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Caritas Chan Chun Ha Field Studies Centre

Perception Study of Natural Hazards

Student Name: _____   Group no.: _____

Course Date: _____

OBJECTIVES

➢   Knowledge: -To understand the major natural hazards in Hong Kong

-To evaluate the perception of Hong Kong citizens on natural hazards

-To analyze the responses of Hong Kong citizens on natural hazards

➢   Skills: -To test hypothesis

-To apply sampling methods in data collection

-To use data collection methods such as questionnaire, interview and scoring

-To use choropleth maps and scatter diagrams to process data

➢   Value: -To understand the role of human in complex man-land relationship

Relevance to the DSE geography curriculum

Opportunities and Risks — Is it rational to live in hazard-prone areas?

Concept recap: Natural hazards

Complete the table below after watching the video clips.

Natural hazard	1.	2.
	https://www.youtube.com/watch?v=Unu8nCQhmKM	https://www.youtube.com/watch?v=4StilBcPXsk
Causes		
Impacts		

Typhoons may cause storm surges, which, according to the Hong Kong Observatory, "like small tsunamis". This field study focuses on the common natural hazards of Hong Kong—typhoon and storm surge. It aims to understand the residents' perception of these natural hazards. In addition, the risk perception of typhoon and storm surge will provide valuable references for studying residents' perception of tsunamis.

STAGE 1: PLANNING & PREPARATION

➢ **Focus of enquiry**: Factors affecting the perception of typhoons and storm surges

➢ **What data to collect?**

Refer to the statement below:

"**What do people consider when deciding to leave or to stay in hazard-prone areas?**", list the factors affecting people's perception on typhoons and storm surges.

Perception of risk and opportunities of natural hazards (Typhoons and Storm surges)		
Physical factors	Human/ Socio-economic factors	Other factors

➢ **Formulating hypothesis**

Referring to the above **"What data to collect?"**, set a hypothesis about the significant factor affecting people's perception on typhoons and storm surges.

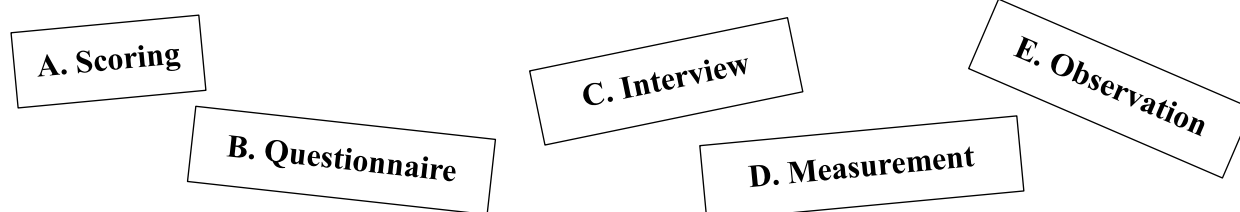| |
|---|
| If _____ , the level of perception of respondents on natural hazards (Typhoons and Storm Surges) will be higher. |

➢ Where do we collect data (refer to the map on p.16)?

Study route	A / B / C / D / E / F / G / H
Scope of sampling	☐ Point ☐ Line ☐ Area
Locational characteristics (Refer the map on p.16)	

How does it affect the results of your study?

➢ When do we collect data?

Date: _____	Time: _____ to _____
Weekday / Weekend	Season: _____

➢ **How do we collect data?**

Data collection methods:

A. Scoring

B. Questionnaire

C. Interview

D. Measurement

E. Observation

Tools and equipment:

1. Questionnaire	2. Camera	3. Anemometer	4. Compass

Research Items	Data collection method	Equipment required	Operational precautions
Opportunity index and risk index of each study point			
People's perception level of natural hazards (Typhoons and Storm Surges)			
Factors affecting perception level (hypothesized items)			

STAGE 2: DATA COLLECTION

Respondent no.：_____

(A) Questionnaire and Interview

Interview _____ Cheung Chau residents in the study area.

Introduction (Background information): On 16th September, 2018, Super Typhoon Mangkhut smashed Hong Kong directly, bringing damaging winds and record-breaking storm surges to Hong Kong; Cheung Chau was thus received severe damages….

Q1. Are you a Cheung Chau resident ?

    A.   Yes, has been living for _____ year(s). (Not necessary to answer the following questions if respondents moved to Cheung Chau after the smashing of Mangkhut)

    B.   No. *(Not necessary to answer the following questions. Please search for another respondent.)*

Q2. Pinpoint the living location on the map provided.

(Students need to search for the nearest location of sampling site, [e.g. B3] and label the number for the living location of the respondent on the map.)

➢ **Experience related to typhoons and storm surges：**

Negative experiences from typhoon and storm surge	Mark
Q3 Did Mangkhut cause any damages to your residence? If yes, please briefly state the extent of damage: Based on the description given by the respondent, assess the damage of residence given by Manghkut. No damage Severe Damage (Require a long period of time and large sum money for repairing) 0 1 2 3 4 5	/5
Q4 According to your experiences, have you felt your life being threatened by Manghlut? If yes, please state the experiences briefly. Based on the description given by the respondent, assess the extent of psychological drawbacks that the respondent received as a result of Manghkut. Life was unthreatened (Feel no threats at all) Life was threatened (severe psychological drawbacks) 0 1 2 3 4 5	/5

Q5	Have you experienced any typhoons possessed similar strength with Manghkut in Cheung Chau? If so, how often did they occur ?	

Never — More than 5 years — Every 5 years — Every 2 to 3 years — Every year — Frequently occur (More than 1 in a year)

0 — 1 — 2 — 3 — 4 — 5

/5

「**Negative experience**」**Total** *(Max. 15)*：

➤ **Potential risk of residence**：

Q6. Please describe your current living conditions according to following items:	**Mark**
☐ Windward ☐ Big Trees/ dangerous slope nearby ☐ Balcony/ roof garden ☐ Roof premises/ canopy ☐ Living on G/F ☐ Building age more than 30 years ☐ Non-reinforced concrete building materials ☐ Lack repair and maintenance	/8

➤ **Views on threat of typhoon and storm surge**：

Q7. Provided that there would be typhoons which have similar strength with Manghkut every year, would you leave your current living location, or even move out from Cheung Chau?

No. of respondent：_____	**Will / Will not** ，because：
Nearest sampling site to the living location of respondent: _____	

➤ **Knowledge and preparedness of typhoon and storm surge risk**：

Reasons should be asked if "knowledge" score is positive but "practice" score is zero.

Knowledge of typhoon and storm surge (Knowledge)	**Mark**	***Preparedness of typhoon and storm surge (Practice)**	**Mark**
Q8 When typhoon signals were issued, the Hong Kong Observatory and Hong Kong Housing Society had suggested citizens had to be aware of following precautionary practice(s) while staying indoor to lower the risks of typhoons and storm surges: 8a) Shut down the window type air-conditioner at the windward side 8b) Close all the doors in the house 8c) Do not manage the aftercare immediately when the window glass bursts *(Base on answers suggested in the attachment, 1 mark is given for each correct answer, Max. 3 marks.)*	/3	Q15 How often would you, even staying indoor, be aware of the precautionary practices mentioned when typhoon and storm surge came? *0 mark= never ----* *3marks= always*	/3

Q9	During storm surges, giant waves continuously smash coastal areas. How deep would the flood water be to flush people away? A. 15cm B. 30cm C. 50cm Answer: **A (1 mark)**	/1	Q16	How often would you practise the measures mentioned in Q10? *0 mark= never ----* *2marks= always*	
Q10	According to the answer in Q9, list one measure that minimizes the threats of human life during storm surges. Answer: **Stay away from coastal/low-lying areas, go to a higher elevation (1 mark)**	/1			/2
Q11	When natural hazards occur (e.g. earthquakes, fire accidents, landslides), your residences might be at risk, and emergency evacuation is required. What would you prepare to facilitate emergency evacuation? Answer: **Emergency kits (1 mark)**	/1	Q17	Do you have any emergency kits in your residence? *Yes:3 mark; no: 0 mark*	
Q12	According to the answer in Q11, except keys, HK ID card (including photocopies) and small amount of money (including Octopus), list **three** items that the emergency kits should include? Answer *(Suggested by Hong Kong Red Cross)*: **Mobile phone and charger, torch and battery, whistle, first aid kit, dry food, drink water, towel, emergency contact card, personal medicine (if necessary), glasses (if necessary), light toy (for children)** *(1 mark is given for each correct answer, Max. 3 marks)*	/3			/3
Q13	What preventive measure could be done to compensate the loss of properties due to natural hazards (e.g. typhoons and storm surges) Answer: **Buy/ Purchase Insurance (1 mark)**	/1	Q18	Did you purchase any insurance for your property inside the residence? Yes: *3 marks; No: 0 mark*	
Q14	According to the answer in Q13, which type of insurance should be purchased? A. Home insurance B. Fire insurance C. All risk insurance Answer: **A. Home insurance (1 mark)**	/1			/3
	「 **Knowledge** 」 Total *(Max. 11)*			「 **Preparedness** 」Total *(Max. 11)*	

After completing the interview above, please collect the background information of the respondent according to the requirement of research topic.

According to the hypothesis set in p.3, you might construct a few questions to collect the respondents' background information other than the questionnaires provided.

Why don't collect the background information of respondents before starting the interview?

How would the background information of respondents affect the results of the fieldwork?

(B) Assessment score

Using the tables below to assess the opportunity and risk of study points along your study route.
You should make appropriate criteria which can summarize the general situation of the area of study points.

Why should we set common criteria?

1. **Opportunity Score Table**

(Score: Highly disagree→ 0 mark; Disagree→ 1 mark; Agree→ 2 marks; Highly agree→ 3 marks)

Indicators	Map evidence and field investigation method	Study point			
1. Flat relief	▪ Field observation: ▪ Map: distribution of contour lines				
2. Good scenery	▪ Field observation:				
3. Good accessibility	▪ Field observation: ▪ Map: distance of main road to pier				
4. Vibrant economic activities	▪ Field observation: ▪ Map: distance to commercial land use and area of commercial land use				
Total score of opportunity					

2. **Risk Score Table**

(Score: Highly disagree→ 0 mark; Disagree→ 1 mark; Agree→ 2 marks; Highly agree→ 3 marks)

Indicators	Map evidence and investigation method	Study point			
1. Vulnerability to flooding	▪ Field observation: ▪ Map: distribution of lowland				
2. Prone to wave attack	▪ Field observation: ▪ Map: distance to sea				
3. Exposed location	▪ Field observation/ Measurement:				
4. High population density	▪ Field observation: Area and density of residential land use				
5. Unstable building design	▪ Field observation: building structure				
Total score of risk					

STAGE 3: DATA PROCESSING & DATA PRESENTATION

A. Processing data from questionnaire

(A1) Experience related to typhoon and storm surge

Total score of negative experience =	Loss of property (Q3) + Threat to life (Q4) + Frequency of hazard (Q5)

(A2) Perception of typhoon and storm surge risk

Perception total score =	Knowledge of typhoon and storm surge risk (Q8-14) + Preparedness of typhoon and storm surge risk (Q15-18)

Using the table below, find out the perception level of respondents on typhoon and storm surge risk.

Knowledge (Q8-14)			Preparedness (Q15-18)			Perception level	
0-3	Low	+	0-3	Low	➔	0-7	Low
4-7	Medium		4-7	Medium		8-15	Medium
8-11	High		8-11	High		16-22	High

➢ Using suitable diagram(s) (_____) to show the relationship between the perception of typhoon and storm surge risk and the hypothesized items.

Respondent no.	(1) Knowledge total score	(2) Preparedness total score	(1)+(2) Perception total score	Hypothesized items			

B. Processing data from interview questions
Views on threat of typhoon and storm surge

➢ Summarize and categorize the responses from Q7.   Find out what factors affect respondents' views on the threat of typhoon and storm surges.

Respondent	Leave or Stay	Respondents' Feedback

Conclusion

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C. Processing data of RISK and OPPORTUNITY index

➢ Use appropriate diagrams (_____) to show the OPPORTUNITY and RISK index of respective study points.

Key: (C1) Distribution of OPPORTUNITY index		
Opportunity index	**Opportunity level**	**Colour**
	Very high	Pink
	High	Orange
	Low	Cyan
	Very low	Light blue

Key: (C2) Distribution of RISK index		
Risk index	**Risk level**	**Colour**
	Very high	Red
	High	Yellow
	Low	Green
	Very low	Dark blue

STAGE 4: DATA INTERPRETATION & CONCLUSION

1. Referring to the choropleth maps which show the distribution of opportunity total score and risk total score at different locations. What are the similarities of location characteristics with high index of opportunity and risk respectively?

2. Referring to scatter diagram(s), describe and explain the relationship between perception level and your hypothesized items.

3. Referring to the interview result (Q7), what are the factors affecting the views of respondents on threat of **typhoons and storm surges** - to leave or to stay in hazard-prone area?

STAGE 5: EVALUATION

1. In which part of the fieldwork sampling methods were used? Explain the merits and demerits of these sampling method(s).

2. Evaluate the strengths and weaknesses of using scoring and questionnaire in data collection. Propose ways to improve the validity and reliability of this fieldwork.

3. Earthquakes are not frequent in Hong Kong but occasion sensible earthquakes have been experienced in Hong Kong. In 2019 and 2020, two minor earthquakes took place close to Cheung Chau and the information of the two minor earthquakes is as follows.

	5 Dec 2019	**5 Jan 2020**
Time	12:22pm	6:55am
Magnitude (Richter Scale)	1.4	3.4
Location (Epicenter)	16km SW of Hong Kong	41km SW of Hong Kong
Intensity (Modified Mercalli Intensity Scale)	III – Vibration likes passage of light trucks.	IV – Hanging objects swing. Window, dishes and doors rattle.

Source: Hong Kong Observatory Website

You are asked to conduct a perception field study of Cheung Chau based on the above earthquakes. The following questions may guide you:
- What is your title?
- What are your research questions?
- What are the study area of Cheung Chau will your group choose? Why?
- When will you conduct the fieldwork? Why?
- What type(s) of research method(s) will you employ?
- What are your expected results?
- What are your anticipated limitations?

(For more detail about the sensible earthquake in Cheung Chau on 5 December 2019, you can refer to the Extract of Investigation Report issued by Hong Kong Red Cross on P.14 and 15. This is helpful to complete question 3.)

Homework:

After the fieldwork, please organize this fieldwork experience in field trip diary on p.17-18 as a reference for the revision of field-based question.

Extract of Investigation Report of Sensible Earthquake in Cheung Chau issued by Hong Kong Red Cross

Background and Purposes:

There was a sensible earthquake hitting 1.4 on Richter Scale in the proximity of Cheung Chau on 5 December 2019 as recorded by Hong Kong Observatory (HKO). Its epicenture was located 16km SW of the headquarter of HKO. More than ten citizens reported to HKO about the feeling of earth shaking for seconds.   In the light of it, local disaster relief and preparedness service team of Community Care Service Department (Hong Kong Red Cross) conducted assessment of this earthquake with the following purposes:

(a) to understand the Cheung Chau residents responses to sensible earthquakes; and

(b) to understand the residents' knowledge and awareness against the earthquakes.

Investigation Methods:

The survey was conducted on 30 December 2019 in Cheug Chau and the informants were Cheung Chau residents. The informants were selected by simple random sampling in the format of face-to-face interview. 239 interviews were successfully completed. Besides that, online questionnaires were sent to two secondary schools in Cheung Chau with three successful returns.

Major Findings:

Earthquake Experience

- 70% of the informants were in Cheung Chau during the earthquake. Only 36% of the informants felt shaking. Most informants (85%) did not take any responses to this earthquake.
- Excluding the sensible earthquake in early December 2019, only a quarter of the respondents have experienced earthquakes. 26% of the respondents take different measures.
- Those living in private housing or public housing, living in East Bay and youngsters were more likely to feel the earthquake.
- Those living in village houses, male and living with family expressed diverse responses than others.

Awareness of Natural Hazards

- 34% of the interviewees believed that Hong Kong was hazard-prone. It was 10% higher than the likelihood believed in Cheung Chau.
- Youngsters living in private housing or public housing were more aware of natural hazards.
- Informants conceived typhoons, flooding and rainstorms were three top priorities of natural hazards no matter in Cheung Chau or in Hong Kong.
- Compared with Cheung Chau, the informants believed that major Hong Kong natural hazards included landslide, fire, infectious diseases and social unrest. Some female informants in Sai Wan pointed out the rats are annoying hazards.

Knowledge of Natural Hazards

- More than 80% informants did not know the location of temporary asylum centre.

- Those living in private housing or public housing (e.g. Cheung Kwai Estate) better knew the location of temporary asylum centre.

- Only one quarter of the interviewee heard about emergency kit. They could point out keys (55%), mobile phone (50%) and battery charger (45%).

- Most respondent ignored whistle as a tool of emergency kit. Only 5% of the informants can name it.

- People who aged 45 or below mastered better knowledge, on the contrary, the knowledge was lower for the aged.

Confidence in Facing Natural Hazards

- One third of the respondents were confident in facing natural hazards.

- Those aged 18 to 35 exhibited higher confidence.

- 40% of the informants trusted that their knowledge can help others.

- The elderly were less confidence in facing natural hazards.

Perception Study of Natural Hazards
自然災害的感知研究

Group 組別 _____
Route 路線 _____

Distribution of RISK / OPPORTUNITY

風險 /機會 指數分佈

Legend 圖例

Main path
主要路徑

Stream course
溪流

Contour line
等高線

Vegetation
植被

Recreational land use
康樂用地

◯	非常高 Very high
◯	高 High
◯	低 Low
◯	非常低 Very low

0 50 100   200   300   400 Meters

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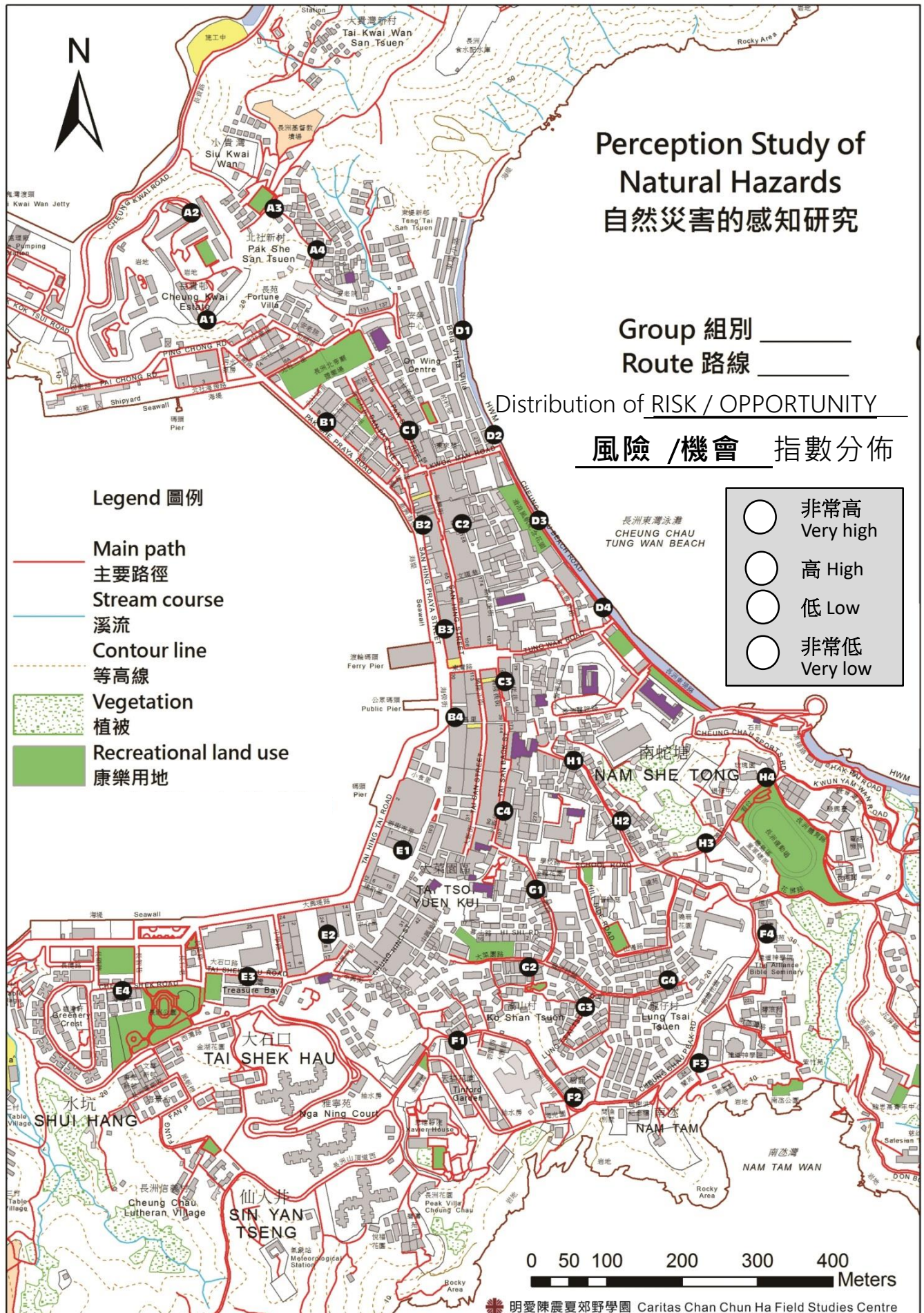
My Field Trip Diary

➢ Related modules: Opportunities and risks—Is it rational to live in hazard-prone areas?

➢ Key point of fieldwork/topic: Factors affecting the perception of typhoons and storm surges

▪ Date:_____ (Weekday/ Public holiday) ▪ Time:_____ ▪ Field site: _____	▪ Weather condition:
Is the above planning appropriate for the fieldwork?	

➢ Primary data:

Data collection method	Data collected	Equipment/ Material (if any)	Merits☺/Demerits☹ of the data collection method (give examples)	Suggestion for improvement (give explanations)
❑ Measurement				
❑ Observation				
❑ Counting				
❑ Questionnaire/ Interview				
❑ Other (if any)				

➢ Secondary data:

Data collected	Use	Obtained from
Apart from the above, what other secondary data could be used for further investigation?		

➢ Sampling method (if any):

Sampling method	Applied in the following	Merits☺/ Demerits☹

➢ Data processing and presentation:

Type of graph/ chart	Content shown and function of graph/chart	Merits☺/ Demerits☹

➢ For deeper learning or further study, I suggest modify the following aspects.

		Suggestion (give examples)
❏	Key point of fieldwork/ topic	
❏	Data to be collected and method of data collection	
❏	Date and time of fieldwork	
❏	Field site	

Sampling Methods (Source: https://www.geography-fieldwork.org/a-level/before-starting/methods/sampling/)

Probabilistic sampling methods (概率抽樣)			Non-probabilistic sampling methods (非概率抽樣)		
Need to know the size of population (母群); *Few differences among individuals;* *Individual has equal chance (機率) of being selected;* *Representativeness of data (代表性) depends on sampling percentage.*			*Size of population(母群) might not be relevant to the research objective;* *Chance (機率) of individual being selected is unknown;* *Representativeness (代表性)) of the results depends on the judgment (判斷) of researcher in sample selection (Such as the correlation between samples and research targets).*		

Methods 抽樣方法	Simple random sampling 簡單隨機抽樣	Systematic sampling 系統抽樣	Stratified sampling 分層抽樣	Quota sampling 配額抽樣/ 定額抽樣	Convenience sampling 便利抽樣/ 方便抽樣	Purposive sampling 立意抽樣
Explanations 解釋	To select sample from the **whole population randomly**. (using computer program, bamboo slip or random number table)	Each member of the whole population is sequentially numbered, then selected according to a fixed, periodic interval.	The whole population are classified according to the variable and divided into separate stratum. Then samples are selected randomly by proportion from each stratum.	The whole population are classified according to the variable and divided into separate stratum. Then desired number (quota) of samples are selected from each stratum.	Research subjects are selected due to convenience of recruitment.	Samples are selected according to research objectives and special requirements.
Examples 例子	To choose a certain number of students to conduct questionnaires/ surveys according to the class number.	To measure the noise level of a street in a regular interval.	To group buildings according to their ages (e.g. above or below 50), and select a certain number of buildings in each group randomly.	To select a certain number of male and female customers, then record the amount spent in a shop.	To interview a certain number of relatives who work in mainland China	To conduct an in-depth interview with a district councilor about the social problems of that district.
Remarks 備註	Suitable for small population and few variations among samples (for relevant research objectives).	Suitable for large population (hidden cyclic ordering which may affect the representativeness of data).	Effectively show the relationship / effect between variables.	Effectively show the relationship / effect of variables, but the characteristics and size of samples are judged subjectively.	Should not generalize the data to larger population	Suitable for qualitative research (data is easily influenced by the subjective judgment of researcher)