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Caritas Chan Chun Ha Field Studies Centre

From Channel to Stream
Kai Tak River

Name：_____ **Group**：_____

Date：_____

Course Objective

- Knowledge:
  - To understand the usage of the urban channel
  - To understand the management strategies of urban channel
  - To analyze the relationship between river and surrounding land uses
  - To analyze the effectiveness of river revitalization
- Skills:
  - To master the skills in measuring the width and depth of urban channel
  - To classify and record the land use and land use distribution
  - To observe the river management strategies and understand their relationship with the surrounding environment
  - To conduct questionnaire survey
- Value:
  - To appreciate the urban channel after revitalization
  - To aware the importance of good water quality to China and Hong Kong.

Relevance to Senior Secondary Geography Curriculum

✓ Managing Rivers Environments: A continuing challenge

Prior knowledge

Background

Existing Kai Tak River running along Choi Hung Road starts from Po Kong Village Road, through Tung Tau Estate, Prince Edward Road East, Kai Tak Development area and finally connects to Victoria Harbour. It is one of the major drainage channels in East Kowloon area.

Kai Tak River, former called Kai Tak Nullah, experienced serious water pollution in 1960-70s. The sewage discharged from the factory and domestic sewage flowed directly into the Kai Tak Nullah, causing bad smell from the nullah.

In 2000s, the drainage capacity of Kai Tak River was inadequate to meet the current flood protection standard. Severe flooding incidents have occurred at Choi Hung Road beside Kai Tak River during heavy rains.

Therefore, the Drainage Services Department (DSD) has planned to start improvement works in 2011 in order to enhance the drainage capacity of the nullah. DSD has implemented works to rehabilitate the River and introduce aesthetic, greening, landscaping and ecological elements at the sides and bottom of the nullah. The project was completed in 2018.

Objectives of the project

1. Enhance drainage capacity.
2. Increase greening and landscape beautification facilities.
3. Improve community environment, link up surrounding area.

Source from web site of Drainage Service Department (https://www.kaitakriverwts.hk/index.php)

River Management Strategies

Classify the followings management strategies into hard and soft engineering.

1. Channelisation	2. Weir	3. Gabion	4. Afforestation
5. Dam	6. Concrete Frame with Soil Sacks	7. Land Use Zoning	8. Flood warning system
9. Diversion channels	10. Dykes	11. Planting at river banks	

Hard engineering：_____

Soft engineering：_____

STAGE 1: PLANNING AND PREPARATION

- **Key point of fieldwork: River management strategies**

- **Enquiry question: Study the river management strategies of urban channel and their effectiveness**

- **When to collect the data?**

Date		What factors would you consider in choosing the fieldwork date?
Time		
Season		
Precipitation three days before the fieldwork	Heavy Rained / Drizzle / No Rain	
Weather conditions		

Why do we have to pay attention to the weather condition before conducting the fieldwork?

- **Where to collect the data (please refers to the map on p.12)**

  Along Kai Tak River (AB) and Tai Shing Street to Tseuk Luk Street (XY)

What factors are considered when choosing the field site?

- **Sampling**

1. What sampling frame is used in the following items?

	Point	Line	Grid
a) Land Use along transect XY	☐	☐	☐
b) Access the effectiveness of revitalization at study site P, Q, R and B	☐	☐	☐

2. Conducting questionnaire research with a few passersby you meet, which sampling method is used?

Simple random / Systematic / Purposive / Stratified/ Convenience/ Quota sampling

3. Completing questionnaire research with 5 residents who have lived nearby for several years, which sampling method is used?

Simple random / Systematic / Purposive / Stratified/ Convenience/ Quota sampling

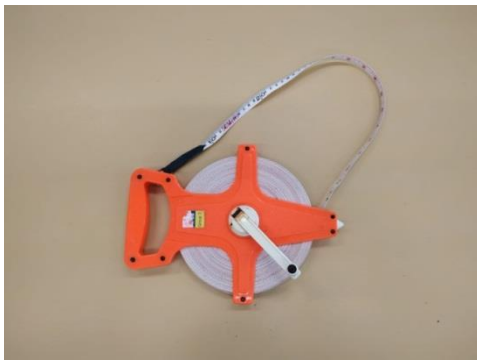
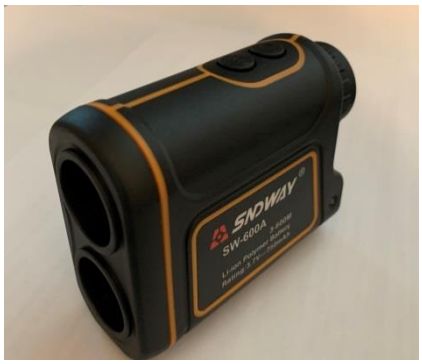
➢ How to collect the data ?

Research items		Primary data collection methods (check all that apply)	Required equipment / Tool (if any)
1. River Management Strategies	a. Artificial structure (e.g. channelisation, monitoring systems)		
	b. Land use zoning		
2. Effectiveness of river revitalization	a. Drainage capacity i. river width ii. river depth		
	b. Water quality		
	c. Ecosystem (e.g. number of fishes)		

Primary data collection methods

A. Observation	B. Measurement	C. Counting	D. Category	E. Distribution (Mapping)
F. Scoring	G. Field sketching	H. Questionnaire	I. In-depth interview	

Equipment

measuring Tape	laser distance meter
	
colour Pencil (self prepared)	**lead line**
	

***For reference only, the outlook may differ by brands.**

STAGE 2: DATA COLLECTION

A. Location and function of different River Management Strategies

Referring to the map (p.12), which of the following management strategies can you find at location 1-7 along transect AB? Choose their major function.

River management strategies	Function	Location on the map						
		1	2	3	4	5	6	7
Channelisation 	☐ enhance drainage capacity ☐ monitor water level ☐ enhance habitat							
Remote Monitoring System 	☐ enhance drainage capacity ☐ monitor water level ☐ enhance habitat							
Box Culvert(箱形暗渠) 	☐ enhance drainage capacity ☐ monitor water level ☐ enhance habitat							
Benchmark (河道基準尺) 	☐ enhance drainage capacity ☐ monitor water level ☐ enhance habitat							
Flow Deflectors and fish shelters 	☐ enhance drainage capacity ☐ monitor water level ☐ enhance habitat							
Submerged planters 	☐ enhance drainage capacity ☐ monitor water level ☐ enhance habitat							

B. Land Use along the river and transect

Walk along the transect XY and classify the land use in the study area. Use the colour scheme below to show the land use distribution on the base map (p.12).

Land use*	Code	Colour
Commercial	Com	
Residential	Res	
Industrial	I	
Government/Community/Institution (G/C/I) (e.g. hospital, school, library, etc.)	G/C/I	
Recreational	Rec	
Vacant	V	
Mixed commercial and residential	Mix	
Transportation	T	

To identify a building belonging to which land use, should you observe the ground floor or the building as a whole?

C. Drainage capacity

Measure the width of the river in the following sites with 2 different equipment and measure the water depth with lead line.

Site		P	Q	R	B
Channel width (m)	Method 1: using laser distance meter				
	Method 2: using measuring Tape				
Water depth (cm)	i. Actual depth				
	ii. Bankfull stage				

What should we aware in measuring?

D. Effectiveness of river revitalization

➢ **D1 Scoring**

According to the following table, evaluate the effectiveness of the river revitalization.

How to decide the scoring criteria ?

Score	0	1	2	3
Clearness of the river water	Very turbid	A bit turbid	Clear	Very Clear
Bad Smell	Strong	Moderate	Slight	None
Number of fishes in water	0	1-3	4-10	11 or more
Number of birds*	0	1	2-3	4 or more
Vegetation along the river	None	Few planters	Many planters	Both trees and planters
Number of people using the sitting out area along the river	0	1-2	3-5	6 or more

*Only count the birds living in the riversides and hunt for food in the river.

Site	P	Q	R	B	Total score of each item	Effectiveness of revitalization
Clearness of the river water					points	
Bad Smell					points	
Number of fish in water					points	
Number of birds					points	
Vegetation along the river					points	
Number of people using the sitting out area along the river					points	
Total score of each site	points	points	points	points		
Effectiveness of revitalization						

Total score of each site	Effectiveness of revitalization
14 or above	Very High
9-13	Moderate
4-8	Low
3 or below	Ineffective

Total score of each item	Effectiveness of revitalization
10 or above	Very High
7-9	Moderate
4-6	Low
3 or below	Ineffective

D2 Questionnaire Survey

Interview_____residents near the river about their comments on river revitalization.

Do you live near Kai Tak River？

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

Did you live near Kai Tak River in 2016 or before?

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

The following is to understand the residents' perception of the river revitalization (after 2019).
1 is strongly disagree and 5 is strongly agree

		Strongly Disagree				**Strongly Agree**
1	Bad smell of river has been lessened	1	2	3	4	5
2	After revitalization (2019), the surrounding environment was beautified	1	2	3	4	5
3	After revitalization (2019), the drainage improved obviously	1	2	3	4	5
4	After revitalization (2019), the number of living organisms increased obviously (more fish, birds and etc. can be seen)	1	2	3	4	5
5	After revitalization work (2019), you have always used the facilities on it (i.e. sitting out, recreation facilities and etc.)	1	2	3	4	5

6. What should other aspects be improved in Kai Tak River?

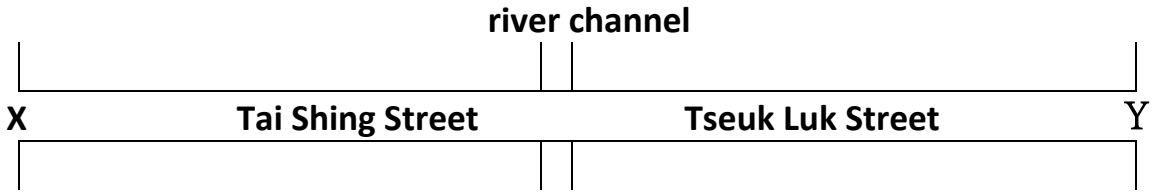
_____

Background information of the interviewee
Sex: ☐ Male ☐ Female

Age Group: ☐ 11-20 ☐ 21-40 ☐ 41-60 ☐ 61 or above

STAGE 3: DATA PROCESSING, PRESENTATION AND ANALYSIS

B. Draw the land use distribution of transact XY



C. Drainage capacity

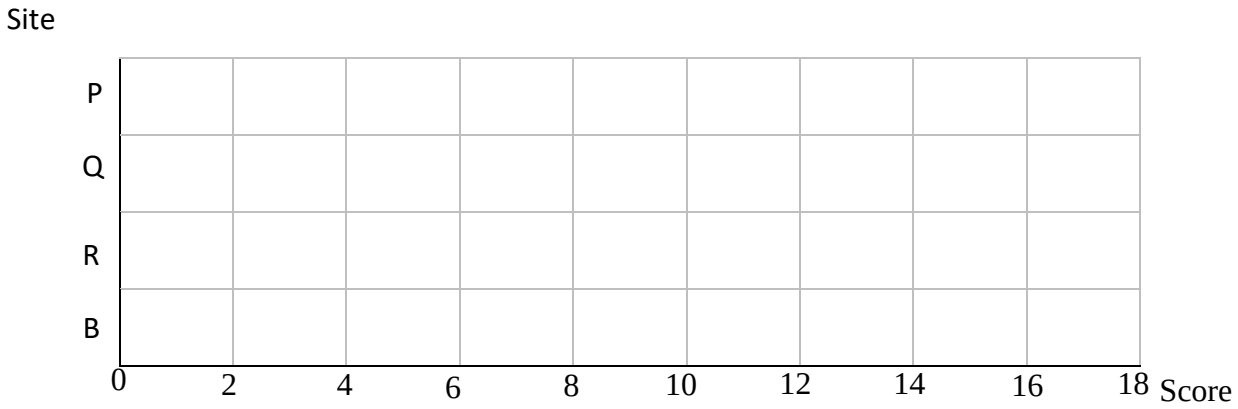
Which graph is suitable to present the change of channel width of Kai Tak River?

☐ Bar graph ☐ Pie chart ☐ Line graph

D1. The effectiveness of the revitalization along Kai Tak River

1. Which graph is suitable to present the differences of the effectiveness of revitalization in the four sites (P, Q, R and B)?

☐ Bar graph ☐ Pie chart ☐ Line graph (Please draw in the following diagram)



2. Calculate the total Score of all 4 sites (P, Q, R and B): _____, and circle the effectiveness in the table below.

Total Score	Effectiveness of the whole river session
54 or above	Very High
34-53	Moderate
14-33	Low
13 or below	Ineffective

D2 Result of Questionnaire Survey

1. Which graph is suitable to present the percentage of different score of each question?
   ☐ Bar graph ☐ Pie chart ☐ Line graph

2. Calculate the mean score of each question of different respondents to reflect whether the respondents agree with the effectiveness of the river revitalization.

Question	Mean Score	Degree of recognition
1) Bad smell had been lessened		
2) The surrounding environment improved		
3) The drainage improved obviously		
4) the number of living organisms increased obviously		
5) Citizens always use the facilities nearby		

Mean Score	Degree of recognition
1.0-1.8	Strongly Disagree
1.9-2.6	Disagree
2.7-3.4	Neither Agree or disagree
3.5-4.2	Agree
4.3-5.0	Strongly Agree

STAGE 4: INTERPRETATION AND CONCLUSION

DISCUSSION QUESTIONS

1. According to the locations of box culvert, why were box culverts built there?

2. With reference to the data collected, to what degree of effectiveness did the river revitalization enhance the habitat of Kai Tak River? Give explanation.

3. With reference to land use distribution of transect XY, explain whether there are land use zoning near Kai Tak River to lower the negative impacts brought by flooding?

4. Do you agree, “The river revitalization brings a better environment for surrounding residents”? Explain your answer with the data collected today.

STAGE 5: EVALUATION

1. We use two equipment to measure the river width. Analyze the advantages and limitations of these two equipment. Explain which one is preferable.

	Laser distance meter	Measuring Tape
Advantages		
Limitations		

2. Is Kai Tak River suitable for conducting river fieldwork about fluvial processes and fluvial landforms? Explain your answer.

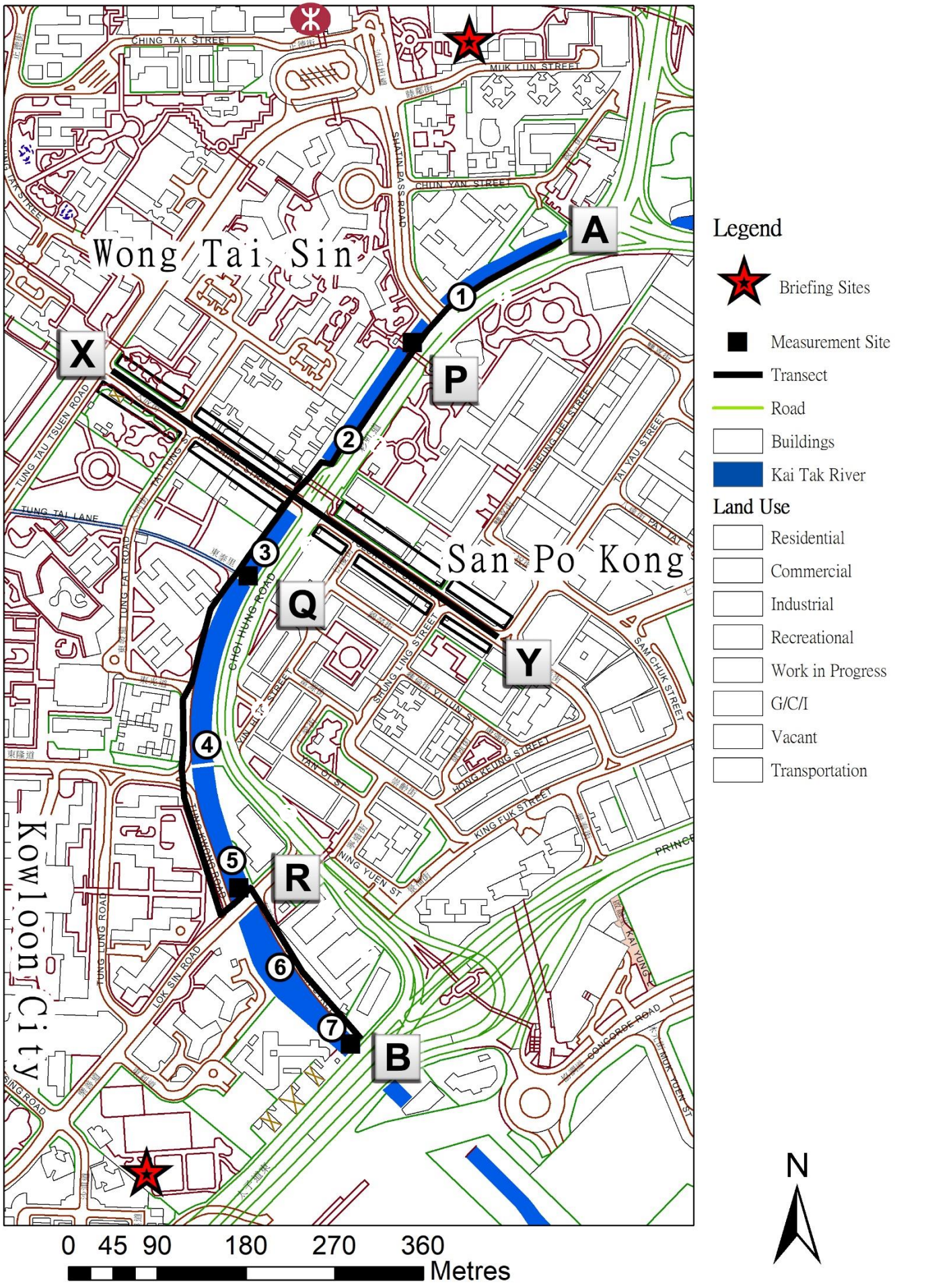
3. Dose the data collected respond the enquiry question?
   i. Analyze the drawbacks of the data collection process and how such drawbacks affect the validity and reliability of data.
   ii. Propose ways to tackle the influences brought by the above drawbacks.

Factors affecting the data reliability and validity		Suggestion for improvement
Fieldwork date/ time ◆ Fieldwork date and time representative? ◆ Any impact by today's weather condition?		
Field site/ study area ◆ Field sites match with research topic? ◆ Field study area adequate?		
Location of data collection (Sampling) ◆ Sampling method in choosing field site appropriate? ◆ Location of measurement representative? ◆ Sample size sufficient?		
Data collection items/ methods ◆ Data collection items adequate to respond the enquiry questions? ◆ Are the data obtained from the data collection method(s) objective and without bias? ◆ Any inadequacy about the equipment/ instruments? ◆ Measurer using the equipment/ instruments correctly?		

4. Today, the data collected is focusing on "river management strategies". We need to have further study for a better understanding about the function of urban channel. Choose one topic about Kai Tak River and elaborate your study plan (e.g. field site / date / time / data collected / field methods / sampling methods).

HOMEWORK

After the fieldwork, please organize this fieldwork experience in field trip diary on p.13-14, as a reference for the revision of field-based question.


Wong Tai Sin
San Po Kong
Kowloon City
A
B
P
Q
R
X
Y
1
2
3
4
5
6
7
CHING TAK STREET
MUK LUN STREET
CHUN YAN STREET
SHATIN PASS ROAD
TUNG TAU TSUEN ROAD
TUNG TAU LANE
LUNG FAT ROAD
CHOI HUNG ROAD
SHUNG LING STREET
HONG KEUNG STREET
KING FUK STREET
SAM CHUK STREET
TAI YAU STREET
SHEUNG HEI STREET
TONG LUNG ROAD
LOK SIN ROAD
CONCORDE ROAD
0 45 90 180 270 360
Metres
Legend
Briefing Sites
Measurement Site
Transect
Road
Buildings
Kai Tak River
Land Use
Residential
Commercial
Industrial
Recreational
Work in Progress
G/C/I
Vacant
Transportation
N

My Field Trip Diary

- Related modules: Managing Rivers and Coastal Environments: A continuing challenge
- Key point of fieldwork/topic: River management strategies

▪ 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)

- Secondary data:

Data collected	Use	Data 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	

Primary data collection methods

Data collection methods	Explanations		Examples
A) Observation	● Using sensory observation to explore the details of research subject (people, things or environment) in a purposive and planned way. Data are recorded using text, photos, sketch, map, etc. (Refer to other data collection methods listed below)		● Identification of surrounding environmental of a field site
B) Measurement	● To estimate or measure the physical quantity of the research subject. It usually requires the use of equipment or tools. Data are usually shown in certain standard, weights or measures.		● Measurement of the width of street and the building height
C) Counting	● To record the number of occurrence of a single item.		● Statistics of pedestrian flow at the pier
D) Category	● To classify based on the nature, characteristics and uses: ◆ to group the same or similar things; ◆ to separate different things.		● Types of goods sold in supermarket ● Customers (serving local residents and tourists) of different shops
E) Distribution (mapping)	● To group similar things according to the research topic (similar to "**D. Category"**); ● Only suitable for spatial representation (different from category); ● Useful in showing the mode of occurrence of research subject in a complex environment.		● Distribution of shops selling big fish balls in Cheung Chau
F) Scoring	● To quantify abstract or subjective concepts; ● To merge various data for easy comparison; ● Scoring items should include different aspects.		● Risk index of natural hazards of Cheung Chau ● Air Quality Health Index (AQHI)
G) Field sketching	● To make simplified drawing of the field site to show what the data collectors observed. Annotations related to the research subject are added to provide key feature or additional information.		● Draw the characteristics and formation of weathering landforms
H) Questionnaire	● Forms: face-to-face, telephone, written, etc.; ● Using questionnaire to understand the opinion of research subject; ● Larger sample size than "**I. in-depth interview"**; ● Mainly closed questions (with options available).	● To collect information by questioning; ● To obtain information which is difficult to be obtained through observations; ● To understand the rationales and opinions of interviewees.	● The main reasons for tourists to visit Cheung Chau ● The level of satisfaction among residents regarding the revitalization project
I) In-depth Interview	● To obtain information through face-to-face/ telephone interview; ● Smaller sample size than "**H. Questionnaire"**; ● Mainly open questions and forthcoming questions will change upon the answer of respondents.		● Opinions of District Council members on the future development of that district

Sampling Methods

	Probabilistic sampling methods ➢ *Need to know the size of population;* ➢ *Few differences among individuals;* ➢ *Individual has equal chance of being selected;* ➢ *Representativeness of data depends on sampling percentage.*			**Non-probabilistic sampling methods** ➢ *Size of population might not be relevant to the research objective;* ➢ *Chance of individual being selected is unknown;* ➢ *Representativeness of the results depends on the judgment of researcher in sample selection (Such as the correlation between samples and research targets).*		
Methods	**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	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	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 interview a certain number of passersby on the street	To conduct an in-depth interview with a district councilor about the social problems of that district.
Remarks	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)