sendai municipal museum. In total 6,800 people joined the rescue works at ninety locations in Iwate, Miyagi, Fukushima and Ibaragi Prefectures for 2 years[52]. The Agency has coordinated the rescue protection especially for movable cultural heritage, with clear tasks and work flow indicated.

[50] Okamura et al, p. 265.
[51] Agency for Cultural Affairs. 2011. Call for your cooperation in saving and recovering cultural properties damaged by the Tohoku-Pacific Ocean Earthquake. Available at: http://www.bunka.go.jp/bunkazai/tohokujishin_kanren/chokan_message_e.htm (accessed 30 November 2014).
[52] Shimotsuma, K. 2014. Recovering efforts in cooperation among private and public sectors, Progress report of Great East Japan Earthquake recovery – present state of affected cultural heritage: 2-3, Japan ICOMOS National Committee.

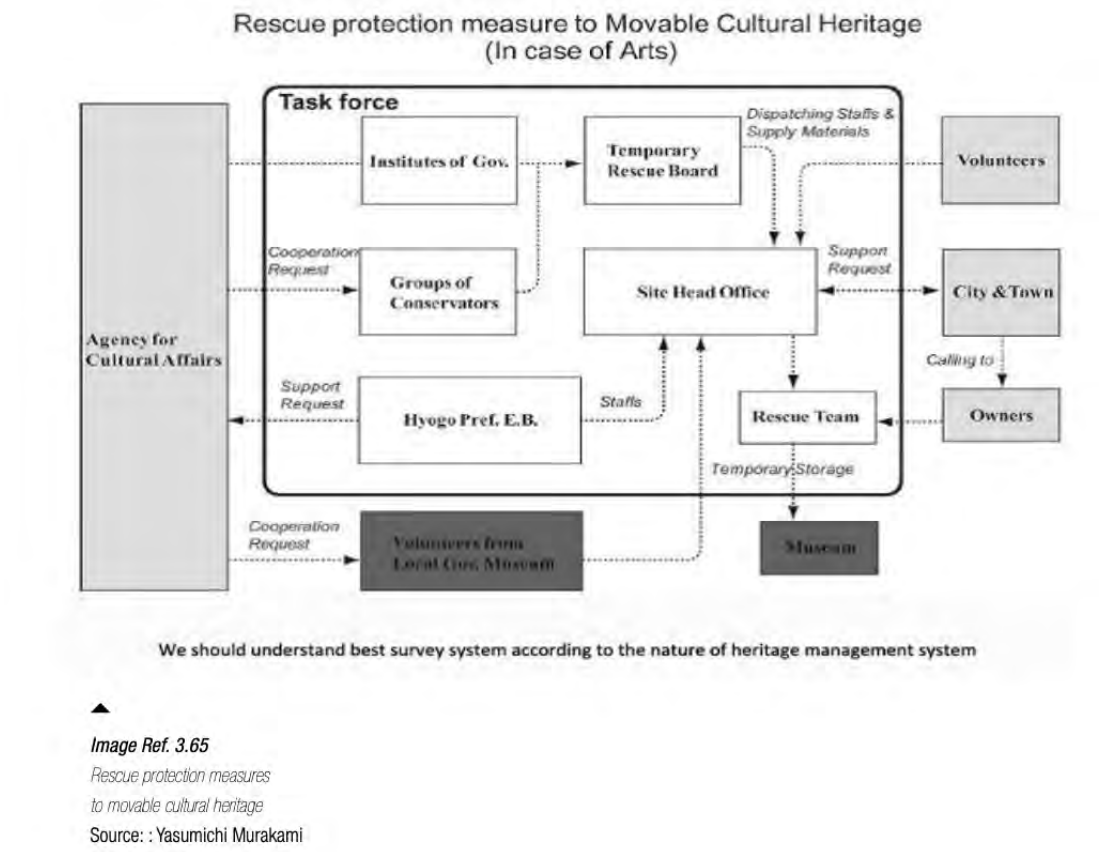

Image Ref. 3.65
Rescue protection measures to movable cultural heritage
Source: : Yasumichi Murakami

Figure 20. Rescue protection measure to Movable Cultural Heritage[53]

The Agency submitted a budget request for the establishment of a 'Disaster prevention and rescue centre for cultural properties'. Centralizing rescue operations and preservation for cultural heritage in disaster emergencies was promoted.

The Network for the Conservation of Historical Documents spearheaded the rescue project. For instance, as of 2013, the Miyagi Branch has rescued tens of thousands of items from ninety collections, by conserving damaged materials stored in museums.[54] Indeed, the network had initially been established by Historical Societies in the Kansai region in response to the Hanshin-Awaji Earthquake of 1995.

Subsequently, the Society of Archaeological Studies held the Earthquake Disaster Forum on 23-24 April 2011. The Japanese Archaeological Association also held a special session on earthquake disaster and formed a special committee at the annual general assembly on 28 May 2011. Its president, Professor Tetsuo Kikuchi, issued a statement in the form of an Appeal for the proper conservation and investigation of cultural properties in the reconstruction process of the devastated area.

Rescue work

[53] Jigyasu, R. and Arora, V. (2012) *Risk Management of Cultural Heritage in Urban Areas: A Training Guide*. Research Center for Disaster Mitigation of Urban Heritage, Ritsumeikan University, p. 130.
[54] Sato, D. 2014. Actions for recovery and protection of privately-owned historic documents damaged by the earthquake by Miyagi Shiryo net (Miyagi Historic Documents Conservation Network), Progress report of Great East Japan Earthquake recovery – present state of affected cultural heritage: 23-24, Japan ICOMOS National Committee.

Ancient documents, ethnological and archaeological artefacts, and the like are being rescued from damaged museums, archives, shrines and the homes of individuals. As numerous elements of cultural heritage around the nuclear plant have been irradiated or those soaked by sea water, items were cleaned and given first-aid conservation treatments, including high speed vacuum freeze-drying in the case of water-damaged Japanese paper documents[55]. Salt was also extracted from the rescued objects.

The Rikuzentakata City Museum has continuously been undertaking these stabilizing treatments on around 460.000 objects, while not only striving to develop stabilization techniques but also creating a new methodology with the cooperation of related organizations.[56]

Prof. Koji Kato, a folklorist from Tohokugakuin University, worked with students rescuing objects to then display them at the University museum, identified them with the help of the owners and produced an oral history for each object.

Later in 2012, the Fukushima Compromised Cultural Properties Rescue Service Headquarters was established and began to 'exfiltrate' lightly contaminated cultural items from their previous holdings in the forbidden zones of Futaba, Okuma, Tomioka and other settlements.[57] Gathered north of Minamisoma, tested for radiation and inventoried, these items were then transferred to a dedicated storage facility located in Shirakawa.

However, there were far more cultural elements remaining inaccessible in the exclusion zone, bereft of monitoring, maintenance or repair. As basic infrastructures are shut down or left unattended, museum display cases will suffer from temperature fluctuations, storage containers might crumble or rust, and organic items of wood or cloth, together with library and archival contents, will gradually decay or fall to infestations. The same went for 'standing cultural properties' and archaeological sites in the exclusion zone, left more vulnerable than ever to further environmental hazards as well as the radiation clearing process. Since the process included topsoil scraping and vegetation clearing, there would more likely be the risks of increased soil degradation, runoff and landslide risks, leading to a range of ecological damage, including the further erosion or burial of many archaeological sites. A Government proposal to build an 'interim' storage facility for radioactivity-contaminated soil in Futaba and Okuma was accepted by a Fukushima Governor, Mr. Yuhei Sato, in September 2014. Spanning over 19 square km, the area will cover the historical landscape of a region containing at least sixty archaeological sites.[58]

5.3 Post-disaster Projects

Reconstruction

[55] Matsui, A. 2011. Heritage rescue in the wake of the Great Eastern Japan Earthquake. *SAA Archaeological Record* 11.4:11-15; Tateishi, T. 2014. Overview of cultural properties affected by disaster in the Great East Japan Earthquake of March 2011, Microbial biodeterioration of cultural property, Proceedings of the International Symposium on the Conservation and Restoration of Cultural Property 2012, National Research Institute for Cultural Properties: 29-33, Tokyo.

[56] Kumagai, K. 2014. Stabilizing treatment by Rikuzen Takata City Museum, Progress report of Great East Japan Earthquake recovery – present state of affected cultural heritage: 25, Japan ICOMOS National Committee.

[57] Kikuchu.

[58] Okamura, p. 252.

In April 2012 the Agency of Cultural Affairs issued a notice entitled 'Regarding Cultural Properties Management Related to the Restoration and Reconstruction Associated with the Great East Japan Earthquake', as they had done for the 1995 Hanshin-Awaji Earthquake, Kobe — whereby archaeological activities, called Fukko (Reconstruction) excavations[59], were integrated into the reconstruction efforts and do not hinder them (Kikuchi 2015: 38, Kikuchi & Nespoulous 2015: 62).

As a range of projects were launched for resettling evacuees in new public housing just above the tsunami line—that was, on higher ground that has proved particularly rich in archaeological occurrences, the Agency emphasised the need for a speedy excavation in a similar manner during the clearance and reconstruction phases, as known as 'disaster-led' preventive archaeology[60], so as not to delay reconstruction works, and to identify, study, make known and preserve heritage[61], and actively disseminate the research results to local people and developers.

As a means to undertake the necessary excavation, Iwate, Miyagi, Fukushima Prefectural Boards of Education and the Agency of Cultural Affairs requested other local governments for an archaeological labour force. Next, from April 2012 onwards, more and more archaeologists from other regions were sent to engage in excavation prior to the reconstruction of towns and other infrastructure. By July 2012, no fewer than 663 archaeological clusters had been identified across the territory of the municipality of Minamisoma. For example, in the locality of Higashimachi, just above the upper reach of the 2011 tsunami, a Middle Jomon site (mid third to mid second millennium BC) has been excavated prior to the construction of several residences with the voluntary involvement of local or neighbouring residents.

Figure 21. Community involvement in preventive archaeology at the Middle Jomon site of Higashimachi[62]

[59] Negita, Y. 2012. Archaeological excavation for reconstruction on the building of new communities. Available at: http://archaeology.jp/sites/2012/rebuilding.htm, (accessed 30 November 2014).
[60] Schlanger et al.
[61] Demoule, J.-P. 2012. Rescue archaeology: a European view. *Annual Review of Anthropology* 41: 611–26; Schlanger, N. 2012. Preventive archaeology, in N.A. Silberman (ed.) *The Oxford companion to archaeology*, volume 2: 661–65. Oxford: Oxford University Press.
[62] Schlanger et al, p. 412.

Another example is an excavation site at Tenkazawa, a 3ha wooded hilltop under assessment for remains of Heian-period (ninth–eleventh centuries AD) iron-smelting activities. Once the investigation is over, the whole hilltop will effectively be truncated to provide hundreds of tonnes of arable soil for a nearby valley whose own soils were washed away and polluted by the tsunami wave.

Figure 22. Preventive investigations at Tenkazawa[63]

Still, there were certain difficult issues including the publication of reports and utilisation of archaeological finds due to the lack of heritage managers in coastal municipalities[64].

Digital inventory[65]

As proposed by the Consortium for Earthquake-Damaged Cultural Heritage (CEDACH), a digital inventory for disaster-damaged heritage management through web-based collaborations was set up by self-motivated workers. The first project, CEDACH GIS, developed an online archaeological site inventory for the disaster area. Although a number of individuals voluntarily participated in the project at the beginning, it gradually stagnated due to limited need for local rescue archaeology. However, the experience of online-based collaborations worked well for the second project proposed by local specialists, in which CEDACH restored the book catalogue of a tsunami-devastated research library. This experience highlighted the need for online education to improve information and communication technologies (ICT) skills of data builders. Therefore, in the third project called CEDACHeLi, an e-Learning management system was developed to facilitate learning the fundamental knowledge and techniques required for information processing in rescue operations of disaster-damaged cultural heritage. This system contributed to improved skills and motivation of potential workers for further developments in digital heritage inventory.

Recovery, reflection and remembering

[63] Ibid, p. 413.
[64] Okamura, p. 252.
[65] Kondo, Y., Uozu, T., Seino, Y., Ako, T., Goda, Y., Fujimoto, Y., & Yamaguchi, H. (2013). Voluntary Activities and Online Education for Digital Heritage Inventory Development after the Great East Japan Earthquake. *ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 391-396.

Remnants of local cultural heritage were exfiltrated from the radiated zone, decontaminated and restored, cultural inheritance was able to be recovered - though some living folklore and 'matsuri' ceremonies were nearly lost, landscapes were to be mapped, drawn and memorised.

The Reconstruction Agency produced a document 'Concerning support for the preservation of memorial buildings or structures to commemorate the disaster in November 2013. The 3.11 Densho Road was initiated along Aomori, Iwate, Miyagi, Fukushima and Sendai, which links memorial sites with community facilities, including parks, halls, museums, archives, turning the disaster into a cultural memory and platforms for disaster awareness communication and centres for disaster prevention.[66]

The Great East Japan Earthquake and Nuclear Disaster Memorial Museum (東日本大震災・原子力災害伝承館) in Fukushima was opened in 2020, aiming at passing on the experiences, records, lessons, and the story of recovery from the unprecedented and compound disaster to future generations. It serves as a repository of heritage disaster-management procedures, and reflection of the disaster.[67]

5.4 Discussion

The case of Northeast Japan sheds light on disaster preparedness particularly regarding cultural heritage. It is worth investigating since Sai Kung communities are also rich in local heritage, especially those of fisher folk communities and local clans, manifested by their traditions in various religious and festive rituals as well as tangible establishments such as ancestral halls and temples. There are a few points that can be taken away for our project's reference:

- Collaboration with local institutions such as museums and universities can be enhanced especially for high-risk areas, on which priority in research can be given. A database of previously conducted local heritage studies can also be compiled, and, if possible, an online inventory can be rendered, in order to consolidate understanding of the current situation and risks of cultural heritage.
- Plotting of potential, or unlisted, heritage sites and intangible heritage and evaluation of their vulnerability under disaster scenarios are important so as to prepare for rescue in case of emergency.
- Identification of temporary space to store or have first-aid treatment of object can facilitate disaster mitigation in case of emergency. Collaboration with local community facilities or nearby university (i.e. the University of Science and Technology) can be considered.
- Historical review of disaster-related issues in local communities can be conducted as a means to both recollect cultural memory and reflect on past experiences and educate people on future disaster preparedness.

[66] 3.11 Densho Road Promotion Organization. https://www.311densho.or.jp/en/denshoroad/index.html
[67] https://www.fipo.or.jp/lore/en/about

6 Case 5: British Columbia in response to seasonal forest fire, 2017

The case is selected because many villages in Sai Kung are surrounded by forests and there are certain risks of wildfire especially during dry seasons in Hong Kong, whereas the villages are prone to disaster risks due to their remote location and limited resources. The situation is quite similar to the local communities facing the risks of seasonal forest fire in British Columbia.

6.1 Background

British Columbia experienced unprecedented impacts from the 2017 flood and wildfire season. Although the wildfires occurred before 2017, the compound events of the year were some of the worst in the province's history, sending the province into a 10-week state of emergency. More than 65,000 residents were displaced, with flood response costs estimated at more than $73 million and direct fire suppression costs estimated at more than $568 million. This case study focuses particularly on disaster preparedness and community resilience in response to forest fires in British Columbia.

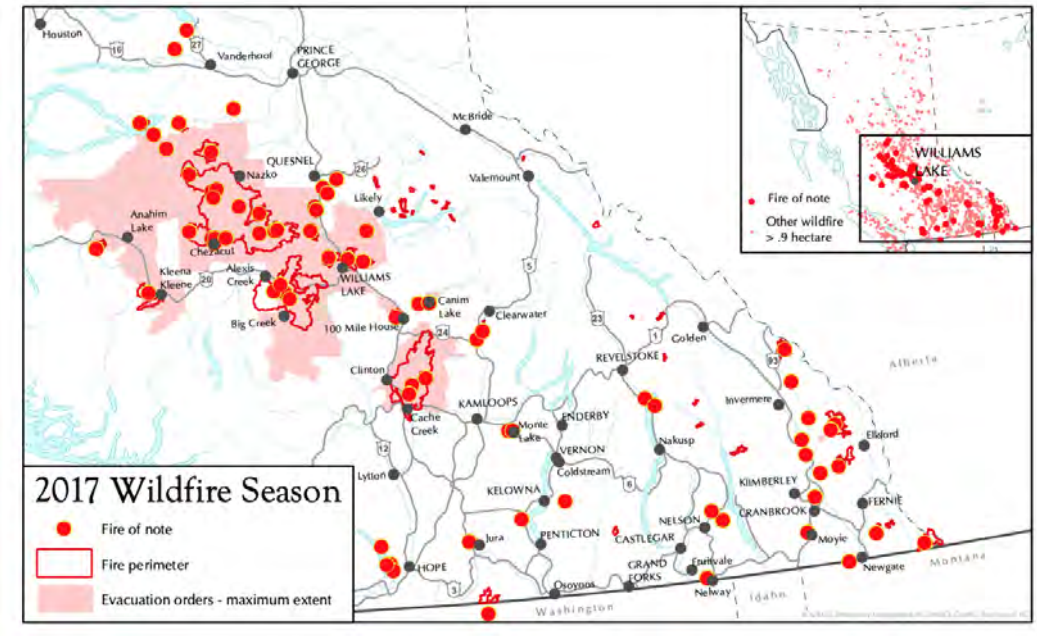

Figure 23. Distribution of wildfire in British Columbia, 2017[68]

[68] Abbott, G. and Chapman, M. 2018. Addressing the New Normal: 21st Century Disaster Management in British Columbia: Report and findings of BC Flood and Wildfire Review: an independent review examining the 2017 flood and wildfire seasons, p. 16.

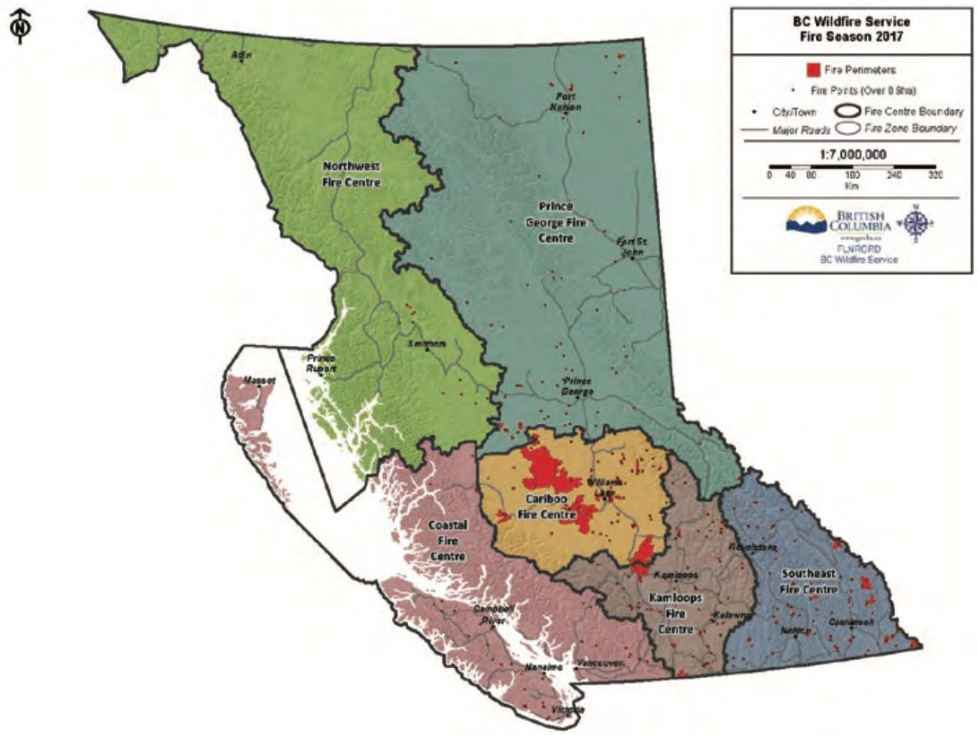

Figure 24. Distribution of fire in British Columbia, 2017, by BC Wildfire Service[69]

The unprecedented scale was attributed to the long, hot and dry summer in 2017 — particularly in the Cariboo, where the majority of fires occurred. These conditions contributed to a high build-up of fuel, and ultimately laid the foundations for the devastation to come. The high point was on July 7, as more than 160 fires began on the same day — largely the result of 'dry' lightning strikes (strikes without rain). In some cases fires began merging together as one.

The report from the British Columbia Wildfire Service stated, "a second wave of heightened fire activity was experienced, with several major fires cropping up throughout southeastern BC and the Southern Interior. The wildfire season remained active until near the start of fall, when cooler, wetter conditions finally gave crews the upper hand on the fire situation … number of these fires started in areas close to communities"[70].

In recent years, as people and communities have moved gradually closer to forests, they have ultimately come into greater contact with wildfires. These areas, where forests meet human development, are known as the wildland urban interface (WUI)[71]. These include "areas where human development is adjacent to or among undeveloped wildland areas that have flammable vegetation" such as trees, bushes and grasses[72]. The Government of British Columbia estimates about 685,000 hectares of forests are at relatively high risk, and 970,000

[69] Abbott and Chapman, p. 25.
[70] BC Wildfire Service website. https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/wildfire-history/wildfire-season-summary.
[71] Forest Practices Board. Fuel Management in the Wildland Urban Interface — May 2015. Page1. https://www.bcfpb.ca/wp-content/uploads/2016/04/SIR43-Fuel-Management-Update.pdf.
[72] British Columbia. Office of the Auditor General. Managing Climate Change Risks: An Independent Audit. February 2018. Page 73. https://www.bcauditor.com/sites/default/files/publications/reports/Climate_Change_FINAL_0.pdf.

hectares are at moderate risk of sending embers into BC communities during a wildfire — the greatest risk to structures in communities.

6.2 State-level Strategies

Administration

British Columbia has a well-established administration system from state to local level in disaster management, from preparedness, mitigation, response to recovery. These institutions are not limited to tackling fires but all sorts of hazards but this section will also encompass some institutions dedicated to wildfires.

Emergency Management British Columbia (EMBC) provides leadership in emergency management on behalf of the Province. EMBC works directly with local governments, provincial ministries, other jurisdictions and volunteers in a coordinated effort to prepare for, respond to and recover from emergencies[73]. Its mission statement suggests it is "... responsible to British Columbians for leading the management of provincial level emergencies and disasters and supporting other authorities within their areas of jurisdiction.

Under the state level institutions, there are six regional emergency management offices, and headquarters in Victoria, responsible for EMBC and its operations falls under the provincial Minister of Public Safety and Solicitor General. Local governments access support from the ministries through the Provincial Regional Emergency Operations Centre (PREOC)[74]. The primary goal of the PREOC is to coordinate the Province's overall response to emergencies and disasters.

It is worth mentioning the BC Wildfire Service (BCWS), a branch of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development on state level. "[It] is tasked with managing wildfires through a combination of wildfire prevention, mitigation and suppression strategies, on both Crown and private lands outside of organised areas such as municipalities or regional districts."[75] In the event of a wildfire in British Columbia, BCWS is the lead in fire suppression.

On local levels, Emergency Operations Centre (EOC) may be activated by a local government or private sector. The EOC provides communication on the site level, manages local multi-agency support to the site level and acquires and deploys additional resources. The local EOC is activated to oversee and coordinate all non-site activities in support of the Incident Commander[76].

[73] Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 1, Page 1. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/ emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

[74] Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 2, Page 14. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/ emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

[75] Government of British Columbia. Public Safety & Emergency Services website. See https://www2.gov.bc.ca/gov/content/safety/wildfire-status/about-bcws/governance.

[76] Government of British Columbia. The All-Hazard Plan. 2012. Page 64. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response- recovery/ provincial-emergency-planning/embc-all-hazard-plan.pdf.

It is worth to note that there are specific institutions dealing with emergency among indigenous groups in British Columbia - the First Nations' Emergency Services Society (FNESS) is funded by Indigenous Services Canada to support First Nations in preparing for emergencies. FNESS assists First Nations with training and developing emergency plans[77][78]. More specifically, that includes providing programs and services in areas including: emergency planning, training, response and recovery; fire training, education and prevention; forest fuel and wildfire management; and leadership and collaborative relationships.

Figure 25. Decision making process from local to state level in case of emergency[79]

Four pillars of disaster management

The authorities of British Columbia adopt four major strategies in disaster management, namely planning and preparedness, mitigation, response and recovery. Specific strategies with regards to fire will be highlighted in this section.

- **Planning and preparedness:** developing emergencies plans, mutual aid agreements, resource inventories, training, exercises and emergency communications systems
- **Mitigation:** Prevention programs are designed to prevent or mitigate the effects of wildland urban interface fires include measures such as fire management planning, fuel management, public education, legislation and policy. Open fire prohibitions and forest use restrictions may be imposed if conditions meet specific thresholds[80].

[77] Government of British Columbia. Emergency Management in BC: Reference Manual. 2011. Chapter 2, Page 15. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/ emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.

[78] FNESS evolved from the Society of Native Indian Fire Fighters of BC (SNIFF), which was established in 1986. SNIFF's original goal was to help reduce fire-related deaths in First Nations reserves, but has changed its focus to incorporate more types of emergency services. In 1994, SNIFF changed its name to First Nations' Emergency Services Society of BC to reflect its growing diversity of services provided.

[79] Abbott and Chapman, p. 40.

[80] Government of British Columbia. British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires. Revised July 2016. Page 23. https://www2.gov.bc.ca/assets/gov/public- safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf.

In the Managing Interface Fire Risks report in 2001, mitigation means preventing or reducing the consequences of interface fires. It involves activities such as reducing excess vegetation (which provides fire fuel), adopting building codes that promote fire-resistant property development, adopting land use restrictions to control activities that increase fire risks, and implementing insurance incentives that promote the use of fire-resistant building materials and property maintenance. Many of these activities are the responsibility of local governments[81].

- **Response:** For wildfires, under the Local Authority Emergency Management Regulation local governments are "required to prepare and maintain emergency plans that detail how the community will respond to known hazards including how to engage mutual aid and contingencies for external support.[82]
  General response phases are established: information-gathering; assessing the disaster threat; prioritizing response activities; allocating resources (especially for life-saving functions such as evacuations, search/rescue and emergency medical assistance); restoring critical infrastructure; and ensuring community services continue being delivered in the aftermath of disaster[83].
  There is also fire specific response planning: in the context of fire management, response planning includes programs and activities designed to ensure that individuals and agencies will be ready to react effectively once a fire emergency starts. Response planning is critical to ensuring that imminent interface fire situations are recognized, that an appropriate level of fire protection is provided in interface zones, and that priorities are established and actions taken. The absence of carefully developed response plans can result in poor decisions and lead to costly operational mistakes or unsafe practices during an emergency[84].
- **Recovery:** Actions in this phase are about addressing the aftermath of disaster, and include establishing resiliency centres, supporting evacuees, providing financial assistance and managing donations.

6.3 Local Execution

6.3.1 Skeetchestn

Emergency plan

It was back in 2006 or 2007 that the local community's Emergency Operations Centre first developed an emergency plan in response to wildfire and activated the plan in 2017. The community also drew on training that its emergency planning team had received from the Justice Institute of British Columbia. When the fires are approaching the community, the

[81] British Columbia. Office of the Auditor General. Managing Interface Fire Risks. Report; 2001/2002: 1. Page 56. https://www.bcauditor.com/sites/default/files/publications/2001/report1/ report/managing-interface-fire-risks.pdf.
[82] Government of British Columbia. British Columbia Provincial Coordination Plan for Wildland Urban Interface Fires. Revised 2016. Page 33. https://www2.gov.bc.ca/assets/gov/public-safety- and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf.
[83] Government of British Columbia. Emergency Management in BC: Reference Manual. Chapter 1, Page 7. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/ emergency-preparedness-response-recovery/embc/training/reference_manual.pdf.
[84] British Columbia. Office of the Auditor General. Managing Interface Fire Risks. Report; 2001/2002: 1. Page 63. https://www.bcauditor.com/sites/default/files/publications/2001/report1/ report/managing-interface-fire-risks.pdf.

Centre took critical steps to 'fireguard' key areas and buildings, including the school, two subdivisions (with 150 structures) and specific residences where owners could not fireproof their properties themselves, hiring a crew of 10 to urgently remove all grass and other fuel adjacent to this infrastructure and digging fireguards measuring five kilometres long and 60 feet wide so that if the fire reached these areas there would be no more fuel to propel it forward.

Evacuation

When the decision was made to evacuate on August 4th (the evacuation lasted until August 21st), the Centre had built a comprehensive list of identified adults, children and pets living at each residence, so as to have a scope of what the Centre was responsible for in our community. The list included contact details, so the team that remained behind to safeguard the community could keep evacuees updated. Like the community's emergency plan, it is a list they update regularly.

Communication system

Once the evacuation happened, the Skeetchestn emergency response team quickly realized there were gaps in reliable, available information. To meet this challenge, and keep people informed, the team relied on three quick-fix solutions: staffing an emergency telephone information line; sending daily updates on local conditions based on information gathered by its team (including GPS and GIS specialists), and distributing these updates by Facebook Messenger; and hosting a series of public information sessions. Available to First Nations and non-First Nations community members alike, ranchers and other area residents attended these sessions to get information.

6.3.2 Logan Lake

Mitigation

The local community established multiple approaches in mitigating wildfires. The first is a yearly, months-long clean-up of fuel on Logan Lake's Community Forest adjacent to the community. This is done using contract and local First Nations crews, as well as high-school students. The high-school crew is a strategic initiative funded through the Logan Lake Community Forest, a collaboration involving the Community Forest, the Logan Lake Wellness, Health and Youth Society, and the District. Though only equipped with manual tools, including handsaws and pruning saws, the students make a big contribution to the effort while learning about forestry, their natural surroundings and fire principles. The local community also brings herds of cows and goats into area fields each summer to eat large patches of dried grass and weeds (cows only eat grass while goats only eat weeds).

Wildfire mitigation also involves installing low-cost sprinklers — a first line of defense for individual homes. Local firefighters help install those sprinklers for homeowners unable to climb a ladder to access the roof, such as seniors.

Preventive measures

FireSmart initiatives are promoted to Logan Lake residents. It is a national initiative to help property owners and communities understand the ways in which wildfire might threaten structures and property located in, and close to, forested and wildland areas, and the steps individuals and communities can take to reduce the susceptibility of buildings and property

to fire.[85] FireSmart involves reducing the potential impacts of wildfire on individual homes by following simple, preventative steps — such as clearing all plants and other vegetation from within 10 metres of a structure, ensuring no trees or other vegetation are overhanging the roof and carefully choosing tree species less susceptible to burning such as birch and aspen[86].

To implement the initiatives, local firefighters regularly visit homeowners, running through a checklist of potential vulnerabilities and practical solutions they can implement. They also hold FireSmart community information sessions, and events where residents can bring dried wood cleared from their properties to a central location for wood-chipping, with the aim of reducing the fuel on each property.

Preparedness

Logan Lake also adopts a "forward-thinking approach" to forest stewardship that includes creating a wildfire risk management plan and surveying the surrounding area using "sophisticated and high-level technology such as LiDAR (high-resolution information), web-mapping tools and geographic system information (GIS) data.

6.3.3 Aq'am

Response: communication and coordination

The Aq'am has a relatively small population of 391. The development of a revised regional emergency operations plan in East Kootenay was released in November 2016, as a major achievement for all area communities. Whether those communities had service agreements with the Regional District or not, consulting directly with them in developing the revised plan was a must.

In 2017, with fire at its doorstep, the community's first call was to 911, then the City of Cranbrook Fire Department — which immediately dispatched its crew to fight the blaze threatening the homes. BC Wildfire Service (BCWS) was also contacted and arrived quickly, with crews from both organizations working together to control the fire. With aircraft in the area, and given the community's proximity to the nearby airport, air support was available in 30 minutes or less. Quick evacuation of 37 homes was carried out. For three days, approximately 110 people were displaced from their homes.

As the fires were being fought, the Regional District of East Kootenay (RDEK) provided staff support while members of the Aq'am checked evacuated households and set up accommodations for evacuees. As events unfolded, the community's Emergency Operations Centre (EOC) and the RDEK's EOC were in constant communication. This coordination, of resources and information, played an important role during the emergency.

In the fall, after the fires, the joint effort and well-coordinated communication were recognized more formally through a special celebration that held great meaning for all involved. Members of the Aq'am are now taking part in joint emergency preparedness meetings and training.

[85] Government of British Columbia. Public Safety & Emergency Services website. See https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/for-your- home-community.
[86] Government of British Columbia. Public Safety & Emergency Services website. See https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/for-your- home-community.

6.4 Review

In December 2017, the government of British Columbia announced an independent review examining the 2017 flood and wildfire seasons, co-chaired by George Abbott and Chief Maureen Chapman. The review was conducted by community engagement approaches, to gather critical knowledge to better understand the experiences that individuals, families, communities and organizations faced. The report was submitted in 2018 and in the same year the government of British Columbia announced action plans according to the suggestions in the report.

Community engagement

One-on-one meetings	This included meeting with and hearing from key stakeholders, as well as government and First Nations leaders and officials
Community events	This involved travelling to communities to hear directly from British Columbians, including the many First Nations communities disproportionately impacted by events in 2017
Online engagement	The team invited all British Columbians to provide feedback through a public online engagement platform launched in mid-February 2018
Written submissions	Public comments submitted by electronic or regular mail for consideration
Analysis and reporting	With community, stakeholder, government and First Nations feedback gathered, this stage of the Review then involved thoroughly assessing that input to produce the report and the series of recommendations.

Working timeline

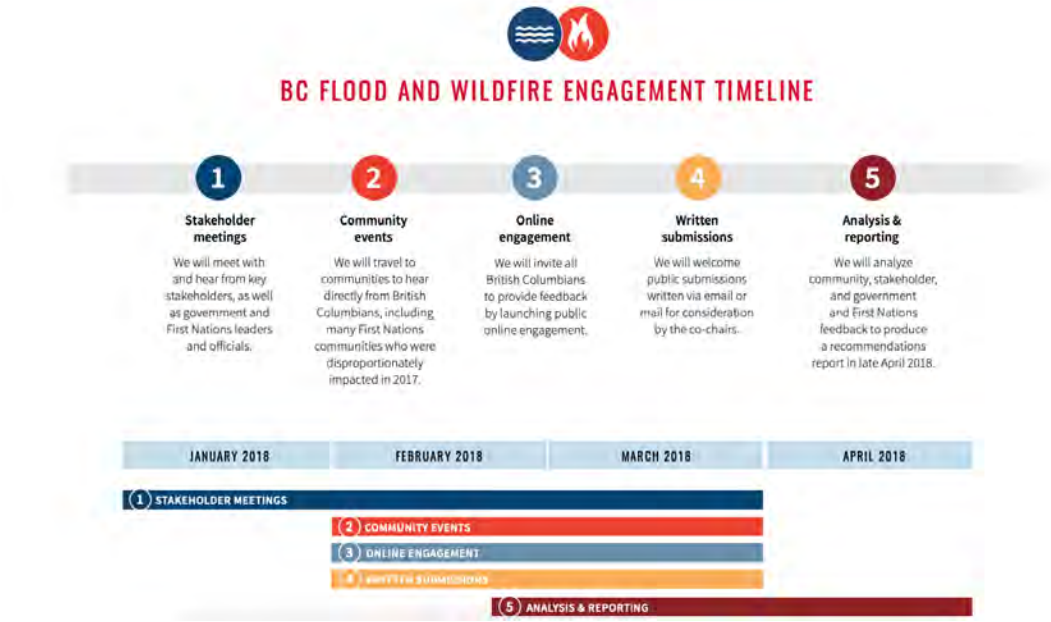

Figure 26. Engagement timeline[87]

Suggestions

After reviewing the experiences, the report puts forward recommendations on state and local levels to enhance disaster management, belonging to several categories as follows:

- **Participation and Partnership:** The team suggest enhanced, on-the-ground partnerships among local groups. Informal partnerships of 2017 should be strengthened and formalized through registration and training.
- **Knowledge and Tools:** Firefighting teams would become familiar with the local area over a two-week period, only to be reassigned to another region of the province. To maximize local knowledge and enable greater consistency in approach, the team suggest incident management teams (IMTs) should be reassigned to the same wildfire whenever possible. Contemporary technological tools such as LiDAR can also be adopted to better protect British Columbia from disasters.
- **Communication awareness:** After evacuation, people are rightly concerned about the condition of their homes and properties. In 2017, obtaining reliable information in real time proved extraordinarily challenging for some evacuees. In the absence of timely and accurate information, some turned to social media for updates — only to be confronted by misinformation. Effective strategies should be developed for information-sharing between response authorities and the public. This also extends to improving communication between and among levels and agencies of government during an emergency.
- **Investment:** There is a growing gap between investment in the first two pillars of emergency management (planning/preparedness, prevention/ mitigation) and spending on response. A review on the fiscal budget should be carried out to allocate resources in a more balanced manner

[87] Abbott and Chapman, p49.

6.5 Discussion

The case of British Columbia is illustrative of a mature system in response to disasters. There are a few highlighted points that the project in Sai Kung can reference, listed as follows:

- The state government of British Columbia has established sophisticated systems with state to local levels of institutions in disaster management, with clear guidelines and strategies in response to specific scenarios. Communication systems are also well established on and across different levels of institutions. Resources and institutions are also available in Hong Kong but further communication mechanisms and coordination plans can be developed in order to enhance disaster preparedness and community resilience.
- Involvement of local communities are also seen in efforts for fire prevention such as clearing fuels close to the community - the involvement of students and animal ranchers is mutually beneficial to the stakeholders and the community as they can learn / gain what they need while keeping the community safer in case of emergency. Therefore, the need and activity of local community can be plotted so that programmes beneficial to both local stakeholders and the community's disaster preparedness can be designed.
- Post-disaster reviews can be outlined and planned, with the engagement of local communities so that they can systematically review their experiences, and sustainably build them up as knowledge in face of hazards and pass them on to others and the next generations.

7 Case 6: Crowd crisis at Love Parade, Duisburg, Germany, 2010

7.1 Disaster

The case is selected for its systematic analysis of crowd crisis, with disaster risks due to mass panic, stampede, and crowd crushes. The case is relevant because Sai Kung town centre is a popular and overcrowded tourist destination during holidays, be it in summer, for water sports, or in winter, as a starting and gathering point for hiking or camping. There are also mass events such as the Birthday of Tin Hau, when many people come to Sai Kung to attend the ceremonies. Meanwhile, Sai Kung has potential risks of crowd crisis since the roads are narrow with high usage by drivers and pedestrians. Although major crowd events seldom take place in Sai Kung, it is still worthwhile to learn about how to prepare or respond to crowd crisis in case of emergency, such as evacuation when fire or sudden natural hazards occur.

The case study is mainly based on the study by Helbing and Mukerj (2012), on the crowd crisis during the Love Parade on July 24, 2010, in Duisburg, Germany where 21 people died and more than 500 were injured. The festival area of the Love Parade in 2010 was approximately 100000 square meters large and located in the area of a previous freight station of the city of Duisburg, which was considered to be too small to accommodate more than a million visitors.

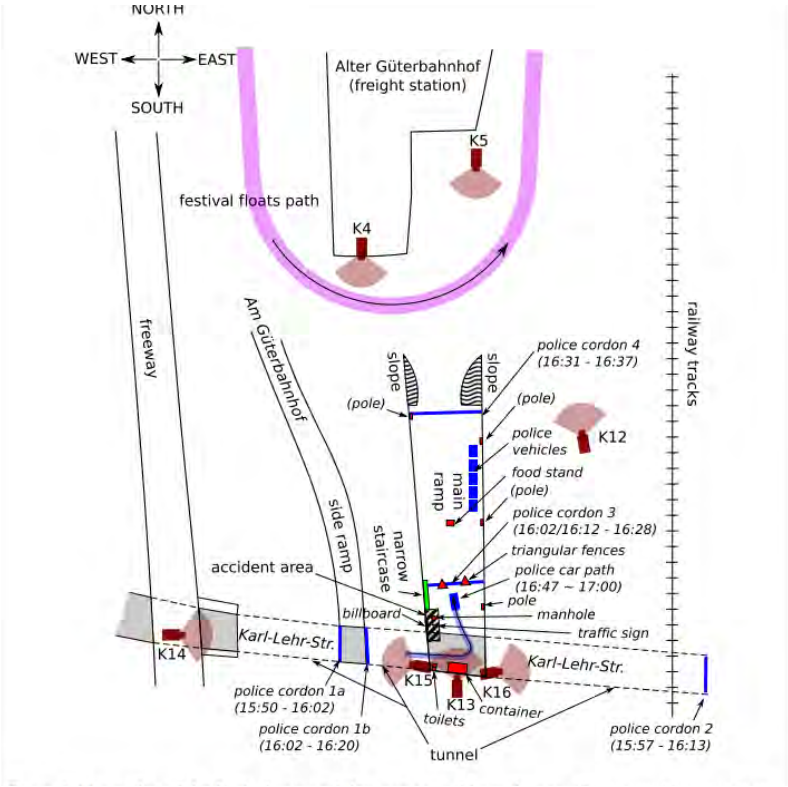

Figure 27. Illustration of the festival area with its entrances and exits[88]

[88] Helbing, D., & Mukerji, P. (2012). Crowd disasters as systemic failures: analysis of the Love Parade disaster. *EPJ Data Science*, *1*(1), p. 5.

Disaster

Helbing and Mukerj (2012) summarise two major factors leading to the crowd crisis - the failure of flow control and a lack of overview of the situation.

Failure of flow control

Since the festival area was relatively small and furthermore constrained by railway tracks on one side (in the East) and by a freeway on the other side (in the West), a risk and the bottleneck at the ramp during peak hours was foreseeable.

The first problem on the day of the Love Parade occurred when the opening of the festival had to be delayed by approximately one hour due to a delay in the completion of the leveling work. Visitors of the event must have become impatient, particularly because there was probably a lack of food, drinks and toilets outside of the festival area (since such long waiting times were not anticipated). One could, therefore, expect that it would be difficult to control the inflow. In this connection, it is also worth noting that there was not much entertainment outside the festival area to shorten the psychological waiting time and to relieve stress and impatience.

It also seems to have taken a considerable amount of time to get the requested police support. Communication by walkie talkies and mobile phones did not work reliably. There were also no functioning loud speakers at the ramp.

A lack of overview of general situation

When the crowd was trapped in a situation of extreme density, it did not have a chance to get an overview of the situation and possible ways to improve it, in particular to get out of the area. Signs and loudspeaker announcements were not available. The only possible emergency exits they could recognise were the narrow staircase, the pole(s), and the container of the crowd management. It is known that dense counter-flows are unstable and may give rise to mutual blockages, which can cause crowd disasters. Police had helicopter surveillance and was filming the ramp from the top. However, it took some time until the criticality of the situation was noticed and evacuation measures were taken. According to the police report for such a delay, there are two major reasons:

- First, it takes time to collect information locally, and bring it to the attention of the chief police officer, who then takes a decision and gives commands. These are then transmitted down to the local police forces through the command chain.
- Second, critical situations are often characterized by incomplete, contradictory, and ambiguous information, which makes it difficult to assess the situation correctly and come to the right conclusions

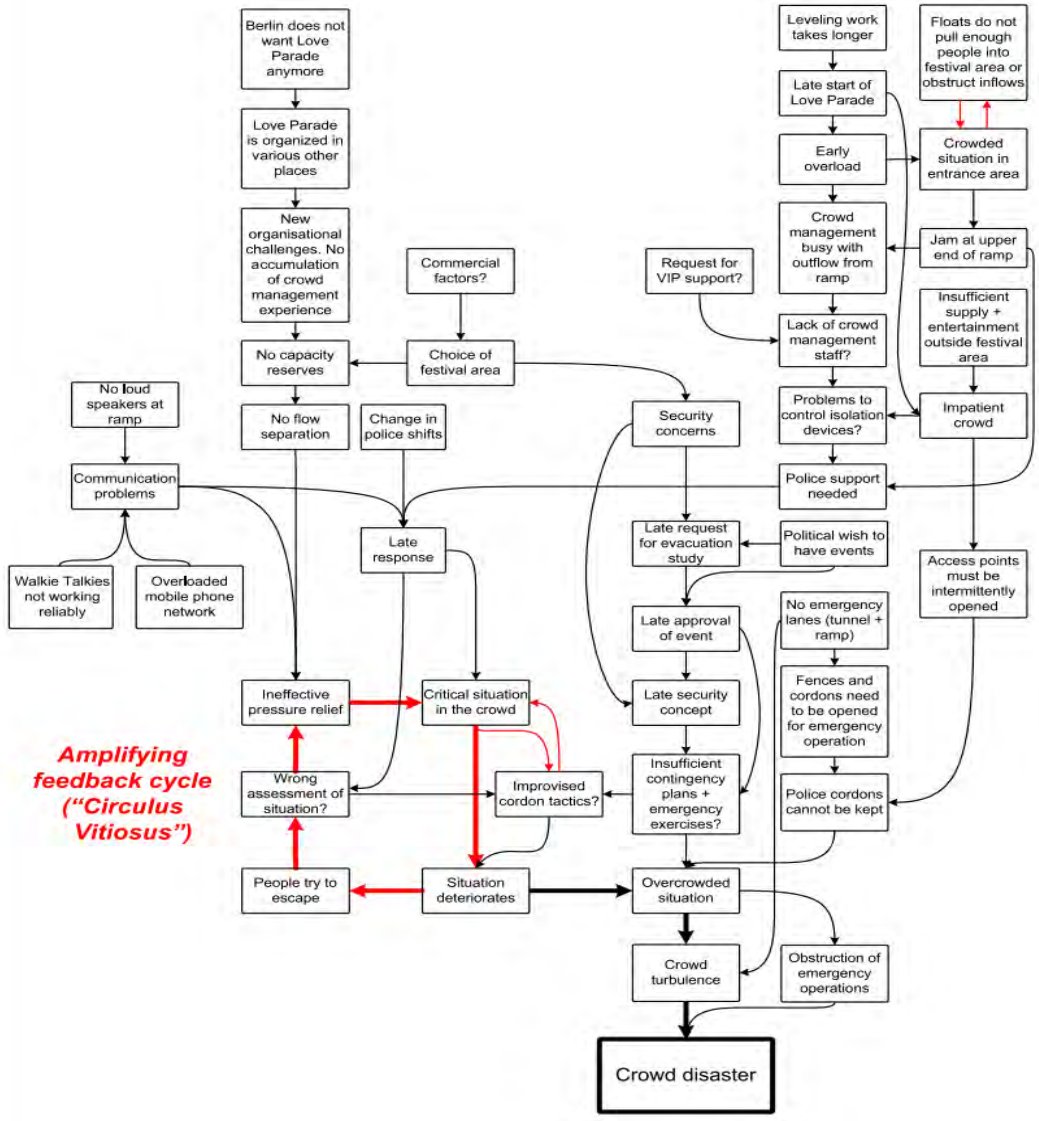

Figure 28. Illustration of causal interdependencies regarding the crowd disaster during the Love Parade.[89]

Emergency

When the situation on the ramp became unbearable and life-threatening, people started to escape via the pole, the container and the staircase next to the ramp. However, due to the noise level, screams for help, were hard to comprehend. Meanwhile, visitors (on the East did not have a sense of emergency. Finally, with the situation poorly-assessed and thus having ineffective responses from crowd control units, the turbulence within the crowd turned into disaster with people falling to death when escaping while there was no immediately available assistance given. The following chart shows the causal analysis of interdependent factors leading to the disaster, and an amplifying feedback cycle (vicious cycle) is identified.

[89] Helbing and Mukerji, p. 21.

7.2 Discussion

Helbing and Mukerj (2012) have highlighted the importance of resilience in their study, that a good organizational concept should be resilient, robust to mistakes and complications since many disasters do not have a single causing factor but are the result of interaction effects. It is also important to identify the risks of and avoid systemic instability, where small perturbations can trigger a series of events through mutual amplification effects in a way that things eventually get out of control. They also suggested a few points to build a safety culture and facilitate disaster preparedness and mitigation in response to crowd crisis:

Preparedness:

- **Prevention**: Critical points should be removed, and it must be checked, whether the remaining problems can be safely handled by crowd management and control measures also under adverse conditions. Safety margins (such as capacity reserves) should be foreseen, and detailed contingency plans should be worked out for likely and unlikely events, and exercised.
- **Analysis**: An analysis of the expected inflows and outflows (and, hence, number of participants) needs to be performed, considering the possibility of large flow variations. There are two main aspects of analysis:
    - Intersecting flows should be avoided and different flow directions should be separated (as dense counter-flows are unstable and dangerous). A 'circular' flow organization, preferably with alternative routes, should be considered. Moreover, space for emergency vehicles and operations should be reserved.
    - A bottleneck analysis is crucial. It must also take into account moving bottlenecks such as floats, but also the operation of police or emergency vehicles. Confluence, turning and intersection points should be determined. In this context, computer simulations with state-of-the art pedestrian software can be useful.
- **Contingency plans**: Pressure relief and evacuation strategies must be prepared for any potentially critical areas. Evacuation measures must be started before an area becomes overcrowded.

Mitigation

- **Facilities**: proper signposting must give visitors orientation everywhere about locations of facilities, ways in and out, and emergency exits. Facilities (e.g. toilets), supply (particularly food and water), as well as entertainment should be ensured also for people on the way to the festival area and for those waiting to enter.
- **Communication**: communication networks must work from both technical and organizational perspectives, so as to detect, avoid, and respond to critical situations, which should be continuously (re-)assessed to check for the plausibility of the situational analysis, considering possible alternatives. Quick information feedback about the situation in any relevant place and about any relevant factor must be ensured. It is important to have an efficient information flow between the different people and institutions involved (organizers, police, emergency forces, crowd).

- **Response**: it should be considered to give police and emergency forces more autonomous (local) decision-making power and responsibility, particularly when communication is interrupted or quick action is needed.

Although the risks of crowd crisis in most cases are evaluated by events instead of local community, our project in Sai Kung can still contribute in reducing the risks by adopting several measures suggested above, to enhance preparedness in local community, or at least, to offer advises to local organisations planning for mass events and emergency services in responding to crowd crisis.

8 Conclusion

The cases in this desktop research study encompass experiences in different categories, including various social contexts - countries, populations, economy and cultures, scale and types of disasters - from large scale earthquakes and tsunamis to relatively small scale crowd crisis, and geographical settings, coastal, mountains, forests and urban, with different focuses on community, urban planning, natural environment and cultural heritage. The scope of study in this Research Project corresponds to particular cases and discussions are conducted on relevant and applicable initiatives and actions from the above cases.

Types of disasters

Cases	Disaster	Environment / landscape	Relevant risk in Sai Kung
Kaohsiung	Hurricane / mudflow	Rural / coastal / mountain	High (in typhoon seasons)
New Orleans	Hurricane / flooding	Urban / coastal	High (in typhoon seasons)
Tharangambadi	Tsunami	Coastal / rural	Medium (in rarer conditions)
NE Japan	Earthquake / Tsunami / Nuclear	Urban / rural	Medium (in rarer conditions)
British Columbia	Fire	Forest / rural	High (in dry seasons)
Duisburg	Crowd crisis	Urban	Medium (in rarer conditions)

Cases	State level	Local level
Kaohsiung	Prevention through education, administrative collaborations, monitoring systems and infrastructure improvements Recovery by rebuilding communities	Community building by accommodating specific needs among indigenous groups
New Orleans	Urban planning with both infrastructure improvement and environmental conservation to protect the city from future disasters	Local participation in policy-making processes and provision of job opportunities to the communities affected by disasters, building community resilience

Tharangambadi	Monitoring and warning systems reinforced Coordination of the allocation of emergency resources Enforcing land use zoning to prevent future disasters	Emergency response centres established and emergency shelters and relocation settlements provided Involving individual households in the design of their own relocation settlements Allowing flexibility for local communities amongst land use zoning restrictions so that they can sustain their livelihood
NE Japan	Unified planning and efforts in coordinating rescue and conservation works for cultural heritage, with academic and professional institutions	Combined process of reconstruction and cultural heritage preservation in local communities Involvement of local communities in rescue and conservation works Preserving the memories of disaster as a basis of knowledge and outlet of sentiment in face of the past and future disasters
British Columbia	Established mechanisms of emergency response and communications across various levels of government and institutions Review and study of disaster experiences for better prevention and actions in case of future disasters	Local authorities initiating tailored schemes and plans in preparedness and response to disasters suiting the resources and needs of local communities
Duisburg	-	Communications among various parties, especially emergency response units being crucial Establishing clear instructions of emergency routes easy to follow and obstacle free being essential to reduce the impact of crowd disasters

To sum up the discussions, this part attempts to generalise some common strategies as cornerstones when our study further proposes plans and actions for local communities in Sai Kung:

- **Understanding**: prior to any plans or guidelines, it is important to understand the local community of what they need, what their life, or taskscape, is like so as to draw sustainable plans which are mutually beneficial for the community members themselves and the disaster management works. Mapping the resources, including natural settings and local organisations, are also important so that plans and actions can be supported or carried out smoothly.
- **Communication**: communication systems are of utmost importance especially during disaster mitigation and response, between local and central level institutions, since their communications affect how actions are executed and resources are allocated. Communication systems should be established as a means to enhance disaster preparedness.
- **Reserving vacant space**: it is common among the cases for contingent actions in response to disaster that the community will have to identify or reserve vacant spaces before or immediately after the occurrence of disasters. For example, temporary shelters, evacuation gathering points or storage space for heritage objects all require spaces away from the heavily affected areas by disasters. It is especially important for Sai Kung to identify these spaces since its open areas are not abundant while villages are surrounded by vegetation, as a means of enhancing disaster preparedness.
- **Encouraging active involvement / central role of local residents**: not only is it important to involve local residents in the process of building disaster preparedness, since they are the main holder of local knowledge and patrons of local resources, in the recovery phase, if and after a disaster occurs, the relief work is not a sustainable means in helping them lead a better life, but they themselves exploring and acquiring various resources and different means of living to move on and reinhabit the local community.

After all, with the cultural and social contexts in Sai Kung differing from the afore studied cases, the above discussions serve as starting points and references to develop the communities' own strategies, plans and actions. With the data collected from field research, more aspects of the local community regarding disaster preparedness and resilience can be plotted. This will be further discussed in our Research Project in the next phase.

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RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX III

RESEARCH REPORT 2B

SWOT ANALYSIS TO THE PRACTICES IN BUILDING COMMUNITY DISASTER RESILIENCE

JULY 2022

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Research Report 2b
SWOT Analysis to the Practices in Building Community Disaster Resilience

Research and Model Development on Community Disaster Resilience Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

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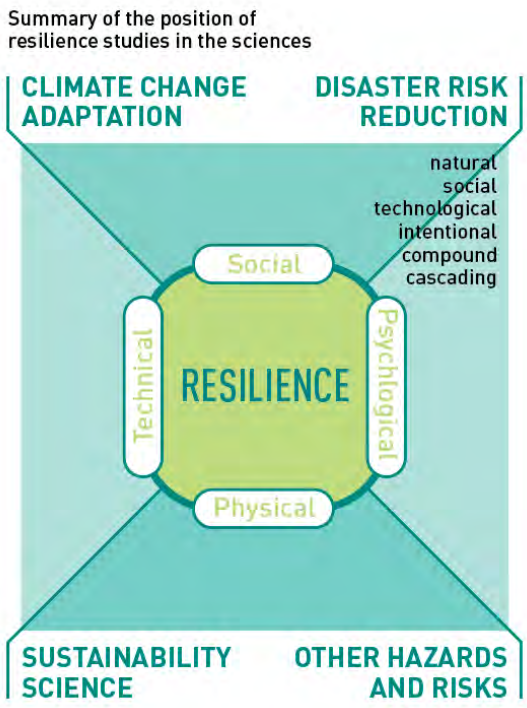
1 Introduction

1.1 Community Resilience

Resilience

"Resilience" in the scope of this study on disaster preparedness within local communities, refers to the capacity, precisely speaking, strengths and resources available to anticipate, cope with, resist and recover from disasters, reducing disaster risk to effectively protect persons, communities and countries, their livelihoods, health, cultural heritage, socio-economic assets and ecosystems[1].

The term "resilience" has been understood analogically from the past to the present. In the past, the term was to describe the mechanical property of materials, and then applied to the study of ecology and psychology, and eventually to climate change adaptation, disaster risk reduction and sustainability science.



Alexander (2013, p. 2714)[2]

[1] Prevention Web. 'Resilience'. https://www.preventionweb.net/understanding-disaster-risk/key-concepts/resilience. Accessed on 18th July 2022.

[2] Alexander, D. E. 2013. Resilience and disaster risk reduction: an etymological journey. *Natural Hazards and Earth System Sciences*, *13*(11), 2707–2716.

"Resilience" has made the transition from ecological to socio-ecological work, or at least to human (cultural) ecology[3]. The clearest articulation of this transition appears in the work of Berkes and Ross (2013, p. 14): "Resilience is a systems concept, and the social-ecological system, as an integrated and interdependent unit, may itself be considered a complex adaptive system."[4]

Community resilience

The concept also entered into sociology and human geography, if understood collectively within our communities, in the sense of resilient communities[5]. The study scope then concerns not only individual responses to changes but a societal phenomenon, in the prospect that higher resilience of the community can enhance sustainability and well-being. Still, there are further expanding definitions on the concept. Apart from the robustness and adaptation capacity of social networks, it also encompasses exposure management and resistance[6].

[3] Ibid, p. 2712.
[4] Berkes, F. and Ross, H. 2013. Community resilience: toward an integrated approach, Soc. Nat. Resour., 26, 5–20.
[5] Tobin, G. A. 1999. Sustainability and community resilience: the holy grail of hazards planning?, Global Environ. Chang. Part B: Environmental Hazards, 1, 13–25; Adger, W. N. 2000. Social and ecological resilience; are they related?, Prog. Hum. Geog., 24, 347–364.
[6] Pelling, M. 2003. The Vulnerability of Cities: Natural Disasters and Social Resilience. London: Earthscan.

In the context of disaster risk management, Rodriguez-Llanes and her colleagues has developed a useful framework to further elaborate different aspects for community resilience[7], including their actions in disaster risk reduction and social protection for the vulnerable, a learning process of the community – how knowledge is produced, accumulated and disseminated, and their resources and capacities in carrying out the above.

In building resilience in a community context, several aspects are expected on the community if viewed as a resilient system, including its high level of diversity, level of connectivity, integration of knowledge, level of redundancy (allowing areas to fail without leading to systemic collapse), equality and inclusivity of the vulnerable, and social cohesion and capital.

1.2 Further analysis of relevant cases

In the previous case studies presented in Research Report 2a, details of disaster prevention, mitigation, preparation and recovery are illustrated. They provide useful references for initiating and implementing approaches of building community resilience in Sai Kung.

Based on the case studies, this report will continue to summarise the strategies in response to the disasters in each case, particularly on building community resilience in mainly two aspects: first, how the institutions of local administration facilitate community resilience, in other words, a top-down direction. It includes their vision for long term planning, knowledge production and institutional coordination in the execution of strategies. Second, how local communities initiate actions to build resilience, such as the establishment of organisations, ways of communication and utilisation of resources.

On each case, the report will generate a SWOT analysis on applying their strategies on Sai Kung. Precisely, opportunity analysis will evaluate the feasibility and readiness, concerning the resources and capacities that the current Sai Kung community and related institutions can apply the strategies; threat analysis will examine the foreseeable limitations of the current situation of the Sai Kung community and related institution which may deter the application of strategies; meanwhile, strength analysis will discuss the prospective benefits of applying the strategies, as an action to reduce disaster risks and/or a learning process, for institutions and local communities in Sai Kung; on the contrary, weakness analysis will critically assess the effectiveness when the strategies are applied on the existing condition of institutions and local communities.

[7] Rodriguez-Llanes, Jose & Deeming, Hugh & McLean, Laurence & Castro Delgado, Rafael & M'Bala, Simone & van Loenhout, Joris & Gil Cuesta, Julita & Delbiso, Tefera & Guha-Sapir, Debarati. 2015. Handbook: data-collection protocols and statistical analysis plan for emBRACE HSS component. 10.13140/RG.2.1.4715.0569.

2 Discussion on Cases

2.1 Local case on disaster preparedness education – Hong Kong Red Cross

Hong Kong Red Cross (HKRC) has been promoting disaster preparedness to the public and organized annual educational activities. In 2019, it held a one-month "International Day for Disaster Risk Reduction 2019: A Closer Look at Disaster Preparedness" activity. Though it was held in the headquarters of HKRC, their activities may be a prototype for educational approaches to be carried out in Sai Kung. The HKRC activities targets the general public and schools as their audience and they include knowledge in raising the awareness of disasters and basic approaches to keep oneself safe in case of emergency. These may not be contextualised in HKRC's activities but they can be applied to Sai Kung's environment – for example, designing particular escape routes according to its landscape.

2.1.1 Summary

The activities are designed and executed by HKRC which encompass several types of disaster to which Hong Kong citizens are commonly exposed to. They include learning processes of understanding disaster risks and ways to minimise loss during disasters, which allowed the public to get more information and knowledge about disaster prevention and preparedness, first aid and community health through various games[8]. Students are also encouraged to design their own tools in response to disasters.

2.1.2 Educational activities

Accident response

HKRC held workshops to promote knowledge in response general accidents such as "First Aid in a Minute".

Specific Disasters

HKRC also designed educational games for specific scenarios of disasters such as "Escape from Fire" games which allowed the participants to learn the correct way of how to plan a fire evacuation route.

HKRC also introduced three newly-developed disaster preparedness virtual reality games, which resembled the real-life situations. For example, the games simulated earthquakes, floods and the spread of infectious diseases, giving the public an opportunity to experience the tension and threats brought by the disasters, and thus raise their awareness of crisis. The games provided bilingual versions, in both Chinese

[8] Hong Kong Red Cross. Newsletter. 2019. https://reliefweb.int/report/china-hong-kong-special-administrative-region/newsletter-hong-kong-red-cross-december-2019

and English, with voice navigation to instruct participants to complete the tasks, so that they can learn from the games and equip themselves with disaster preparedness knowledge.

Community

HKRC invited students from Sik Sik Yuen's primary and secondary schools, as well as their special schools to design a disaster kit with environmentally friendly materials. It is a way in disaster education that students can be involved in a process of evaluating disaster risks faced and their knowledge enhanced in minimising their risks with appropriate tools. Thus, their knowledge on disaster response can be strengthened.

2.1.3 SWOT analysis – Local case

Strength

Educational activities on general first aid knowledge is useful and can be applicable to many occasions including disaster scenarios when first aid can be performed to prevent or deter the physical condition from further worsening. The tools can be easily obtained and distributed. It is just that in the context of rural villages in Sai Kung where sufficient amount of first aid materials cannot be easily or instantly obtained such as a stretcher or steriliser if transport routes are disrupted, the educational activity can also elaborate more on alternative materials, such as household items or natural resources, to be used as first aid tools in case of emergency.

Specific disasters are also posing risks to Sai Kung residents and familiarising with the disasters and basic approaches to minimise harm are beneficial to residents. The use of VR technology is also an effective way to visualise the actual scenario when some disasters have not been encountered before especially for younger generations such as fires or flooding, or even say earthquakes, for example, have not been experienced by older generations either. Their awareness can be raised and residents may realise the importance of building up their disaster preparedness.

Designing a disaster kit to list and prepare tools and resources needed in case of emergency (such as flooding, mudflow or fire) can serve both functions as learning process and an action for disaster preparedness. Residents are encouraged to evaluate the disaster risk in the context of their communities and make use of their resources to design appropriate and efficient tools to minimise their loss.

Weakness

First aid education activities might not be interesting or relevant to their daily lives when related information or first aid services has already been available within the community. For example, the Sai Kung District Office has been organising activities such as the 'Fire Safety Ambassador Scheme', first aid courses, fire safety talks and visits to Fire and

Ambulance Services Education Centre cum Museum for residents and students in the district[9].

VR technology is by its nature a virtual game. Some factors such as the magnitude of the disaster or response of other people (which may lead to crowd crisis) may be downplayed. Disaster kit is designed based on people's assumption of the scope and the scale of disasters, which may not reflect or be capable of reducing risks of disasters whose scale and scope may exceed their assumption. Moreover, VR games are individually conducted there may not be interaction with other community members so that it is uncertain whether resilience is enhanced for the entire community.

Opportunity

Designing a kit with local materials is possible given the fact that Sai Kung has a diverse landscape and abundant resources such as objects and vegetations along the coast and by the mountains – some also still practice fishing or farming. Even they are no longer practicing, the reuse of abandoned tools may also be possible. Residents involved can utilise the resources and capacity their community have.

Threat

Escape routes can be more easily predicted in an urban context but in a rural context such as the villages in Sai Kung, escape routes are to be subjected to the environment and whether residents can plan their routes, to a certain extent, depends on their knowledge to the relatively complex neighbouring landscape and judgement on the changing disaster scenario. Thus, trained knowledge, such as the observation of wind direction in case of fire, or the assessment of the risk of further collapse in case of landslide, has to be rendered instead of a simple escape route.

[9] Home Affairs Department. District Fire Safety Committee Activities. https://www.buildingmgt.gov.hk/en/Whats_New/8_2_2h.html. Accessed on 18th July 2022.

2.2 International cases

2.2.1 Case 1: Kaohsiung and its surroundings, South Taiwan in response to Typhoon Morakot, 2009

In a similar context, Hong Kong also faces the disaster risks brought by typhoons especially during summer. Particularly in Sai Kung, communities are exposed to the risks of flooding due to the proximity to the coast and the risks related to hilly landscape such as mudflow and blockade of land traffic.

Summary of strategies on building disaster preparedness and community resilience

Institution

In the case study, it is revealed that Taiwan shares common institutional strategies with those in Hong Kong such as warning systems and response mechanism in the emergency situations particularly those induced by extreme weather conditions such as typhoons and hurricanes, including flooding and mudflow. But Taiwan's strategies encompass more than the aforementioned aspects, which are listed as follows:

Education

The educational institutions assume their leading role in knowledge production and dissemination regarding disasters. Schools are also conceptualised as a "disaster-ready community": each campus will evaluate threats of disaster, the societal situation and disaster history; the school will also integrate the campus environment to evaluate its capability for performing emergency response tasks. Different learning targets are set for each level of students, for example, those at kindergartens to learn about safety awareness, primary schools about understanding disasters, secondary schools about helping each other and leadership in the prevention of disasters, and universities about developing and executing prevention plans.

Administration

Governmental institutions also help build disaster preparedness by coordinating different community organisations, on one hand, identifying groups in need such as long-term care facilities such as elderly homes and nursing homes, and on the other hand, listing partnering organisations, particularly those with spare space for accommodating people such as with local accommodation providers, religious spaces and logistics companies, can thus provide not only space but also other resources such as manpower and transport instruments to assist other groups when in emergency. In this way, community resilience is strengthened by enhancing their readiness in responding to disasters.

Community

Under the coordination of institutions such as schools and the government, local groups are also organised and enhancing community resilience within themselves. For example,

schools set up disaster prevention club to help build organisation and action plans for disaster prevention. Communities, for example, in Xingang Village, are also collaborating with local tertiary education institutions to conduct disaster risk assessment and produce disaster prevention map, for both tourists and local residents, indicating lowland areas (with higher risk of flooding) and evacuation routes to higher lands.

Volunteering

Within local neighbourhoods, volunteers are also recruited under the coordination of multiple government agencies to build an information dissemination platform to monitor the changing environment and disaster risks, so that the institutions may gain more accurate and instant information in response to disaster.

2.2.2 SWOT analysis – International Case 1: Kaohsiung

Opportunity

In Sai Kung, there are strengths in terms of tangible resources to facilitate the implementation of the aforementioned strategies. Particularly in the area of Sai Kung Town Centre, there is a wide range of clustering institutions providing various services with different groups of residents such as long-term care facilities as well as educational institutions. The residents of surrounding areas commute to the Town Centre and it is possible to coordinate groups in collaboration with organisations stationed there and then to disseminate information to other areas. Educational events and the establishment of partnership between institutions can be conveniently carried out as a cluster.

The Hong Kong University of Science and Technology is also a potential partnering institution located in close distance to build a knowledge platform for disaster preparedness with local communities.

Threat

However, regarding community-initiated approaches, there are several weaknesses in Sai Kung that may make the approaches difficult to be implemented. With regard to volunteer groups in building information dissemination platform, local communities in Sai Kung, unlike those in Taiwan, may not usually station in the district. Instead, they may commute to other districts for work which makes it hard to regularly gather people to conduct training or community work.

Strength

Though disasters in Hong Kong in general, including Sai Kung, are well monitored by governmental institutions, there are still a lack of autonomy and proactivity among local institutions. Plotting available resources and spotting groups in need will be of great

benefit so that in cases of emergency, responses can be accurately made without delay for awaiting decisions from governmental agencies and make greatest use of community resources for groups in need.

The setting up of groups of local volunteers will be a good opportunity for local residents to understand not only about disaster preparedness but the environment and history of their own communities. The bonding established within the members are also important as they can connect with one another, along with their own families and neighbours – when in cases of emergency, they are well prepared with their knowledge and respond quickly with mutual assistance.

Partnership with local tertiary institution such as the Hong Kong University of Science and Technology may bring benefits to local communities not only in the sense that practical knowledge on disaster resilience but their resources and expertise in anthropology may also help understand the historical context in facing disaster and consolidate the sense of belonging among residents in the process of collaboration.

Weaknesses

In Taiwan's case, it is worth noting that the community initiated strategies are indeed in their nature dependent on the coordination of institutions such as schools for the clubs of students and government agencies for volunteers. It is not to say that the involvement of institutions weakens community resilience. But it should be concerned that a sustainable way should be explored so that the regular involvement of the local community can be run by themselves, even without the lead by institutions, so that in case of emergency, without the instant assistance from outside parties, local communities can organise themselves to be an effective force in response to disasters.

2.2.3 Case 2: Northeast Japan, in response to earthquake, tsunami and nuclear plant accident, 2011

The Japanese case focuses particularly on the response to the compound disasters of earthquake, tsunami and nuclear plant accident with regards to cultural heritage in Fukushima and its surroundings in Northeast Japan in 2011. It is worth discussing along with Sai Kung because both are rich in local heritage among rural villages and town (for fisher folk communities), and both are facing risks from the coast, as well as nuclear risks due to the proximity to the nuclear plants along coastal Guangdong. The case also particularly addresses many strategies on rescue and recovery work to which Sai Kung can refer for strengthening community resilience in terms of disaster mitigation.

Summary of strategies on building disaster preparedness and community resilience

Instead of merely clearing up the mess and destructed materials right after a disaster, the Japanese institutions and local communities have allowed beneficial work on cultural heritage to operate, before or at the same time with reconstruction or recovery work. This does not only serve as sustainable way in rebuilding the community when cultural heritage is a part of the society but also a perspective to re-imagine disaster as an opportunity which the community can adapt to and benefit from, embracing the idea of resilience as an adaptive mechanism.

Institution and community

The strategies are mainly led by institutions given the fact that the preservation of cultural heritage involves professional knowledge but at the same time members of local communities are also important actors as they participate in telling the story behind the heritage and volunteer in the work of preserving.

Institutions serving as temporary shelter and repository

For example, in the case study, the Rikuzentakata City Museum has continuously been storing rescued objects and undertaking stabilizing treatments on around 460,000 objects, to prevent them from being further damaged by the environment.

Documentation with the community

Local universities, such as Tohokugakuin University in the case study, worked with students rescuing objects to then display them at the University museum, identified them with the help of the owners and produced an oral history for each object. A digital inventory is also set up with the participation of local community. These serve as an opportunity to review the existing but undocumented cultural heritage, as well as their connection with people within local communities.

Rediscovering heritage of community

Instead of rebuilding the destructed houses right away, the residents agreed that archaeological excavation can be performed before reconstruction so that local heritage

can be enriched and protected from being further damage due to construction projects. Some residents even participated in the process of excavation.

2.2.4 SWOT analysis – International Case 2: Northeast Japan

Strength

To apply the case of Japan in Sai Kung's context, institutions can be reserving or at least spotting potential vacant space to serve as temporary shelter and repository. By doing so, not only important cultural heritage can be protected during cases of emergency, other important community assets can be temporarily relocated and soon be recovered as well. In terms of community resilience, such a strategy preserves the resources and capacities of a community for future action.

Documentation and rediscovery of community asset after disaster helps the local community gain an in-depth understanding not only of the heritage or other tangible items but the incident of the disaster and community themselves. During such a process, members of the local community can picture the impact of and the response of the community to the disaster. And by rediscovering and protecting their heritage or community assets, members can build stronger sense of belonging and coherence in joint effort. Most important of all, they can reconceptualise disaster not only as bringing harm but also opportunity and reaffirming their own resilience in adverse situations.

Weakness

To reserve or spot vacant space will concern the right and liability to use and manage (and the duration of usage), in other words, the property owner's and the users' interests. If this is to be an official policy, it may also involve complications such as the setting up of regulations regarding the aforementioned issues.

Documentation and rediscovery of community asset may not be of the interest, or, one of the top priorities, among the stakeholders, who may be prioritising rebuilding or replacing what has been lost during the disaster. There are also issues over to whom the assets belong if they are unidentified. These make residents unlikely to be willing to commit their agreement on such strategies beforehand.

Opportunity

There are quite a number of community facilities in Sai Kung, especially in the area of Sai Kung Town Centre, for example schools, community centres and sports facilities. Although they are in use in normal periods, they can still be designated as space for storing in emergency use. Moreover, as rural village settings may not allow such a space, this may be necessary if there is a regional one set up in the Town Centre.

Members of local community may be willing to join the documentation and rediscovery projects as they may find protecting their ancestral heritage important and there is an urgency to restore their status. The local members as volunteers may work with professional personnel and share their local knowledge so that better understanding on the heritage as a community asset and on the disaster experience.

Threat

Even with space for storage, there should be professional personnel to manage or at least advice the operation of such a space. Unfortunately, there are not many cultural institutions of such kind in Sai Kung such as the Salt and Light Preservation Centre in Yim Tin Tsai, and the Sheung Yiu Folk Museum, which are yet remotely located and not designed as an ideal space for conservation or storage. Moreover, many heritage or community assets are not located in Sai Kung Town Centre. When a disaster takes place, rescue work will be deterred by disrupted transport including the transferral of portable objects.

The work of documentation, excavation, or any sort of field work taking place may be still dangerous. There are risks of secondary disasters such as sudden collapse of trees or structures which may threaten community members or people who come to preserve the heritage or community assets on site.

2.2.5 Case 3: British Columbia in response to seasonal forest fire, 2017

Many villages in the western side Study Area of Sai Kung are surrounded by forests and there are certain risks of wildfire especially during dry seasons in Hong Kong, whereas the villages are prone to due to their remote location and limited resources. The situation is quite similar to the local communities facing the risks of seasonal forest fire in British Columbia.

Apart from a system of disaster management established by the governmental agencies, the towns or villages in British Columbia are quite distantly located from one another and in the case study, whose situation and population are quite similar to those of Sai Kung's. Some of them have developed quite unique disaster prevention, preparedness and response strategies by the efforts of their communities which have demonstrated a high level of resilience.

Summary of strategies on building disaster preparedness and community resilience

Institution

In this case study, it is found that British Columbia has well-structured institutions on governmental level and an established mechanism in response to cases of emergency encountering disaster, not limited to forest fire but flooding and other kinds of natural hazards as well. There are two major strategies that can be taken into consideration for Sai Kung's application:

Central and regional response systems

In the case of British Columbia, there are clear division of labour between central (state) and regional institutions in disaster response mechanisms, which coordinate resource allocation and decision making on different levels. There are also Emergency Operations Centre in charge of local towns and villages as well as the First Nations' Emergency Services Society to serve specifically the indigenous population whose livelihood is different from other national.

Regular review work

The review is conducted every few years by the state government and its processes include community engagement approaches, to gather critical knowledge to better understand the experiences that individuals, families, communities and organizations face. It provides feedback to the institutions so that disaster management strategies can be improved and also enhances community resilience in the process of engagement activities – not only understanding of the community is gained but the community members themselves are familiarised with disaster related knowledge.

Community

Hereby local community refers to the local operators of emergency operation services who are also community members residing in the towns or villages concerned in the case study. In the case of British Columbia, they establish regular practices to enhance community resilience to disaster.

Sustainable disaster management

Apart from emergency operation plans designated by local centres which help minimise losses and harm in cases of disasters, local centres also proactively work with residents in spotting and managing risks in a sustainable way. Particularly in the case of Logan Lake, the local centre work with local schools and residents, to spot and clean up fuel that exposes the village at risks of forest fire. In such a process, the students are also learning about forestry, their natural surroundings and fire principles. The local community also brings herds of cows and goats into area fields each summer to eat large patches of dried grass and weeds (cows only eat grass while goats only eat weeds).

Practically, the application of the strategy need not be related to fire risks but can be applied to spots with high risks of, for example, flooding or landslide. The point is to sustainably alter the landscape or land use so that residents can stay away from major risks during disasters while they can flexibly use the space to perform social or economic activities at other times.

Localised communication systems

Emergency hotlines and also social media are established by local emergency operation centres to deliver information on disaster related issues. Meanwhile, apart from emergency information, there are also regular public information sessions to educate the public about the local environment and disaster risks.

2.2.6 SWOT analysis – International Case 3: British Columbia

Strength

More detailed division of labour and dedicated work force on institutional level will benefit administrative work on regional level. In the context of Sai Kung, there is currently only the district office which oversees a large area and has no special task force working on disaster management and building community resilience. A task force at district level such as a regional emergency operation centre can coordinate and serve as a communication platform for all related institutions such as governmental agencies and local institutions, for instance, schools and NGOs. It also facilitates local groups or services (such as fire services and first aid services) to initiate their programmes in local communities when they have such a network.

Regular review work can also improve the efficiency and effectiveness of the work done by institutions on disaster management and building community resilience. Especially when disaster management and community resilience are still in a pioneering stage in Sai Kung and in Hong Kong generally, review work can provide useful feedback to future planning and also for the reference for the other areas in Hong Kong.

Sustainable disaster management can be an ideal strategy as it goes in line with the needs of local residents, in particular, their ways of living. It benefits not only the situation of disaster management but in general the environment, economy and society, in other words, the resources and capacities of the local community. It can also easily gain the support of local groups and residents, and a network can be built up.

Localised communication systems can be an effective way of delivering disaster related messages, related to both long-term education and in emergency situations. Residents can be fed with official and reliable information on a regular basis, to continue enhancing their awareness and knowledge on making informed decisions in terms of disaster risks assessment and reduction.

Weakness

It would be a complicated process to set up a regional task force on disaster management and community resilience at governmental level since it will involve legislative processes and administrative procedures. Instead, a funded local group, probably in the mode of an NGO, can be a more plausible way. Still, as it is not a governmental agency, their resources and authority may be limited so that they can only perform an advisory function instead of a leadership and executional force.

Regular review work can be performed easily with sufficient funding but the key is whether there is a trustworthy agent, proficient both in disaster-related knowledge as well as community engagement, and with long-term commitment and connection with the local community. Otherwise, the review work may not be sufficiently in-depth and critical to generate constructive findings and feedback to improve the existing work.

Sustainable disaster management can be an ideal picture but it will require a dedicated group of local agents to perform the activities in long term and motivate local residents to perform together. It may also involve a series of practical concerns such as space and finance if those are required. Another issue is that as the result is to be attained in long term – local residents may not be willing to take part in when they are yet to see the rewards in short term.

Localised communication systems can be an effective way to deliver message. Yet, it has to be addressed which party is in charge of generating the information and sustains the cost of operation.

Opportunity

Sai Kung Town Centre in particular has already been stationed by a cluster of governmental agencies which makes setting up a regional emergency operation centre, for example, possible.

Regular review work can be possibly put into operation when there are quite a number of tertiary education institutions with proficient departments or research centres which presumable are capable of carrying out critical review work as well as community engagement projects. For example, Collaborating Centre for Oxford University and CUHK for Disaster and Medical Humanitarian Response (CCOUC) have conducted Ethnic Minority Health Project in China to carry out healthcare need assessment. CUHK and HKU also have projects in conducting community engagement works in rural settings such as projects on Community-based Narratives and Public Experiential Engagement as well as Inclusive Conservation[10].

Threat

The effectiveness of a regional emergency operation centre may be challenged. Even there is a centre as such, there may not be sufficient localized information such as weather and environmental data. There is only one rainfall station in at Hong Kong Adventist College, one weather station at Sai Kung Marine East Station, a tide gauge station at Tai Miu Wan and a wind station at Tap Mun. Regional conditions around Sai Kung Town Centre and the surrounding villages may not be well reflected by the environment data collected from existing stations. Therefore, regional responses may not be accurately generated.

Sustainable disaster management may involve a wide range of stakeholders and issues of resource allocation such as land and manpower. There may be obstacles or opposition when the rights or interests of specific groups are overlooked or infringed. For example, mobilization of villagers, say, to clear up a bush to minimize the risk of fire while using the wood materials to produce artworks or furniture, may lead to several questions: Whose is the land involved? Say, if that belongs to a village's communal property, who will be in charge of the project and what if other opposes, because, for example, it is a *fungshui* forest. Moreover, since such kind of projects mainly involve the utilization of natural resources, when most residents in Sai Kung are not practicing primary economic activity, or have long been away, chances of benefiting them are low and there may not be capable residents to take part in these activities.

10

https://www.epd.gov.hk/epd/sites/default/files/epd/tc_chi/environmentinhk/conservation/files/RA1_Towards%20Sustainable%20and%20Inclusive%20Conservation%20%28Chi%29.pdf
https://www.epd.gov.hk/epd/sites/default/files/epd/tc_chi/environmentinhk/conservation/files/RA1_Yim%20Tin%20Tsai%20%28Chi%29.pdf

RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX IV

RESEARCH REPORT 3A

ASSETS MAPPING OF SAI KUNG COMMUNITY

JULY 2022

Organiser

香港賽馬會災難防護應變教研中心
Hong Kong Jockey Club Disaster Preparedness and Response Institute

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MAKING ON LOFT
社會設計及研習所
COMMUNITY DESIGN & RESEARCH STUDIO

Research Report 3a
Assets Mapping of Sai Kung Community

Research and Model Development on Community Disaster Resilience Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

Date: 19 July 2022

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1 Introduction

This Asset Mapping of Sai Kung Community aims at identifying the social asset and unfolding the potential interconnection between individuals and parties, and the potential correlation between skills and resources for building a disaster-resilient community in the future. With diverse existing assets and their in-between relationships found in the mapping, this report tries to explore on the potential of the discovered assets and deficiencies for the reveal of the key enabling and disabling factors of the future intervention.

Sai Kung retains as a rural development for decades, and emergingly being sub-urbanised. Referring to the "Community Profiling Report", It has gotten more population since the past decades, diversified people of living other than the indigenous locals, the reformation of economy, also being more vibrant in terms of the position of leisure and recreation as a gateway to access preserved nature behind Sai Kung Town. The continuous and upcoming changes threaten the existing way of living of the locals with limited spaces for big initiative to absorb the expansion and to adapt to changes. The complexity and the diversity of Sai Kung require more flexibility and resilience of the community; therefore, assets mapping is essential for a better understanding to the correlation among resources, which enables a better utilisation of community assets.

As mentioned by Research Report 2a, field knowledge including the understanding of the local environment and the community, the active involvement of local residents, and an efficient communication system are essential in disaster management from disaster preparedness to recovery. Resource mapping is as a means to get to know Sai Kung community and to build interdependencies among players and knowledge, aiming to develop a close community with strong bonding and sufficient resources during disaster.

Asset Based Community Development (ABCD) is a Broad Community Building Methodology, a bottom-up implementation scheme involving a variety of local individuals, organisations, and local government with policy making level. By identifying the existing resources and the deficiencies of the community, ABCD helps to connect fragmented resources to maximize the effectiveness, which builds dependence between

people, their knowledge and resources. Empowerment of people is as a result in the process of unfolding hidden relationships and skills to enhance an asset-based resilient Sai Kung community. Assets mapping is always a process rather than a product, in which the map grows and develops over time, aligning with the development of the community.

2 The Assets of Sai Kung Community

A community is full of resources, both tangible and intangible. They are contained in different bodies and groups, that can be categorized into three scales of entities: local institutions, citizens' association and gifts of individuals. Local institutions are the formal institutions located in the community, including private businesses, educational institutions, parks and sport facilities, farms, markets, medical services, uniformed groups, governmental offices, public goods and services, fire stations, police forces, post offices, recycling services and libraries. Citizens' associations is less formal. They may serve particular groups and own particular interests, purposes or social responsibilities. They are livelihood and neighbourhood groups, clubs sharing common interests and activities, concern groups on specific issues, information exchange groups, culture groups, village halls and religious groups. Beside organizations, individuals are essential in identifying resources, who store diverse skill sets and the fundamental power to the formulation of a resilient community.

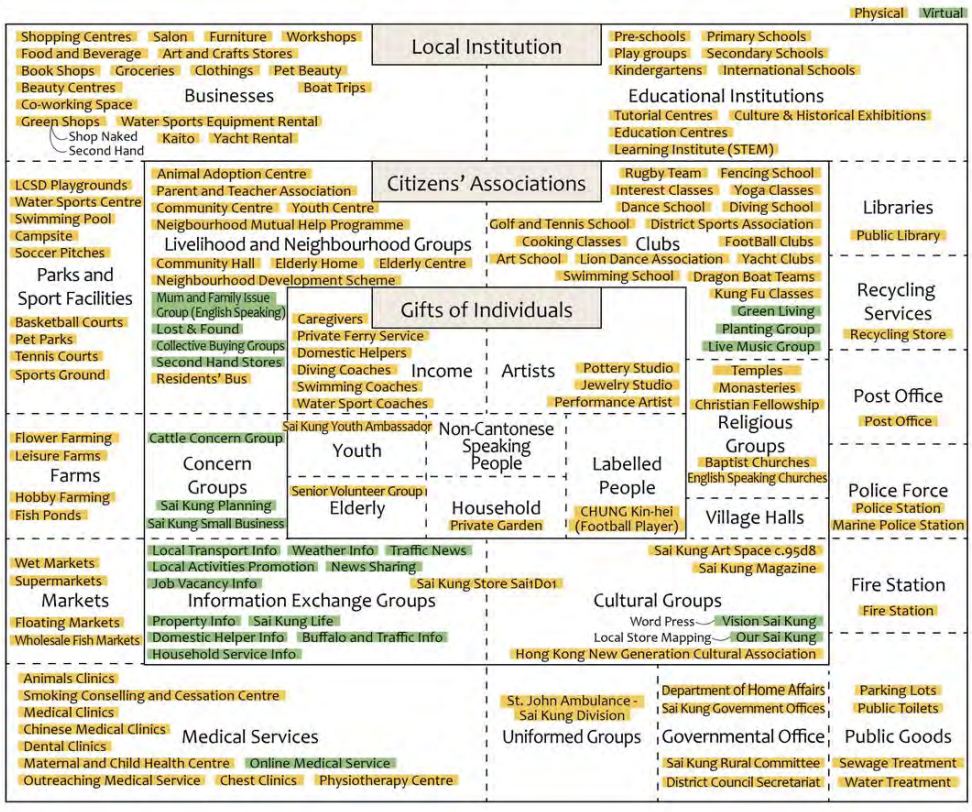

Figure 1 Community Assets Map of Sai Kung Community

3 Releasing capacities of community assets

Local religious institutions, senior villagers and young generations are the selected target groups for elaboration on their capacities of community assets.

Local religious institution is one of the most important social networks of Sai Kung Community, where several religious sites and facilities are found (referred to "Community Profile Report" Section 4.6.3). Religion acts as an important role in the development history of Sai Kung (mentioned in "Community Profile Report" Section 2.1). From the 1950s to the 1970s, different religious groups visited villagers and fishermen around Sai Kung. By resettling fishermen on land and developing better housing in village setting for the poor residents, religious institutions built communities and supported their basic necessities such as water, electricity and food, that made religious institution a very important character in people's lives. The happening in the old days brought about a strong and long-lasting relationships among religious community. With the growing of the religious community, religious institutions are healthily and broadly attached to Sai Kung community.

Senior villagers are essential for discovering assets of Sai Kung Community as they are rooted for decades, going through diverse past events with Sai Kung. Some villages have relatively high median age and low working population (referred to "Community Profile Report" Section 4.1 and 4.3), which implies the existence of surplus manpower within the community. Yet, they are experienced and talented with lots of hidden community assets to be discovered.

Young generation is the new blood and the new trend of the development of a community. The high mobility of Sai Kung community cannot be neglected, which is significate in some old villages (referred to "Community Profile Report" Section 4.5). The mixed neighbourhood (referred to "Community Profile Report" Section 4.1) also drives young generation an important player. Young generation is one of the trending players with energy and fresh ideas to Sai Kung community, which contains lots of potential to create various bonding with different assets and attachment to their living place.

3.1 Local Religious Institutions

3.1.1 Rediscovering local religious institutions as resource centres of Sai Kung community

Sai Kung neighborhood contains a wide variety of religious institutions. Each particular religious institution offers a unique configuration of skills and resources that can be utilized in the process of community building. However, every institution shares common sets of resources, no matter how small or big, where they locate, and what they believe. The following elaboration mainly refers to the Catholic church in Sai Kung Town Centre, the Sacred Heart Church (the Church), which is selected as a target institution of the in-depth interview. Roman Catholicism has rooted in Sai Kung over 150 years with over 3000 registered members and strongly attached to the Sai Kung community with various works regarding community building.

Personnel. The geographic feature of Sai Kung drives members of churches in Sai Kung mainly residents in the district, which causes the multiple relationships between members. They are both neighbors living in the same community and church members in their church. Churches serve an important purpose of maintaining group living, in which individuals support and share with each other.

Numerous members visiting and serving the churches, forming a huge manpower and an effective network of information exchange. Beside the organized task forces for church activities and service in the Church, a Filipino Catholic Group of thousands of members, El Shaddai, has the team Mass in the Church. They always help with the maintenance in and devote much time and power to the Church.

Space and Facilities. Churches are places for worship and gathering, as well as the important physical assets for community buildings. A large hall, meeting rooms and activity rooms can be expected and available to be turned into multi-functioning space as community assets. The Sacred Heart Church contains a large hall for worship, rooms for gathering, meeting rooms, kitchens, plenty outdoor areas for large and small church activities, as well as a building in Hebe Haven for Filipino workers without shelters.

Since the Father of Sacred Heart Church lives in the church and the existence of a 24-7 security guard protecting the Church and the adjacent campus of Sai Kung Sung Tsun Catholic School, the space is ready to be opened at all time for any emergency.

Materials and Equipment. To support the operation of the church and the activities held, a wide variety of equipment is essential such as computers and printing machines for office works, music equipment, sport equipment and cooking equipment. Those can be utilized for supporting community as well as improving bonds of Sai Kung community.

Expertise. Churches assemble people from different backgrounds with professional skills in diverse specialties. Teachers, doctors, business leaders, writers, scholars and artists can be found within the community. The Church has expert in architectural aspects, who has given professional ideas and built connection between the Church and related firms.

Religious leaders frame the overall development for community building with real practices. They often have certain understanding and appreciation over the life of the community. With several experience serving the community, the church and the leaders should be knowledgeable in dealing with some of the household issues, who become one of the advising committees of the social affair.

Economic Power. Religious Institutions may have not only the capacity to purchase materials and resources, but the ability for fund community projects for capacity building. Although projects involving monetary resource require long application process for the Sacred Heart Church, they have the capacity to develop meaningful community projects and investment and link up with wide range of funding. For instance, the Church involves in the ongoing research regarding the evolution of Catholic Mission in Sai Kung and the revitalization of the abandoned churches.

The listing is not completed, which is only a part of the many resources offered by local religious institutions. Yet, the resources found should be connected actively to the other major resource centres and turned into useful assets for enhancing the Sai Kung community. Local religious institution should collaborate with different institutions and individuals, and participate in partnerships to maintain reciprocal relationships for a strongly bonded community.

3.1.2 Building bridges between local religious institutions and other community assets

With some of the identified resources offered by the local religious institutions, partnerships can be observed and suggested in a better utilization of resources. The following **Figure 2** shows the relationships between local religious institutions and other community assets with the existing practices among the partnerships.

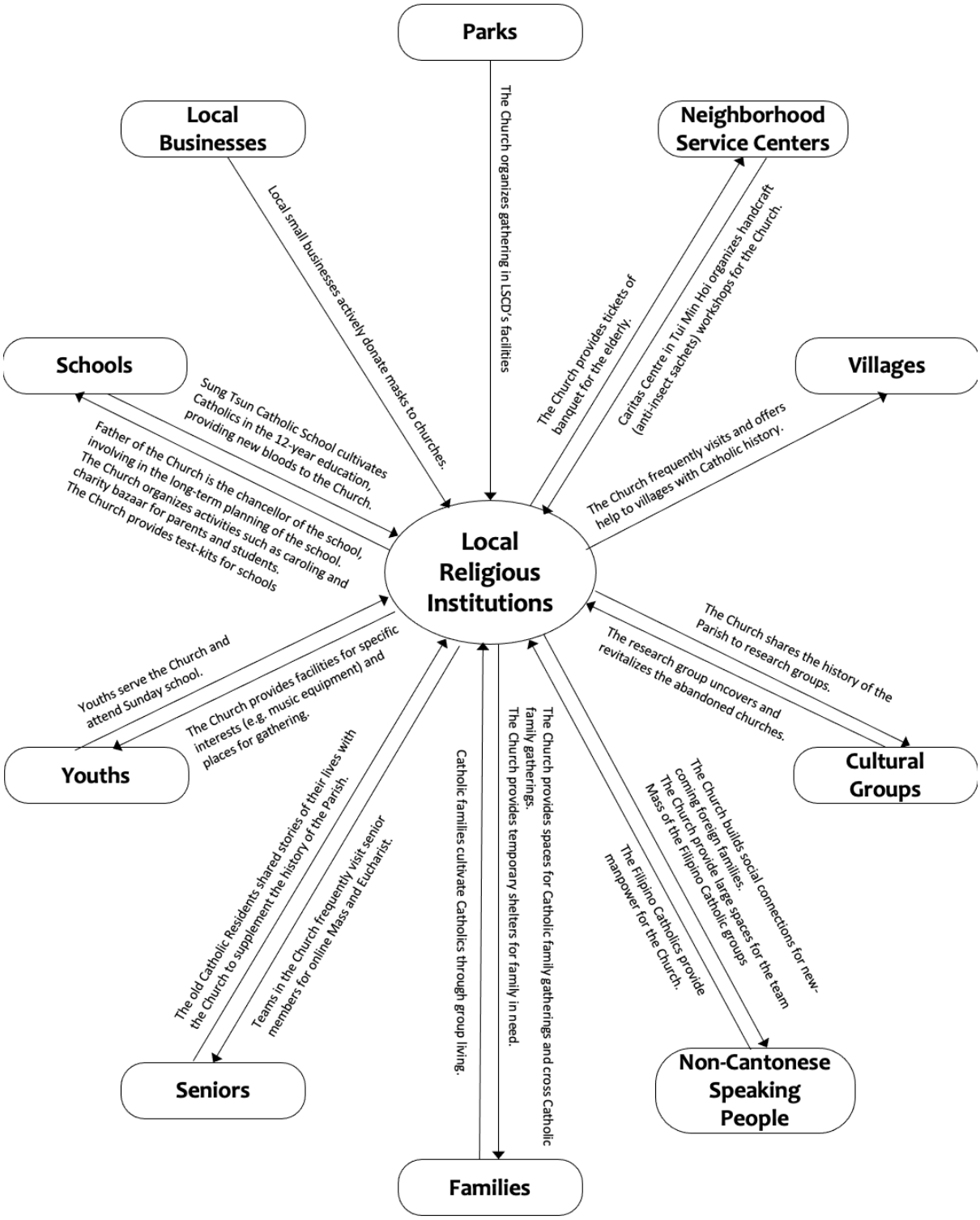

Figure 2 One-on-one relationships building on existing assets (local religious institutions)

Some reciprocal relationships are observed and show how the resources are used for specific purposes and interests. Yet, more potential connections can be suggested to be made to develop more community assets and form a strong partnership among different

resource centres. The below **Figure 3** elaborates on the potential reciprocal practices to be made for strengthening the partnerships and to introduce new relationships within the community. Strong bonding among parties is essential for a resilient community.

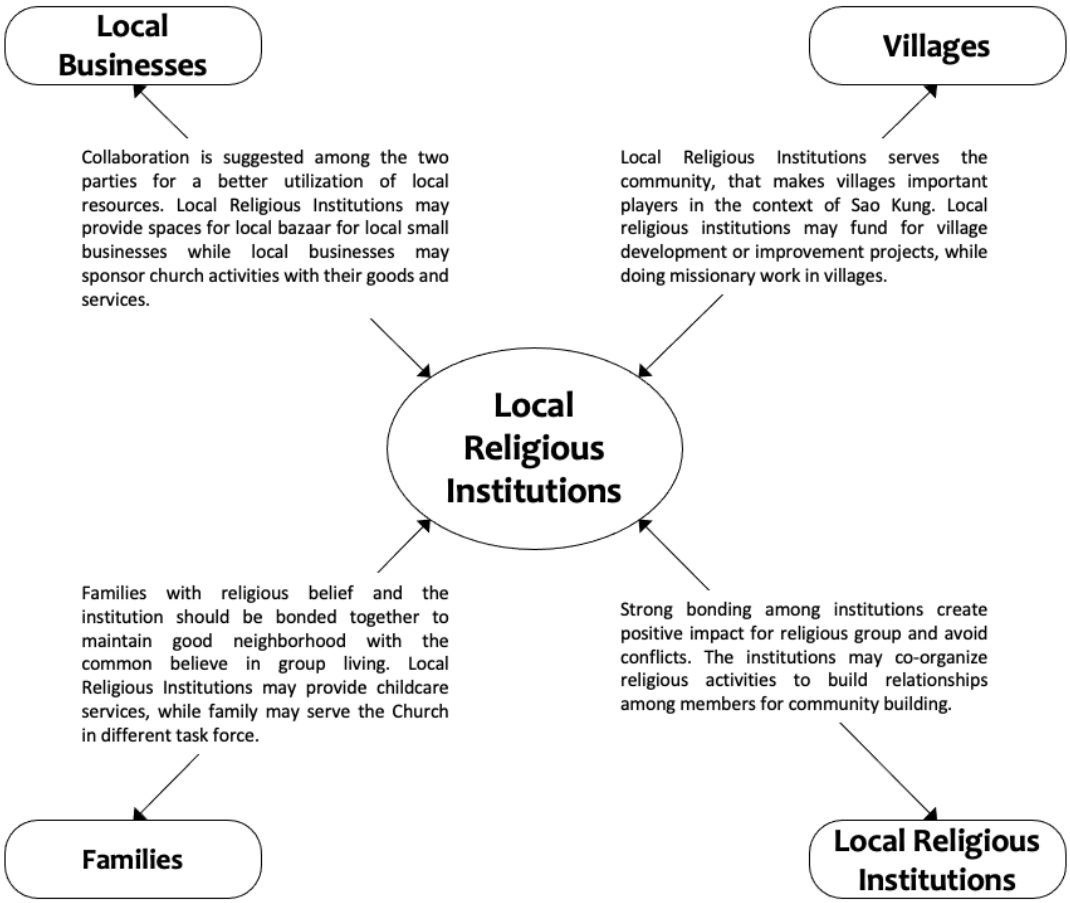

Figure 3 Potential assets for strengthening partnerships (local religious institutions)

3.1.3 Potential roles in disaster management

With the resources and partnerships obtained, local religious institutions may serve as an influential media for disaster education for disaster preparedness, collaborating with diverse educational institutions and associations. They maybe the information center for exchanging disaster information in the preparedness and the recovery stages. For instance, extreme weather forecast can be shared through church activities and mental health support can be given to affected residents. Not only do churches act as a service provider (e.g. providing food and temporary accommodation for residents affected), they maybe a platform for matching needs with aids among community, such as

matching donation to the receivers, further building connections among people and resources.

3.2 Senior Villagers

3.2.1 Rediscovering senior villagers as assets within Sai Kung community

Senior villagers have experienced a wide range of past events with the community. From experience, they have developed skills, talents, local wisdoms, resources and relationships. Yet, without practicing the skills and utilizing the resources, those are never community assets for enhancing community building. The following **Table 1** demonstrates how skills, resources and relationships are practiced, redistributed and utilized to create assets for improving their lives in Sai Kung. They are identified according to interviews conducted (referred to Report F) and small talks during fieldworks.

Table 1 Identified assets of senior villagers

Practices	Types of assets	Elaboration
Waste Breads into Food	**Resource**, Relationship and Skills	SO collects waste breads from supermarket and recycled into food for goats. He frequently receives waste breads, which have passed its "best before" date but would still be perfectly good to eat, from a known staff from supermarket. The recycling breads are dried and stored in plastic boxes under shelter for feeding his goats.
Waste Woods into Fuel	**Resource**, Skill, and Relationship	SO collects fallen trees from his neighborhood, turning the leaves into food for animals, and the tree trunks and branches into a fuel for fires. The fallen woods are collected and cut in his workshop, stored as the fuel for cooking.

Waste Materials for Building house and garden	**Resource**, Skill, and Relationship	SO collects construction waste to build his own living spaces. Gotten from the construction sites and the firms he worked in, the underutilized construction materials are recycled as the ad hoc items and the structure of his house. He usually builds new structures and reinforces the existing structure, such as the framework as a support for climbing plants and the staircases to enhance accessibility.
Protecting Neighbor by Building Wall	**Relationship**, Skills, and Resource	SO built a wall along one of his staircases for protecting his neighbor, a lady in short skirt, from peeping. The wall was made of bricks recycled from construction waste.
Electrical and Mechanical Engineering Skills	**Skill** and Relationship	SO is knowledgeable and experienced in electrical and mechanical engineering. He helps his neighbors to fix their urgent household problems.
Sharing with Ropes among Neighbors	**Relationship** and Skills	FONG and her neighbors in her building love to share food and other daily necessity by ropes. By tying up the shared stuff with ropes, they pass along the façade of their building.
Informal Public Space for neighborhood	**Space** and Relationship	FONG owned a store in their village before in a flat on the ground. The store occupied some public spaces outside her flat as a gathering point among the villagers. The store was closed due to her retirement for more than two years. The structure is partially functioned as her personal storage and partially kept as a public space with tables, chairs and shelter.
Reciprocity	**Relationship**	FONG and her neighbors help each other to collect their clothing before rain.
Tree Cutting Skills and Machine	**Skill** and Resource	An expert at tree cutting owned his professional wood cutting machine and his skills, which helped to clean up the main road full of fallen trees along the village after typhoon. He was call HERO by the uniformed group.

	Skill and Resource	Village Head gained tree cutting skills and machines from Sai Kung Rural Committee, which helped much in the disaster recovery works under typhoon Mangkhut.
Electric Home Appliances Donation	**Resource** and Relationship	Parents in an international school donated unused but functioning washing machines and refrigerators to the affected households in Tui Min Hoi Village.
	Resource and Relationship	Village Head gathered surplus washing machines and refrigerators from his networks and distributed to the affected households in Tui Min Hoi Village.
Manpower in post-disaster	**Relationship**	Village Head gathered villagers to clean up the streets in the village. The cleansing work lasted for two weeks. Over twenty villagers active participated in the cleansing task.
Collaboration between the Locals and the Authority	**Relationship** and Authority	For the cleansing of the main road (Hong Kin Road) in Tui Min Hoi Village after typhoon Mangkhut, three teams of firefighters were assigned to clean up fallen trees from the west (from the fire station near the Hiram's Highway) and a group of villagers gathered by the Village Head volunteered to clean up the road and the adjacent streets from the east.
Bulldozer and Excavator for Post-disaster Management	**Resource** and Relationship	Village Head thought of the construction material firm after the disaster recovery of typhoon Mangkhut. He should have contacted the firm and the firm could have operated bulldozer or excavator to fast pick up the blocking trees and boats.
Minibuses Group	**Space** and Relationship	CHAN gets to know her neighbors well partially because of the same minibus they take every morning. When villagers have similar schedule, they meet regularly on their ways to town. They would exchange information regarding their daily lives and their neighborhood.

Senior Volunteer Group	**Resource** and Relationship	CHAN and LEE actively participate in the senior volunteer group organized by Caritas' Neighborhood Development Scheme. They provide regular home visits for the vulnerable group in their community and improvement works for their living environment by conducting assessment and adding necessary household equipment.
Weather Forecast and Disaster Preparedness	**Skill** and Relationship	Residents in Tui Hoi Village are knowledgeable about weather condition and sensitive about extreme weather. They practice preparedness efforts every time before typhoon comes. They extract and exchange information efficiently, attributing to the strong bonding among neighbors. They discuss the news and observe the preparedness works done by their neighbors easily on street, which act as an effective reminder of the coming natural disaster.

3.2.2 Building bridges between senior villagers and other community assets

The existing practices imply several skills, resources and relationships of the senior villagers. Matched to other community assets within the community, they can be turned into community assets, creating strong partnerships for community building, shown in **Figure 4**.

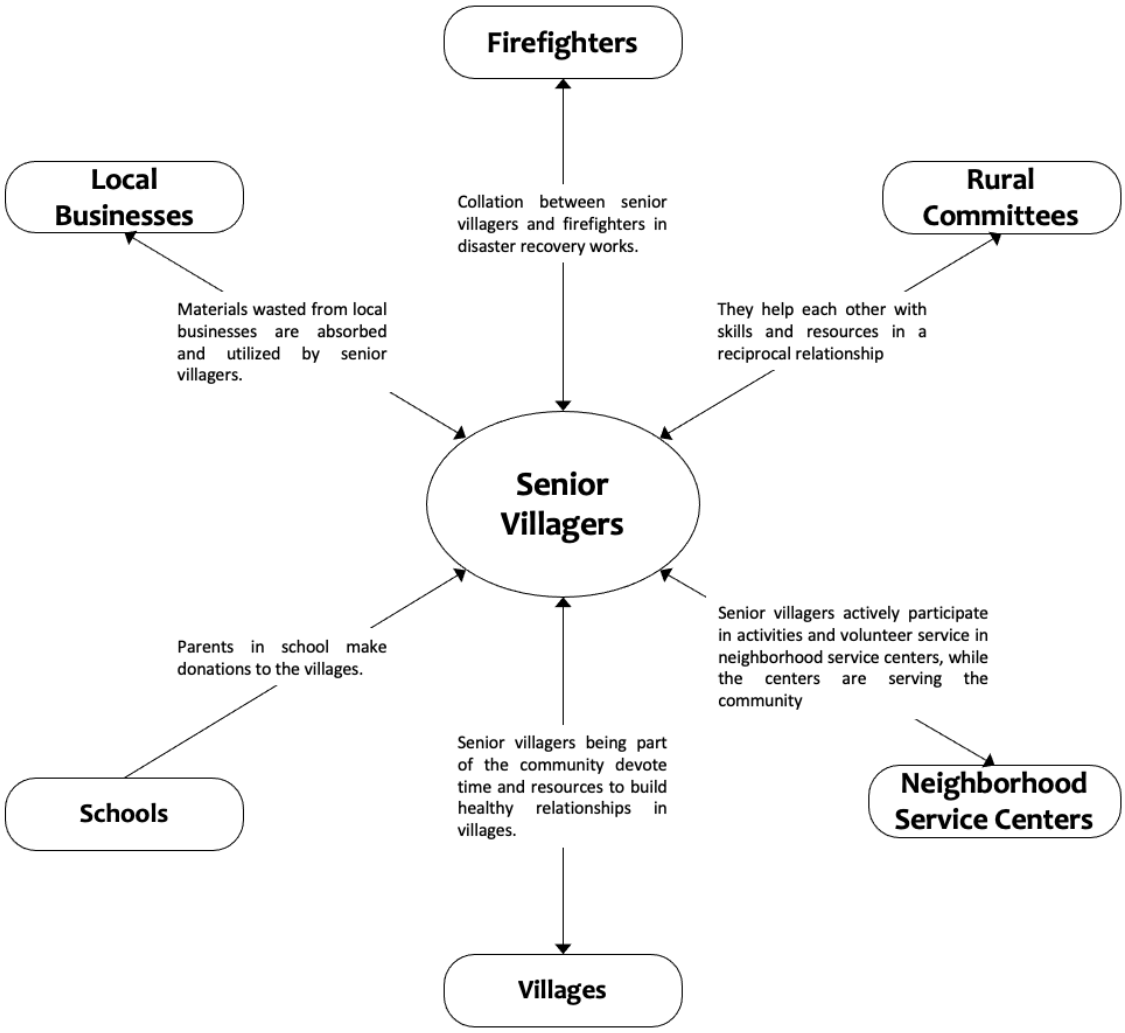

Figure 4 One-on-one relationships building on existing assets (senior villagers)

When reciprocal relationships are built, skills and relationships can be utilized, further developed into community assets. Partnerships share common interests or purposes in redistributing resources and exchange information and knowledge in the process of collaboration, which may discover more unseen assets. **Figure 5** shows the potential partnerships between senior villagers and other groups of assets, which tries to generate new power, skills and resources during the process of collaboration. Relationships built are the optimate results.

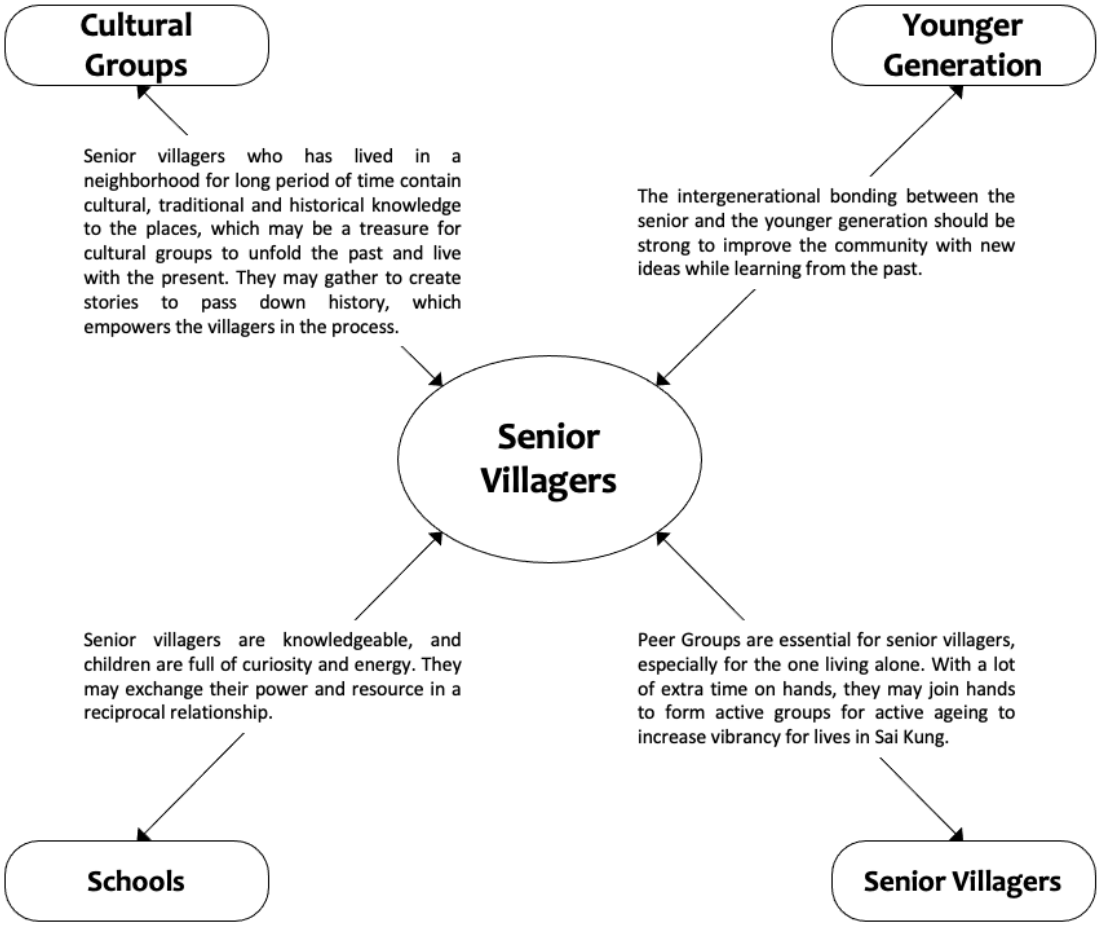

Figure 5 Potential assets for strengthening partnerships (senior villagers)

3.2.3 Potential roles in disaster management

Senior villagers may need to immediately respond to disaster especially for those who live in fragile places. Close relationship between peer groups is essential for disaster response when their neighbours or even themselves are seriously affected, in which they may help themselves in preparing for and escaping from the coming disaster. Their connection with resources and their knowledge to their community drive them to be the possible assistants in disaster response, who may effectively exchange information with the rescue teams.

3.3 Young Generation

3.3.1 Rediscovering young generation as assets within Sai Kung community

The young generation is a large group of people in Sai Kung. Some are rooted in the community with their parents, while some have moved in for several reasons. Sai Kung offers an alternative life style, village life rather than urban life, which Cherry (referred to Report F) loves living in rural setting, maintaining closer relationship with natural. This group of people brings unique skills and resources that can be utilized and redistributed in the process of community building. The following elaboration mainly refers to interviews conducted (referred to Report F) and small talks during fieldworks.

Connection to Place. The young generation are strongly attached to Sai Kung, their living place, attributing to different reasons. Some have been rooted since their birth with the older generations within the families. WONG and Jack were born in Sai Kung with many relatives and family members living in Sai Kung, building a large social network among families there. Some have moved to villages in Sai Kung for village-type life style. Cherry loves the natural environment and village houses, that makes her moving into her place. Debby was the ex-district councillor of Sai Kung, which made her a specific attachment to Sai Kung with both responsibility and appreciation. Diverse relationships are formed between the young generation and the place.

Skills and Talents. Many young people brings their skills and talents to Sai Kung, which are gained from their experience and education received. They are from different backgrounds with diverse occupations and professions, carrying particular skill sets and resources. As they are young and energetic, more skills and resources can be developed over time. WONG is one of the young car owners within the community and she sometimes uses her skills to drive her neighbours in and out of their living places. Anna is knowledgeable in farming because of the need of her family. She is also a yoga teacher with much experience in teaching.

Time. The young generation engages in different types of work according to their life styles. Other than a full time job, some of them work as freelancers with flexible working hours. Time is not fixed in their schedule. Anna works freelance sparing her time for other jobs or works.

Friendships and networking. Many young generation studied in schools in Sai Kung, in which they build their very first social network and made friends. As friendships in early stage are strong with certainty and much time spent together nearly every day at schools. MA has many close friends in Sung Tsun College and they develop healthy and supportive relationships.

Family Relationships. Many young people lives in Sai Kung with their core families or parents, who are part of their lives. Parents, partners and children are included in their family relationships. The young generation can become very effective as a means to mobilize their family members into more active participation in the life of the community. Cherry brings her son to join interest classes in the community centre and WONG brings her daughters to public swimming pools. For catholic families, the whole family visit church frequency on Sunday.

The listing is not fully reflected the capacities of the young generation, but only a part of the many. However, isolated resources are not yet useful and mobile community assets until they are paired with other major resource centres through partnerships. The young generation should connect with different institutions, associations and individuals to build up reciprocal relationships for strengthening the community bonding.

3.3.2 Building bridges between senior villagers and other community assets

With the identified resources provided by the young generation in Sai kung, some connections can be made between the young generation and the other community assets. **Figure 6** demonstrates the reciprocal relationships among different groups of people within the community.

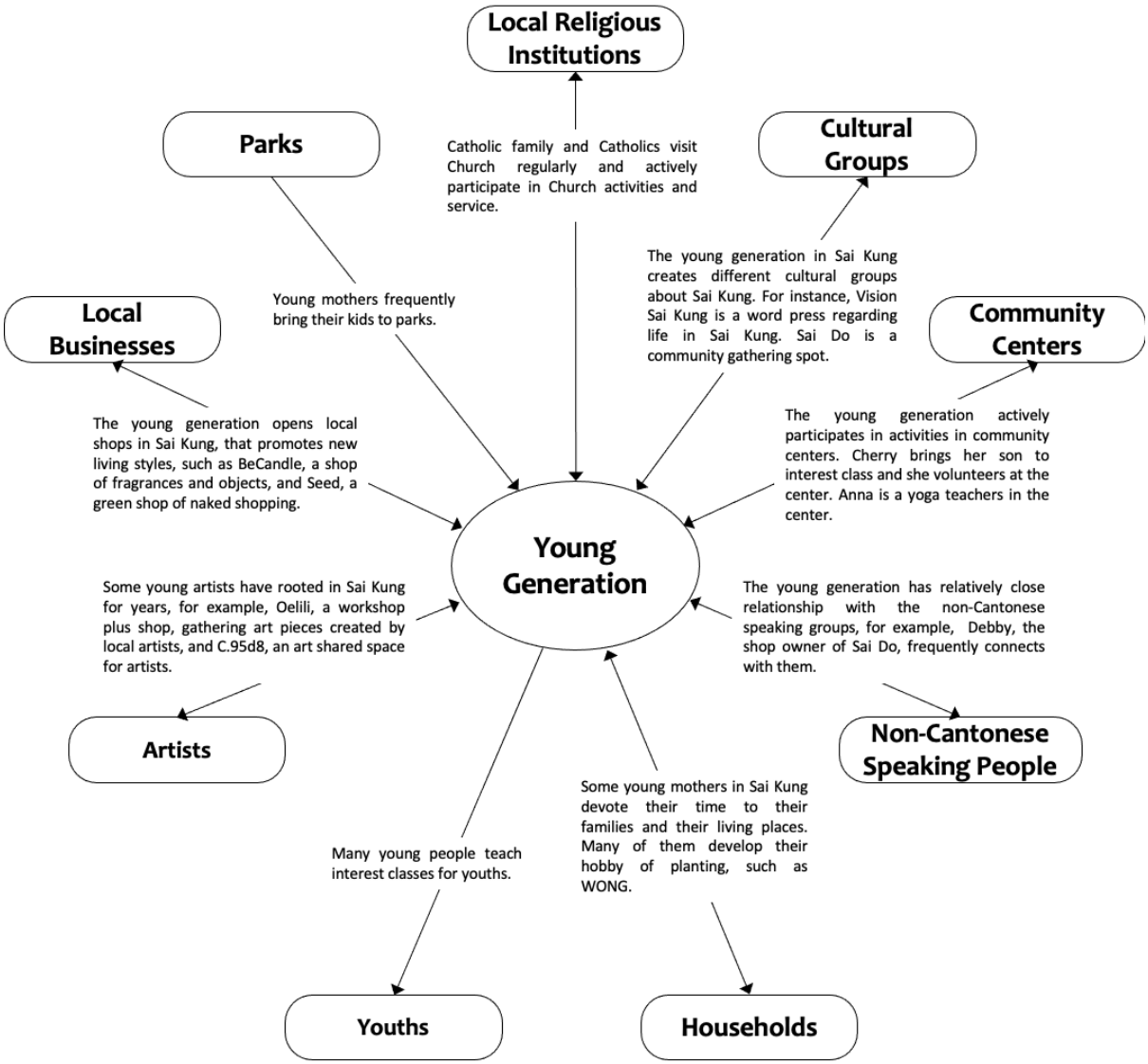

Figure 6 One-on-one relationships building on existing assets (young generation)

The Young Generation is strong bonded with some of the groups and creates diverse community assets, which utilizes their skills and better redistributes their resources. Relationships are built through reciprocity. Yet, more groups can be connected to the network of the young generation for a resilient community.

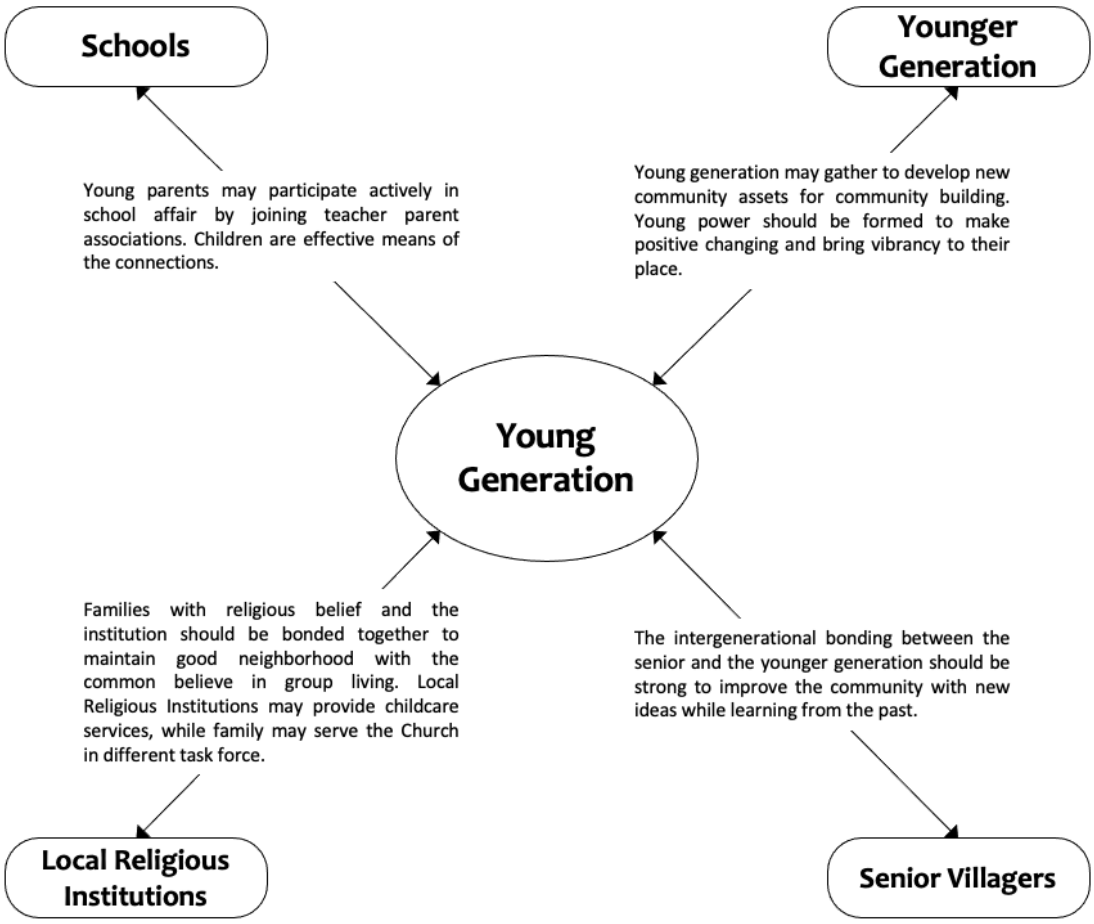

Figure 7 Potential assets for strengthening partnerships (young generation)

3.3.3 Potential roles in disaster management

Young generation is a huge manpower for the community in response to disaster with their energy and their network outside Sai Kung. For instance, they can spread information of Sai Kung in virtual platform for external assistance. They may be an influential media of disaster education in their family, increasing their awareness and their capabilities of managing disaster. With the strong bonding among the generation, they can utilize their skills and resources for immediate recovery to retain the operation of the community, of which the food and basic necessities are effectively distributed and sent to every household in need.

RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX V

RESEARCH REPORT F

STAKEHOLDER ENGAGEMENT PROGRAMME: PROFILE OF COMMUNITY PLAYER

SEPTEMBER 2022

Organiser

香港賽馬會災難防護應變教研中心
Hong Kong Jockey Club Disaster Preparedness and Response Institute

Sponsor

The Hong Kong Jockey Club Charities Trust

Study Consultant

樂在製造
社區設計及研習所
Community Design and Research Studio

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MAKING ON LOFT
社會設計及研習所
COMMUNITY DESIGN & RESEARCH STUDIO

Research Report F
Stakeholder Engagement Programme: Profile of Community Player

Research and Model Development on Community Disaster Resilience Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

Date: 11 October 2022

Version: Final

Prepared by:
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1 Introduction

Beside the Community Profile Study of Sai Kung Community, Profile of Community Player is essential for identifying the local players and shaping the existing characters and roles in community building. Through in-depth interviews, some round characters are developed to comprehensively understand the life and experience in Sai Kung rural township. From the perspective of local residents, we can deeply investigate the relationship between the space and the residents, as well as the connection among their neighborhoods. With personal experience in disaster preparedness and response, we can further review on the capacity of the community in disaster management and the potential to be explored in the latest stage of the research. The Profile of Community Player is comprised from the key objectives as listed below,

- To identify the types of locals/ players;
- To collect stories from players by categorizing into various persona;
- To understand and explore the potentials of being proactive agent/ facilitator/ connector of disaster risk awareness/ capability from their existing way of living, capability and connection; and
- To map out the daily geo- and human- interactions between the disaster risk initiatives and the communities.

An Interview kit in log-book design was used to map out the daily live journey and personal connections from the interviewees, as well as their knowledge and daily practice for disaster preparedness. The interviews with the tools covered four main topics, including (1) persona, forming a round character in society; (2) living environment, formulating the relationship between the living environment, their daily lives and natural disaster; (3) skills and resources, discovering the potential community assets and relationships; (4) capability of disaster management, reviewing the past experience and potential threats.

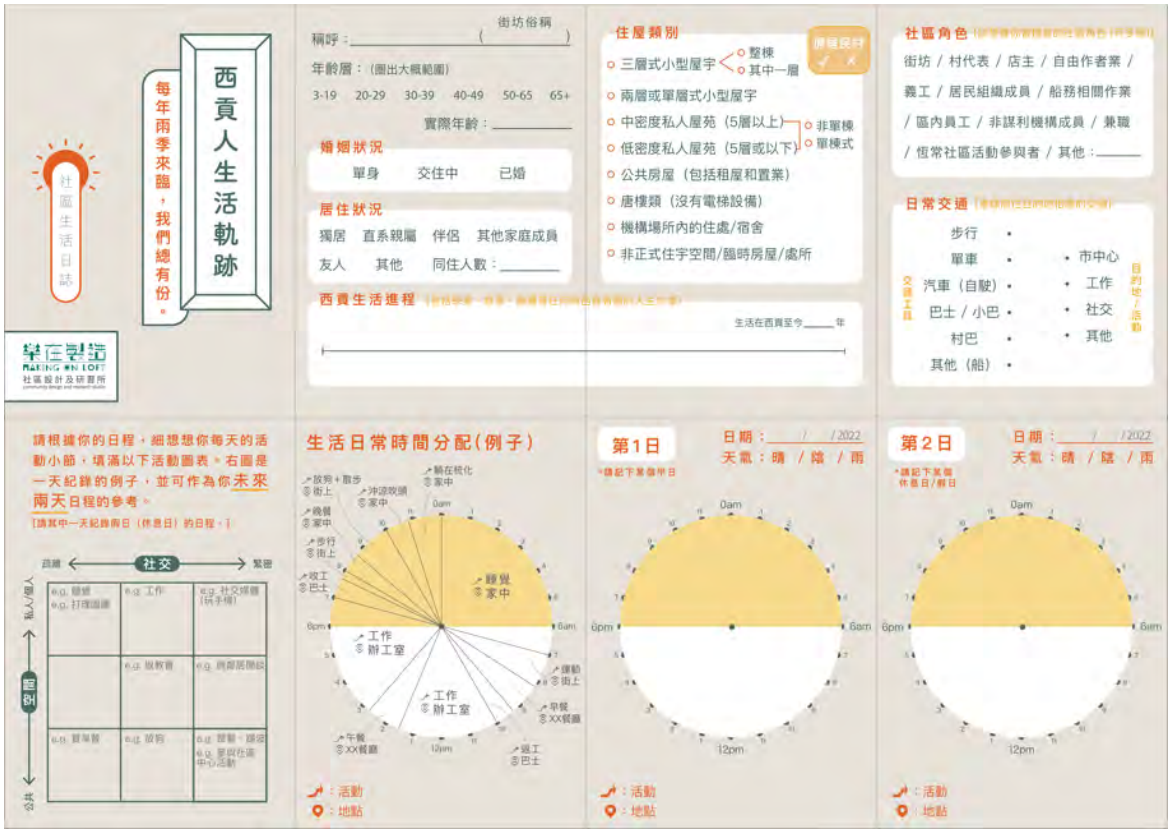

Figure 1 *Content page 1 of Log Book*

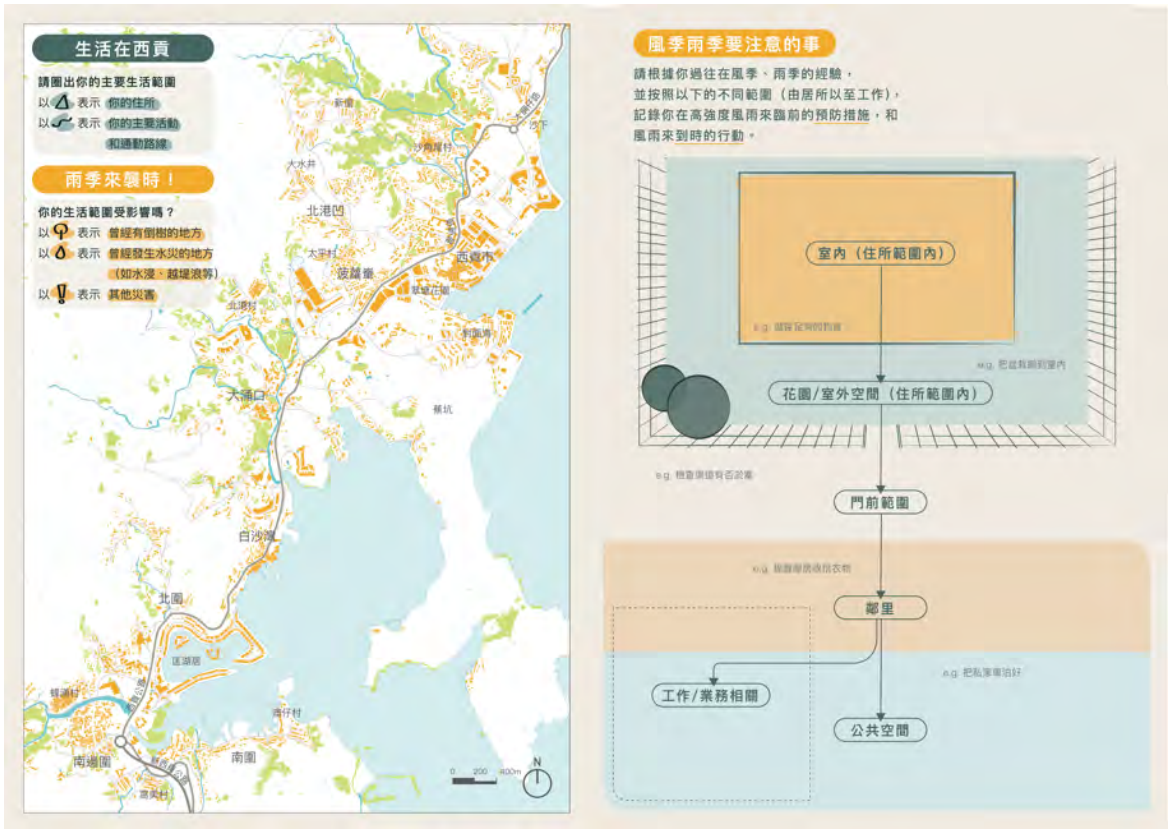

Figure 2 *Content page 2 of Log Book*

2 Summary of persona

8 In-depth Interviews were conducted between late May and early July 2022. 7 out of 8 semi-structured interviews were conducted on-site with guiding tours led by the interviewees for providing a more detailed understanding of the interviewees' daily lives and their living environment, while 1 interview was conducted through video call with pictures supplemented from the interviewee. Interviewees were mainly matched up by our community partners, including 4 from Sai Kung District Community Centre (SKDCC) and 2 from Caritas Sai Kung Community Development Project (Caritas), and the rest were from open recruitment through social media platform. 6 out of 8 interviewees were visited twice on-sites and the rest were visited once. Logbooks were completed and discussed during the interviews.

The 8 distinctive persona are categorizing into 4 groups: Persona 1 (Village representatives), Persona 2 (Senior villagers), Persona 3 (Fulltime mothers) and Persona 4 (Youngbloods). They were aged between 30 and 88.

Persona 1 (Village representatives) are the head of village with long age in Sai Kung. They are responsible for managing village affairs and represent their villages in various meetings. They have relatively strong bonding with their villagers and villagers are willing to help when asked by their representatives. Villagers would contact their village representatives when they have household issues and concerns to their neighbourhoods. They work closely with governmental department.

Persona 2 (Senior villagers) are villages with long age in Sai Kung. They have strong attachment to the neighbourhood and they tend to contain much resource and skill developed through their experience with the place. In the old days, they participated in the community in different roles. They also have rich knowledge regarding the place and people.

Persona 3 (Fulltime mothers) devote much time to their family. They have fruitful group living, who likely take care of their children and parents. Since they spend most of their

time in the community, they tend to actively participate in activities in community centre or develop particular hobbies, such as planting. They have strong bonding with their neighbours, building reciprocal relationships among their community.

Persona 4 (Youngbloods) are the young people in the community. They always practice new life style and bring new ideas to the community. Some are rooted in Sai Kung with their parents and some are moved in with diverse interests and purposes.

The overall profiles are summarized as the table below.

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Table 1 List of interviewees

	Categories	Name	Age Range	Living Area	Occupation	Description/ Specific Background	Referred by
1	Village Representatives	Mr LEE (李生)	65+ (69)	Pak Kong (FSA B)	Retired	Indigenous villager; Village representative	SKDCC
2		Mr FONG (方生)	50-65 (57)	Tui Min Hoi (FSA A)	Technician	Village representative with experience in dealing with disaster management; Offspring of boat dwellers; Living in low-lying area along the shore with experience in house flooding; Car owner and driver	Caritas
3	Senior Villagers	SO Gor (蘚哥)	65+ (88)	Mang Kung Wo (FSA B)	Retired (ex-driver)	Roof top gardening, occupying field for small scale agriculture and animal farming as leisure purpose; Experienced in urgent household problem fixing for his neighbors; Experienced in tree falling in garden	SKDCC
4		Ms FONG (芳姐)	50-65 (62)	Man Yee Fishermen Estate (FSA A)	Retired (ex-store owner)	Offspring of boat dwellers; Experienced in fishing industry and fish farming; Ex-village kiosk owner	Caritas
5	Fulltime Mothers	Cherry	30-39 (34)	Sun King Terrace (FAS A)	Freelancer (local tour related)	Living with children; Experienced in water-related tourism industry; Working freelance	SKDCC
6		Mrs WONG (黃太)	30-39	Ho Chung (FAS D)	Housewife	Living with husband, children and parents; Backyard gardening; Experienced in house flooding; Car owner and driver	Open Recruitment
7	Youngbloods	Anna	30-39	Ho Chung (FAS D)	Freelancer (yoga instructor)	Practicing farming and managing large agricultural land; Family operating leisure farming; Living in houses built by themselves; experienced in roof damage in strong wind	SKDCC
8		Niko	30-39	Tai Chung Hau (FAS B)	Designer	Operating own business in parallel in Sai Kung; Operating workshops and partnering with businesses in Sai Kung	Open Recruitment

3 Summary of in-depth interviews

3.1 Interview Summary – Interview with Mr Lee (Pak Kong)

Study Area: Focused Study Area B
Interviewee: Mr LEE
Interviewers: Wingchun CHENG
Date: (first) 26 May 2022 09:00am-10:15am | 11 July 2022 11:45am-13:00pm
Venue: Sai Kung District Community Centre and Pak Kong

Persona

LEE is an indigenous villager of Pak Kong. He went to the UK during the 70s at his teenage for 40 years, he retired in 2012 and came back to HK. Although he spent 40 years in the UK and his children and grandchildren are all in the UK, he still sees Hong Kong as his home therefore he chose to come back. He was elected as resident representative in 2018 and his relative was elected as indigenous representative. They work as partners to serve in the village.

Living Environment

There is a two way road going to Pak Kong which is rare to see in Sai Kung. This is due to the work of 總督 during the colonial period as there a nice hike trail behind this village. Therefore a road is built for the authorities to use, Pak Kong villagers also enjoy this construction. Pak Kong is a higher land so water is not a problem, when there's heavy rain the water just flows through the channel towards the sea which brings no flooding to this village. We can still see traces of the old village wall which protected the village from thieves in the old times. It is all broken with no repair now as development is a bigger concern than thieves' problem. Over half of the villagers in Pak Kong are not indigenous.

According to an old villager, the reason for village houses to be so closely built is also a measure to protect them from thieves. The narrow space in front of the main door of each house didn't allow enough space for the thieves to use a big trunk of trees to break the doors. There is a natural stream behind the village which in the old times people would swim and

play there, but now it's abandoned. Farming was also a main industry in the old times, but there's no production in this village now.

Skills, Resources & Relationships

As an indigenous villager, LEE has a good connection with the power of the village and also with government officials. As he has retired, he spent most of his time in the village which gives him a very good understanding of everyone in the place. He also makes good use of the entertainment room of the village which was a primary school in the old times. People would play mahjong, sing karaoke, do calligraphy or chill in the room.

Capability of Disaster Management

LEE mentioned that they don't have a threat or problem with natural disasters that is due to the good location picked by their ancestors. If there's any need in the village, he will be the one to handle it, which is usually a dispute between villagers. If there are affairs that need a government department to deal with, 1823 is his hotline.

During Chinese New Year time they also do self patrol to check out the village and to make sure everyone is safe. They would brief the Police Department about voluntary service, some of the villagers don't like this patrol as that affects their privacy.

On-site Photo Record

Top left: Entertainment Centre
Top right: Narrow space between houses
Bottom left: Natural stream
Bottom right: Old village wall

Quote

「北港有好多戶。有舊村同新村，我地舊時條村姓劉，因為第一間起係呢到，嚟個啲人就要包圍佢，因為係中間最安全，所以中間係最先嚟嘅，出面個啲就最遲嚟，或者啲後代一唔起屋起出去。」

「知唔知點解 D 巷咁窄?因為以前山賊會幾個人擔碌木撞門，如果條巷夠窄，佢地就唔夠位撞。」

「我地紅雨無事，因為我地有坑，又斜又高，我地去水量可以。好在啲坑夠好，絕對無事。有史以來都無水浸。打風落雨係近海先有事。」

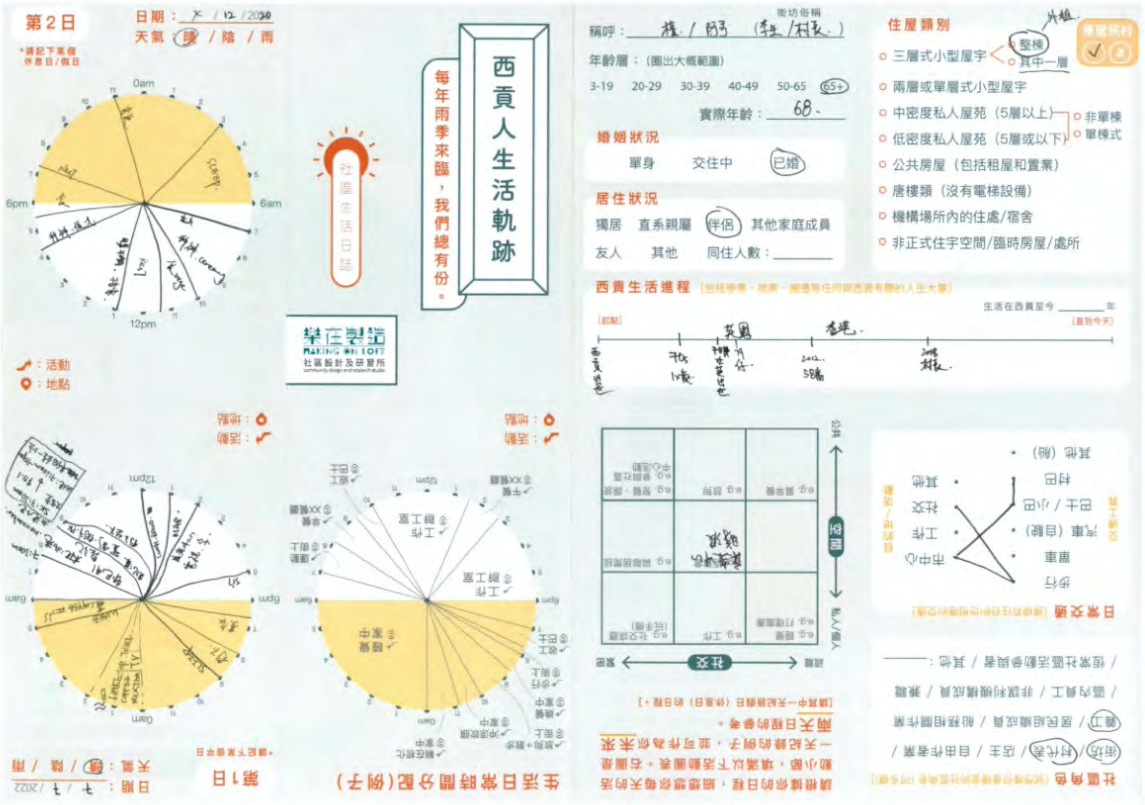
「你知道呢啲地方以前無王管，西貢有四大古村，大網仔、豪涌、北港、沙角尾，每村都要防山賊，有條城牆做防守。求救無援，要靠自己。」

「我地過年會通知差館，會有巡房，我地巡足一個月。巡房係夜晚分兩隊入村行，一隊七點，另一隊十一點，保障大家安全。我地係自發架，不過有啲外來住戶都會唔鍾意，我地就要解釋。」

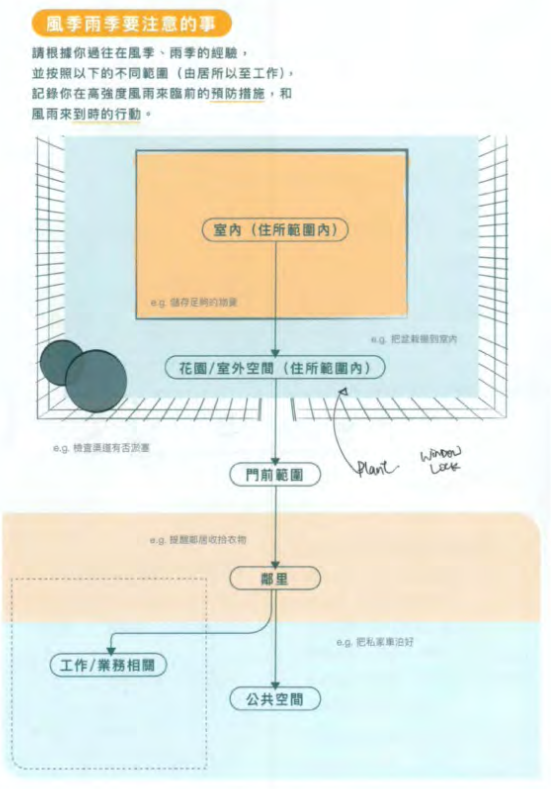
「得我地同豪涌會打蘸，我地岩岩打完，我地係零字頭。」

「呢到有舊城牆，以前就係地界，出面就係啲田啲地。啲屋係牆入面。」

Log Book


第2日
西貢人生活軌跡
每年雨季來臨，我們總有份。
社區生活日誌
稱呼：
年齡層：（圈出大概範圍）
3-19 20-29 30-39 40-49 50-65 65+
實際年齡：68
婚姻狀況
單身 交往中 已婚
居住狀況
獨居 直系親屬 伴侶 其他家庭成員
友人 其他 同住人數：
住屋類別
三層式小型屋宇
兩層或單層式小型屋宇
中密度私人屋苑（5層以上）
低密度私人屋苑（5層或以下）
公共房屋（包括租屋和置業）
唐樓類（沒有電梯設備）
機構場所內的住處/宿舍
非正式住宇空間/臨時房屋/處所
西貢生活進程
生活在西貢至今 年
：活動
：地點
第1日
生活日常時間分配（例子）
日常交通
社區角色
日期：
天氣：晴 / 陰 / 雨


生活在西貢
請圈出你的主要生活範圍
以 表示 你的住所
以 表示 你的主要活動
和通勤路線
雨季來襲時！
你的生活範圍受影響嗎？
以 表示 曾經有倒樹的地方
以 表示 曾經發生水災的地方
（如水浸、越堤浪等）
以 表示 其他災害
西貢市
北港凹
大水井
大水口
白沙灣
北園
南園
0 200 400m
N


風季雨季要注意的事
請根據你過往在風季、雨季的經驗，
並按照以下的不同範圍（由居所以至工作），
記錄你在高強度風雨來臨前的預防措施，和
風雨來到時的行動。
室內（住所範圍內）
e.g. 儲存足夠的物資
e.g. 把盆栽搬到室內
花園/室外空間（住所範圍內）
e.g. 檢查渠道有否淤塞
門前範圍
Plant
Window Locks
e.g. 提醒鄰居收拾衣物
鄰里
e.g. 把私家車泊好
工作/業務相關
公共空間

3.2 Interview Summary – Interview with Mr Fong (Tui Min Hoi)

Study Area: Focused Study Area A
Interviewee: Mr FONG (方生)
Interviewers: Emily CHAN
Date: 6 July 2022 4:00pm-5:30pm
Venue: Caritas's Centre in Man Yee Fishermen Estate

Persona

Since his birth, FONG, aged 57, has lived in a squatter with his core family along the shore in Tui Hoi Village, where his father, a fisherman practicing fishing around Tui Hoi Village, settled his aged parents on land in the old days. FONG is not only the Resident Representative of Tui Min Hoi Village but also actively participates and represents his villagers in several parties in different scale, including the Sai Kung Rural Committee, Tui Hoi Village Mutual Aid Committee, Tui Min Hoi Village Residents Association, etc. He is strongly bonded with his place, where contains lots of relationships and responsibilities. His occupation as an on-call technician provides flexibility to his schedule, in which he spares much time devoted to his village to build relationship among villagers and deal with issues. In his regular life, he attends different meetings representing his village, travels around Hong Kong for work and enjoys his life in Sai Kung.

Living Environment

His squatter is in low-lying area with high risk of flooding. Along the shore, various boats are parked, and several furniture and water-related equipment are heaped outside his place as one of the potential dangers under typhoon. The living environment forces FONG to be sensitive to extreme weather, that helps him to get prepared for the coming disaster.

Skills, Resources & Relationships

Being the head of village, FONG owns a wide network of asset inside and outside his neighborhood. He maintains good relationships with residents, associations and businesses around his place, which he can utilize and arrange those resources when needed. Sai Kung Rural Committee provided him with wood cutting training, enabling him to provide tree

cutting service. Contributed to his occupation as a technician, he is somehow knowledgeable in engineering.

Capability of Disaster Management

FONG had once dealt with disaster management under the typhoon Mangkhut (Year 2018), when dwellings and boat factories in Tui Hoi Village were seriously flooded. Boats were stranded on street and fallen trees blocked most of the access inside and outside the village. During the disaster, he opened his place for temporary resettlement and frequently observed the situation around his place. For disaster recovery, FONG gathered committees of the residents' associations and villagers to clean up the street for two weeks, collaborating with teams of firefighters. Several resources supported the operation from his network, for example, tree cutting machines from Sai Kung Rural Committee and cleaning tools from District Councilor (NG, Sze-fuk). He also collected over 60 electrical appliances (refrigerators and washing machines) for affected household through donation from the international schools and his network outside Sai Kung.

For the disaster preparedness of his own place, he places sandbags and boards to reduce flood water damage. Furniture and boats are moved out of the low-lying area. The strong bonding among neighborhood and their sensitivity to extreme weather enables them to exchange and discuss information rapidly. They can observe the preparedness works done by their neighbors easily on street, which acts as an effective reminder of the coming natural disaster.

Others: Recommendations regarding Disaster Management

FONG reflected on the existing issues regarding disaster management with recommendations. For disaster mitigation, the original planned reclamation work along Tui Hoi Village is essential for raising the level of the shore, bringing about the redevelopment of the area of squatters. A breakwater should be added for the extension and the improvement of the typhoon shelter, followed by a more effective planning for boat parking. Regular dredging in water is needed for sufficient flood protection. For disaster response, the government should set up more temporary shelters close to the neighbourhood for emergency.

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On-site Photo Record





Top left: Tui Hoi Village Mutual Aid Committee
Top right: FONG's squatter
Middle left: Heaped objects surrounding FONG's place
Middle right: Sandbags and boards for reducing flood water damage
Bottom: Sai Kung Typhoon Shelter

Quote

「對海村係最原本嗰個（名），係民政搞錯咗，應該成個沿海都叫對海村，後期喺選舉期間將個 number（號碼）搞亂晒，有啲就變咗做對面海村。」

「山竹啲老人家話超過左溫黛，我朝頭早六點半就收到電話去望一望，對面海川翠塘入口嗰度，已經係膝頭哥（高度）水咁上下，10:00 再入去已經係心口（高度）水，有啲就到腰，冇得點算，只可以撤退。」

「對海村成條路都係滿目瘡痍，快艇、龍船、水上電單車，人已經撤退晒，想綁返啲龍舟已經趕唔切，我咁大個仔第一次要着救生衣巡村。」

「想一勞永逸嘅話，之前政府有個計劃將污水廠搬入岩洞，然後會填多一個地方，再伸條駁（防波堤）出嚟，就形成一個避風塘。」

「之前三期填海裏邊嘅第三期係由翠塘迴旋處填到去濤苑迴旋處，本來個地方升返高，就冇低窪地方。當政府填得你筲地方，海邊嘅都係牌照屋、寮屋，就會俾政府收返，就解決晒成件事。但件事係擱置咗嘅，勘探已經做咗嘅，差環評未過。」

「而家政府淨係會放啲沙包，其他已經做唔到㗎啦。喺山竹都冇用㗎喇。」

「康健路到消防局，成條路都係秣樹，封晒，係我有個親戚同佢個夥計開咗半條路，用電油鋸，消防員仲直程問呢個超人係邊個嚟嘅。」

「之前消防搵咗三隊人，但山竹之後幾日後，見到都仲未清嘅，我就吹雞組織人喺度清樹鋸樹，做咗兩個禮拜。消防局由出邊青入嚟，而我哋就喺裏邊清上去，樹、垃圾、船，乜都有，有幾十人參與呢件事。」

「山竹第二日，我就去搵車，車雪櫃、洗衣機，將啲人唔要嗰啲車晒返嚟，我哋每樣野有十幾部，國際學校有個家長會收集左每樣十五部，全部派返晒比啲街坊。」

「鄉議局之前送咗幾把電油鋸，就上堂簡短咁教咗我哋點樣用把鋸，有啲村長啊、執委去學，其實係幾好㗎。吹雞之前一晚，有啲街坊一家人出嚟鋸樹，用啲好弱嘅鋸，應該要搵啲公司，贊助啲鋸。」

「船廠本來都有工具，但已經浸晒，自己都救唔到。唯獨是我冇諗起消防局對面嘅建材舖有鏟車，一日就可以開返條路，冇諗起就冇聯絡到。」

「對面海冇公眾街喉，剩係得屋企裏面條水喉，之前因為魚市場所以有，依家就冇咗，有嘅話清潔會快好多，當時就用咗好多掃把、垃圾鏟、膠袋。」

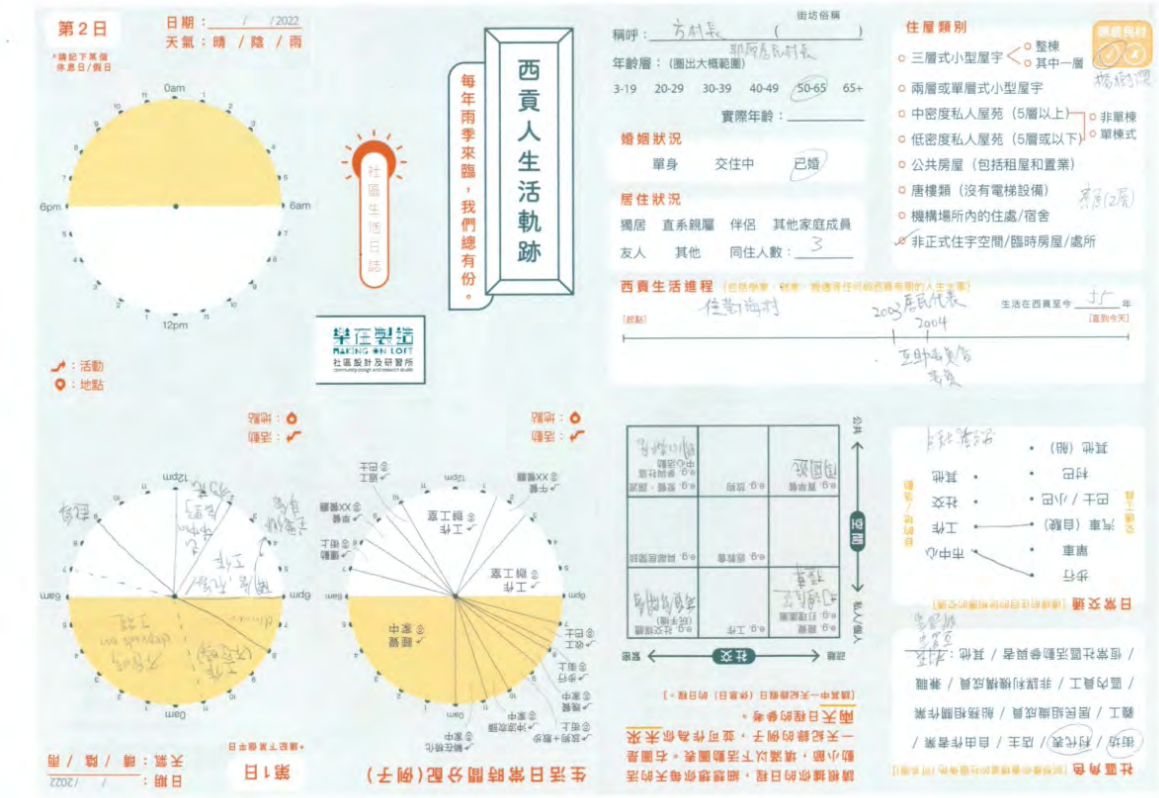
「山竹嘅時候有兩個去咗互助委員會，期間啲物資同埋人嘅聚會都喺晒嗰度，（對面海）需要應該要開放庇護中心俾人，依家對面海就有一個，喺互助委員會，但遲啲可能冇㗎啦，互助委員會個期限去到 2023 年，遲啲冇咗就唔知點樣申請去租用嗰個地方。」

「山竹大家都冇事，第一場風係朝早嚟同埋行得好快，同埋香港政府一早通知晒有超級颱風，同埋話俾你知個浪會將漲幾多水。近海嗰啲呢通常自己都有準備嘅（沙包等物資），自己都知點樣去防範，同埋其實應該要知、要識睇風向同水漲。」

「民政處會通知我，打俾我話開咗個庇護站，但你開咗你個庇護站都救唔到我㗎啦，遠水救唔到近火。」

「其實都係睇吓場風咩環境，明知今次場風唔會到，都擇左沙包先。」

Log Book




生活在西貢
請圖出你的主要生活範圍
以 表示 你的住所
以 表示 你的主要活動
和通勤路線
雨季來襲時！
你的生活範圍受影響嗎？
以 表示 曾經有倒樹的地方
以 表示 曾經發生水災的地方
（如水浸、越堤浪等）
以 表示 其他災害
風季雨季要注意的事
請根據你過往在風季、雨季的經驗，
並按照以下的不同範圍（由居所以至工作），
記錄你在高強度風雨來臨前的預防措施，和
風雨來到時的行動。
室內（住所範圍內）
花園/室外空間（住所範圍內）
門前範圍
鄰里
工作/業務相關
公共空間

3.3 Interview Summary – Interview with So Gor (Mang Kung Wo Village)

Study Area: Focused Study Area B
Interviewee: SO Gor (蘇哥)
Interviewers: Emily CHAN
Date: (first) 22 June 2022 3:00pm-5:00pm | (second) 5 July 2022 10:30am-12:30pm
Venue: SO's house in Mang Kung Wo Village

Persona

SO, aged 88, has lived in Sai Kung for over 40 years and currently lives with his wife and a domestic helper. Despite his age, he is a hardworking farmer, regularly practicing small-scale agriculture and animal farming for leisure. His daily routine aligns with the schedule of his goats with the three feeding time. During the day, he takes good care of his pets and plants and maintains various spaces such as storage space and roof. At night, he stays indoor and takes rest with his wife. Sometimes, his sons and daughter drives SO, his wife and their domestic helper to town for Chinese dim sum and groceries.

Living Environment

SO lives in a hillside squatter in Mang Kung Wo Village where is relative secure from strong wind. With most of the structures designed by himself, his living space is flexible with changes such as adding the sun blocking fabric for avoiding high indoor temperature. SO is very sensitive to weather changing, attributing to his practice in leisure farming.

Skills, Resources & Relationships

SO is talented in small-scale construction and electrical and mechanical engineering. With the help of his workshop, his living space is full of his creations, including staircases for access, frameworks for gardening, houses for goats, water tanks for fishes and turtles, etc.. He is an expert in utilizing resource. For instance, he frequently recycles waste breads (by drying and storing under shelter) from supermarket into food for goats. Fallen trees are collected from his neighbourhood. He turns the leaves into food for animals while the tree trucks and branches are turned into fuels for fires. The construction works in his living space mainly rely on the construction wastes collected and recycled. SO is knowledgeable and experienced in

electrical and mechanical engineering, enabling him to contributing to his neighbourhood by fixing their urgent household problems. He is helpful to his neighbours that he has constructed a wall along one of his staircase for protecting a lady in short skirt from peeking.

Capability of Disaster Management

Although his place is not sensitive for natural disaster, he experienced tree falling once in his garden. Fortunately, the tree did not cause serious damage, that was eventually cut and resulted in the fuel of fire for cooking. Diverse spaces implies chunks of tasks for disaster preparedness, which are not only done before predicted disasters but practiced in regular basis. SO checks the clearance of the drains especially for the roof and the water tanks, reinforced the shelter for goats and the frameworks for climbing plants, and tightens the plants and trees with ropes. Door is always open for dogs. After typhoon, he supports the slanted trees with different recycled materials. Besides, he believes that strong bonding among neighbours is essential for being ready to face disaster, which should be developed and strengthened for building a reciprocal community.

On-site Photo Record



Top left: Workshop
Top right: Wood as fuels for fires
Middle left: Staircase constructed by SO
Middle right: Goat farming
Bottom: Reinforcement of slanted tree

Quote

「呢間屋我 design 嘅，地板我鋪嘅，……，行路嘅樓梯全部我做嘅，人地做我又隨手跟住做，水電、燒焊、油漆都係我做。我屋企乜都有嘅，燒焊機乜都有。」

「張枱係沙田間酒樓人地唔要，運返嚟嘅；個囝喺學校做咗好耐，啲學生櫈唔要，又攞返嚟，無謂掠咗去。」

「（對於生活模式）各人有各種鐘意啦，你比間屋我喺出面住，我都唔鐘意㗎。」

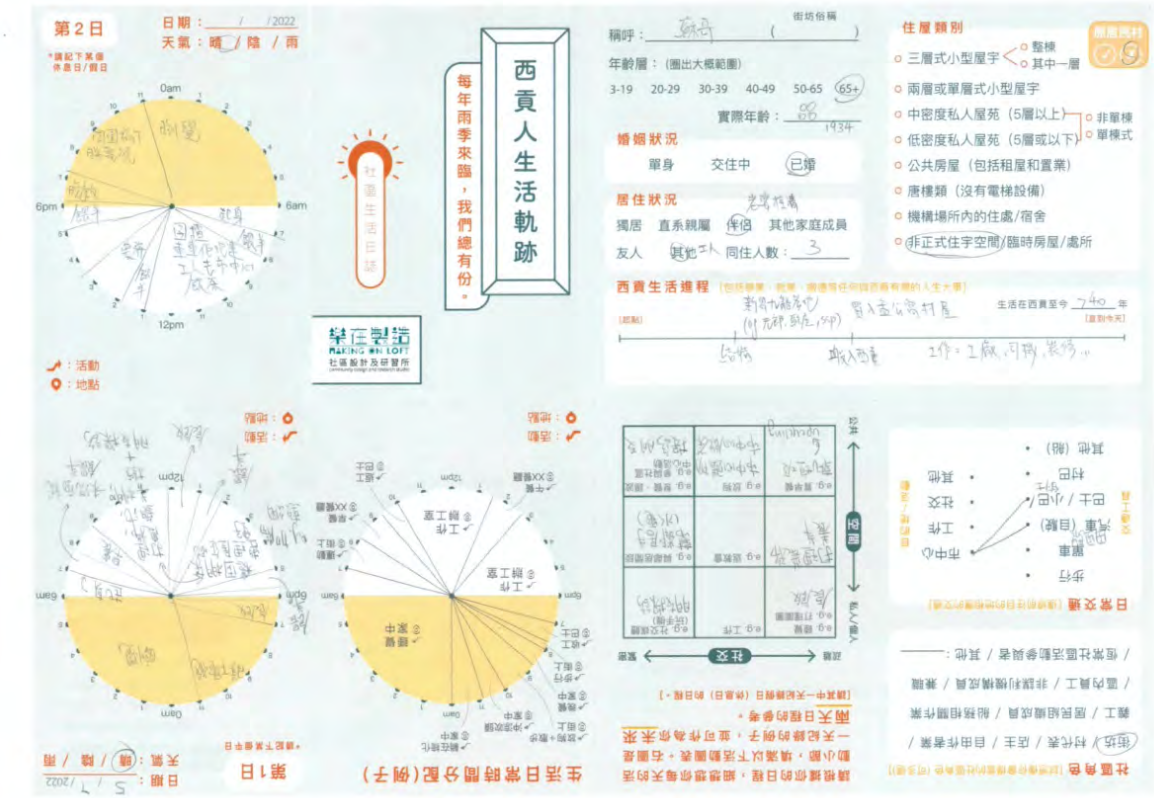
「呢條村數上嚟唔夠十户，我早幾年管七家，水電嗰啲，水喉壞咗又嚟搵我。」

「機場跑道嗰啲工程，做完啲鐵皮唔要就搬咗過嚟，咁我就用嚟鋪屋頂。四十幾年前搬嚟呢道，由間屋開始，唔洗開工嘅時候就起，之前揸車係工地攞啲用淨嘅材料返嚟。」

「超市夠期落架嗰啲麵包，我識得個做清潔嘅，再同佢攞返嚟曬乾，係俾啲羊食㗎。」

「之前打風，咁大棵樹冧咗落嚟，啱啱好冧落間屋，冇撞到窗，都係瞓醒先見到。」

Log Book



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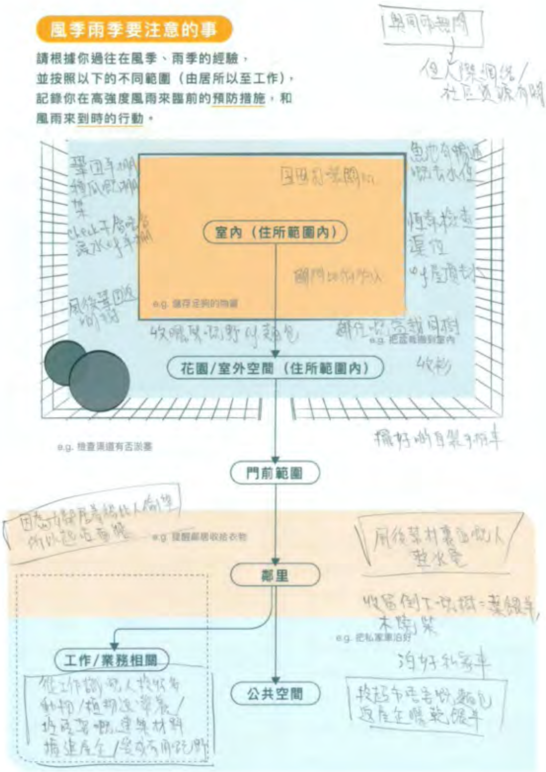

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3.4 Interview Summary – Interview with Fong (Ho Chung)

Study Area: Focused Study Area A
Interviewee: Fong
Interviewers: Belle LAO
Date: 6 July 2022 2:30pm-4:00pm
Venue: Caritas's Centre in Man Yee Fishermen Estate

Persona

Fong, aged around 60, has lived in Sai Kung since her birth. She first lived on a boat with her family when very young. The whole family then moved to Tui Min Hoi Chuen later at her age of 10-ish and she started working outside Sai Kung as a factory worker. Ten years later, she moved to Man Yee Fishermen Estate after marriage. Her family lived at a flat on 4th floor for about 30 years, while she ran a convenience store on the ground floor of the building in the past 30 years. 2-3 years ago, she closed the business, the whole family moved to the flat at G/F.

She lived with husband and two children. She is now a full-time housewife, practising a healthy retirement life in Sai Kung. Sometimes she goes swimming at Sai Kung Town in the early morning, then enjoys cooking and making handicrafts in the afternoon. She is active in joining the activities organised by Caritas's Centre. She made handicraft products for sale in the Centre.

Living Environment

Man Yee Fishermen Estate is located at hillside that keep them away from flooding. She heard that the lower level of Sai Kung was seriously suffered at Typhoon Mangkhut, she was lucky that she was not in this case. But she also witnessed the boats at the seaside crashed to the shore from her flat.

Skills, Resources & Relationships

The relationship between the neighbors is close as they know each other for more than 20 years. They will transfer and share objects like snacks, keys by using rope. As running the store

for more than 30 years, she witnessed the changes of the community and the growth of the children. The store used to be a gathering point of the residents.

She had joined the volunteer team of Caritas's Centre, making masks for the elderly nearby. She goes to the center quite often for borrowing sewing machine in the Centre.

There is a Mutual Aid Committee in the Estate. The committee strive for direct water supply for the estate some years ago. They also help to manage the electricity supply in the public area. The Committee are mainly focusing above issue. As all the committee are volunteers, she thinks it is reasonable that they cannot devote too much.

Capability of Disaster Management

When typhoon is near, she will reinforce the shelter, tightens the objects with the ropes. She thinks the buildings and the facilities of the estate are stable and safe. Residents do not need to do much preparation for disaster.

On-site Photo Record



Top left: Residents hang clothes with ropes outside the buildings. The area at the ground floor used to be Fong's store and gathering points of the neighbors.
Top right and Middle left: Fong will reinforce the shelter, tightens the objects with the ropes when bad weather.
Middle right: There are few trees around the buildings, Fong thinks that does not cause any potential crisis to them.
Bottom: Fong adopted three cats in the community. Residents sometimes come to her place to play around with them.

Quote

「好似山竹嗰陣時諗住多啲囉，因為呢度啲地方一路都係斜，所以係唔會水浸嘅，如果水浸山腳嗰啲已經係冇晒㗎啦。」

「「因為我而家住樓下啦，出邊有個膠布嘅布帳，如果真係好大風嘅話就要收，收緊 D 個膠布唔好俾佢鬆。」

「啲仔女開頭都有諗過出去住，但係而家啲租金咁貴，諗都唔使諗。」

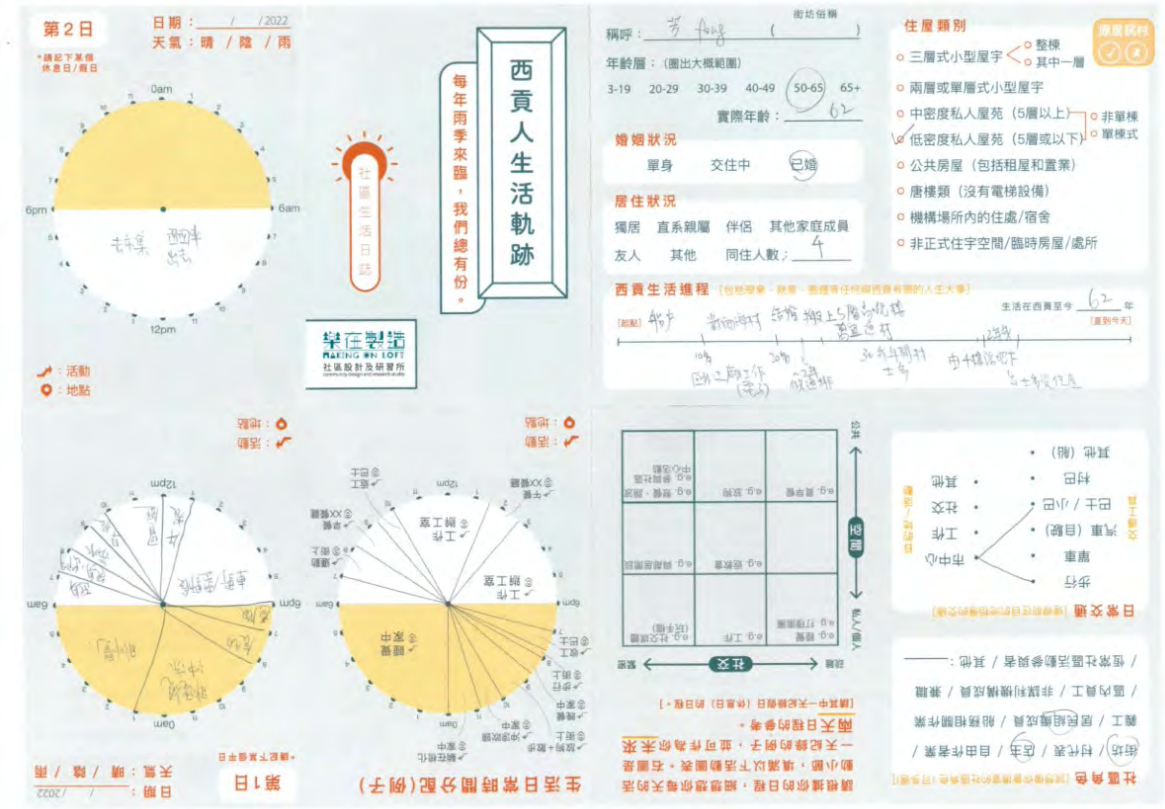
「有時有啲咩大家（鄰舍）都會互相幫，（例如呢？）有時我晾咗衫落咗街，一落雨佢就會即刻走落嚟同我收㗎啦，因為晾喺出面，你出太陽嘅……可能一場過雲雨就濕晒，佢見到，知道你唔喺度，就即刻同你收，有時搵都未必有咁快，佢即刻落嚟同我收咗。」

「我同樓上嗰個好熟㗎，咁佢有時有啲乜嘢……去後邊攞嘢，佢喺（露台）後邊吊條繩落嚟，咁你就攞得㗎啦，行都唔使……因為佢唔高喺 2 樓嘅啫，好近嘅就喺隔離，一行出去打個電話，出去攞嘢啦，你抗條繩落嚟啦我有嘢調上去，佢就抗條繩落嚟。有時整咗啲嘢食，或者攞啲嘢嚟食下咁都會㗎。」

「（互委會主要做啲咩？）互委會收好少嘅月費，因為我哋條村都好特別嘅，樓梯無燈嘅，互委會裝晒嗰啲燈同埋交電費，都係互委會負責，所以就要交管理費就係比呢啲，同埋條村有咩維修都用到嗰度啲錢。」

「近年冇咁多人願意出嚟做，就算做，後生嘅做，咁你通常都要返工，冇咁多餘時間去做，年紀大嗰啲如果佢唔返工就可以咁多啲時間去做。」

Log Book



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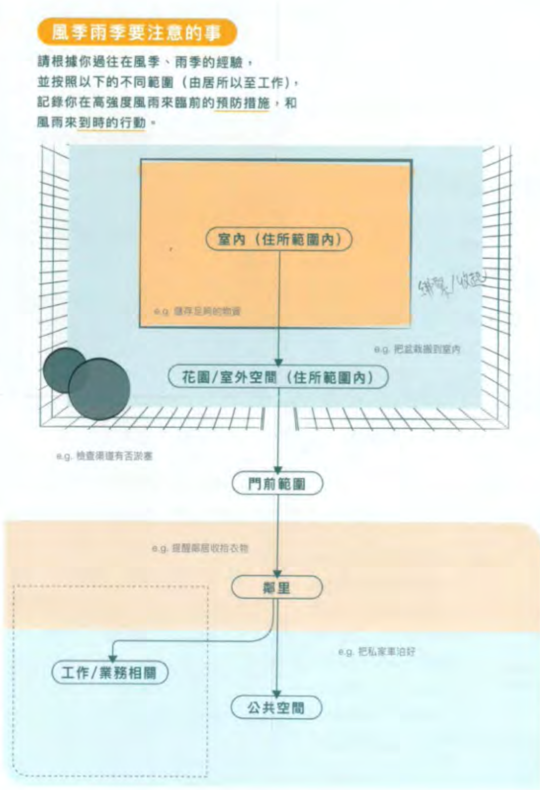

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3.5 Interview Summary – Interview with Cherry (Sun King Terence)

Study Area: Focused Study Area A
Interviewee: Cherry YEUNG
Interviewers: Wingchun CHENG
Date: (first) 26 May 2022 1030am-11:45am | (second) 11 July2022 10:00am-11:30am
Venue: Sai Kung District Community Centre and Sun King Terence

Persona

Cherry, aged 34, came to Sai Kung 8 years ago upon marriage. As Cherry worked in Tseung Kwan O and her husband worked in Sha Tin, Sai King is the middle point. Before moving to Sai Kung she lived in several spots in Kowloon. She has enjoyed Sai Kung a lot since she's here, especially during winter and autumn, summer is a bit too hot to live in a village house. Covid-19 also brings changes in Sai Kung, as more local tourists come to Sai Kung. She lived in Sha Kok Mei Village for three years and moved to Sun King Terence(新景臺) after having their baby for a bigger place to stay. She also became a full-time mum.

Living Environment

Sun King Terence, which one can only search on google map with its English name, keying in 新景臺 will give no results. The exact cluster of houses named Sun King Terence is actually unknown, but the village commonly understood is called Tan Cheung Ha Village (頓場下村). Cherry lives in an old style village house. It's a two-floor village house with a footprint of 60sqm. The landlord lives on the ground floor, Cherry and her family live on the first floor with the roof. The roof is unlike the usual one we normally see, it only has metal bar fence without concrete, and it doesn't have drainage on the roof. The roof is mainly used for planting and drying cloths.

The location of the house is on a hillside but without the threat of landslides or flood. There was a time that the neighbour's roof structure's roof got blown away during typhoon. Government officials came to cleared it up after two weeks on a slope. Her another neighbour living right next to her has a garden in front of the house, they plant for themselves to eat and also make compost by burning some unwanted plants.

Skills, Resources & Relationships

Cherry was a scriptwriter before she became a fulltime housewife. She made good use of her skills by volunteering at Debby Chan's, a Sai Kung district councilor, office as editor when it was still a relatively democratic district council election. Now she volunteers at a local store a day or two every week. The store is just 10mins away from her home, so she would also bring her kids to the store while volunteering.

There is a Mutual Aid Committee in the village. She got a friend who found a way to get into the committee, but there was no meeting, duty, resources or right to do anything.

There is a park in the village where she often brings her child to play, it's also a place to meet other parents in the village. A park that connects children and parents in this village. For the cluster of houses that Cherry lives in, she can name all her neighbours. Cherry get to know Sai Kung District Community Centre as she brings her child for the hobby classes there. She would also volunteer at the centre from time to time.

Capability of Disaster Management

The main task before the typhoon for Cherry is to take the plants and cloth hanger back indoors. If there's heavy rain, sometimes she might need some towel to put at the window's gap. Besides the above measures, there's nothing much she needs to worry about as they are not affected much by bad weather.

If there's any urgent matter, the first one to contact is Cherry's husband. If tangible help is needed, there are few handy men that she knows just live around.

On-site Photo Record

Top left: Sun King Terence building cluster on the slope
Top right: Her Neighbour's roof fall onto the green side
Bottom: Back of the Sun King Terence building, the slope is well maintained

Quote

「新景台有一排屋，我地有十幾戶，大家相對熟啲，隔離屋我地講得出個名，租客同業主都有，後生嘅通常係租客。呢排多左裝修，裝完應該都係租出去。」

「應該係新景台獨有，我同隔離個天台係相連，而我地個欄桿下面無一級，所以一沖水啲污穢嘢會沖晒落樓下。」

「山竹打風係最嚴重一次，則邊有間屋僭建嘅屋頂成個飛左出黎，發覺入面原來係發泡膠，兩邊係鐵板，之後飛左去山破底，普通市民去唔到執，過左個幾月有一日無左，應該係政府啲人黎清左佢。」

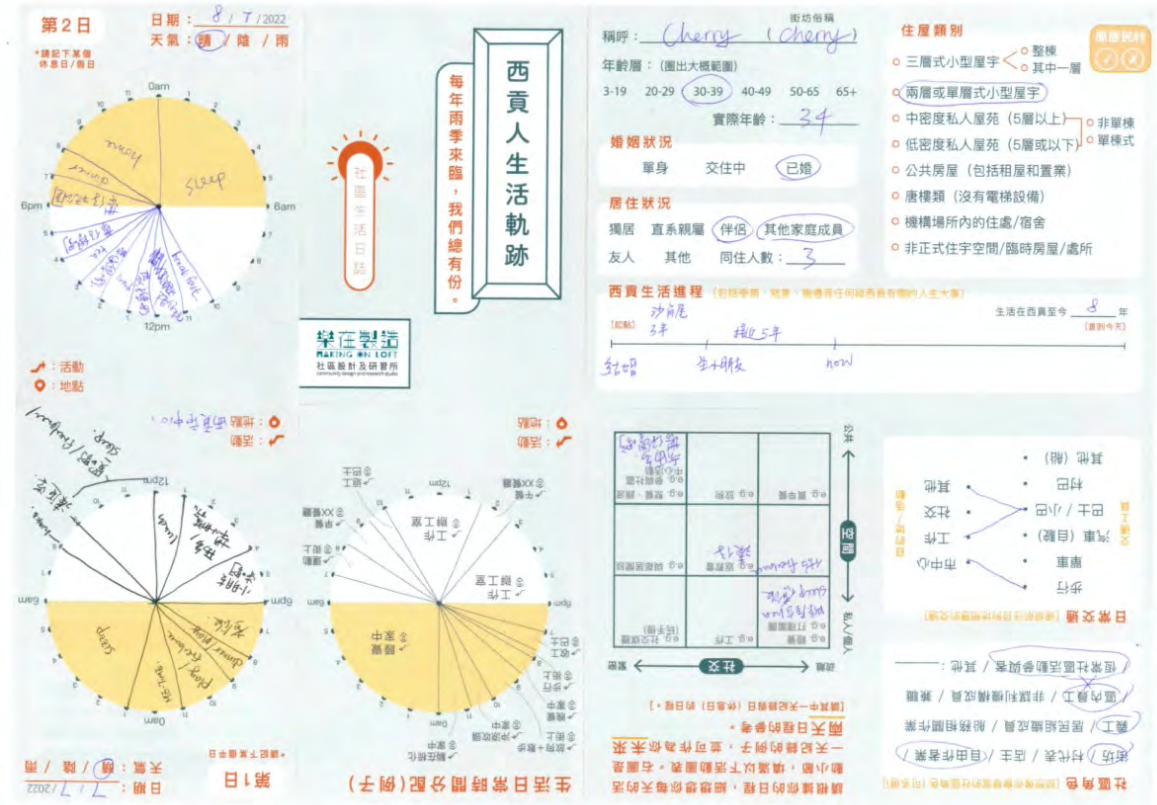
「岩岩呢個風好弱，我地完全無野。可能因為吹唔正我地，雖然係 8 號，但感覺似 3 號。我地事前會買多少少嘢食，啲盤栽都無收埋晒，只係 l 埋牆。」

「太大風大雨個陣我要用毛巾 SIP 下啲窗，其餘都無乜要擔心。」

「我見到啲渠其實唔係好深，大雨個陣有時有小噴泉，我地有同互委會講過，搵人搞下佢，不過都好似一直都無人理。」

「村口個公園，四周圍都有屋圍住，大家一行出黎就會見到，咁就可以知道邊個小朋友係邊一間屋。另外都會有唔同家長帶小朋友去玩，我主要係呢到認識村內其他有小朋友嘅家庭。呢邊鄰社關係比沙角尾村好，可能因為係多啲小朋友。」

Log Book

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以 表示 其他災害
北港凹
大涌口
白沙灣
北圍
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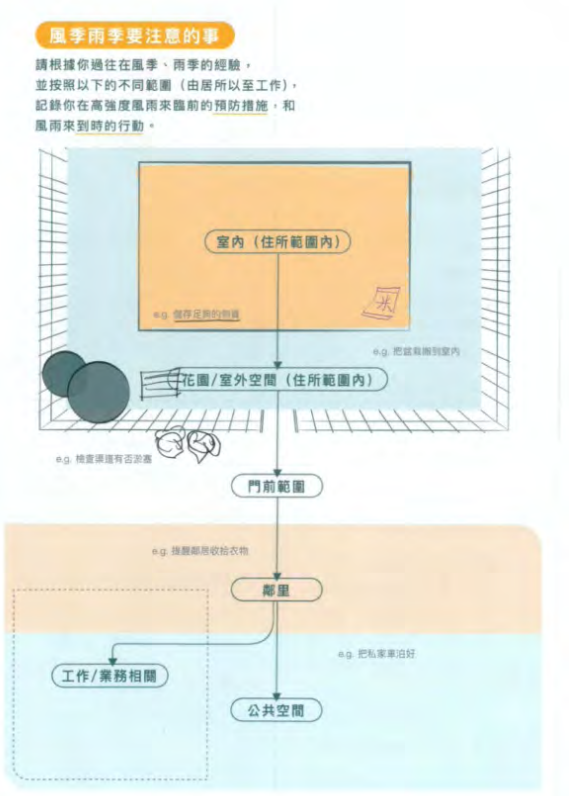

風季雨季要注意的事
請根據你過往在風季、雨季的經驗，
並按照以下的不同範圍（由居所以至工作），
記錄你在高強度風雨來臨前的預防措施，和
風雨來到時的行動。
室內（住所範圍內）
花圃/室外空間（住所範圍內）
門前範圍
鄰里
工作/業務相關
公共空間

3.6 Interview Summary – Interview with Mrs Wong (Ho Chung)

Study Area: Focused Study Area D
Interviewee: Mrs WONG
Interviewers: Emily CHAN
Dates of Interview: (first) 15 June 2022 11:20am-12:20pm | (second) 30 June 2022 9:30am-10:30pm
Venue: Online (video call)

Persona

WONG is a fulltime mum aged 30-39, strongly attaching to Ho Chung with her daily life and her family. Having stayed in area around Ho Chung since her birth, she currently lives with her husband, 3-year-old twin daughters and her parents, and she devotes much of her time to her family. For instance, she drives her children to school and has breakfast with her mum every day, followed by taking care of her mobility impaired dad at home. The family frequently visit her mum's friends and their relatives around Ho Chung, which makes a closer relationship between WONG and the place. Although she has lived in Ho Chung for long time, she only defines herself as a good tenant without taking any other roles in her community. Since her core living circle concentrates in Ho Chung and Tseung Kwan O, she treats Town Centre as a place for leisure with a wide range of sports facilities and parks, as well as a place for fish.

Living Environment

Her house is close to the Ho Chung River but fortunately on a big step separating her place with flooding. Surrounded by the neighbouring houses, her house is relatively safe from natural disaster such as rainstorms and landslide. She lives closely to nature, and she practices gardening in her sheltered backyard, which makes her sensitive to the change of the weather condition.

Skills, Resources & Relationships

WONG is a good neighbor who sometimes drives her neighbors out of Ho Chung. Although She does not actively participate in the community, she maintains reciprocal relationship

among her neighborhoods. For urgent or important issues, they would share information and discuss in private virtual group. For district-scale issues, she relies on social media (mainly Facebook groups and pages) to obtain updated information, including disaster related information, of Sai Kung.

Capability of Disaster Management

She experienced house flooding under the typhoon Mangkhut (Year 2018) in her previous place which was adjacent to Ho Chung River. When the house was flooded, she could only elevate the electrical appliances and wait for the water retreat, followed by the cleansing as one of the main recovery works. After this experience, she constructed a brick wall for flooding prevention, prepared sandbags and frequently checked the clearance of the drains. With all the preparedness tasks done, she is not worried about facing the upcoming natural disaster as she deems that all are under control. The bigger concern is on the affected traffic after disaster, which trees are fallen and reduce the accessibility of people in Ho Chung to elsewhere.

On-site Photo Record

Top left: Backyard gardening in WONG's place
Top right: Sheltered backyard
Bottom two: Flooding and house flooding in Ho Chung under Typhoon Mangkhut
(Photos provided by interviewer)

Quote

「我屋企距離大概行一分鐘啦，但因為高咗少少，所以唔驚水浸，同埋周邊啲屋圍住咗，就唔係好應風。」

「平時會去附近行下山，例如去水口，會幫襯買業餘農夫嘅菜。」

「打風嘅時候去將軍澳方向嘅路好易有冧樹，揸車坐車都好麻煩。」

「種植物嘅地方有頂，所以落雨都唔會驚，但有時濕度太高就種唔到，花園住要都係攞嚟種野，夜晚食飯就少啲，太多蚊啦。」

「Facebook 有啲西貢 group，通常有人見到有冧樹，就會影上去，有時有啲天氣新聞可能未必報得切，要靠 social media 先知。whatsapp group 都有，但少啲野講，通常有大事先會講，係我地呢邊幾間比較熟啲嘅。」

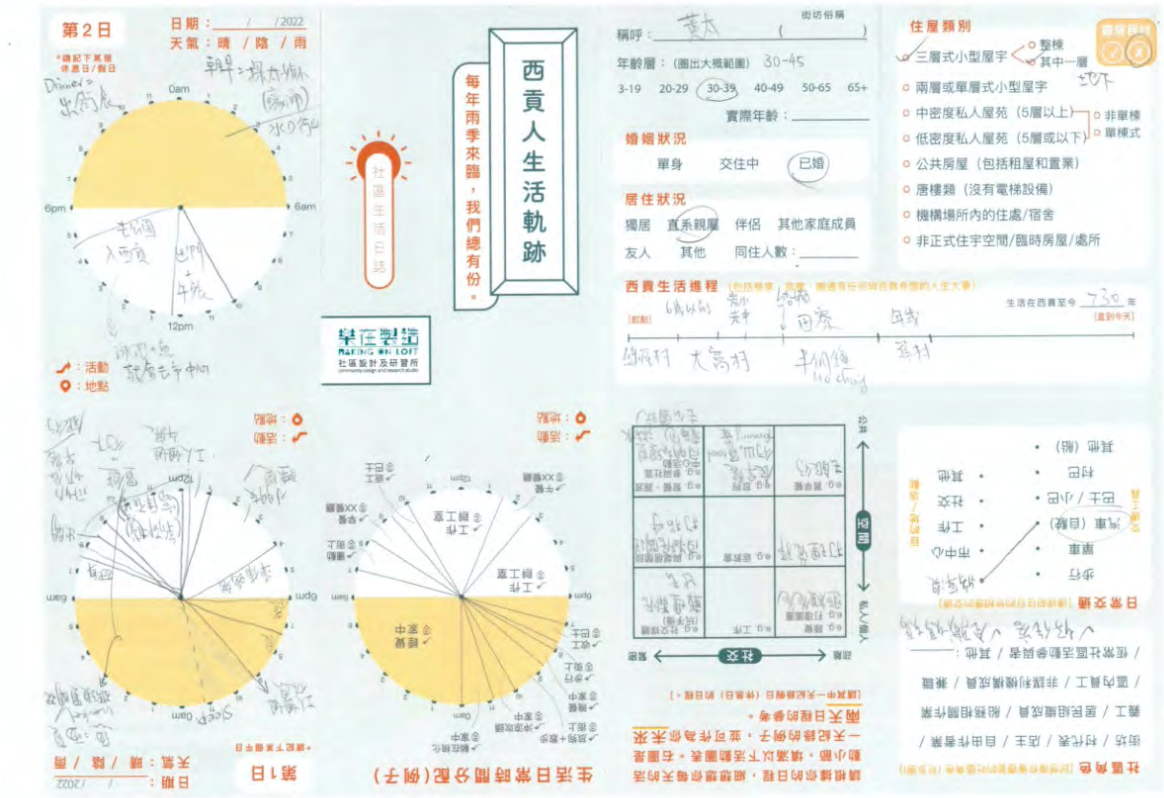
「有水入屋嘅時候，會拎起啲可以拎高嘅電器先囉，水入屋嘅話其實好快已經會湧入嚟，嗰陣時有冇沙包係屋企呢，所以都冇辦法。只可以望住佢擁入嚟，然後等佢走。」

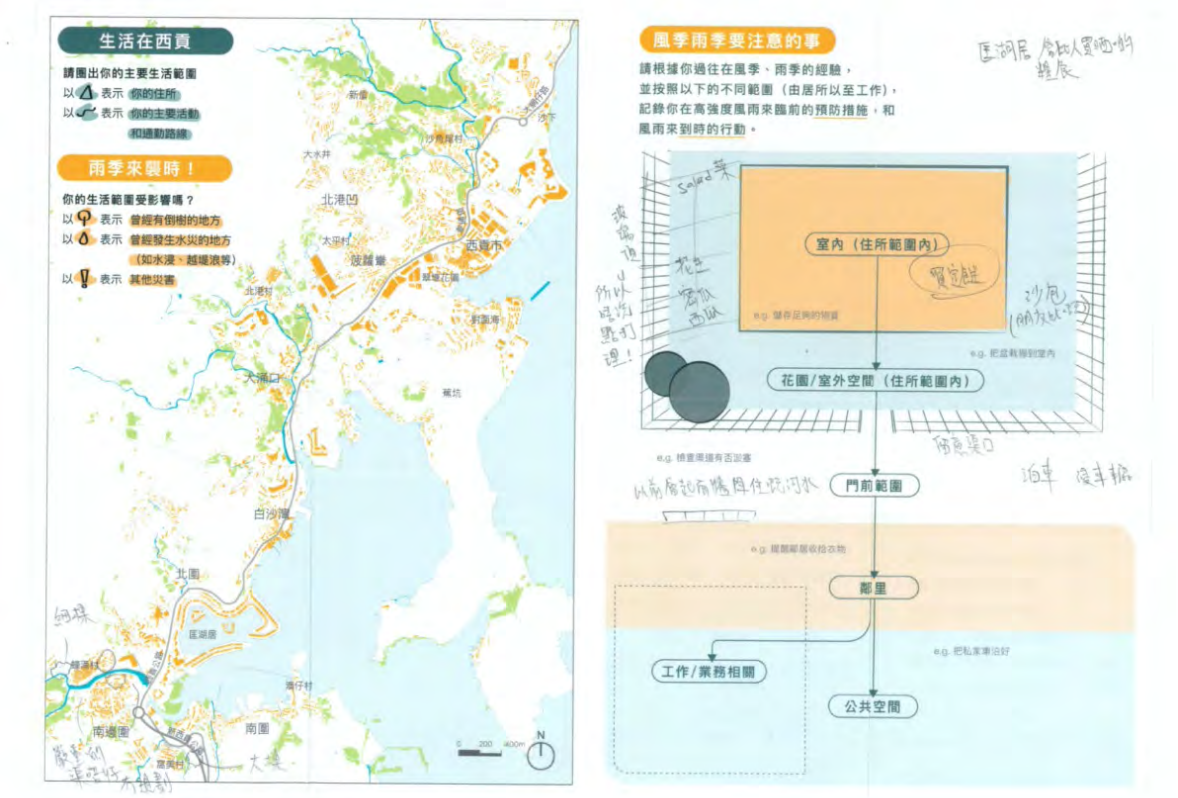
「後尾知道大概邊個位置入水，就會封咗佢，河邊嗰啲位呢，有個位置啲水會倒灌返入嚟，再搵啲磚切面牆封咗佢。」

「有試過停電，停電嘅話就會打俾中電，如果同一時間有好多個地方要去，佢可能都未必即刻嚟到。試過會上唔到網，啲機房一打風就好易有事，就要等人搶修。」

「打風之後，有時咁啱車我老公出去，見到啲鄰居就會一齊車埋出去，我哋呢邊交通比較麻煩先會有呢啲情況。」

Log Book




生活在西貢
請圈出你的主要生活範圍
以 表示 你的住所
以 表示 你的主要活動和通勤路線
雨季來襲時！
你的生活範圍受影響嗎？
以 表示 曾經有倒樹的地方
以 表示 曾經發生水災的地方（如水浸、越堤浪等）
以 表示 其他災害
風季雨季要注意的事
請根據你過往在風季、雨季的經驗，並按照以下的不同範圍（由居所以至工作），記錄你在高強度風雨來臨前的預防措施，和風雨來到時的行動。
室內（住所範圍內）
花園/室外空間（住所範圍內）
門前範圍
鄰里
工作/業務相關
公共空間
西貢市
大水井
北港凹
大浪口
白沙灣
北圍
南圍

3.7 Interview Summary – Interview with Anna (Ho Chung)

Study Area: Focused Study Area D

Interviewee: Anna

Interviewers: Belle LAO

Date: (first) 9 June 2022 4:30pm-6:00pm | (second) 8 July 2022 11:00am-12:00pm

Venue: Anna and her family's house in Shui Hau, Ho Chung

Persona

Anna, aged 30-39, has lived in Ho Chung with her family since she was born. She grew up and studied in Sai Kung District. She lived with her parents in a stone house before and moved to another house around 2 years ago with her brother in the same area, around 8-10 mins walking distance. Her relationship with family is close, she sometimes come to parent's house for dinner.

She is now a freelance Yoga instructor and a part time office lady. She works outside Sai Kung many of her time while she stays in Sai Kung when she is off, or when she teaches Yoga lessons in the Sai Kung District Community Centre. She also helps managing the farms of her family. Her family start farming near their house since 1970, planting various of flowers and sell them to Flower Market. Recently they rent out most of their farmlands to leisure farmers and kindergarten who organize activities for children in weekends. They reserved some of the lands for themselves. Her parents practice farming for leisure.

Living Environment

It takes around 15 mins to walk to the house of Anna's family from the road. The Stone house of Anna's Family located at hillside in a relatively high place. They never suffered from flooding or landslide. But the old stone house was fragile when facing strong wind. In Anna's memory, the tin roof had been destroyed and removed during a typhoon around 15 years ago. The whole family could just stay in the house as the wind was too strong and they had no place to go. The building has been reinforced after that. In addition, they have large area of agricultural lands outside their house. Installations like canopies, shelters, farming trellis would be more or less destroyed during typhoon season. Blocking of the lane is evitable, but Anna thinks that the farmers (the tenants) are experienced and would prepare when Typhoon. Installations are stronger than before.

There is a river in front of the village. Villagers must walk pass the bridge to go home. Water flow is large and rapid during typhoon season. Buildings along the river had been destroyed at Typhoon Mangkhut, the bridge was damaged (see attached photos).

The house of Anna and her brother was built by her family around 10 years ago. Although the house is stable, they have been suffered from tree-falling outside their house during Typhoon Mangkhut. Fortunately, no one was harmed. Their house is located at a gentle slope, the footpath outside is a bit steep with lichen. It is slippery in the rainy season.

Skills, Resources & Relationships

There is a small community around the house. Most of the neighbors lived there for more than 30 years, they know each other for long. Due to the reconstruction of the public walk path a few years ago, they setup a WhatsApp Group for discussion. The group since then become a communication channel of the community. They will exchange the information like Traffic jams, weather in the group.

Anna joined the volunteer team of Sai Kung District Community Centre in Covid-19 in recent years. She became an interest class instructor, providing online Yoga courses to SKDCC's members since the pandemics. She knows more Sai Kung residents from the activities of SKDCC. The members introduced her to other friends in Sai Kung, now she holds private classes for them in Sai Kung. She thinks her network is widened due to the Yoga classes.

Capability of Disaster Management

When a typhoon is near, Anna will move the small plant back indoor. She and her family will reinforce the shelter, tightens the plants and trees with ropes. For the rented land, she thinks the tenants are experienced for the change of weather. The tenants will prepare and strengthen the installations 1-2 days before the typhoon. Her family usually do not need to do additional works for them. They will also remind the elderly living near them before and after the typhoon as they know many years.

On-site Photo Record

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Photos during Typhoon Mangkhut:
Pic 1-3: The bridge was damaged. The glass house is removed now.

Photos of the area now:
Pic 4: Stone house of her family
Pic 5-6: lands for leisure farming
Pic 7: installations around the area
Pic 8: Houses to be rebuilt nearby
Pic 9: House of Anna and her brother
Pic 10: Tree (at the back) fell during Typhoon Mangkhut

Quote

「（由以前到而家嘅變化係）多咗好多人嚟種嘢，我哋同租戶嘅關係都好 friend，而家都有好多害蟲.....啲棚以前係用竹搭，而家就用鐵枝，而家係租戶自己整嘅，都係我哋教佢，從我哋一直以來嘅經驗指導佢哋。」

「我細個嘅時候， 20 年前嘅一個颱風，吹起左個屋頂，大家係要淋住雨咁食飯；而家雖然牆邊係石屎，但係個頂仲係鐵皮，因為牌照屋唔可以加建。」

「我哋條村啲村民都有一啲通報嘅（WhatsApp Group？），係喇，都會去有啲咩事呀、通知返。而家條村有 10 零戶，全部都係原住民。（有村長嗎？）有㗎，但係我都唔知係邊個，佢都從來冇講過自己係村長。」

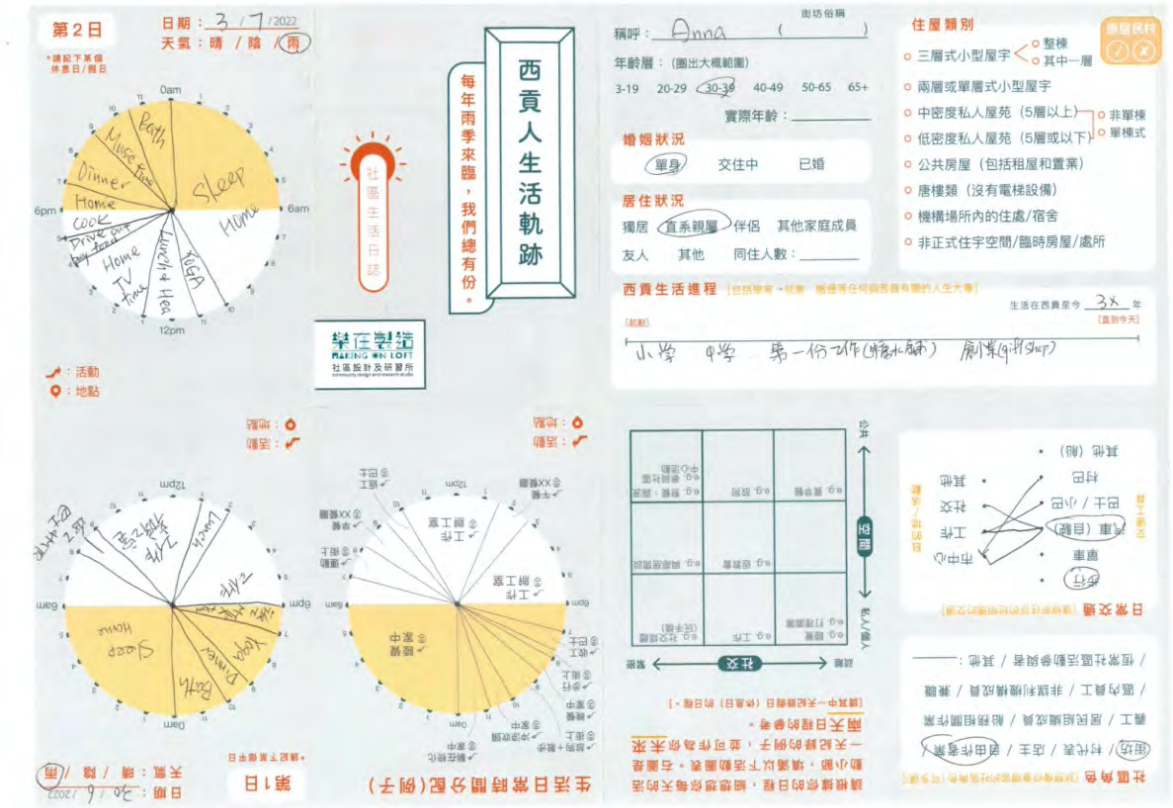
「條村主要都係種下野，種下蔬菜，有啲都會拎出去買。而家冇本地人自己種㗎啦，係外來人做種多嘅。本地居民已經唔想種，上邊啲地主要都係蠔涌嘅地主，咁佢哋覺得辛苦都唔會自己種。」

「咁之前試過我屋企出邊條路冚咗樹，咁隔籬屋嗰啲男仔咪幫手開路，因為大家要返工。」

「（慣左農作物損失？）其實你慣咗嘅心態，就唔會特別（難過）……咁損失你就一定會唔開心嘅，我哋依啲農友都係過日神。」

「（有乜嘢防災準備？例如走佬包？）因為我哋呢啲又未至於要走佬，即使打風都係要留守喺度咁樣……屋頂吹走左都係要留喺屋企，咁所以冇呀。」

Log Book



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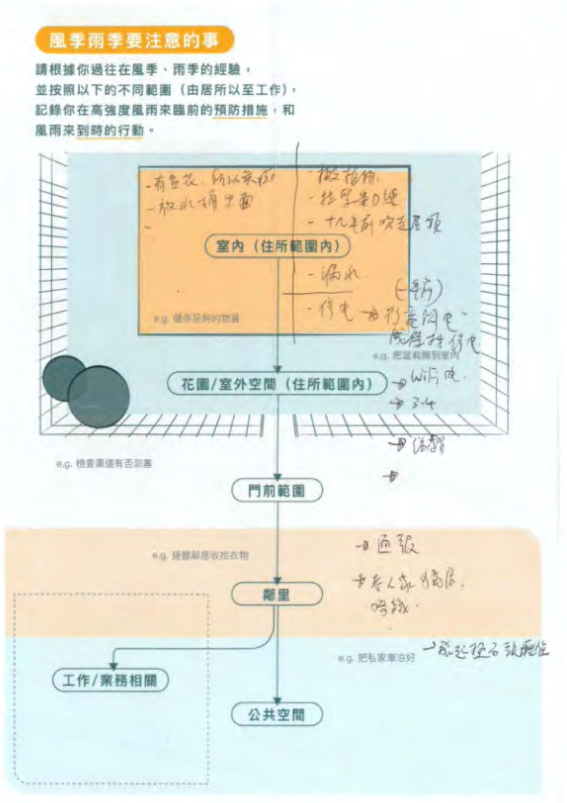


3.8 Interview Summary – Interview with Niko (Tai Chung Hau)

Study Area: Focused Study Area B
Interviewee: Niko LEUNG
Interviewers: Wingchun CHENG
Date: 20 June 2022 9:30am-11:30am
Venue: Niko's workshop in Tai Chung Hau

Persona

Nik, aged 3x, is a multi-disciplinary designer who works and lives in Sai Kung. Her studio is a practice for materials, object, and installation design.

She has been living in Sai Kung since young. After 10 years of studying and working outside Hong Kong, she chose to come back to Sai Kung with her Partner in 2019, at the same time setting up her work studio in this area. She's now living near Sai Kung Town Centre, and the studio is in Tai Chung Hau. Minibus is her main public transport for work.

Living Environment

Niko found out the workshop space by walking and asking around. She met a second landlord who rented a few spots in this area. They are being rented out as garage, gardening or storage. Niko rented an idle space outside a garage around 30sqm for 3k/month which is a roofed open area. She renovated the space into a cozy workshop with partition and insulated roof. The well-articulated materials bring the space alive.

Niko and her colleague usually start working early, especially during summer time. The space is not air conditioned, in the middle of the day, working in the workshop can be physically and mentally challenging. During rainy days, there are spots that Niko needs to deal with water leakage. The primary roof owned by the second landlord needed to be repaired, however what Niko can do is either wait for the landlord or handle the problem herself.

Skills, Resources & Relationships

The project Niko is working on is called HK SOIL. It is a project that explores the technical and cultural opportunities of recycling and reusing discarded soil from construction sites. The project made a new Sai Kung community.

The first batch of soil which she is handling is from a church in Sai Kung, 15 tones of soil. To handle such a large amount of soil, Niko needed another space for soil storage and sorting. She walked around again and met another landlord who had a site for construction equipment storage. She rented a corner for soil storage and sorting for different kinds of use.

After sorting the right size of soil. The team will make a mix so that they are good for making ceramic pots. The mixed clay are then sent to a Sai Kung potter to make ceramic candle pots. Once the candle pots are done, they will be brought back to the workshop to fire and put on finishes.

The final destination for the pots is BeCandle in Sai Kung town center for sale. The whole process are done in Sai Kung, Niko has a strong ability to connect dots.

Capability of Disaster Management

The main issue Niko needs to deal with is the rain problem, a bit well fixed roof consumes her time to handle the water leakage.

Her Dad also lived in Sai Kung. Before the typhoon, he would take away all the plants on the balcony. Taping the cross on the window does not work well. Her dad always has two wooden boards at home to enclose the balcony window.

On-site Photo Record

Top two: Workshop interior
Middle left: Workshop exterior, no sign of design workshop inside
Middle right: Niko's workshop in a semi-open space
Bottom left: Second landlord business, gardening shop
Bottom right: The place rented for soil sorting

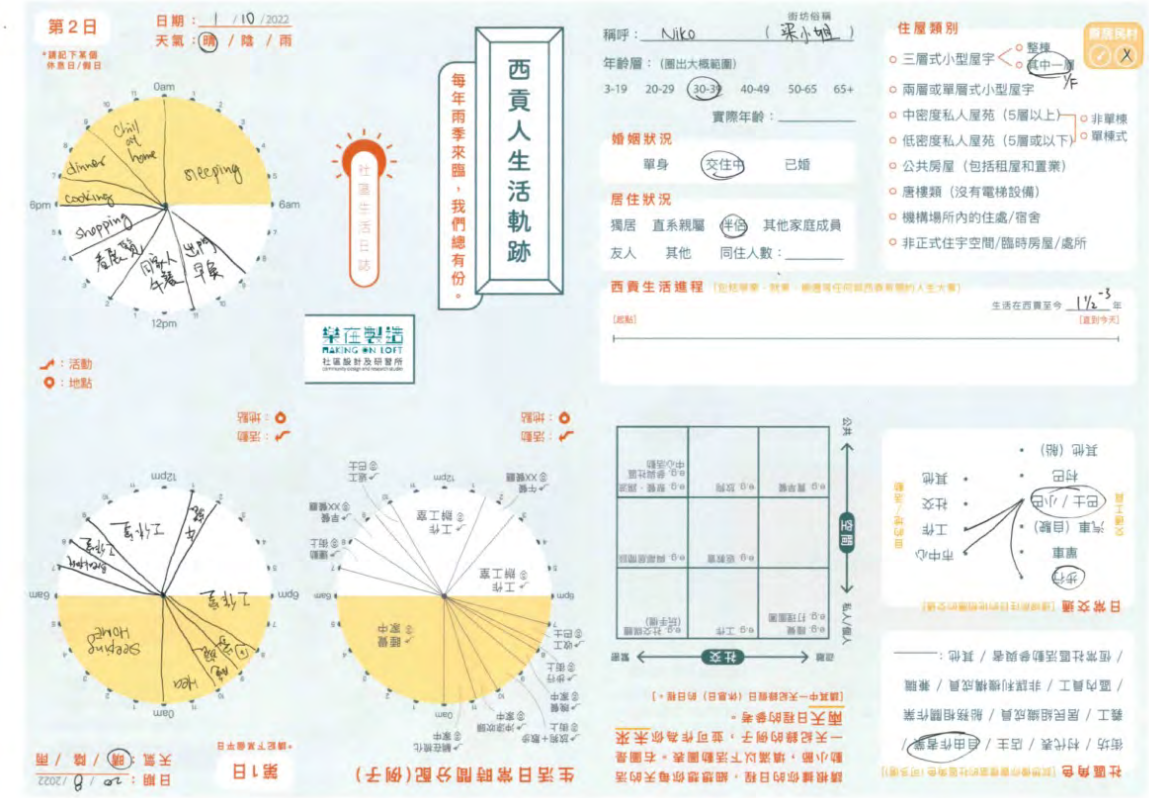
Quote

「打風之前我爸爸就會將啲盆栽收晒入屋，另外屋企有一啲木板，佢會用嚟盯住個窗。」

「工作室同儲存泥嘅地方都係我喺呢一個社區周圍走周圍問人而認識嘅業主和二房東。」

「我用緊嘅工作室原先都有屋頂，不過我地另外做多個天花。有個角位每逢落雨都會漏水，我地等緊二房東整翻好佢，因為外面個到係佢負責嘅。」

Log Book

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請圈出你的主要生活範圍
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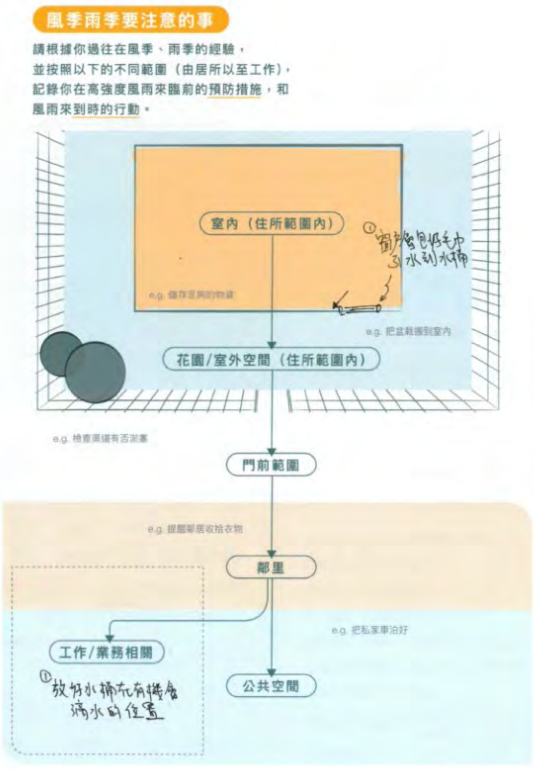
雨季來襲時！
你的生活範圍受影響嗎？
以 表示 曾經有倒樹的地方
以 表示 曾經發生水災的地方（如水浸、越堤浪等）
以 表示 其他災害
北港凹
大水井
大涌口
白沙灣
北圍
南圍
N


風季雨季要注意的事
請根據你過往在風季、雨季的經驗，
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門前範圍
鄰里
工作/業務相關
公共空間

RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX VI

RESEARCH REPORT G

STAKEHOLDER ENGAGEMENT PROGRAMME: FOCUS GROUP MEETINGS REPORT

OCTOBER 2022

Organiser

香港賽馬會災難防護應變教研中心
Hong Kong Jockey Club Disaster Preparedness and Response Institute

Sponsor

The Hong Kong Jockey Club Charities Trust

Study Consultant

樂在製造
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Community Design and Research Studio

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MAKING ON LOFT
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COMMUNITY DESIGN & RESEARCH STUDIO

Research Report G
Stakeholder Engagement Programme: Focus Group Meetings Report

Research and Model Development on Community Disaster Resilience Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

Date: 20 October 2022

Version: Final

Prepared by:
Ms. Emily, CHAN Wai-yiu (Researcher)

Please contact our Research Project staff for details:
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Making on Loft Limited

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1 Introduction

1.1 Objectives

Among all Stakeholder Engagement Programmes, Focus Group Meeting aims to consult the representatives of experts from various related disciplines, for example HKRC, Caritas Sai Kung, relevant government departments and the locals, in which opportunities and concerns are identified and prioritized from professional perspectives. The Meeting tries to validate and develop focus for further discussion regarding to the professional concerns and limitations.

1.2 Implementation

Focus Group Meetings (FGMs) were conducted from 13 September 2022 to 6 October 2022. Two Group meetings and 7 individual interviews were carried out. The two group meetings and 6 of 7 individual interviews were conducted online via Zoom with assistance of using Miro, the online real time tool to facilitate discussions. Two research staffs of Making On Loft Limited hosted the meeting facilitators throughout the online FGMs. One of the individual interviews was responded in written format.

Four groups of people are identified as the participants of the FGMs, including (1) Sai Kung Locals, (2) NGOs, (3) Academics and Scholars, (4) Rescue Related Groups and Official Departments. For group (1) Sai Kung Locals and (2) NGOs, participants were in two separated online group meetings of 6 active individuals in Sai Kung and 5 representatives from 3 local or topic related NGOs respectively. The adoption of focus group meetings aims at providing a platform for discussion. Participants of Sai Kung Locals were expected to discuss together regarding their experience in disaster resilience and the community assets in order to exchange information and encourage collaboration among distinct parties of the targeted community. Representatives of NGOs were expected to share their experience in community works especially in community resilience and disaster management, and explore the

future direction and the opportunity of collaboration in developing a disaster resilient community. For group (3) Academics and Scholars and (4) Rescue Related Groups and Official Departments, individual interviews were conducted for a deeper understanding of the functions of departments and insights from related studies.

FGMs	Date (Duration)	Format and Mode of FGMs	No. of Participants	Objectives
FGM 1 – Sai Kung Locals	13 Sep 2022 (90 min)	Online group meeting	6	To understand disaster management in Sai Kung according to the disaster risk management circle, including their perspective on their role, right, responsibility, position, resource, potential and establishing community resilience and disaster resilience; To find out their potential networks, connections and collaborations.
FGM 2 – NGOs	15 Sep 2022 (90 min)	Online group meeting	5 from 3 NGOs	To understand their previous experiences in disaster management and community building, their aspirations to potential party promoting disaster resilience; To find out the potential of collaborations.
FGM 3 – Academics and Scholars	23 Sep to 5 Oct 2022 (60 min)	Online individual interviews (2 in total)	2	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

FGM 4 – Rescued Related Groups and Official Department	16 Sep to 6 Oct 2022 (60 to 120 min)	Online Individual Interviews (6 in total); one in written format	7 from 5 Depts	To understand their functions in disaster management according to Contingency Plan for Natural Disaster (CPND), their performance pledge and services provided; To understand the existing collaboration among departments and between public and departments; To understand their future development in disaster resilience.

2 Findings of Focus Group Meetings (FGMs) and Interviews

2.1 Findings of FGM 1: Sai Kung Locals

Detailed information of meeting	
Date and Duration	13th September 2022; 90 min
Format and Mode	Online group meeting
No. of Participants	6
Participants	**Ms Debby CHAN** – the shop owner of Sai Kung Store and the former district council member of Sai Kung Islands **Ms Cherry CHEUNG** – active residents involving in many volunteer work in Sai Kung; living in Sai Kung **Ms Emily LAM** – active indigenous resident of Tui Min Hoi (act on behalf of Indigenous Inhabitant Representative) **Ms Niko LEUNG** – designer and studio owner in Tai Chung Hau; living in Sai Kung **Mr SIN TK** – co-founder of a property and design firm in Sai Kung Town Centre; living in Sai Kung **Mr Joseph MA** – P. C. Chairperson of Sacred Heart Church in Sai Kung; living in Sai Kung (according to alphabetical order)
Objectives	To understand disaster management in Sai Kung according to the disaster risk management circle, including their perspective on their role, right, responsibility, position, resource, potential and establishing community resilience and disaster resilience; To find out their potential networks, connections and collaborations.

Question 1: Did you collaborate with any parties or individuals in the community?

- Niko shared the existing collaboration between construction sites, artists, and retail stores on her project regarding the technology of transferring local materials into construction materials. Some private construction companies were willing to give their construction waste to her, but there were more concerns from companies in governmental construction projects.
- Niko expressed the idea of transforming local materials into urban furniture in public space in Sai Kung, and she further envisioned that houses and public facilities could be built by using this technology. But her biggest challenge was the storage issue of the collected construction waste.
    - Joseph found it meaningful and proposed a vacant site for storage owned by the church. He further suggested Niko to obtain construction material from an ongoing construction site of the church.

- Emily proposed a vacant site for storage owned by SKDCC in Sai Wan, where was developing into a multi-functioning space. Some workshops could be held for the residents regarding Niko's project.

Question 2: What did you do with your community under disaster? Any experience in disaster response?

- Cherry shared her observation under Typhoon Mongkhut, in which people kayaked for transport when flooding. She opened her house for her friends nearby for temporary sheltering. Information exchange relied mainly on social media, say Facebook and Whatsapp groups. She found that the elderlies were willing to help the community in disaster preparedness, such as cleaning the drains, while she helped her neighbors in old age to purchase the groceries when necessary.
- Sin said that he owned technical skills in home repair for disaster response. He cut and moved away a fallen tree with his neighbor after disaster, at which he did not try to contact official department but did it by himself because he understood how busy the department after typhoon were.

Question 3: Are there any tools you own/ can obtain for disaster response?

- Sin replied that he owned tools, say circular saw for cutting trees, and he believed that many in Sai Kung owned such tools in their storeroom for maintaining their garden.
- Sin added on envisioning the establishment of a network of machines and tools for locating useful resource when facing disaster.
    - Niko agreed on the necessity of having this network. She shared her experience in asking Makita, a manufacturing company, for tools to clean up the fallen trees, which suggested the importance of involving different parties and industries in the community.
    - Joseph agreed on it. But he expressed his concern on the lack of knowledge in handling fallen trees and using the tools. Regular maintenance of the tools were also an important issue. He further expressed his concern on the division of labour for volunteering tasks after disaster to avoid resource mismatch.
- For handling fallen tree, Joseph further suggested that local NGOs and residents might help to bridge the gap, that organise manpower for moving the fragmented branches to the main roads for massive collection by the government department.

Question 4: Any specific concern/ weakness of disaster management in Sai Kung?

- Sin concerned the poor drainage system in village setting (Tai Chong Hao), which adversely affected the mobility of residents after disaster.
- Joseph doubted the accuracy of information shared in social media. He believed that there should be authorities for spreading information, since trust between the information providers and receivers was essential for further collaboration, especially in disaster management.
    - Joseph further explained that his church was a unit building community with trust and more units should be identified or founded to cover different residents in Sai Kung. It was believed that the platform served the exchange of both information and resource.

Question 5: What does Sai Kung need in disaster management?

- Niko believed the importance of sharing disaster preparedness knowledge and home repair skills, such as the way to stop seepage of water. Knowledges and experience might pass through generations and among community. Some ready-to-function public spaces were needed for gathering people in extreme situation.
- Cherry expressed the demand of some small-scale temporary shelters, but not those big and distant.

Question 6: What did you or your companies/ shops/ institutions do for community resilience?

- Joseph shared the method the church used to connect older resident with younger residents for obtaining helps and information, one plus one (一拖一). He recommended local organizations to use such method to connect individuals for further reaching potential audiences.
    - Debby agreed that the unis for gathering people with regular meetings, such as church, were essential in building community resilience. She shared her experience as a district council member serving Sai Kung that spoted out those vulnerable people in the communities with regular updates. She also matched those vulnerable with active villagers.
    - Debby believed that more units/ organizations should be established to pick up these kinds of community works, which required much time and resource in the process.
- Emily shared her experience in connecting the elderlies in the community by knowing their children or neighbors.
- Debby spotted out the village office as a very important stakeholder in community resilience, who owned the strongest network and database in manpower, resource, and knowledge in disaster management. She

mentioned that they were willing to collaborate with other institutions and organizations for village affairs.

- Debby suggested the possible collaboration with local construction companies for resource and knowledge since they owned rich experience in construction and destruction.

2.2 Findings of FGM 2: NGOs

Detailed information of meeting	
Date and Duration	15th September 2022; 90 min
Format and Mode	Online group meeting
NGOs	Caritas - Hong Kong Sai Kung Community Development Service (Caritas) Hong Kong Red Cross (Community Resilience Service) (HKRC) Sai Kung District Community Centre (SKDCC)
No. of Participants	5
Participants	**Ms Emily LAM** – SKDCC **Ms May NG** – Project Manager – SKDCC **Ms Betsy SO** – Sai Kung Caritas **Mr Terry TAM** – Deputy Manager – Community Resilience, Hong Kong Red Cross **Ms Eva YEUNG** – Senior Manager – Community Resilience, Hong Kong Red Cross (according to alphabetical order)
Objectives	To understand their previous experiences in disaster management and community building, their aspirations to potential party promoting disaster resilience; To find out the potential of collaborations.

Question 1: What services did your organization provide for disaster preparedness?

- HKRC replied that they served the identified fragile districts/ vulnerable individuals depending on people's living environment, population of districts and their capability to respond to disaster in general. Cased were referred by local NGO partners according to the given qualities.
    - HKRC said that they closely collaborated with SKDCC and Carita.
- HKRC replied that they regularly held workshops and talks to different target groups, say students, who were identified based on their research.
- SKDCC replied that classes were given to the residents, such as cooking class of survival food and emergency food, and they were encouraged to transfer their knowledge to their neighbors. Regular visit to older residents helped identify their needs and their capability in disaster response for better and accurate support before disaster.

- Caritas deemed that they closely collaborate with HKRC for about two years. Survival kits were distributed to the residents with id card copying service and demonstration of the use of the kits. Classes, say AED course and first-aid course, were co-held with HKRC, which were an ongoing project. AEDs were installed in villages. Food parcels were regularly delivered to residents in need during pandemic.
    - HKRC added on sharing that drill was given to residents in Tui Min Hoi area, which was the new attempt.

Question 2: How did the communication work and sustain? What were the positionings of your organizations in these collaborations?

- HKRC clarified that the collaborations mainly depended on DPRI project. But the communication mechanism involved only HKRC and local NGOs (no official department as the leader), in which services were delivered after discussion.
    - HKRC expressed their willingness to continually collaborate with the two NGOs.
- HKRC deemed that local NGOs were the one to clear identify the specific needs of the specific area with their site knowledge and experience. NGOs might firstly find out the potential threat of communities. Then, HKRC joined in to further explore and discover the issues by field works before deciding whether the cases were worth doing. Alternatively, HKRC approached local NGOs depending on secondary data, in which they asked if the communities needed their intervention.
    - HKRC explained that they were not the leading role but the partners looking into local issues together with local NGOs. They applied bottom-up approach and the willingness of the local NGOs was valued.

Question 3: Which parts were the most vulnerable/ fragile identified throughout your project? Where was the missing gap?

- HKRC replied that facilities, say fire extinguishers and alarm, were missing in the villages. Tui Min Hoi area was low-lying and fragile when typhoon, while some remote villages had very low accessibility. HKRC hoped that the upcoming services could facilitate the building of the strong bonding among villagers with the ability of self-help and close relationship between NGOs and villagers.
    - HKRC believed in self-help groups. They suggested to organize self-help groups for remote villages (referring to the fire extinguishing team in Pok Fu Lam village), with hardware, regular drill, and training.

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Question 4: What is your direction in developing disaster resilience community? Is self-help group a clear direction? Anything planned pathway/ direction?

- HKRC replied that they have no relevant planning, which they required more resources (capital) to expand their scope of research and service. But the vision was clear in developing disaster resilience community, while knowledge exchange among villages was good to have a try.
- HKRC deemed that the location was essential for better matching between service/ tools providers with receivers in community mapping. More focus groups might be held to match up needs and problems with supports and solutions. More than identifying resource, site knowledge was essential. For instance, service would be given to a community of people in old age, while training would be provided to a community of people with strength and the ability of self-help.

Question 5: What is the positioning of your organization in the overall disaster preparedness and response? Which gaps are you trying to fill among the official mechanism, say advocacy?

- HKRC replied that they were discovering the needs of the local communities, which were sophisticated in rural setting. They might help with the setup of the facilities. For advocacy, they involved official department, says FSD, to practice drill, which enabled the needs of the communities to be seen by the authorities.
    - HKRC added on explaining their role on facilitating the public engagement, which was not the major focus of the government. HKRC tried to bridge the gap between general public and the government. For instance, they could collaborate with local NGOs to create community map, in which residents were involved and empowered throughout the process.
- Caritas shared their official advice for emergency, which was built over time. Vulnerable people and groups were on listed and some of the residents were matched up. Caritas organized a group of residents for discussing the needs of Tui Min Hoi area and reporting to the official departments, say pedestrian crossing for elderlies and temporary shelters.
- SKDCC believed that close bonding among villagers were essential in emergency. They shared their experience in reaching residents in various locations which depended on their volunteering networks and their relationships with village heads. Regular visit and resource delivery helped them to identify residents' needs and supports were given according to their needs.

Question 6: How to handle privacy issue? What is the positioning of local NGOs in the collaboration with HKRC?

- Caritas considered HKRC as the knowledge resource provider. Through local projects, HKRC might observe the community and find out their needs, followed by offering appropriate service and resource.
    - Caritas shared the experience of collaborating with HKRC in a programme, in which HKRC passed the knowledge of improving living environment to the resident volunteer group. With this knowledge, the group could assess the living environment and add necessary household equipment during their regular home visits to the vulnerable group.
- SKDCC believed that good relationship and trust were maintained among village heads, villagers and HKRC through programmes, and SKDCC facilitated throughout the process.

Question 7: [Facilitator explained the poster of CPND] What is your positioning to facilitate the collaboration between public and government department in disaster response? What is your positioning in the timeline? Any experience in Typhoon Mangkhut (2018)?

- SKDCC suggested that the self-help groups might visit identified vulnerable neighbors before disaster came according to weather news. During disaster, the groups might help to guide the official rescue teams to the destination in need.
- Caritas believed that they had a stronger database regarding residents' information than that of the government department (FSD and HAD). They could call all their residents to make sure that they escaped from dangers immediately. They also helped their residents to contact related department (e.g. CEDD for impact of slope maintenance on residents) and helped department to spread information to the residents (e.g. HAD for the location of sand bags before typhoon).

Question 8: What is the feedback of the survival kits?

- Caritas replied that some of the residents thought that it was useful, which reminded them with the preparation of the medications.

Question 9: Any intention to collaborate or existing collaboration with academic to research in relevant topics?

- HKRC replied that they did some research with education institution. They had training for relevant departments and institutions regarding disaster management. A research for identifying communities at risk was conducted with CUHK.

2.3 Findings of FGM 3: Academics and Scholars

List of Participants (according to the date of interview)	
Dr Crystal KWAN	Assistant Professor, Department of Applied Social Science, The Hong Kong Polytechnic University (according to alphabetical order)
Dr GUO Chunlan	Lecturer, Department of Geography and Resource Management, The Chinese University of Hong Kong

2.3.1 Findings of interview with Dr Crystal KWAN

Detailed information of interview	
Date and Duration	23rdSeptember 2022; 60 min
Format and Mode	Online individual interviews
Interviewee	**Dr Crystal KWAN** – Assistant Professor, Department of Applied Social Science, The Hong Kong Polytechnic University
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

Question 1: What is your background in disaster resilience?

- Crystal shared that part of her research focused on older adult and disaster resilience, especial the influence of disaster resilience on older women in resource-poor community. She taught disaster resilience course in mainland in Sichuan, which was a summer service-learning course regarding resilience building activities in village.
- Crystal focused on the relationship between per-disaster time and disaster time for the discussion on disaster resilience, in which she expressed her research interest in mitigation and long-term recovery in social aspect, including the enhancement on social infrastructure and social support system in non-disaster time.
    - Crystal further explained the 3 phrases of social infrastructure: self-esteem and psychological resilience of individuals, relationships in family and community units, and social protection system, say financial system, retirement protection scheme and physical and mental health system.

    - Crystal believed that mitigation was essential when disaster was as a magnifying grass for social issues. Everyday mitigation was important.
- Crystal gave examples of her studies. One of the projects regarding cardboard grannies helped to build social networks and supports, which was missing out in their lives as a cardboard collector. One provided leadership training programme for older men for disaster mitigation to enhance their social support.

Question 2: What are the major differences in building disaster resilience in Canada, China, and Hong Kong?

- Crystal deemed that disaster resilience in Canada had stronger focus on individual, while that of China and Hong Kong were more on family as a unit. This depended on the traditional culture of the places. Social protection systems of these places were different.

Question 3: What were the audiences of your course in university?

- Crystal replied that the group of students was interdisciplinary. Some were from engineering.

Question 4: What is community resilience and disaster resilience in Hong Kong's style?

- Crystal expressed her struggle in defining community resilience of Hong Kong but certain unique elements of Hong Kong could be obtained, say the family system and the strong community network among local residents. She saw the opportunity that the traditional elements like the close neigborhood could be integrated with resilience building in Hong Kong.
- Crystal believed that community resilience was tantamount to elderly resilience in Hong Kong, attributing to the aging population. Certain relevant topic like aging in place should be discussed together.

Question 5: Since the awareness of natural disaster is relatively low in Hong Kong, how can we promote disaster resilience to general public?

- Crystal replied that we should do promotion in different ways, say linking resilience with development, since people in Hong Kong were interested in developing themselves, their family and their community. Workshops and trainings for self-development might be an opportunity to engage them. Taking leadership in projects was another way but not to keep them as

passive knowledge recipients. Crystal believed that youth loved to gain experience for their career prospect and elderlies loved to learn.

Question 6: Which sector/ institution/ organization/ individual can be the lead to develop community resilience in Hong Kong?

- Crystal replied that HKRC might be the one. She believed that pandemic set a good example for explaining the importance of disaster resilience, which reflected how vulnerable the systems were in disaster. This reminded relevant organizations to have a plan for disaster management used either in natural disaster or pandemic.
    - Crystal gave an example of the homeless sleeping over in McDonald, who demanded support under pandemic when restaurants were close at night time.
    - Crystal believed that works in developing disaster resilience facilitated human development at the same time, to build good connection for social work.

Question 7: What are the biggest strength and issues for developing disaster resilience in rural setting?

- Crystal replied that rural areas had more challenges in terms of geographic contexts, such as the disconnection from mainstream service. But they had stronger social capital.

Question 8: What are the limitations?

- Crystal deemed that agencies executing disaster resilience works might not realize that they were doing for it. An adaptable dynamic system was suggested to formulate universal guideline for resilience building. However, respecting the uniqueness of communities, practitioners should not treat it as a bible, but actively adapt it into their context. That should be a starting point rather than an end point.

Question 9: What can be better in building disaster resilience in Hong Kong?

- Crystal suggested more engagement with elderlies to build stronger social capital. Intergenerational opportunities were recommended, for example holding service-learning course in university with engineers for upward improvement for houses.
- NGOs could focus more on engaging the communities especially the elderlies and become the leader of the communities.

- For post-disaster tasks, some large youth volunteering bases could be formed for cleaning works.

Question 10: Do you have any new insight for methodology in community development?

- Crystal shared her application of multimedia method, say videovoice and photovoice in multi-generational project, to use an interesting way to rediscover the community (say community assets and the fragility of the community) through the eyes of villagers.

Question 11: Did you plan to have further research in disaster resilience?

- Crystal proposed to organize service-learning course in Poly U regarding disaster resilience in Sai Kung, including field studies and mini campaign for building community resilience.

2.3.2 Findings of interview with Dr GUO Chunlan

Detailed information of interview	
Date and Duration	5th October 2022; 60 min
Format and Mode	Online individual interviews
Interviewee	**Dr GUO Chunlan** – Lecturer, Department of Geography and Resource Management, The Chinese University of Hong Kong
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

Question 1: What is your background in disaster resilience?

- Guo shared her current research on the disaster literacy of the general public in Guangdong-Hong Kong-Macao Greater Bay Area, which focused more on individual level for evaluating one's capability and knowledge in disaster response.
    - Guo added on explaining the result of the research project is for mitigation and preparedness, which reflected on their response in disaster.
- Referring to the disaster risk management circle, Guo put less attention on disaster recovery as she believed that the importance of mitigation and preparedness account for 98% of disaster management in her profession in geography and public health.
- Both bottom-up and top-down approaches were covered in her research. For bottom-up part, she shared her experience in the project that university in China took lead and collaborated with local NGOs to deliver

education regarding emergency response and preparedness to resident in Shaanxi.

- [Follow-up question: Do you think this kind of education is enough?] Guo replied that the scope of projects/ research was limited by the sustainability of funding and time. The positioning of institution is more on innovation. Therefore, the intervention of the state is essential, who is rich in resource for providing incentive to relevant organizations, long-standing and regular training for resident and agencies. State-led approach is the most effective way for China.

Question 2: What are the major strengths and weaknesses of building disaster resilience/ disaster management in Hong Kong, compared with other cities?

- Guo emphasized on government administration. Guangdong, following the governance of the Chinese Central Government's Ministry of Emergency Management, established the Department of Emergency to centralize all the functions of relevant departments in disaster management for better coordination.
  - Comparing with that of Hong Kong, Guo stressed on the regularity and constancy of the department, whether it is a long-standing agency even open during non-disaster time.
- Guo believed that state-led approach is the most effective way for China in disaster management. According to the experience in COVID, the Chinese government knew everyone in the community well with accurate statistics, which was useful for management.
  - Comparing with that of Hong Kong, Guo concerned how much knowledge of the population the government held in the data base.
  - [Shared the case of Caritas with rich field information in their service area in Sai Kung] Guo replied that Hong Kong is more on the bottom-up approach, depending on the functions of the local NGOs. But all in small scale.
  - Guo concluded that state-led approach with strong government power is a good thing in disaster management.

Question 3: Without a powerful government, who should be the lead in/ which kinds of collaboration facilitate the building disaster resilience in Hong Kong?

- Guo replied that the government should take up more responsibilities, but not directly referring to that of the Chinese government. She suggested to combine the method of the foreign countries (bottom-up and community resilience, say New York and Australia) with that of China (top-down) to

establish the unique way for Hong Kong. The government may not be the leading role, but to input more resource in community works and research.

- Guo suggested that the government should invest more on education, putting knowledge of emergency response into the curriculum from kindergarten to tertiary education. It is essential to promote 居安思危 when disasters do not frequently impact Hong Kong.
- Different parties should be involved.
- Guo deemed that the character of JCDPRI is essential. Referring to the similar institute in the USA, this kind of institute received and redistributed donation for research and community projects. It is important to establish institute for disaster management at district level and country level. Researchers from different specialties should sit in for interdisciplinary collaboration with sustainable funding source and independency in research.
    - She deemed that the limitation of JCDPRI were the limited source of funding and dependency on the Hong Kong Academy of Medicine, in which the scope of research was confined.
    - She added on recommending that JCDPRI could provide more training to nursing, medicine and public health students, collaborating with universities.

Question 4: Should the government be the coordinator or the source of fund?

- Guo replied that both are possible. The government should not be the only source of fund, but it should encourage the business world to invest in disaster management, which directly impacts the economic development.
- Coordination depends on the functions and sections, say research institutions have the resource to initiate their own research and find different collaborating parties.

Question 5: What is disaster resilience in Hong Kong's style?

- Guo emphasized on the level of disaster resilience, including individual level, household level and community level, in which was not clearly addressed in JCDPRI's research projects. (42) Household should be the starting point and as the smallest unit of developing disaster resilience, which is more practical for disaster preparedness, while individual resilience is as a support.
- According to the research conducted by PolyU, Hong Kong is relatively weak at risk identification and institutional capacity. Hong Kong lacked an overall picture indicating the vulnerable area responding to different types of disasters, which JCDPRI should do. The government took a small role in

community resilience without enough understanding of communities, which limited the improvement in institutional capacity.

Question 6: Since the awareness of natural disaster is relatively low in Hong Kong, how can we promote disaster resilience to general public?

- Guo deemed that this was a difficult task as both developed countries (say the USA) and developing countries (say China) have started to develop disaster resilience since the occurrence of serious disasters (911, and 2008 Sichuan earthquake respectively).
- The government should put more resources in education.

Question 7: What can be better in building disaster resilience in Hong Kong?

- Guo believed in the flexibility and diversity of Hong Kong. Communities are diverse but not monotonous, in which provides opportunities for developing district specific and localized models of disaster resilience to serve every community in terms of disaster mitigation and preparedness. Bottom-up approach is possible for developing residents-oriented and community-based projects.
    - [Follow-up question: Local NGOs seem to be one of the important agencies for community-based projects. How and who can equip local NGOs with disaster resilience knowledge?] Guo replied that there should be disaster resilience courses in the curriculum of the major in social worker, where most of the workers in local NGOs received their professional education. Knowledge should be given by other departments, say the school of nursing in PolyU.
    - Guo further suggested that the standing department for emergency management or the similar role of JCDPRI should provide on-job training for NGOs.

Question 8: Do you think the information delivery regarding disaster is effective in Hong Kong?

- Guo replied that the delivery of information is essential, in which the government has done a set of information but lacks an effective way to deliver the correct information to different groups of people. For instance, in her previous research, people migrating to Hong Kong lacked understanding of weather warning signal in Hong Kong. They needed an information package for emergency response. Promotion is more important than information design.

2.4 Findings of FGM 4: Rescue Related Groups and Official Departments

Detailed information of interviews	
Date and Duration	16th September to 6th October 2022; 60 to 120 min
Format and Mode	4 Online individual interviews; 1 response in written format
Departments	Civic Aid Service (CAS) Civil Engineering and Development Department (CEDD) Drainage Services Department (DSD) Fire Services Department (FSD) Hong Kong Observatory (HKO) (according to alphabetical order)
No. of Participants	7
Participants	**Mr YEUNG Hok Yin** – Senior Scientific Officer (Forecast Operation), HKO **Mr CHU Chi Keung, Paul** – Senior Engineer (Flood Control), DSD **Mr CHIU Yue Tai** – Senior Operations & Training Officer (Kowloon), CAS **Mr CHAN Chi Pang Anthony** – Senior Geotechnical Engineer/ Project Management 1, CEDD **Mr WONG Ngai Fung, Ivan** – Engineer/ Climate 3, Port Works Division, CEDD **Mr YUEN Wai Man** – Senior Engineer/ Projects 4, Port Works Division, CEDD **Mr LI Wai Cheong** – Senior Division Officer (Public Safety and Communication), FSD (according to the date of interview)
Objectives	To understand their functions in disaster management according to Contingency Plan for Natural Disaster (CPND), their performance pledge and services provided; To understand the existing collaboration among departments and between public and departments; To understand their future development in disaster resilience.

2.4.1 Findings of interview with Hong Kong Observatory (HKO)

Detailed information of interview	
Date and Duration	16th September 2022; 120 min
Format and Mode	Online individual interview
Interviewee	**Mr YEUNG Hok Yin** – Senior Scientific Officer (Forecast Operation), HKO
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

<u>Question 1: What is the positioning of HKO in Contingency Plan for Natural Disaster (CPND)? What are the collaborations between HKO and other departments?</u>

- Yeung replied that HKO was the gatekeeper, responsible for monitoring, forecasting weather and issuing warnings on weather-related hazards. After the issuing of warning according to the forecast and the current weather, various departments activate their operation for emergency.
- Yeung shared that they closely collaborated with Civil Engineering and Development Department (CEDD) and Drainage Services Department (DSD) for issuing warning regarding landslides and storm surge, in which data of real-time events recorded were shared among department ; Home Affair Department (HAD), Fire Services Department (FSD) and Hong Kong Police Force (HKPF) for localized disaster preparedness; Transport Department (TD) and Education Bureau (EDB) for transport and school arrangements; Marine Department (MD) for providing marine weather information; Airport Authority (AA) for meteorological information; Information Services Department (ISD) for press release; and most importantly Security Bureau' Emergency Monitoring and Support Centre (EMSC) for the overall control of the emergency response management.
- HKO mainly used SMS for spreading weather information and immediate information regarding warnings and alerts to the department mentioned above.

Question 2: For press/ information release, who are your audiences and what are the information respectively?

- For general public, "Weather Note" and "Special Weather Tips" are the media to announce the forecast and discuss weather-related topics in a casual way in different phrases, apart from warning. Also, 9-day weather forecast with the probability of significant rain forecast was added for the earliest preparedness.
- Electronic media is a target group whom HKO provides with basic weather knowledge for the accuracy of news release to the public.
- Tropical Cyclone Outlook Briefings are regularly given to customers in departments and industries which are most affected by weather, say construction industry sector and electricity providers every two weeks.

Question 3: What are HKO duties during the period from issuing warning to the occurrence of a disaster?

- After issuing warning, HKO alerts relevant departments for immediate disaster preparedness tasks and actions referred to the CPND, while keeping updating weather information and deciding to upgrade or downgrade the warning when necessary. HKO alerts the public through messages, posts in social media, videos and press conference.

- Yeung shared his experience in Typhoon Manghkut. They began their function as an information provider to grab public's attention to the super typhoon 6 days before the issuing of the highest typhoon warning signal No.10, which resulted in a great success of saving all lives. They started with alerting relevant departments at D-6, conducting press briefing for, press conference with departments and actively promoting weather information and forecast in the following days. They did various videos and posts before issuing any warning, while early alerting different departments (say HAD and FSD) for activating the action for disaster preparedness. At the D-day, HKO closely communicated with EMSC.

Question 4: Any duties after the occurrence of a disaster?

- HKO's duties were concentrated at the time before the occurrence of the disaster.

Question 5: Any mechanism targeting specific areas/ districts (especially for Sai Kung rural area)? What are the mechanisms?

- Localized heavy rain advisory and special announcement on flooding in the northern New Territories are district-specific alerts. The boundaries of the areas were defined by DSD according to their drainage projects. HKO closely collaborated with DSD in issuing these warning by using their sensors in the marked areas.
- For some vulnerable communities like Tai O and Lei Yue Mun, relevant departments have site-specific action plans. HKO would send message to them when forecasting the occurrence of disaster to activate the emergency plan.

Question 6: What is the development direction in the future?

- Yeung showed the interest in developing impact-based forecast for the enhancement of the function of HKO, which transforms disaster preparedness from what weather will be into what weather will do for planning effective response to hazard risks through crowdsourcing of information on disaster from public.
    - He further elaborated that HKO tried to gather images and videos regarding the impact of the typhoon for analyzing the impact of the hazard after Typhoon Mangkhut.
- Yeung expressed their concern on the accuracy of the warning and forecast when they lacked impact-related data for confirming the real-time event

matching with the warning issued (i.e. not all flooding was observed and reported). Therefore, impact-based forecast helped.

  - Yeung suggested potential collaboration with insurance industry and airlines.

- To enhance the coverage of mobile application's users, audio function is proposed to be added in the chat bot.

Question 7: What does HKO do for public education?

- Yeung believed that public education at the right time was essential according to his experience in Typhoon Manghkut. The hit rate of the video released a few days before issuing the highest typhon warning signal No. 10 were extremely high, which alerted public to the dangers of the coming typhoon and shared weather-related messages at the same time, effectively promoting disaster preparedness.
- Yeung believed that the detailedness and frequency of sharing weather information with public affected public's awareness and the amount of interest and attention of the information and knowledge. Yet, he replied that HKO was discovering the extent of making more information public while building more advanced system for the spreading of information.

2.4.2 Findings of interview with Drainage Services Department (DSD)

Detailed information of interview	
Date and Duration	19th September 2022; 60 min
Format and Mode	Online individual interview
Interviewee	**Mr CHU Chi Keung, Paul** – Senior Engineer (Flood Control), DSD
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

Question 1: What is the positioning of DSD in Contingency Plan for Natural Disaster (CPND)? What are the collaborations between DSD and other departments?

- DSD is responsible for partial on-site disaster preparedness and determining the issuing of warnings regarding storm surge with HKO and CEDD. For mitigation, DSD conducts routine inspection in vulnerable areas identified by staff in various district divisions.
- DSD closely collaborates with CEDD for storm surges related issues.

Question 2: What are DSD duties during the period from issuing warning to the occurrence of a disaster?

- After receiving message about warnings (to be) issued from HKO, DSD would assess the situation and send staff from district division under Operations and Maintenance Branch to the identified vulnerable communities. They work closely with HAD and CEDD for local disaster preparedness, including the distribution of sandbags, the installation of floor barriers and clearing blocked drains. They do inspection around the areas for helping the residents with their preparedness works. Machines, say water jetting and suction units, are prepared for emergency during disaster.
- Real-time monitoring of water levels of major rivers and channels under the Floor Monitoring and Reporting system in DSD's Emergency Control Centre. DSD alerts other departments, say FSD and HAD, when necessary.
- A 24-hour hotline is set up for flooding complaints.

Question 3: Any duties after the occurrence of a disaster?

- For serious cases, DSD might help to clear blocked drains and applied water suction units for the clearance of rainwater and flood water.

Question 4: Any mechanism targeting specific areas/ districts (especially for Sai Kung rural area)? What are the mechanisms?

- Local flood warning systems were installed at floor prone villages and areas to inform the locals, say local office of HAD and village representatives, when the floor water reaches a predetermined alert level.
- Smart sensors were installed for monitoring water level of major rivers and channels.
    - Chu added on explaining the specific issue for rural area. The development in rural areas always requires a change of land use. The pavement works might adversely affect the drainage systems in the areas and the impact is always overlooked.

Question 5: What is the development direction in the future?

- Improvement measures are planned for the identified 26 coastal low-lying or windy residential areas, which would be further developed by CEDD.

Question 6: What does DSD do for public education?

- Short clips on TV educate public to keep their drainage system clean in peak season.

- Chu replied that shops along the streets were an important audience for public education as they put stuff along the street. When big wind and rain come, garbage and their packing waste might block the drain, causing flooding.
- Private sector is also an important audience since they should take care of their private properties for flooding prevention.

2.4.3 Findings of interview with Civil Aid Service (CAS)

Detailed information of interview	
Date and Duration	20th September 2022; 60 min
Format and Mode	Online individual interview
Interviewee	**Mr CHIU Yue Tai** – Senior Operations & Training Officer (Kowloon), CAS
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

Question 1: What is the positioning of CAS in Contingency Plan for Natural Disaster (CPND)? What are the collaborations between CAS and other departments?

- Chiu replied that the function of CAS was to provide support to the government bureau and departments (mainly FSD, HKPF and Government Flying Service (GFS)) on counter infectious disease or disaster operations, mountain search and rescue, flood rescue, countryside fire protection duties, etc.
    - Chiu gave example on the special arrangement in Typhoon Mangkhut. CAS received order for cleaning collapsed trees from EMSC and Land Department (LandsD) directly, which bypassed the departments mentioned above.
- The division of Kowloon covers the whole Kowloon and Sai Kung district and all operation regarding typhoon and flooding in Hong Kong. CAS operates a training camp in Tai Tan in Sai Kung.
    - Tai Tan Camp is mainly for training for CAS staff. Security guards and cleaners stay at the site for 24/7. Sometimes, the site is shared with other government departments for training.

Question 2: What are CAS duties during the period from issuing warning to the occurrence of a disaster?

- CAS has standby operation teams in vulnerable areas.

- HAD and CAS discuss on and decide the routes for inspection and CAS executes. Once the teams found people in need or flooding occurring, they start their operation.

Question 3: Any duties during disaster/ after the occurrence of a disaster?

- Among disaster response, CAS is capable for clearing landslide dirt, cutting collapsed trees, first aid, flood rescue and managing temporary shelters for HAD.
- During disasters, CAS has standby operation teams. When collapsed trees blocking main roads are needed to be removed in urgent and FSD cannot finish all cases, CAS might send to handle the cases.
- After the disaster when weather condition is getting better, LandsD would handle the cases.
    - Chiu shared the experience in Typhoon Mangkhut. After canceling the typhoon warning signal, many teams (say Rapid Response Team of Emergency Rescue Company) together with the standby team were called for the clearance of collapsed trees and roadblock.
- CAS is responsible for rescue. In the case of Lei Yue Mun, HAD has the lists of all residents and identifies fragile locations in typhoon and heavy rain. When both HAD, HKO and DSD determine to practice evacuation, HAD would call the relevant residents and ask CAS to find those in need.
- In the case of Tai O, CAS helped to uplift villagers' furniture and transfer villagers to temporary shelters. For emergency first aid, every party did immediate emergency case to the injured people and sent patients to the shelter for the wounded.

Question 4: What is the position of CAS in emergency rescue works?

- When it is in real emergency without accurate forecast and disaster preparedness by HKO, DSD and HAD, FSD would be the first team arriving at the site for rescuing. CAS would guide by FSD and HKPF for the distribution of rescue works.
    - Chiu further explained that when CAS received calls for operation, members were gathered at the headquarters and formulated into teams driven to the site. Yet, FSD sent teams according to their performance pledge, which required shorter time.
    - Chiu added on explaining that members were stand-by at the headquarters under typhoon warning signal No. 8. Teams could arrive at the sites in a short period of time; however, FSD and HKFS took the lead and CAS received orders from them. CAS reported to either FSD or HKFS, depending on whose call they received.

Question 5: Any experience of collaborating with villagers in rescue work?

- Chiu shared CAS's experience in Tai O. Since the distribution of houses in Tai O was sophisticated, local NGOs, village/ resident representatives and local police officers led us to the areas for rescue work and evacuation.
    - Chiu further explained that the district office of HAD gathered different parties including representatives from government departments and village/ resident representatives according to the contingency plan.

Question 6: What is equipment needed for rescue works, how is the quality and how are they stored in normal days?

- Chiu replied that CAS seldom used inflatable boat because of the geographic contents. It is only applicable on the river of Tai O but not at the harborside.
- Equipment for mountain search and rescue reaches the highest standard in Asia.
- Equipment for emergency rescue should be enhanced in two aspects: the safety of members and the efficiency of equipment, in which the former is prioritized.
- For first-aid, knowledge of using AED is essential for all member and the selection of equipment is referred to the other rescue team, say FSD.
- All equipment is brought to the sites by CAS but not daily stored on site.

Question 7: How is the logistics when the operation requires marine transport? Where are the proper landing locations for helicopter in Sai Kung?

- When operation requires marine transport, CAS accesses to the disaster site by FSD's fire boats, HKPF's vessels or helicopters.
- Landing locations include but not only Hoi Ha Country Parks Management Centre in Hoi Ha Road, a helicopter landing site on high island dam and Sai Kung Tang Shiu Kin Sports Ground.

Question 8: How is the division of labor for the clearance among CAS?

- Chiu replied that EMSC had distributed tasks for specific teams according to the geographic location, and new tasks were given when the pervious one was finished.

Question 9: Any mechanism targeting specific areas/ districts (especially for Sai Kung rural area)? What are the mechanisms?

- CAS has standby operation teams in vulnerable areas, especially for Tai O and Lei Yue Mun.
    - Chiu explained that only Tai O and Lei Yue Mun had contingency plan for flooding, in which CAS was involved.
- Chiu deemed that the weakness of Sai Kung was the single route for some remote areas. When there is a landslide or some roadblock obstructing the access, the areas are isolated.
    - For example, a landslide occurred at Pak Tam Road near Pak Tam Au in Sai Kung on 8 June 2022, in which the affected road section was temporarily closed for emergency slope works. Residents including CAS staff in Tai Tan Campsite were trapped with no water supply and food supply for nearly a month. Emergency ferry services were arranged between Ma Liu Shui Pier and Wong Shek Pier to connect residents with the outside world.

Question 10: What is the development direction in the future?

- Chiu shared their current duty of operating and managing quarantine camps. They provided wide range of services.
- Chiu replied that CAS might improve in public education. He hoped to provide education at different levels.
- Equipment is kept upgrading to enhance the safety of members and the efficiency of equipment, in which the former is prioritized.

Question 11: What does CAS do for public education?

- Talks are delivered to residents' association and rural committee for educating the residents.
- The contexts are general and applicable in all areas.
- Cadet Corps, a youth uniformed group in CAS, is responsible for promoting the danger of hill fire in country parks every public holiday.
    - Tasks are distributed according to their locations, which encourages their participation.

Question 12: What is the relationship between CAS and the public?

- CAS performs drills regularly for training the members with their skills of rescue work and the problem-solving skills in different situation, say comforting the injured people.
- Chiu replied that CAS has a positive image among public with trust. For instance, FSD and HKPF loved to send CAS for crowd management duties, in which CAS and the public have good communication.

Question 13: As more disasters (say frost on Tai Mo Shan and potential nuclear event) can be expected in the future, what does CAS do/ plan to do to face the challenges?

- Chiu shared CAS's experience in frost on Tai Mo Shan, in which they purchased ice grips for boots for the rescue work.
- Daya Bay Contingency Plan was formulated by SB. CAS is responsible for collecting sample of the environmental condition for HKO and transferring affected residents to an isolated area for cleaning and settling.

2.4.4 Findings of interview with Civil Engineering and Development Department (CEDD)

Detailed information of interview	
Date and Duration	21st September 2022; 75 min
Format and Mode	Online individual interview
Interviewee	**Mr CHAN Chi Pang Anthony** – Senior Geotechnical Engineer/ Project Management 1, CEDD **Mr WONG Ngai Fung, Ivan** – Engineer/ Climate 3, Port Works Division, CEDD **Mr YUEN Wai Man** – Senior Engineer/ Projects 4, Port Works Division, CEDD (according to alphabetical order)
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

Question 1: What is the positioning of CEDD in Contingency Plan for Natural Disaster (CPND)? What are the collaborations between CEDD and other departments?

[Port Works]

- CEDD and DSD executes emergency preparedness after receiving SMS sent by HKO, while HAD notifies local representatives and activate sheltered centres.

[Geotechnical]

- CEDD discusses with HKO for the issuing of landslip warning signs. Since many landslips are as a result of persistent heavy rain, the prediction of number of landslides is based on rainfall intensity, according to real-time rainfall data, rainfall prediction in coming 3 hours from HKO, spatial distribution of slopes and landslide frequency-rainfall correlation formed.
- GEO launched Inter-departmental Multi-faceted Common Operational Picture (COP) for Emergency Management for the location of real-time events.

Question 2: What does CEDD do for disaster prevention and mitigation?

[Port Works]

- CEDD mainly focus on infrastructure resilience, emphasizing adaptation and resilience. Under the Steering Committee on Climate Change and Carbon Neutrality chaired by Chief Executive, Climate Change Working Group on Infrastructure (CCWGI) has been established to coordinate efforts among works departments to combat the adverse effects brought by climate change and extreme weather on government infrastructure with three sub-groups: Design Considerations (Rainfall and Sea Level Rise), Design Considerations (Heat), and Resilience of Critical Infrastructures.
    - The working group updated the design manuals and guidelines for infrastructure for CEDD, DSD, ArchSD, HyD and BD according to the Fifth Assessment Report of Intergovernmental Panel on Climate Change (IPCC AR5) and they would be reviewed and updated according to AR6.
    - Several studies were completed/ to be completed for enhancing the performance of infrastructures and the guidelines. Topics regarding extreme temperature, government Cis, extreme sea level, extreme wind were covered.
    - CCWGI shared relevant adaptation and resilience experiences with relevant organizations and utility undertakers for facilitating the enhancement of society's overall infrastructure resilience. Companies say CLP, HEC, HKCG, MTRC and HA were involved.
- CEDD adapted progressive adaptive approach for adaptation works, installing from existing seawall to large scale coastal structure. Multi-layered enhancement measures are applied including constructing wave walls along coastline, flood barriers at suitable places behind coastline and at building frontages. Action plans with early alert system and emergency preparedness are formulated for targeted areas, say triggering level of early alert system identification, sandbags, and demountable flood gates distribution, opening of temporary shelters and pumping facilities and emergency preparedness gangs.

[Geotechnical]

- GEO established Hong Kong Slope Safety System and formulated key landslide risk management strategies: containing risk from new developments, risk reduction on existing developments, and minimizing landslide consequences.
    - For new development, GEO exercises geotechnical control and discourages unauthorized slope works.
    - For existing development, GEO upgrades government man-made slopes, mitigates natural terrain landslide hazards, maintains government slopes and promotes private slop maintenance.
    - For minimizing consequence, GEO clears squatters from hilly terrain, issues landslip warning, provides landslide emergency services and educate public on precautionary measures.
- Landslip Prevention and Mitigation Programme was launched for the maintenance of slope works. Sub-vertical drains and drainage tunnels were built along Po Shan Drainage Tunnel. Landslide Sci-Tech Chamber was set up.

Question 3: What are CEDD duties during the period from issuing warning to the occurrence of a disaster?

[Port Works]

- CEDD executes emergency preparedness, say distributing sandbags and demountable flood gate.

[Geotechnical]

- Geotechnical Engineering Office (GEO) operates a 24-hour year-round emergency service, handling on average 300 reported landslides every year. Emergency Control Centre (ECC) is mobilized at time of “Declared Emergency”.
    - District geotechnical engineers and emergency duty officers are standby for normal situation. 13 emergency teams on roster to operate ECC in emergency situation. The response time depends on the intensity of incident.

Question 4: Any duties during disaster/ after the occurrence of a disaster?

[Geotechnical]

- GEO provide geotechnical advice to government departments to deal with landslides for closure of roads, evacuation of buildings and emergency slope works.
- Automation and robotics are used for searching and collection field data by scanning the full picture of the incident at instant landslide locations.
- Landslip incidents are reported and uploaded to their website, Hong Kong Slope Safety, for informing residents.

Question 5: Any mechanism targeting specific areas/ districts (especially for Sai Kung rural area)? What are the mechanisms?

[Port Works]

- Early alert system has been implemented in the area of Nam Wai and Heung Chung to alleviate the impact of coastal hazards.
- More sandbag collection spots have been set up in Tui Min Hoi in May 2022 for the emergency response for storm surge. The amount and the collection location of sandbags were adjusted according to residents' opinions received through email and the hotline 1823. CEDD would collaborate with HAD for keeping their opinions up to date.
- CEDD planned to install demountable flood gates for identified low-lying houses.

[Geotechnical]

- Smart Barrier System is installed in remote districts with rigid barrier, for which the locations are not easily observed by people.

Question 6: For press/ information release, who are your audiences and what are the information respectively?

[Geotechnical]

- A Slope Information System is launch under Hong Kong Slope Safety for releasing related information, including their features, location, photos and maintenance responsibility. Dangerous Hillside Orders would be issued to private owners with their manmade slopes and retaining walls not meeting engineering standards or lacking in maintenance.
- Landslip incidents are reported and uploaded to their website, Hong Kong Slope Safety, for informing residents.

Question 7: What is the development direction in the future?

- CEDD conducted study of coastal hazards regarding the likelihood and consequence of coastal hazards and identifying vulnerable areas to formulate enhancement measures.
    - The studies include Sai Kung Town Centre and Tui Min Hoi, and Nam Wai and Heung Chung in Sai Kung, in which enhancement works could be expected in the coming five years.
- CEDD researched on the control on private development involving harborside design and construction.
- CCWGI planned to strengthen infrastructure resilience strengthening, and update manual.
- GEO collaborated with institution, say Centre for Slope Safety from HKUST, to research on advanced landslide-related technology.
- Alert system and action plan to landslide risks are planned.

Question 8: What does CEDD do for public education?

[Geotechnical]

- GEO ran Landslide Sci-Tech Chamber and provides guided tours. Thematic exhibition and outreach at blackspots were organized. Briefing and webinar was given to media and the public. GEO held school ambassador programme and thematic school visit for geotechnical engineering.
- The information shared online regarding the landslip incidents helps alert residents to the potential danger of landslips nearby.

Question 9: Does the plan of relocating Sai Kung Sewage Treatment Works to caverns relate to port works?

[Port Works]

- The relocation is mainly under the consideration of enhancing land supply, but nothing done with port improvement.
- The research is still in process without conclusion announced.

Question 10: Is it possible to streamline some of the information in Common Operational Picture (COP) and share with the public?

[Geotechnical]

- Since the Picture obtains information from various departments, it should be determined by officers with higher authority. The detailedness of information provided to the public is doubt, which affected their awareness and understanding of the incidents.

Question 11: Why does CEDD not install wave walls along coastline in Sai Kung?

- The installation of wave wall depends on the willingness of the residents. The construction would obstruct the operation of the floating fish market near Sai Kung Public Pier, which is not favorable to the residents. Yet, for areas seriously attacked by storm surge, people are more willing to build wave wall for protection.

2.4.5 Findings of interview with Fire Services Department (FSD)

Detailed information of interview	
Date and Duration	Responded on 6th October, 2022
Format and Mode	Written response
Respondent	**Mr LI Wai Cheong** – Senior Division Officer (Public Safety and Communication), FSD
Objectives	To understand their previous studies on community resilience or disaster management and their aspirations and insights in building disaster resilience in Hong Kong.

(Only available in Chinese version)

問題 1-9：搜救工作 (以風暴潮引發倒樹、水浸、泥石流災難事故作為例子)：

1. 在天文台發出預警到災難發生當刻至到收到出勤命令，消防處的角色與相關緊急行動/工作如何啟動？(包括與政府部門的直接對口單位作連繫與溝通)；

2. 消防處在有災難發生時到參與搜救的現行機制 (包括與其他部門的連繫與溝通)；

3. 消防處的搜救工作內容 (包括服務與物資)，與其他搜救隊 (民安隊)的分工；

4. 到達災場架設臨時工作站所須的最少面積與條件；

5. 當中有否涉及災場當區的社福機構/ 居民組織/ 市民個體的連繫與溝通 (包括報案人)；

6. 機制有否針對部分區域 (如西貢鄉郊) 調節服務？如有，有甚麼特別措施；

7. 在西貢市等鄉郊地區進行搜救工作主要面對的特別困難，如門牌不清楚等，未能確定處所內的災民是否安全等問題，消防員又會如何處理？會否需要當區人士的協助或介入；

8. 災難前及災難期間，消防處有沒有涉及關於災民消息/ 搜救進展發佈的工作，包括與鄉委會/ 村代表的資訊通報；

9. 未來加強鄉郊地區水險/ 風災相關救災服務及工作的方向與規劃

回應：消防處處理災場的高級消防人員會擔任救援指揮官，負責在發生火警或其他災難和進行緊急救援工作時，撲滅火警和保護人命財產，包括協助需要即時救護的人，以及載送他們往醫院。消防處負責主導救援工作，香港警務處(警務處)及／或其他部門和機構則提供支援。在極端情況下，保安局會擔任救援階段工作的"主要協調部門"。

一般而言，天文台發出 8 號或以上的熱帶氣旋警告信號、黑色暴雨警告信號或海嘯警告時，保安局的「緊急事故監察及支援中心」便會啓動。該中心亦會在其他惡劣天氣及／或緊急情況下啓動。消防處的部門聯絡主任會在該中心啓動後調派到中心工作。負責該中心與消防通訊中心建立聯繫，並通知該中心發生的事件。

視乎情況所需，在政府新聞處(新聞處)的協助下，"主要協調部門"可以在應變階段和善後階段考慮指派 1 名官方發言人定時在傳媒及／或社交媒體上報告災情；回應市民的關注、澄清謠言及提供安全須知；以及提供有關應變及善後資訊。

消防處現有多個針對大澳、鯉魚門和新界西北等低窪地區的緊急應變計劃，以應對嚴重水浸事故和風暴潮。消防處亦會不時檢討及更新其內容，確保緊急應變計劃適用於最新情況。

問題 10-12：公眾教育工作 - 消防處在有關天災的公眾教育工作以及受眾：

10. 有關處方 2022 年設下「主要目標 - 繼續提高市民的社區應急準備意識」，請介紹當中的計劃，與防災相關的教育工作，包括會否計劃與西貢區內組織進行協作；

11. 消防處有沒有為特定群組 (如相關部門/ 機構)提供教育方面的服務？有關「消防處社區聯動網絡」會否設定專題，探討加強包括西貢在內的鄉郊地區作更緊密與全面的支援與社區聯繫；

12. 未來加強服務及工作的方向與規劃

回應：消防處公眾安全及傳訊課會繼續利用各種平台例如社交媒體 Facebook、廣告宣傳等去接觸不同年齡層的社會各界人士，進行宣傳教育，以提升廣大市民的應急準備意識，加強他們在面對自然災害或恐襲等緊急事故時的應變能力，以及增加他們對防火安全、心肺復甦法和自動心臟除顫器的使用等多方面的認識。

較早前，本處人員亦聯同其他部門及非政府機構到訪受颱風巨浪或水浸影響較高風險的沿岸低窪地區，例如杏花邨及鯉魚門，加強當區居民的應急準備意識，為惡劣天氣做好準備。

此外，消防處亦成立社區聯動網絡，加強地區層面傳遞應急救援信息的能力。透過定期會議、通訊群組，以及主動與地區人士交流互動，善用和協調地區資源，以配合消防處推行政策和措施，提昇消防處服務質素。

RESEARCH AND MODEL DEVELOPMENT ON COMMUNITY DISASTER RESILIENCE

Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

COMMUNITY RESILIENCE

APPENDIX VII

RESEARCH REPORT I

STAKEHOLDER ENGAGEMENT PROGRAMME: QUANTITATIVE STUDY REPORT

OCTOBER 2022

Organiser

香港賽馬會災難防護應變教研中心
Hong Kong Jockey Club Disaster Preparedness and Response Institute

Sponsor

The Hong Kong Jockey Club Charities Trust

Study Consultant

樂在製造
社區設計及研習所
Community Design and Research Studio

樂在製造
MAKING ON LOFT
社會設計及研習所
COMMUNITY DESIGN & RESEARCH STUDIO

Research Report I
Stakeholder Engagement Programme: Quantitative Study Report

Research and Model Development on Community Disaster Resilience Based on "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"

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Version: Final

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Making on Loft Limited

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1 Introduction

1.1 Introduction to the Questionnaire

1.1.1 Background of Research Project

In late February 2022, the Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) appointed Making On Loft Limited (MOL) to provide research and evaluation services based on HKJCDPRI's "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)"" (the Research Project). The goal of this Research Project is to establish a "blueprint" for future development of strategy, approach(es), measure(s) and tool(s) that bring about effective development of community disaster resilience. The Research Project will be designed and executed by the research team of MOL as agreed by the Client.

Sai Kung is located at the south-eastern of New Territories in Hong Kong, where a typically rural township setting with diverse communities, it is connected to major traffic routes of urban areas within half an hour. The well-established rural township in New Territories East is comparing the changes in terms of partnerships enhancement, empowerment of individuals as well as communities for self-awareness and self-initiations to risk of disaster, and capability of making uses of local networks as well as local resources. The players (local communities) will be the key of the Team to understanding the changes in the Project.

1.1.2 Background to the Programme

The International Federation of Red Cross and Red Crescent Societies (IFRC) defines community resilience as "The ability of communities exposed to disasters, crises and underlying vulnerabilities to anticipate, prepare for, reduce the impact of, cope with and recover from the effects of shock and stresses without compromising their long term prospects." Capacity-building initiatives can facilitate individuals and communities to develop abilities, resources, networks, and confidence, which empower them to become change agents to proactively identify, mitigate and cope with local disaster

risks more efficiently. This community participatory approach has proven to be effective worldwide, compare with the traditional top-down "respond and rescue" structure.

Hong Kong is a dynamic city, with a robust disaster response mechanism mainly developed and led by the government. Contingency plans and disaster drills have been carefully considered and rehearsed. However, a significant gap remains in awareness, knowledge and engagement in disaster risks management and response planning at the community level. Based on one of the findings of Scoping Research Project conducted by Harvard University under HKJCDPRI's commission, there is broad recognition among agency leaders and the community of the need to improve community engagement in all aspects of disaster management.

Sai Kung (excluding the Tseung Kwan O area) is identified as the one of the vulnerable districts in terms of natural disaster risk in Hong Kong. Due to its geographical location, most of the residential areas are located at coastal or mountainous areas, which are frequently stricken by typhoon, extreme rain, and storm surge in recent years. With its geographical features and narrow roadway with slopes which are difficult to be reached by emergency vehicles such as fire appliances and ambulances), the risks of critical health issues and property damages are relatively high. Given the vulnerability to floods and landslide and difficulty or delay in being accessed by rescue and emergency pre-hospital care. The detailed characteristics of Sai Kung have been covered in the Report of Community Profiling Research Project as endorsed in May 2022.

A "Community-based Capacity Building in Disaster Preparedness Programme (Sai Kung)" has therefore been developed by the HKJCDPRI, aiming to enhance awareness, knowledge and engagement in disaster risk management and response planning of Sai Kung (excluding Tseung Kwan O area) community members.

Community resilience model is essential for improving disaster resilience, as a process of continuous engagement that builds preparedness prior to a disaster and allows for a healthy recovery afterwards (Arbon, 2014[1]). It has been adopted in different disaster

[1] Arbon. (2014). Developing a model and tool to measure community disaster resilience. Australian Journal of Emergency Management, 29(4), 12–16. https://doi.org/10.3316/agispt.20150224

mitigation and preparedness project, for example, the Los Angeles County Community Disaster Resilience Project[2], in which communities with population ranging from 10,000 to 150,000 are covered.

Currently, there is no community resilience model in the local context being developed in Hong Kong. Therefore, it is considered valuable to conduct a programme-research, to develop a community resilience framework or model based on the evidence and lessons derived from the design, delivery and outputs of HKJCDPRI's "Community-based Capacity Building in Disaster Preparedness (Sai Kung)." All research deliverables could hopefully be able to serve as a "blueprint" for the future effective development of strategy, approach(es), measure(s) and tool(s) of community disaster resilience.

While the Research Project will derive data and findings from, and recommendations for selected programme areas in Sai Kung, we envisage that the recommendation(s) and model(s) developed can also benefit communities in other areas and/or districts with a similar setting. Research findings and recommendations will also be published and disseminated to relevant parties, to facilitate understanding and dialogues among relevant stakeholders for continuous enhancement of disaster resilience in Hong Kong.

1.1.3 Questionnaire Design and coverage

1.1.3.1 Area of the Research Project

The quantitative study approach shall cover the following areas.

1. Confidence in the knowledge of potential threats;
2. Confidence and willingness to seek knowledge to face and deal with potential threats;
3. Actions against potential threats;

[2] Eisenman, Chandra, A., Fogleman, S., Magana, A., Hendricks, A., Wells, K., Williams, M., Tang, J., & Plough, A. (2014). The Los Angeles County Community Disaster Resilience Project - a community-level, public health initiative to build community disaster resilience. International Journal of Environmental Research and Public Health, 11(8), 8475–8490. https://doi.org/10.3390/ijerph110808475

4. Community resilience; and

5. Demographics of the respondents.

1.1.3.2 Sampling method

Quota sampling had been adopted in the questionnaire design. The research methodology is based on the participation of HKJCDPRI's community resilience capacity-building activities.

1.1.3.3 Questionnaire Design

The respondents can be divided into two groups, i.e. participating respondents and the control group. The design of questionnaire focuses on the programme's effectiveness in developing abilities and confidence in the said areas in 1.1.3.1.

1.1.3.4 Research timeframe and format

The questionnaire research was conducted via an online survey platform, the respondents are asked to conduct by self-administrating questionnaire. The timeframe of the questionnaire process covered from 1st September to 30th September 2022.

1.1.3.5 Sampling targets and completed cases

The target of the questionnaire is the residents of Sai Kung. With a total of 122 completed plus validated cases, 52 and 70 completed case comes from participating respondents and the control group respectively.

2 Descriptive results of the Questionnaire

In this section, a descriptive analysis of the participating respondents, control group and the total would be discussed. Meanwhile, the independent sample t-test would be conducted to determine whether there is statistical evidence that the associated population means are significantly different between participating and control groups.

2.1 Demographics of the respondents

2.1.1 Joining the programme offered by HKJCDPRI

Among 121 respondents, more than two-fifths (42.6%) of the respondents have participated in the programme offered by HKJCDPRI (i.e. participation group) and 57.4% of them hadn't participated before this Research Project (57.4%) (i.e. control group).

	Count	Valid %
Yes	52	42.6%
No	70	57.4%

2.1.2 Age group

It is found that around two-fifths of the respondents are aged 60 or above which mostly contributed by participating group (63.5%).

	Participating Valid %	Control Valid %	Total Valid %
18-19	3.8	1.4	2.5
20-29	5.8	7.2	6.6
30-39	3.8	24.6	15.7
40-49	11.5	31.9	23.1
50-59	11.5	11.6	11.6
60 or above	63.5	23.2	40.5

2.1.3 Household Size

Respondents reported that their household size is 3.5 ($\bar{X}$=3.50, s=1.702), which was higher than the average Hong Kong household size in Hong Kong (i.e. 2.65 members in 2020), the household size of the participating and control group are 2.96 ($\bar{X}$=2.96, s=1.468) and 3.90 ($\bar{X}$=3.90, s=1.762) respectively.

	Participating Valid %	Control Valid %	Total Valid %
1	11.5	0.0	4.9
2	36.5	21.4	27.9
3	23.1	28.6	26.2
4	11.5	22.9	18.0
5	7.7	11.4	9.8
6	9.6	4.3	6.6
7	0.0	8.6	4.9
9	0.0	1.4	0.8
10	0.0	1.4	0.8

2.1.4 Monthly household income

Around half of the respondents falls into the group of HK$30,000 or above (49.8%) which mainly contributed by the control group. Only 29.8% of the respondents have less than HK$10,000 household income per month.

	Participating Valid %	Control Valid %	Total Valid %
<HK$2,000	13.3	11.1	11.9
HK$**2,000-** HK$3,999	0.0	0.0	0.0
HK$4,000- HK$5,999	10.0	0.0	3.6
HK$6,000- HK$7,999	3.3	0.0	1.2
HK$8,000- HK$9,999	33.3	1.9	13.1
HK$10,000- HK$14,999	0.0	7.4	4.8

HK$15,000- HK$20,000	6.7	3.7	4.8
HK$20,000- HK$29,999	13.3	9.3	10.7
HK$30,000- HK$39,999	10.0	25.9	20.2
HK$40,000 or above	10.0	40.7	29.8

2.2 Part 1: Confidence in the knowledge of potential threats

This section, it aimed to learn more about the confidence to face different types of natural and urban disasters in the future. Respondents are asked to self-report with a 7-point Likert scale which 1 represents not at all confident and 7 means full of confidence.

2.2.1 Mastering the knowledge to deal with potential household crises

General speaking, the overall respondents are somewhat confident in mastering the knowledge to deal with potential household crises ($\bar{X}$=4.57, s=1.178). The participating group who received the programme intervention ($\bar{X}$=4.81, s=1.237) compared to the control group ($\bar{X}$=4.39, s=1.107) demonstrated higher scores in confidence. However, it failed to support the level of significance, t(120)= 0.152, p=0.697.

	Participating Valid %	Control Valid %	Total Valid %
1 Not Confident at All	3.8	0.0	1.6
2 Mostly Unconfident	1.9	5.7	4.1
3 Somewhat Unconfident	5.8	14.3	10.7
4 Average	15.4	31.4	24.6
5 Somewhat Confident	48.1	34.3	40.5
6 Mostly Confident	21.2	12.9	16.4
7 Full of Confident	3.8	1.4	2.5
Mean	4.81	4.39	4.57
Standard Deviation	1.237	1.107	1.178

2.2.2 Mastering the knowledge to deal with potential natural disasters

The Overall respondents' confidence levels are average in mastering the knowledge to deal with potential natural disasters ($\bar{X}$=4.19, s=1.229). The participating group who received the programme intervention ($\bar{X}$=4.40, s=1.125) compared to the control group ($\bar{X}$=4.03, s=1.285) demonstrated higher scores in confidence. However, it failed to support the level of significance, t(120)= 0.500, p=0.481.

	Participating Valid %	Control Valid %	Total Valid %
1 Not Confident at All	3.8	0.0	1.6
2 Mostly Unconfident	0.0	15.7	9.0
3 Somewhat Unconfident	11.5	17.7	13.9
4 Average	36.5	34.3	35.2
5 Somewhat Confident	32.7	20.0	25.4
6 Mostly Confident	15.4	12.9	13.9
7 Full of Confident	0.0	1.4	0.8
Mean	4.40	4.03	4.19
Standard Deviation	1.125	1.285	1.229

2.2.3 Mastering the knowledge to deal with potential public health threats

The Overall respondents' confidence levels are average in mastering the knowledge to deal with potential public health threats ($\bar{X}$=4.30, s=1.204). The participating group who received the programme intervention ($\bar{X}$=4.58, s=1.273) compared to the control group ($\bar{X}$=4.09, s=1.113) demonstrated higher scores in confidence. However, it failed to support the level of significance, t(120)= 0.359, p=0.359.

	Participating Valid %	Control Valid %	Total Valid %
1 Not Confident at All	3.8	0.0	1.6
2 Mostly Unconfident	3.8	10.0	7.4
3 Somewhat Unconfident	7.7	15.7	12.3

4 Average	21.2	41.4	32.8
5 Somewhat Confident	46.2	21.4	32.0
6 Mostly Confident	13.5	11.4	12.3
7 Full of Confident	3.8	0.0	1.6
Mean	4.58	4.09	4.30
Standard Deviation	1.273	1.113	1.204

2.2.4 Mastering the knowledge to deal with potential urban or suburban crises

The Overall respondents' confidence levels are average in mastering the knowledge to deal with potential urban or sub-urban crises ($\bar{X}$=4.05, s=1.225). The participating group who received the programme intervention ($\bar{X}$=4.19, s=1.103) compared to the control group ($\bar{X}$=3.94, s=1.306) demonstrated higher scores in confidence. However, it failed to support the level of significance, t(120)= 2.051, p=0.155.

	Participating Valid %	Control Valid %	Total Valid %
1 Not Confident at All	3.8	2.9	3.3
2 Mostly Unconfident	1.9	12.9	8.2
3 Somewhat Unconfident	13.5	18.6	16.4
4 Average	42.3	30.0	35.2
5 Somewhat Confident	28.8	25.7	27.0
6 Mostly Confident	9.6	8.6	9.0
7 Full of Confident	0.0	1.4	0.8
Mean	4.19	3.94	4.05
Standard Deviation	1.103	1.306	1.225

2.3 Part 2: Confidence and willingness to seek knowledge to face and deal with potential threats

In this section, it aimed to learn more about the confidence and willingness to seek knowledge to face and deal with potential threats. Respondents are asked to self-report

with a 7-point Likert scale which 1 represents strongly disagree and 7 means strongly agree.

2.3.1 Willingness to seek information on disaster preparedness

Overall respondents somewhat agree on the statement on willingness to seek information on disaster preparedness ($\bar{X}$=4.85, s=1.050). The participating group who received the programme intervention ($\bar{X}$=4.63, s=1.121) compared to the control group ($\bar{X}$=5.01, s=0.970) demonstrated lower agree scores. However, it failed to support the level of significance, t(120)= 0.046, p=0.831.

	Participating Valid %	Control Valid %	Total Valid %
1 Strongly Disagree	3.8	0.0	1.6
2 Disagree	1.9	1.4	1.6
3 Somewhat Disagree	1.9	2.9	2.5
4 Neutral	25	25.7	25.4
5 Somewhat Agree	59.6	35.7	45.9
6 Agree	1.9	31.4	18.9
7 Strongly Agree	5.8	2.9	4.1
Mean	4.63	5.01	4.85
Standard Deviation	1.121	0.970	1.050

2.3.2 Possessing sufficient knowledge to prepare for possible threats and disasters

The overall respondents indicated neutral on agree level on the statement on possessing sufficient knowledge to prepare for the possible threats ($\bar{X}$=4.20, s=1.113). The participating group who received the programme intervention ($\bar{X}$=4.48, s=1.093) compared to the control group ($\bar{X}$=4.00, s=1.093) demonstrated higher agree scores. However, it failed to support the level of significance, t(120)= 0.258, p=0.895.

	Participating Valid %	Control Valid %	Total Valid %
1 Strongly Disagree	3.8	0.0	1.6
2 Disagree	0.0	5.7	3.3
3 Somewhat Disagree	5.8	30.0	19.7
4 Neutral	42.3	34.3	37.7
5 Somewhat Agree	30.8	18.6	23.8
6 Agree	17.3	11.4	13.9
7 Strongly Agree	0.0	0.0	0.0
Mean	4.48	4.00	4.20
Standard Deviation	1.093	1.090	1.113

2.3.3 Confidence to solve the threats and disasters

Overall respondents indicated neutral on agree level on the statement on possessing sufficient knowledge to prepare for possible threats ($\bar{X}$=4.31, s=1.053). The participating group who received the programme intervention ($\bar{X}$=4.40, s=1.071) compared to the control group ($\bar{X}$=4.24, s=1.042) demonstrated higher agree scores. However, it failed to support the level of significance, t(120)= 0.258, p=0.612.

	Participating Valid %	Control Valid %	Total Valid %
1 Strongly Disagree	3.8	0.0	1.6
2 Disagree	0.0	5.7	3.3
3 Somewhat Disagree	5.8	30.0	19.7
4 Neutral	42.3	34.3	37.7
5 Somewhat Agree	30.8	18.6	23.8
6 Agree	17.3	11.4	13.9
7 Strongly Agree	0.0	0.0	0.0
Mean	4.40	4.24	4.31
Standard Deviation	1.071	1.042	1.053

2.4 Part 3: Actions against potential threats

In this section, it aimed to learn more about the actions against potential threats. Respondents are asked to self-report with a 7-point Likert scale which 1 represents not needful at all and 7 means full of needful on the first 2 questions. Meanwhile, when asking about the importance of the items in the evacuation packs, 7 point Likert scale is applied that the higher the score, higher the importance.

2.4.1 Importance to prepare of the evacuation packs (or supplies)

Overall respondents claimed that somewhat needful to prepare the evacuation packs ($\bar{X}$=4.85, s=1.050). The participating group who received the programme intervention ($\bar{X}$=4.69, s=1.058) compared to the control group ($\bar{X}$=4.30, s=1.344) demonstrated a significantly high level of importance in preparing evacuation packs, t(120)= 6.859, p=0.010.

	Participating Valid %	Control Valid %	Total Valid %
1 Not Needful at All	3.8	0.0	1.6
2 Mostly Unneedful	1.9	8.6	5.7
3 Somewhat Unneedful	0.0	18.6	10.7
4 Average	23.1	34.3	29.5
5 Somewhat Needful	59.6	18.6	36.1
6 Mostly Needful	9.6	12.9	11.5
7 Full of Needful	1.9	7.1	4.9
Mean	4.69	4.30	4.47
Standard Deviation	1.058	1.344	1.241

2.4.2 Importance to prepare of the evacuation packs (or supplies) in multiple reachable places

Overall respondents claimed that somewhat needful to prepare the evacuation packs ($\bar{X}$=4.12, s=1.175). The participating group who received the programme intervention

(X̄=4.46, s=0.979) compared to the control group (X̄=3.87, s=1.250) demonstrated a high level of importance in preparing evacuation packs, but it failed to support the level of significance, t(120)= 6.859, p=0.010.

	Participating Valid %	Control Valid %	Total Valid %
1 Not Needful at All	3.8	4.3	4.1
2 Mostly Unneedful	1.9	10.0	6.6
3 Somewhat Unneedful	1.9	17.1	10.7
4 Average	32.7	41.4	37.7
5 Somewhat Needful	55.8	18.6	34.4
6 Mostly Needful	3.8	7.1	5.7
7 Full of Needful	0.0	1.4	0.8
Mean	4.46	3.87	4.12
Standard Deviation	0.979	1.250	1.175

2.4.3 Action to prepare evacuation kits for their families

More than one-third of the overall respondents claimed that somewhat needful to prepare the evacuation packs (35.2%). It is observed that there is significant positive correlation when participating the programme, r(122)=0.683, p=0.000**.

	Participating Valid %	Control Valid %	Total Valid %
Prepared	73.1	7.1	35.2
Not yet prepared	26.9	92.9	64.8

2.4.4 Importance of the items in the evacuation packs

Overall respondents claimed that the softcopies of legal documents (X̄=5.32, s=1.344), First Aid Kit (X̄=5.28, s=1.294) and flashlight (X̄=5.16, s=1.294) are top three important in the evacuation packs.

It is observed that the participating group who received the programme intervention ($\bar{X}$=5.46, s=1.179) compared to the control group ($\bar{X}$=5.21, s=1.454) demonstrated a high level of importance with significance to the softcopies of legal documents in evacuation packs, t(120)= 6.228, p=0.014.

Also, the participating group who received the programme intervention ($\bar{X}$=4.98, s=1.180) compared to the control group ($\bar{X}$=5.50, s=1.338) demonstrated a lower level of importance with significance to the First Aid Kit in evacuation packs, t(120)= 3.932, p=0.050.

		Participating	Control	Total
Softcopies of legal documents	Mean	5.46	5.21	5.32
	Standard deviation	1.179	1.454	1.344
Daily medication list	Mean	5.12	5.04	5.07
	Standard deviation	1.338	1.449	1.398
First Aid kit	Mean	4.98	5.50	5.28
	Standard deviation	1.180	1.338	1.294
Bank notes (cash)	Mean	5.35	5.00	5.15
	Standard deviation	1.219	1.394	1.328
Phone charger	Mean	4.12	5.27	4.78
	Standard deviation	1.504	1.372	1.535
Flashlight	Mean	4.65	5.53	5.16
	Standard deviation	1.312	1.271	1.355

2.4.5 Food reservation for the disaster preparedness

When asking the number of days of food reservation for disaster preparedness, overall respondents claimed that they have prepared around a week, but it is observed that there are high discrepancies ($\bar{X}$=11.69, s=33.544).

It is observed that the participating group who received the programme intervention ($\bar{X}$=16.19, s=50.003) compared to the control group ($\bar{X}$=8.34, s=9.927) prepared more on food reservation for disaster preparedness, t(120)= 3.352, p=0.070.

		Participating	Control	Total
No. of day of food reservation for the disaster preparedness	Mean	16.19	8.34	11.69
	Standard deviation	50.003	9.927	33.544

2.4.6 Financial reservations for disaster preparedness

When asking for financial reserved for disaster preparedness, it is reported the median of the saving reservation for disaster is 12 months or below for the overall respondents, participating and control groups.

	Participating Valid %	Control Valid %	Total Valid %
No Saving	6.7	5.0	5.7
2 weeks below	4.4	1.7	2.9
6 weeks below	6.7	5.0	5.7
12 weeks below	2.2	6.7	4.8
3 months below	13.3	15.0	14.3
6 months below	13.3	10.0	11.4
9 months below	2.2	3.3	2.9
12 months below	33.3	21.7	26.7
24 months below	8.9	11.7	10.5
24 months or above	8.9	20.0	15.2

2.5 Part 4: Community resilience

In this section, it aimed to learn more about community resilience. Respondents are asked to self-report with a 7-point Likert scale which 1 represents strongly disagree and 7 means strongly agree on the first 4 questions. Meanwhile, when asking about the current community resources for handling potential natural disasters and urban threats, 7 points Likert scale is applied that the higher the score, the higher the sufficiency.

2.5.1 Community resilience

2.5.1.1 Confidence to mutual support within the community

Overall respondents claimed that somewhat agree the confidence in mutual support within the community ($\bar{X}$=4.70, s=1.030). The participating group who received the programme intervention ($\bar{X}$=4.58, s=1.054) compared to the control group ($\bar{X}$=4.80, s=1.008) demonstrated lower scores in agree level. However, it failed to support the level of significance, t(119)= 0.228, p=0.634.

	Participating Valid %	Control Valid %	Total Valid %
1 Strongly Disagree	3.8	0.0	1.7
2 Disagree	0.0	1.4	0.8
3 Somewhat Disagree	3.8	2.9	3.3
4 Neutral	30.8	39.1	35.5
5 Somewhat Agree	53.8	33.3	42.1
6 Agree	3.8	17.4	11.6
7 Strongly Agree	3.8	5.8	5.0
Mean	4.58	4.80	4.70
Standard Deviation	1.054	1.008	1.030

2.5.1.2 Willing to contribute to the community

Overall respondents claimed that somewhat agree that they are willing to contribute to the community ($\bar{X}$=4.91, s=1.061). The participating group who received the programme intervention ($\bar{X}$=4.63, s=1.067) compared to the control group ($\bar{X}$=5.12, s=1.015) demonstrated low scores in agree level with the statement. However, it failed to support the level of significance, t(118)= 0.005, p=0.943.

	Participating Valid %	Control Valid %	Total Valid %
1 Strongly Disagree	0.0	3.8	1.7
2 Disagree	1.4	0.0	0.8
3 Somewhat Disagree	2.9	0.0	0.0
4 Neutral	39.1	38.5	31.7
5 Somewhat Agree	33.3	44.2	41.7
6 Agree	17.4	9.6	16.7
7 Strongly Agree	5.8	3.8	7.5
Mean	4.63	5.12	4.91
Standard Deviation	1.067	1.015	1.061

2.5.1.3 Confidence in supporting and contributing to developing a more closed and stronger community network

Overall respondents claimed that somewhat agree that they are confident in supporting and contributing to developing a more closed and stronger community network ($\bar{X}$=4.50, s=1.050). The participating group who received the programme intervention ($\bar{X}$=4.33, s=1.024) compared to the control group ($\bar{X}$=4.64, s=1.057) demonstrated low scores in agreement level with the statement. However, it failed to support the level of significance, t(118)= 1.759, p=0.187.

	Participating Valid %	Control Valid %	Total Valid %
1 Strongly Disagree	3.8	0.0	1.7

2 Disagree	0.0	2.9	1.7
3 Somewhat Disagree	3.8	5.8	5.0
4 Neutral	55.8	42.0	47.9
5 Somewhat Agree	26.9	26.1	26.4
6 Agree	7.7	20.33	14.9
7 Strongly Agree	1.9	2.9	2.5
Mean	4.33	4.64	4.50
Standard Deviation	1.024	1.057	1.050

2.5.2 Current community resources for handling potential natural disasters and urban threats

Overall respondents agree top three current community resources are the participation of local residents ($\bar{X}$=4.15, s=1.248), awareness of the disaster ($\bar{X}$=4.05, s=1.352) and local organisation ($\bar{X}$=4.04, s=1.201). On the other hand, overall respondents claimed that shelter ($\bar{X}$=3.01, s=1.285), government policy ($\bar{X}$=3.29, s=1.308) and space for storage/ preparation works ($\bar{X}$=3.46, s=1.021) are rated lowest among the scopes mentioned.

It is observed that the participating group who received the programme intervention ($\bar{X}$=3.82, s=1.551) compared to the control group ($\bar{X}$=3.76, s=0.971) rate higher with significance in knowledge in disaster preparedness, t(82)= 3.352, p=0.071.

Also, the participating group who received the programme intervention ($\bar{X}$=3.60, s=1.404) compared to the control group ($\bar{X}$=3.43, s=0.925) rated higher with significance in space for storage/ preparation work, t(80)= 3.150, p=0.080.

Finally, the participating group who received the programme intervention ($\bar{X}$=3.27, s=1.870) compared to the control group ($\bar{X}$=2.96, s=1.130) rated higher with significance in the shelter, t(82)= 12.787, p=0.001

		Participating Valid %	Control Valid %	Total Valid %
Knowledge on disaster preparedness	Mean	3.82	3.76	3.77
	Standard Deviation	1.551	0.971	1.101

		Participating Valid %	Control Valid %	Total Valid %
Knowledge on disaster responses	Mean	3.93	3.52	3.60
	Standard Deviation	1.438	0.927	1.041
Knowledge of post-disaster responses	Mean	3.88	3.60	3.65
	Standard Deviation	1.310	0.938	1.017
Awareness of disasters	Mean	4.47	3.94	4.05
	Standard Deviation	1.586	1.278	1.352
Personal skills	Mean	3.87	3.58	3.83
	Standard Deviation	0.903	1.346	0.991
Government policy	Mean	3.58	3.21	3.29
	Standard Deviation	1.346	1.295	1.308
Space for storage/preparation work	Mean	3.60	3.43	3.46
	Standard Deviation	1.404	0.925	1.021
Shelters	Mean	3.27	2.96	3.01
	Standard Deviation	1.870	1.130	1.285
Information flows	Mean	4.13	3.71	3.79
	Standard Deviation	1.544	1.305	1.354
Financial resources	Mean	3.71	3.58	3.61
	Standard Deviation	1.309	1.017	1.087
Other resources (other than financial resources)	Mean	3.75	3.57	3.60
	Standard Deviation	1.483	1.060	1.148
Local organisations	Mean	4.40	3.96	4.04
	Standard Deviation	1.682	1.065	1.201
Participation of the local residents	Mean	4.40	4.09	4.15
	Standard Deviation	1.765	1.111	1.248

3 Conclusion

This quantitative Research Project found the following facts.

1. **Mastering the knowledge to deal with potential home crises, natural disasters and public health issues**

   The respondents commonly believed they had a higher ability to deal with household crises than others. Meanwhile, it is found that the respondents had more faith in their ability to handle potential public health threats than natural disasters, which might be caused by the outbreaking pandemic for more than 2 consecutive years.

2. **Confidence and willingness to seek knowledge to face and deal with potential threats**

   By observation, it is found that the respondents rated neutral to possessing sufficient knowledge and confidence to solve the threats and natural disasters.

3. **Actions against potential threats**

   The Research Project shows that the programme can act as an effective intervention to make the public know the importance of preparing evacuation packs or supplies for disaster preparedness. As a consequence, respondents from the participating group have a higher proportion of preparing evacuation kits for their families than the control group.

4. **Importance of the items in the evacuation packs**

   The Research Project shows the respondents of the participating group had a higher awareness of the importance of the softcopies of the legal document in the evacuation packs due to the programme.

5. **Food reservation for the disaster preparedness**

   The programme shows effective factors to promote preparing food reservations for disaster preparedness. The respondents from the participating group reported having a higher volume of food reservations for disaster preparedness than the control group.

6. **Community resilience**

   Respondents generally somewhat agree on the confidence in mutual support within the community. Meanwhile, they somewhat agree to contribute to the community. Thus, those factors help to build confidence and support the development of a more closed and stronger community network.

7. **Current Community Resources for Handling potential natural disaster and urban threats**

   Generally speaking, all respondents rated neutral to the resourcefulness of the current community resources, it is found that the resources related to government rated the lowest among the said areas (i.e. shelter, government policy and space for storage/ preparation works). The programme can help the public learn more about the existing information shelter and space for storage/ preparation works within the community.