JC-WISE
Water Initiative on Sustainability and Engagement
賽馬會惜水・識河計劃

My River, My Community 河處是吾家

Guided Field Trip to

Shing Mun River (城門河) Catchment

Students' Workbook

Faculty of Social Sciences
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捐助機構 Funded by:

香港賽馬會慈善信託基金
The Hong Kong Jockey Club Charities Trust

Field Study of Shing Mun River Students' Workbook

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1 About Shing Mun River

Shing Mun River flows through the central New Territories, southeast of Tai Mo Shan (大帽山). Its main stem originates from the south of Tai Mo Shan's summit, at an altitude of 930m – the highest headwater for a river in Hong Kong.

The highest section of the main stem, Tai Shing Stream (大城石澗), initially flows northeast from the headwater. The stream then turns southeast and flows down into Upper Shing Mun Reservoir (上城門水塘), situated in a valley towards the southwest. From there, the river flows southeast through Shing Mun Gorge (城門峽), where Upper Shing Mun Reservoir's Gorge Dam is located, and enters Lower Shing Mun Reservoir (下城門水塘), formerly a river valley. After passing the main dam of Lower Shing Mun Reservoir, it zigzags northeast through Tai Wai and becomes Shing Mun River Channel, before converging with Kwun Yam Shan Stream (觀音山溪), Siu Lek Yuen Nullah (小瀝源明渠), and Fo Tan Nullah (火炭明渠), and finally entering Sha Tin Hoi, or Tide Cove (沙田海), at Sha Tin Sewage Treatment Works. The former estuary of the Shing Mun River is situated near the Hong Kong Heritage Museum. The river channel located from the museum to Sha Tin Sewage Treatment Works was artificially reclaimed from a shallow sea.

The horizontal length of Shing Mun River's main stem is 16.5km with an average gradient of 0.056 (or 1:17.7). The catchment area is about 58km^2.

"Rivers@HK Database"

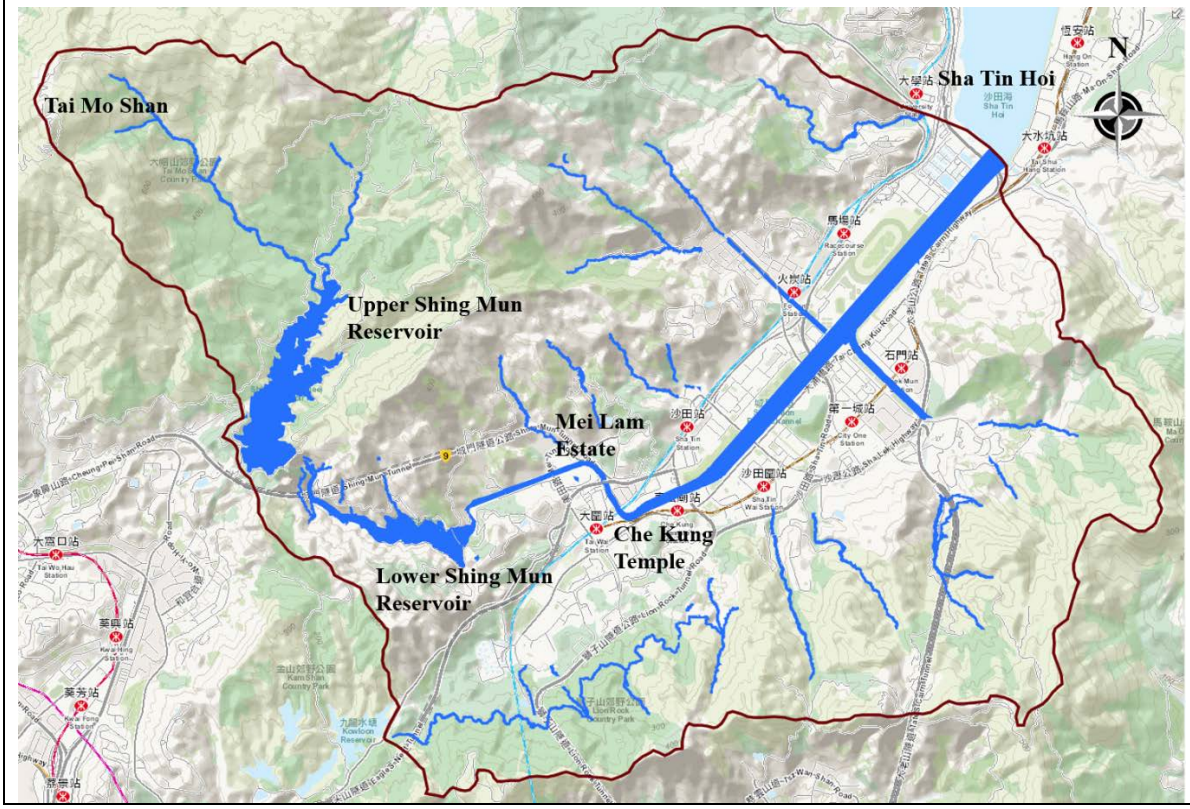
[Shing Mun River > Shing Mun River Location and Catchment > About Shing Mun River]
https://bit.ly/3gtJPcX

🕮 Students' Workbook - Exercise

Answer the following questions:

1. Refer to the Map 1.1, describe the direction of flow of Shing Mun River.

Map 1.1: Shing Mun River



2. What is the drainage pattern of Shing Mun River?

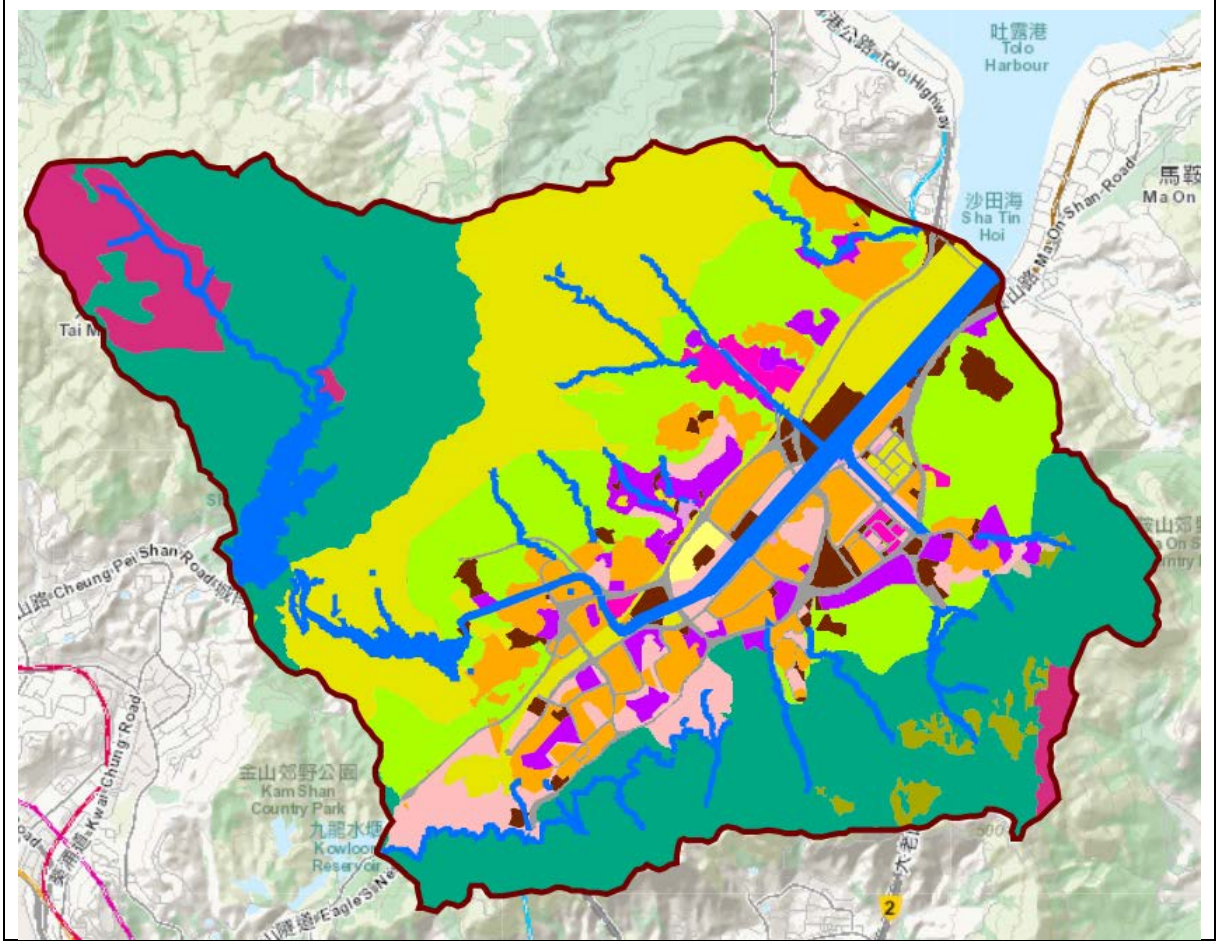
3. Refer to the map below (Map 1.2), identify the type of river mouth of Shing Mun River.

A. Estuary B. Delta

Map 1.2: River mouth of Shing Mun River

2 Land Use of Shing Mun River Catchment

Map 2.1: Land Use Map of Shing Mun River Catchment

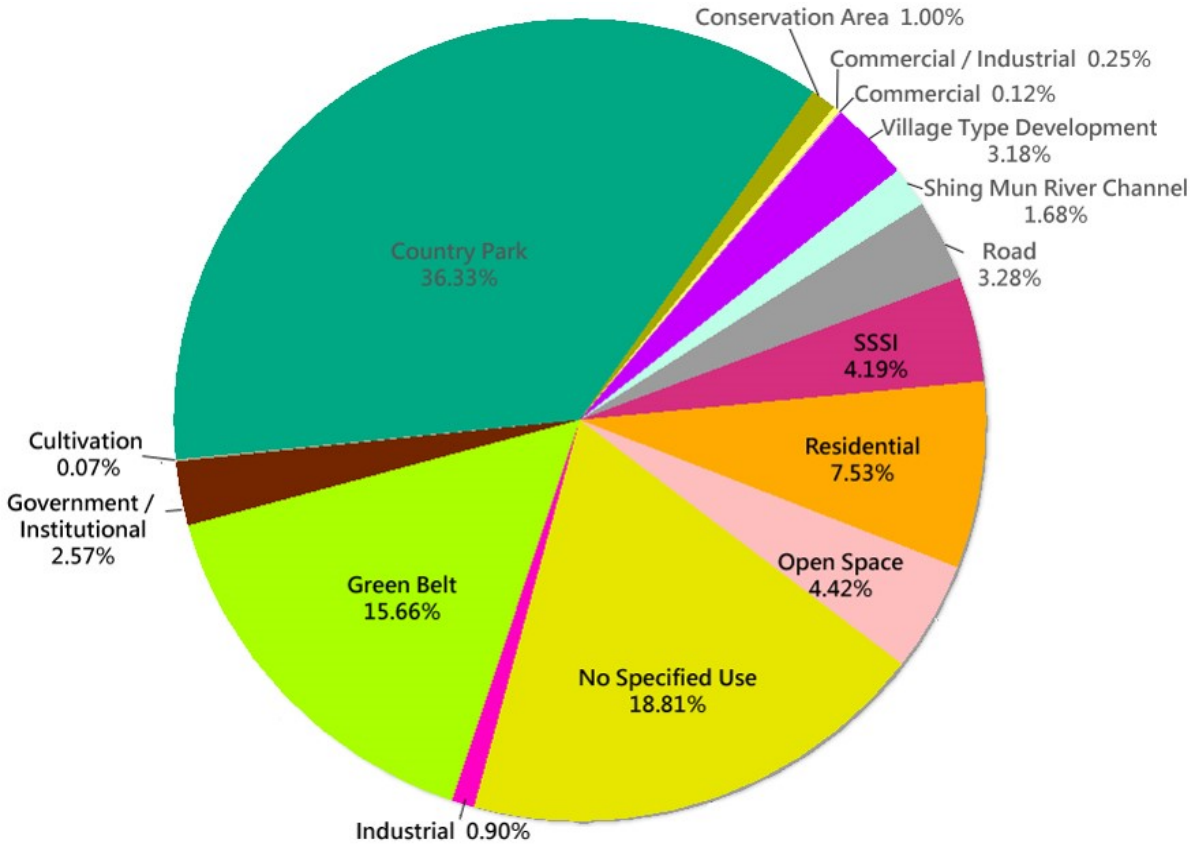


- Most of the land around the upper course of Shing Mun River is reserved for conservation purposes. This comprises over half of the entire catchment area. The upper part of Shing Mun Valley, near Upper Shing Mun Reservoir, and the northern slopes of Lion Rock and Tate's Cairn are designated as **Country Parks** (36.33%), with **Green Belts** (15.66%) on the hillsides adjacent to Tai Wai, Sha Tin, Fo Tan, and Siu Lek Yuen. Meanwhile, part of the southwestern slopes of Tai Mo Shan and Shing Mun Fung Shui Wood are **Sites of Special Scientific Interest** (4.19%).
- Areas classified as **Village Type Development** are scattered among the villages of Sha Tin, Fo Tan, and Siu Lek Yuen, making up around 3% of the total catchment area.
- With the development of Sha Tin New Town, the lower course of Shing Mun River is now dominated by land uses associated with impermeable surfaces, such as **Residential** (7.53%), **Roads** (3.28%), and **Government/ Institutional** (2.57%).

- Around 4% of land in Shing Mun River Catchment is designated as **Open Space**, including urban parks in Sha Tin New Town and open spaces near country parks.

	"Rivers@HK Database" **[Shing Mun River > Landscape > Land Use Map]** **https://bit.ly/3iHwVte**

Figure 2.1: Area Percentage by Land Use Type

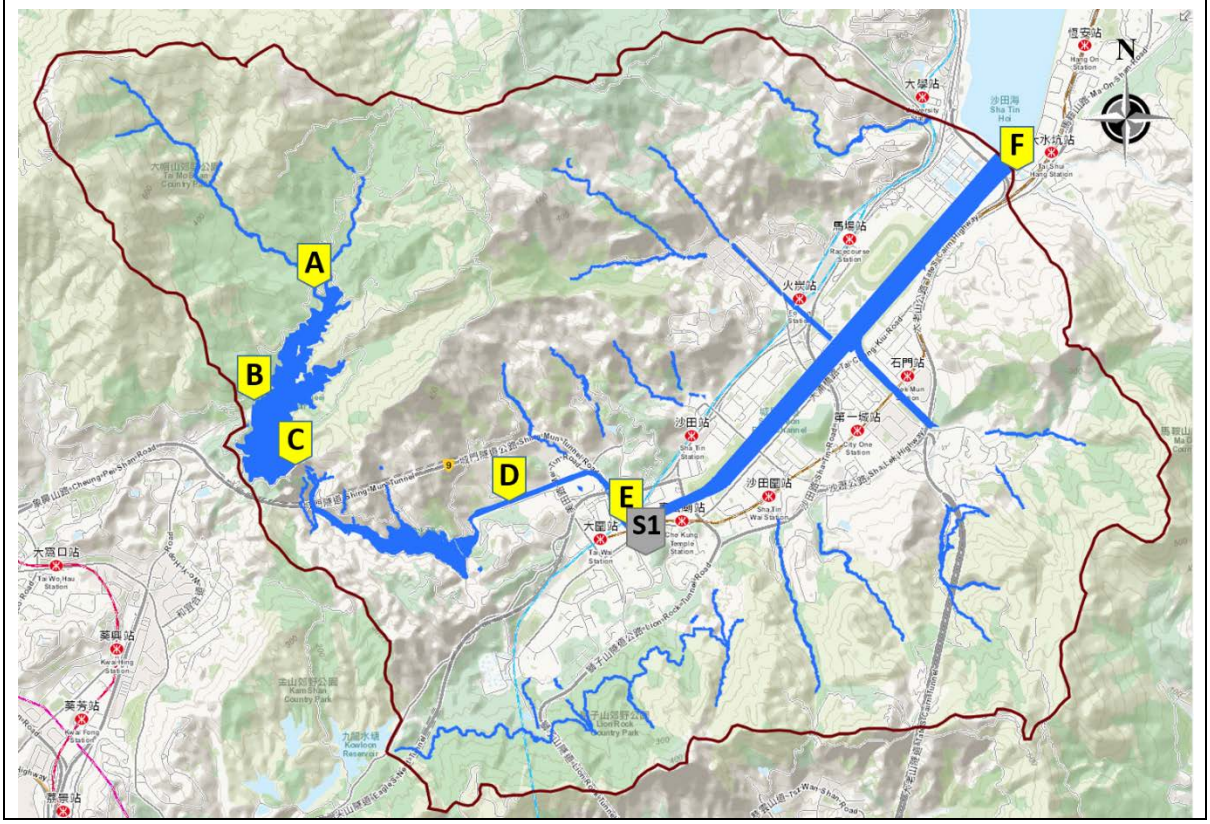


Further readings on Shing Mun River

Cheng, L.K., Lui, H., Chong, A., Chung, P. (2011). *Rivers Reviving – Shing Mun River.* Hong Kong: Green Power.

3 Shing Mun River and Fieldwork Sites

Map 3.1: Shing Mun River Catchment and Fieldwork Sites



- **A** • **Tai Shing Stream（大城石澗）**
- **B** • **Shing Mun Catchwater（城門引水道）**
- **C** • **Gorge Dam, Upper Shing Mun Reservoir（上城門水塘主壩）**
- **D** • **Heung Fan Liu（香粉寮）**
- **E** • **Man Lai Court（文禮閣）**
- **S1** • **Che Kung Temple（車公廟）**
- **F** • **Estuary（河口）**

3.1 Fieldwork Site A: Tai Sheng Stream

Tai Shing Stream, which flows from Tai Mo Shan to Upper Shing Mun Reservoir, forms part of the upper course of Shing Mun River. Large boulders scattered along the stream are a typical feature.

As the stream is located in the water gathering ground and a country park, it remains largely pristine with abundant flow, providing habitats for a wide variety of freshwater creatures, such as the Hong Kong Newt (*Paramesotriton hongkongensis*). Various rare plants, including Grantham's Camellia (*Camellia granthamiana*), can also found on both sides of the stream.

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[Site A: Tai Shing Stream]

https://bit.ly/3g3rkvu

Map 3.2: Field Study Site at Tai Shing Stream

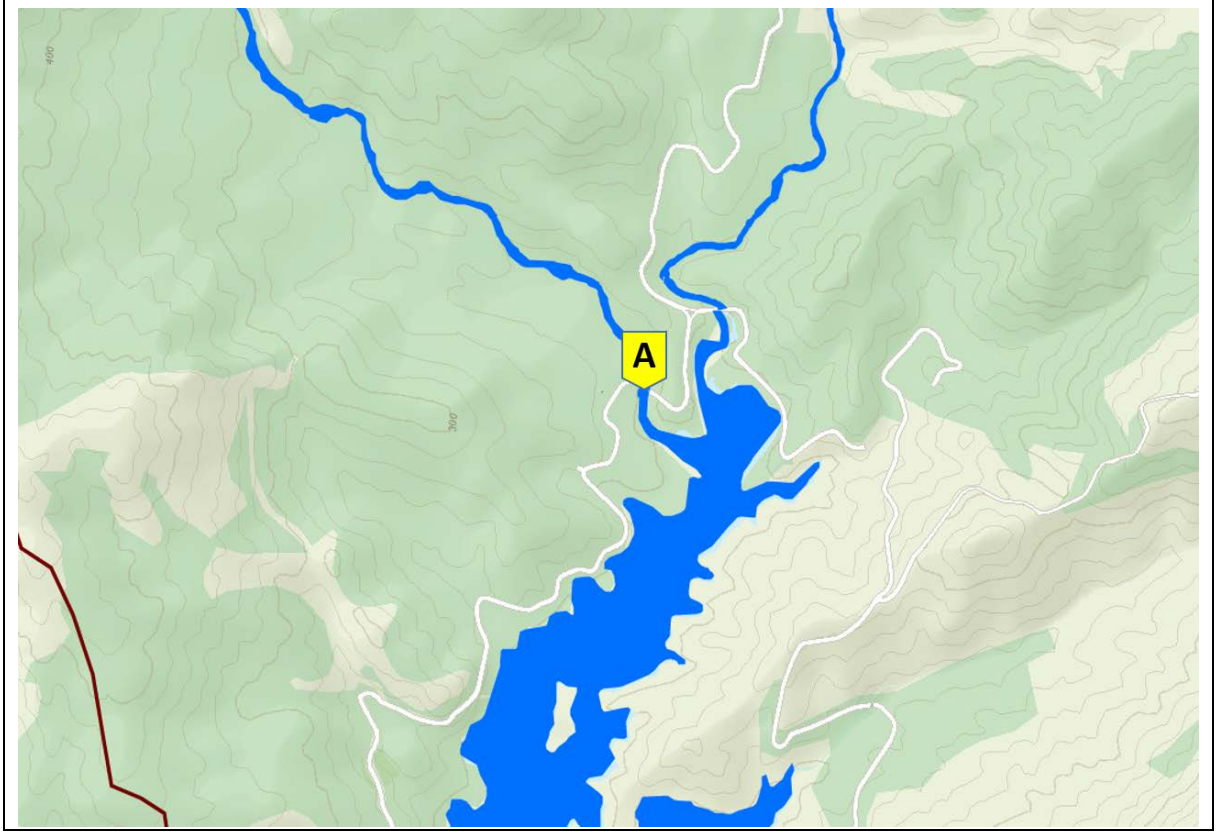

Figure 3.1: Tai Shing Stream

Figure 3.2: Hong Kong Newt (*Paramesotriton hongkongensis*)

3.2 Fieldwork Site B: Shing Mun Catchwater

To increase the water supply provided by the Upper Shing Mun Reservoir, the 9km Shing Mun Catchwater was constructed along the southwestern slopes of Tai Mo Shan, diverting all water from streams outside the Shing Mun River Catchment to the reservoir. These include Tai Tso Stream (大曹石澗), Tai Yuen Stream (大圓石澗), Sheung Fa Hang (上花坑), and Ha Fa Hang (下花坑).

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[Site B: Shing Mun Catchwater]

https://bit.ly/3g3rkvu

Map 3.3: Field Study Site at Shing Mun Catchwater

Figure 3.3: Shing Mun Catchwater next to the Pineapple Dam Nature Trail

Figure 3.4: Water collected by Shing Mun Catchwater enters the Upper Shing Mun Reservoir

3.3 Fieldwork Site C: Gorge Dam, Upper Shing Mun Reservoir

Upper Shing Mun Reservoir

The reservoir was built between 1923 and 1937 to help meet the city's growing demand for drinking water due to population growth in the 1920s and 1930s. Situated in the upper part of Shing Mun Valley, it was once the largest reservoir in Hong Kong, with a capacity of 13 million cubic metres. It was also the first reservoir to transfer stored water from Kowloon to Hong Kong Island. As the reservoir collects water from the upper reaches of Shing Mun River, it has led to a substantial reduction in water discharged into the lower course.

Lower Shing Mun Reservoir

This reservoir is located beneath Gorge Dam in Shing Mun Gorge, a deep, narrow valley that lies between Upper Shing Mun Reservoir and Sha Tin. It was constructed between 1961 and 1964 as part of the Plover Cove Water Scheme, being used to store the overflow from Upper Shing Mun Reservoir.

Through the Inter-reservoirs Transfer Scheme, targeted for completion in 2022, any overflow from the Kowloon Group of Reservoirs will also be transferred to Lower Shing Mun Reservoir via an underground tunnel, strengthening flood resilience in West Kowloon and maximising the yield of the reservoirs.

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[Site C: Gorge Dam, Upper Shing Mun Reservoir]
https://bit.ly/3g3rkvu

Map 3.4: Field Study Site at Gorge Dam, Upper Shing Mun Reservoir

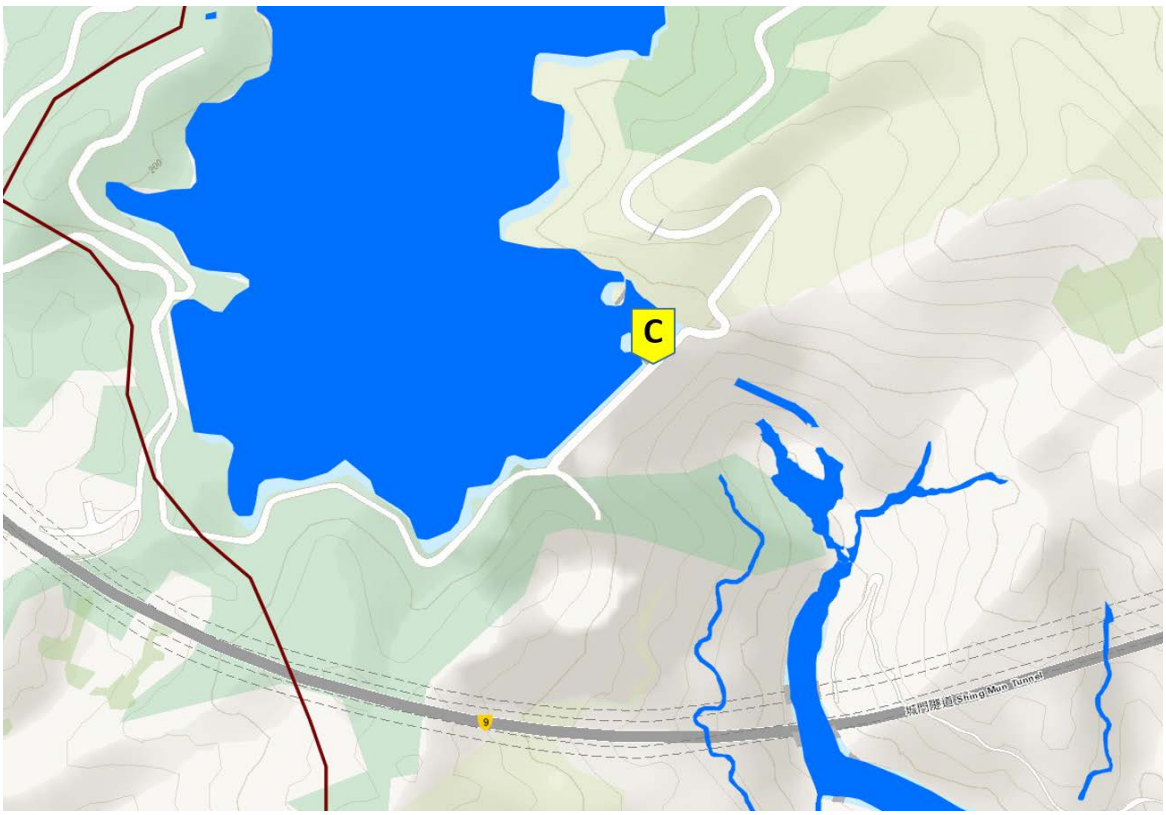

Figure 3.5: Gorge Dam, Upper Shing Mun Reservoir

Figure 3.6: Bellmouth Overflow, Valve Tower and Steel Bridge (from left to right)

Figure 3.7: Shing Mun Gorge

3.4 Fieldwork Site D: Heung Fan Liu

Naming of Heung Fan Liu

Heung Fan means incense in Chinese. Historical records suggest that Heung Fan Liu, located along the lower course of Shing Mun River, was once a production hub for incense products. Up to the early 20th century, a number of village mills, powered by the flowing river water, produced powder from harvested incense trees, highlighting the significant role of rivers in supporting traditional industries.

Revitalisation of Tai Wai Nullah

The section of the river next to Heung Fan Liu underwent massive training works in the 1970s to reduce the risk of flooding, transforming the original river into a wide, straight, concrete-lined channel known as Tai Wai Nullah.

In 2019, the Drainage Services Department proposed revitalising Tai Wai Nullah into a green open space, to enhance the ecological value of the river channel and improve connectivity between rivers and human communities. The feasibility of allowing public access for water-friendly activities is also being explored.

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[Site D: Heung Fan Liu]
https://bit.ly/3g3rkvu

Map 3.5: Field Study Site at Heung Fan Liu

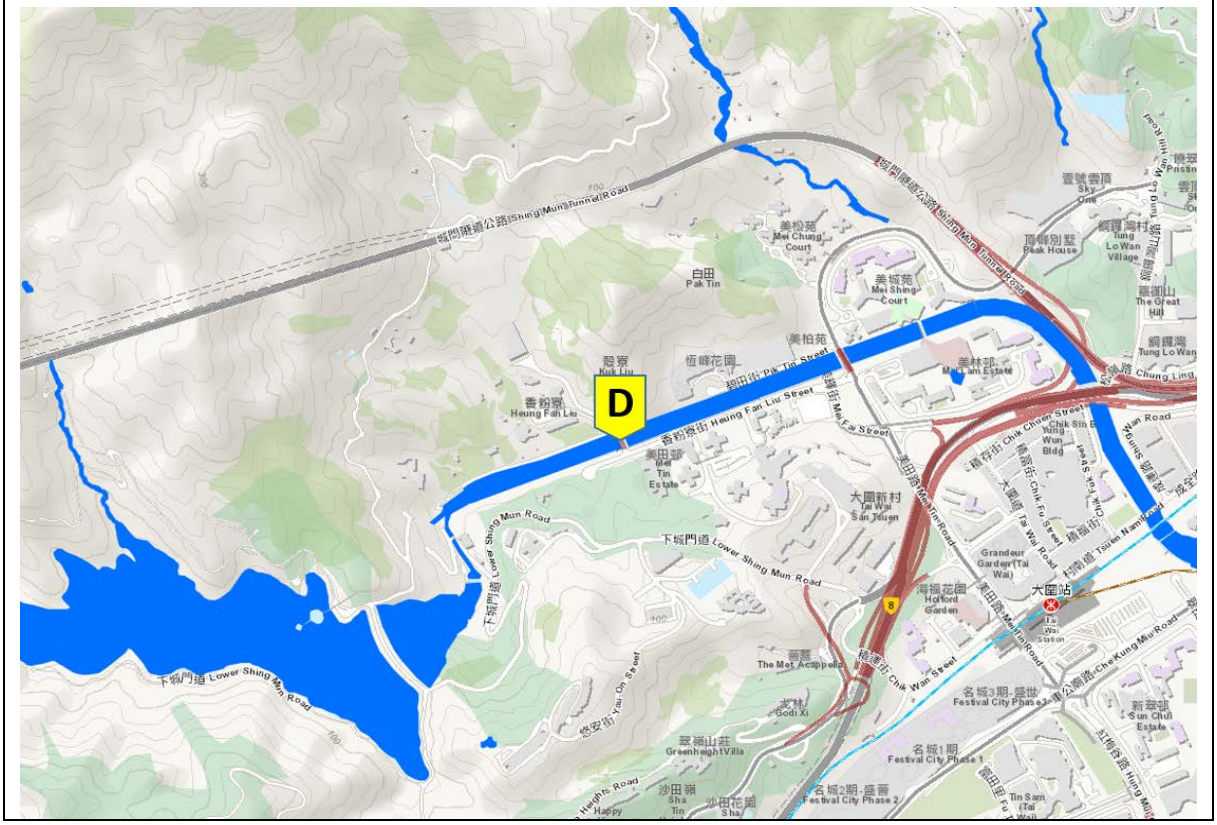

Figure 3.8: Proposed site of green open space after revitalisation at Tai Wai Nullah

Figure 3.9: The intersection between channels managed by the Water Supplies Department and the Drainage Services Department

3.5 Fieldwork Site E: Man Lai Court

Man Lai Court is situated where Tai Wai Nullah ends and the Shing Mun River Channel begins, close to the Shing Mun River's former estuary. Before the 1970s, the area beyond the estuary was still a shallow sea. With the development of Sha Tin New Town, large-scale reclamation greatly affected both the estuary and shallow sea, leading to the construction of an artificial channel that flows through Tai Wai, Sha Tin, and Fo Tan.

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[Site E: Man Lai Court]

https://bit.ly/3g3rkvu

Map 3.6: Field Study Site at Man Lai Court

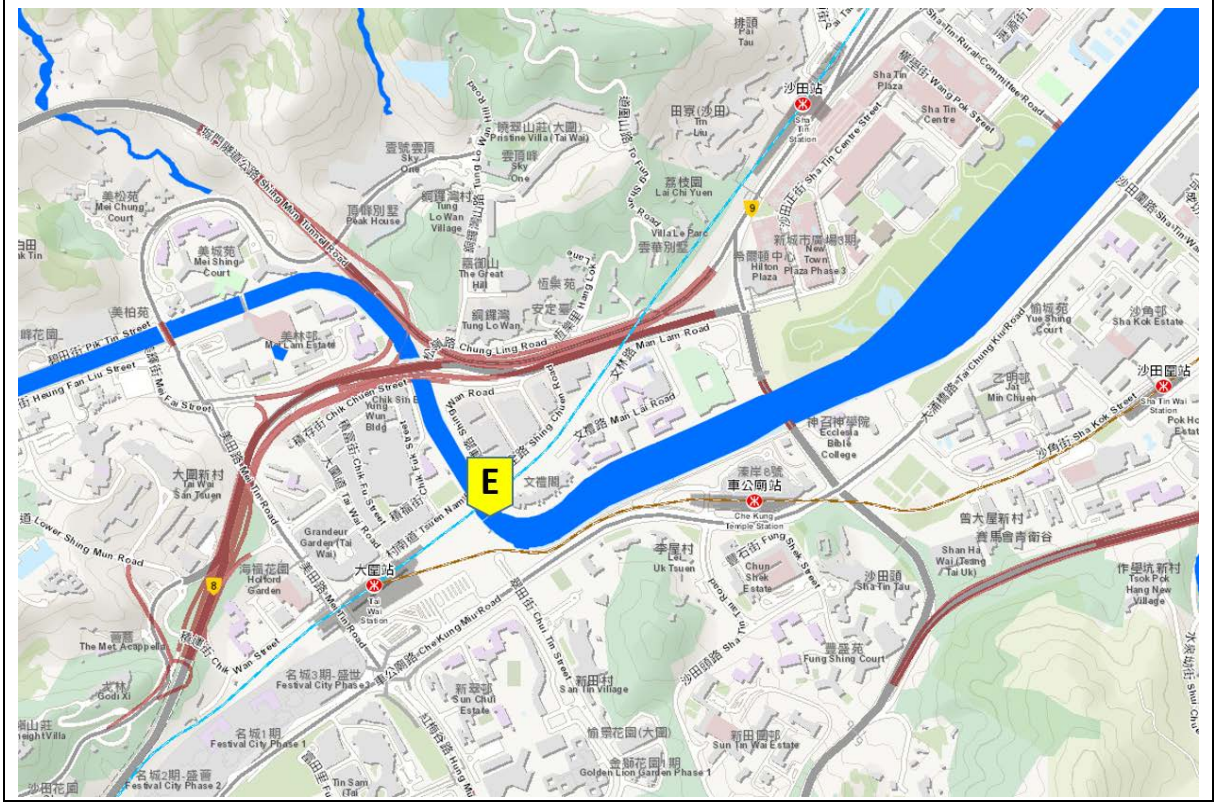

Figure 3.10: Shing Mun River section at Man Lai Court (upstream)

Figure 3.11: Shing Mun River section at Man Lai Court (downstream)

3.6 Fieldwork Site S1: Che Kung Temple

Che Kung Temple, a Grade II historic building, is one of four major temples in Hong Kong. Its origin can be traced back to the late Ming Dynasty, though the exact year is unknown. Displays in the temple relate how Che Kung was granted the title of General for supressing rebellion in southern China. In the late Southern Song Dynasty, General Che died from illness while escorting Emperor Zhao Bing to Hong Kong. One story related to the founding of the temple suggests that when Tin Sam Village was first established, a fung shui master advised the villagers to construct a temple at the confluence of three rivers to retain wealth and bring good fortune. Hence, Che Kung Temple was built, honouring Che Kung.

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[Site D: Che Kung Temple]

https://bit.ly/3v5qVNA

Map 3.7: Field Study Site at Che Kung Temple

Figure 3.12: Che Kung Temple

Figure 3.13: Statue of Che Kung

3.7 Fieldwork Site F: Estuary

Sha Tin Sewage Treatment Works

Sha Tin Sewage Treatment Works occupies a position next to the estuary where Shing Mun River Channel enters Sha Tin Hoi or Tide Cove (沙田海). Commissioned in 1982, it is the largest secondary sewage treatment works in Hong Kong with a daily treatment capacity reaching 340,000 cubic metres. Through the Tolo Harbour Effluent Export Scheme, fully commissioned in 1998, treated effluent from the treatment works is transferred to Kai Tak River to be discharged into Victoria Harbour, to help improve water quality in Tolo Harbour.

In light of rising demand for land resources, Sha Tin Sewage Treatment Works is due to be relocated to caverns near A Kung Kok (亞公角) in future years. Relocation work commenced in 2019 and is anticipated to be completed in 2030.

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[Site F: Estuary]
https://bit.ly/3g3rkvu

Map 3.8: Field Study Site at Estuary

Figure 3.14: Estuary of Shing Mun River

Figure 3.15: Sha Tin Sewage Treatment Works

4 Enquiry-based Field Study for Junior Secondary Students (📖 Students' Worksheet)

Enquiry question

In what ways does Shing Mun River Channel benefit the Hong Kong community? (Use data collected through interviews and observation to answer this question)

What data to collect

- Type and number of recreational facilities along the channel
- Evidence of non-recreational functions of the channel
- Age of interviewees
- Purpose of interviewees visiting the river
- Frequency of visits to the river by interviewees
- Interviewees' suggestions to improve the present function of the river channel

Where to collect data

The banks of the channel between Man Lai Court (Site E) and Estuary (Site F).

How to collect data

- Work in groups of two to four students.
- Walk along the two banks of the channel from Man Lai Court to the Estuary, or the other way round.
- Each group needs to collect data by: i) observation; and ii) interviewing any 20 people met on the way and chosen at random.

Part I: <u>By observation</u>

1. Identify all recreational facilities found along the channel and its embankments.
2. Complete Table 1.

Table 1

Facilities	Uses

3. Look for evidence along the channel and its embankments that suggests non-recreational functions of Shing Mun River. Take a photo of each piece of evidence.
4. Complete Table 2.

Table 2

Evidence	Commercial	Lowering urban temperature	Water drainage	Flood control	Others (specify)

Part II: <u>By interview (with questionnaire)</u>

1. Reproduce 20 copies of the questionnaire below.
2. Try to get equal numbers for each gender when choosing interviewees.
3. To carry out the interview, one student should ask the questions on the questionnaire below, while the other(s) fill(s) in the answers in the appropriate boxes.

Questionnaire

A) To which age group do you belong?

☐ 20 or below ☐ 21 – 40 ☐ 41 – 60 ☐ above 60

B) What is/are your purpose(s) for visiting the river channel? Select one or more of the following:

Purpose			
	Biking		Enjoying river view
	Strolling		Enjoying fresh air
	Jogging		Taking photos
	Rowing		Bird watching
	No specific purpose (e.g. just passing by)		Others (specify:_____)

C) How many times have you visited Shing Mun River Channel in the past 12 months?

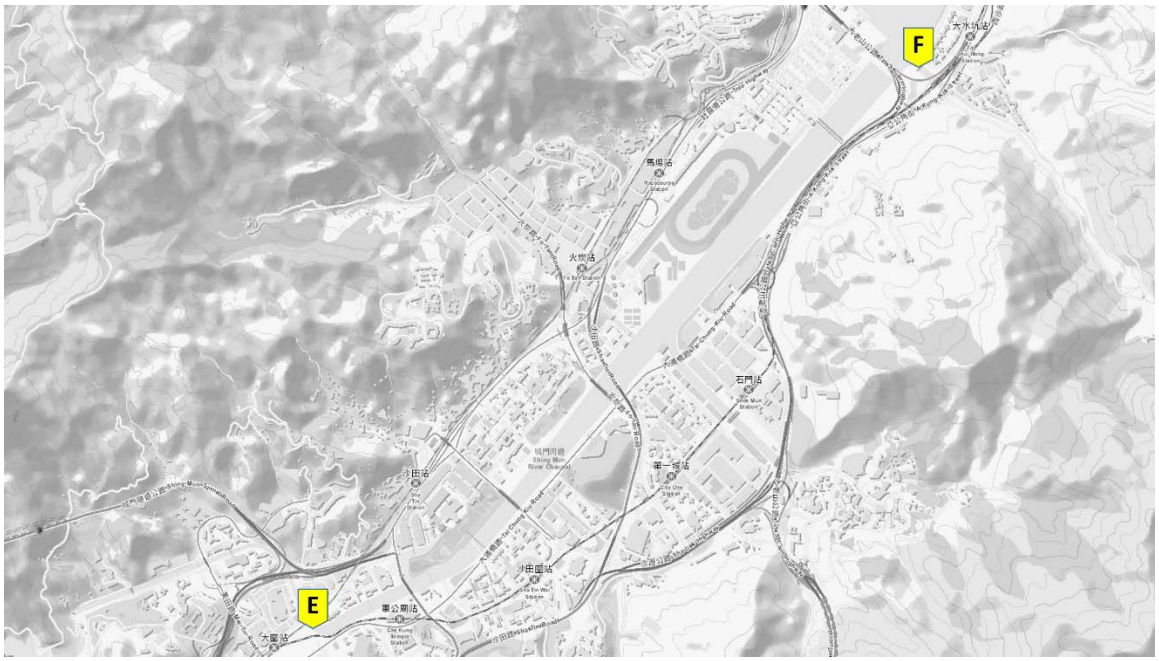
☐ 1 – 2 ☐ 3 – 6 ☐ 7 – 12 ☐ above 12

D) What changes would you suggest if the government were to improve the channel? Select one or more of the following:

	Suggested improvement
	Control the number of visitors on holidays
	Stricter control on pollution (specify: _____)
	Better maintenance of existing facilities (specify: _____)
	Expansion of existing facilities (specify: _____)
	Setting up new facilities, e.g. model boat pools (specify: _____)
	More ecological enhancement (specify: _____)
	Installation of new sites of interest. E.g. outdoor displays (specify: _____)

Data presentation

1. On the base map below, mark the distribution of recreational facilities, as listed in Table 1.



2. Based on the photos you took for evidence in Table 2, draw an annotated diagram to summarise the non-recreational functions of the river channel.
3. Work out the total number for each option of Questions B, C, and D from interviewees' responses to the questionnaire.
4. For each option, work out the number of times it was chosen for each age group to find the total frequency for the whole study.
5. Using grouped bar charts, show the following data for comparison:
   (a) the frequency of each purposes for visiting the river channel;
   (b) the frequency of interviewees' visits in a year; and
   (c) the frequency of each suggested improvement.

Each of these three data sets can be further broken down for different age groups, for a more detailed examination.

Questions for discussion

1. In what ways is Shing Mun River Channel a resource for people in Hong Kong? What benefits does it provide? Support your answers with evidence from your base map, annotated diagram, and grouped bar graphs.
2. Describe the patterns associated with the people using the channel as a resource. Which age groups are the most frequent users? How frequently do users visit the channel? What are the most popular activities along the channel?
3. What channel improvements do users suggest the government makes? Which are the most frequently suggested? Will they be sustainable?

5 Enquiry-based Field Study for Senior Secondary Students (📖 Students' Worksheet)

Enquiry Question

Dissolved oxygen is regarded as an important indicator of water quality. Evaluate the validity of the following statement:

"The level of dissolved oxygen in a channelised watercourse is generally lower than that in a natural stream."

What data to collect

Part I: Channel appearance and surrounding environment

- Channel width
- Shape of the riverbank
- River bed material
- Water depth
- Type of streamlines
- Channel gradient
- Surrounding environment

Part II: Water quality in the watercourse

- Air and water temperature
- Dissolved oxygen (DO)
- Chemical oxygen demand (COD)
- Conductivity
- Salinity

Optional items

- Ammonia (NH_3)
- Phosphate (PO_4)

Where to collect data

- **Fieldwork site A:** **Tai Shing Stream**
  Water flows into Upper Shing Mun Reservoir
- **Fieldwork site B:** **Shing Mun Catchwater**
  Water flows into Upper Shing Mun Reservoir
- **Fieldwork site D:** **Heung Fan Liu**
  Water comes from Lower Shing Mun Reservoir
- **Fieldwork site E:** **Man Lai Court**
  1.5km downstream from Heung Fan Liu
  Close to old river mouth of Shing Mun River

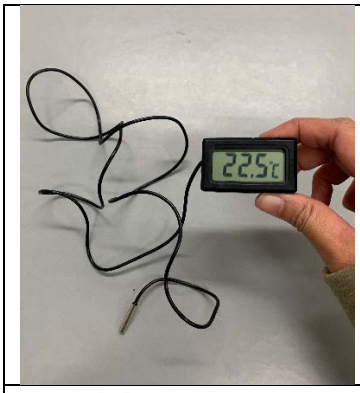
When to collect data

- Avoid collecting data on rainy days, and wait for three to four days after heavy rain
- Collect data during ebb tides

How to collect data

Preparations

- Work in groups of three or more students.
- Each group is responsible for data collection related to the appearance of the channel and surrounding environment in all fieldwork sites, and for completing *Data Record Sheet 1*.
- Each group should record water quality data for their assigned site simultaneously, then collaborate with other groups to complete *Data Record Sheet 2*.
- Each group should bring the following tools:

		
Digital thermometer	Dissolved oxygen (DO) meter	Chemical oxygen demand (COD) pack test

	
Conductivity meter	Digital salinity meter

**For optional items*

	
Ammonia (NH_3) rapid test kit	Phosphate (PO_4) rapid test kit

Part I: Data collection by observation

Conduct field observation at each fieldwork site. Compare the appearance of the channel and the surrounding environment, and complete *Data Record Sheet 1*.

Data Record Sheet 1: Channel Appearance and Surrounding Environment

Fieldwork date: _____

Fieldwork site	**A**	**B**	**D**	**E**
Channel width ▪ narrow ▪ moderate ▪ wide				
Shape of river bank ▪ smooth ▪ irregular ▪ straight ▪ meandering				
River bed material ▪ rocky ▪ sandy ▪ muddy ▪ concrete paving				
Water depth ▪ shallow ▪ moderate ▪ deep				
Type of stream flow ▪ laminar flow ▪ undulating flow ▪ turbulent flow				
Channel gradient ▪ gentle ▪ moderate ▪ steep				
Surrounding environment (please specify)				

Part II: Data collection by measurement

Collect water samples from the watercourse of the field sites.

Upstream of Upper Shing Mun Reservoir (Sites A and B)

1. Immerse the plastic bottle in water, with its mouth facing the opposite direction of the stream flow.
2. After filling up the bottle, screw on the lid tightly before taking it out of the water.
3. Invert the bottle to make sure that there are no air bubbles or leaks. If there are, repeat Steps 1 and 2.
4. For accuracy, it is recommended to test each water sample as soon as possible after collection.

Downstream of Upper Shing Mun Reservoir (Sites D and E)

1. Lower a bucket with a string into the watercourse to collect a water sample.
2. After retrieving the bucket, immerse the plastic bottle in the bucket.
3. Repeat Steps 2 to 4 as per the data collection method for Sites A and B.

A. Air and water temperature

Temperature can affect the oxygen level in water, i.e. the lower the temperature, the more oxygen can be dissolved in a watercourse. Variations in temperature can cause large fluctuations in dissolved oxygen content over the course of a day, impacting the ability of plants and animals to thrive.

Equipment/tools:	✓ Digital thermometer

Procedure:

1. Hold the sensor of a digital thermometer in the air to ensure that the reading is not affected by the ground temperature.
2. Take an air temperature reading when it becomes steady.
3. Put the digital thermometer sensor into the water sample (Figure 5.1).
4. Wait until the water temperature reading becomes steady, or for one minute, then record the data.
5. Write down the results on *Data Record Sheet 2*.

⬇ Figure 5.1: Measure water temperature with a digital thermometer

B. Dissolved oxygen (DO)

As bacteria uses oxygen to break down organic pollutants, natural streams with consistently high dissolved oxygen (DO) levels are most likely to offer healthy and stable environments, capable of supporting a diversity of aquatic organisms. Generally, the level of DO is subject to fluctuation due to the impact of human activities. A DO level that is too high or too low can harm aquatic life and affect water quality.

Equipment/tools:	✓ Dissolved oxygen meter (DO meter)

Procedure:

1. Turn on the DO meter.
2. Insert the DO meter probe into the water sample (Figure 5.2).
3. Wait until the reading becomes steady, or for one minute, then record the data.
4. Write down the results on *Data Record Sheet 2*.

A rapid tester provides an alternative way to test dissolved oxygen content (Figure 5.3).

⬇ Figure 5.2: Measure with a DO meter

⬇ Figure 5.3: Measure with a rapid tester

C. Chemical oxygen demand (COD)

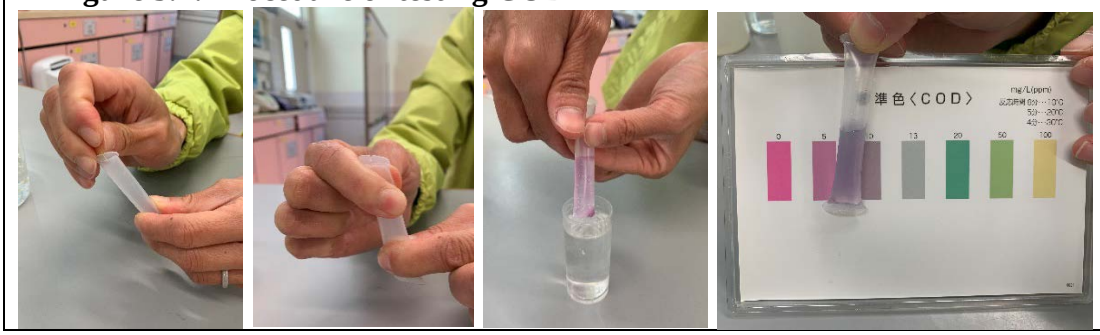
A higher chemical oxygen demand (COD) level means a greater amount of oxidisable organic material in the sample, reducing the level of dissolved oxygen (DO). When organic matter is present, the bacterial action increases due to a rise in temperature, and in turn results in a rapid decrease in DO.

Equipment/tools:	✓ COD pack test

Procedure (Figure 5.4):

1. Hold the COD pack test tube vertically, with the coloured line on the top.
2. Pull out the coloured line from the top of the tube.
3. Keep the aperture facing up and press the lower half of the tube firmly to expel the air inside.
4. Keep pressing the tube and immerse the aperture in the water sample, then release.
5. Wait until the water sample fills about half the tube.
6. Take it out of the water. Slowly sway the tube five to six times.
7. Wait for five minutes.
8. Match the solution with the colour chart to find the concentration of COD.
9. Write down the results on *Data Record Sheet 2*.

⬇ Figure 5.4: Procedure of testing COD



D. Conductivity

Conductivity indicates the ability of water to pass an electrical current. Dissolved salts and other inorganic chemicals can conduct an electrical current. Conductivity thus increases as salinity rises. Human disturbance tends to increase the amount of dissolved solids in water, resulting in increased conductivity. Conductivity is also affected by water temperature: the warmer the water, the higher the conductivity.

Equipment/tools:	✓ Conductivity meter

Procedure:

1. Turn on the conductivity meter.
2. Insert the probe into the water sample (Figure 5.5).
3. Write down the results on *Data Record Sheet 2*.

⬇ Figure 5.5: Measure with a conductivity meter

E. Salinity

Estuary water contains different levels of dissolved salt. Salinity varies depending on the amount of freshwater inflows as well as the tidal movement and location within the estuary. Generally, the higher the salt level, the lower the dissolved oxygen content.

Equipment/tools:	✓ Digital salinity meter

Procedure:

1. Turn on the digital salinity meter.
2. Insert the probe into the water sample (Figure 5.6).
3. Wait until the reading becomes steady, or for one minute, then record the data.
4. Write down the results on *Data Record Sheet 2*.

A refractometer provides an alternative way to test salinity (Figure 5.7).

⬇ Figure 5.6: Measure with a digital salinity meter

⬇ Figure 5.7: Refractometer

(Optional)

F. Ammonia (NH_3) and phosphate (PO_4)

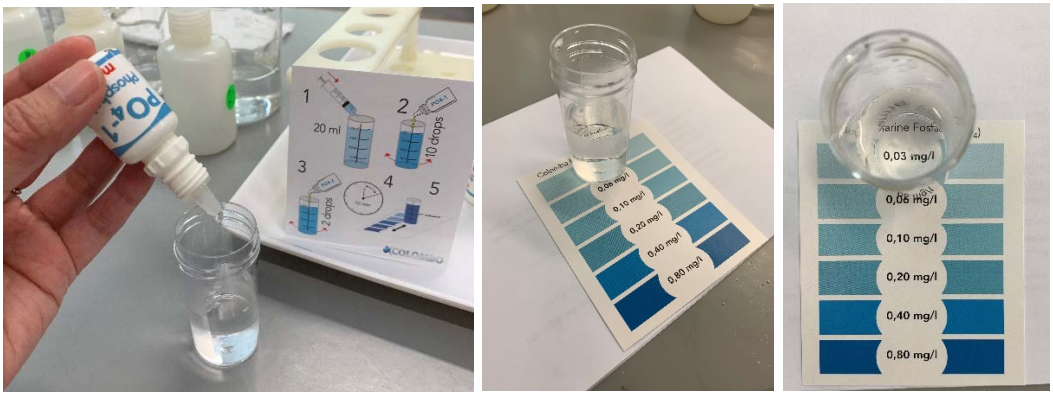
Sources of ammonia and phosphate include fertiliser, agricultural runoff, decomposing organic matter, and untreated sewage. A high level of nutrients can lead to overgrowth of plants and increased bacterial activity. As a result, the amount of oxygen in the water decreases.

Equipment/ tools:	✓ Rapid testers of ammonia (NH_3)/ phosphate (PO_4) (commonly available at aquarium shops at low cost)

Procedure (Figure 5.8):

1. Follow the instructions on the rapid test kits. Use a syringe to transfer the water sample into a test tube.
2. Add several drops of the reagent into the test tube.
3. Cap and agitate well. Make sure the reagent is thoroughly mixed with the water sample before adding the next reagent.
4. Repeat Steps 2 and 3 until the required reagents are thoroughly mixed with the water sample.
5. Wait for 10 to 15 minutes.
6. Compare the solution with the colour chart to find the amount of ammonia and phosphate.
7. Write down the results on *Data Record Sheet 2*.

⬇ Figure 5.8: Procedure of testing phosphate (PO_4) content



Data Record Sheet 2: Water Quality

Fieldwork date: _____ Fieldwork Time: _____

Weather of the day: _____

Fieldwork site	**A**	**B**	**D**	**E**
Air temperature (^{o}C)				
Water temperature (^{o}C)				
Dissolved oxygen content (mg/L)				
Chemical oxygen demand (mg/L)				
Conductivity (ppm)				
Salinity				
(🡻 Optional)				
Ammonia (NH_3) (mg/L)				
Phosphate (PO_4) (mg/L)				

Discussion and field study evaluation

1. Compare the data between the natural stream and channelised watercourse. Which has a higher level of dissolved oxygen?
2. With reference to the fieldwork data and Figure 5.9, analyse the factors that cause the different levels of dissolved oxygen upstream of Shing Mun Reservoir and Tai Wai Nullah.
3. Explain how to redesign the data collection method to raise the validity and reliability of the field study.

Extended learning

In July 2019, the government announced its “Revitalisation of Tai Wai Nullah” project (Figure 5.10). How can this project help to improve the channel’s levels of dissolved oxygen?

Figure 5.9: Conceptual diagram for dissolved oxygen

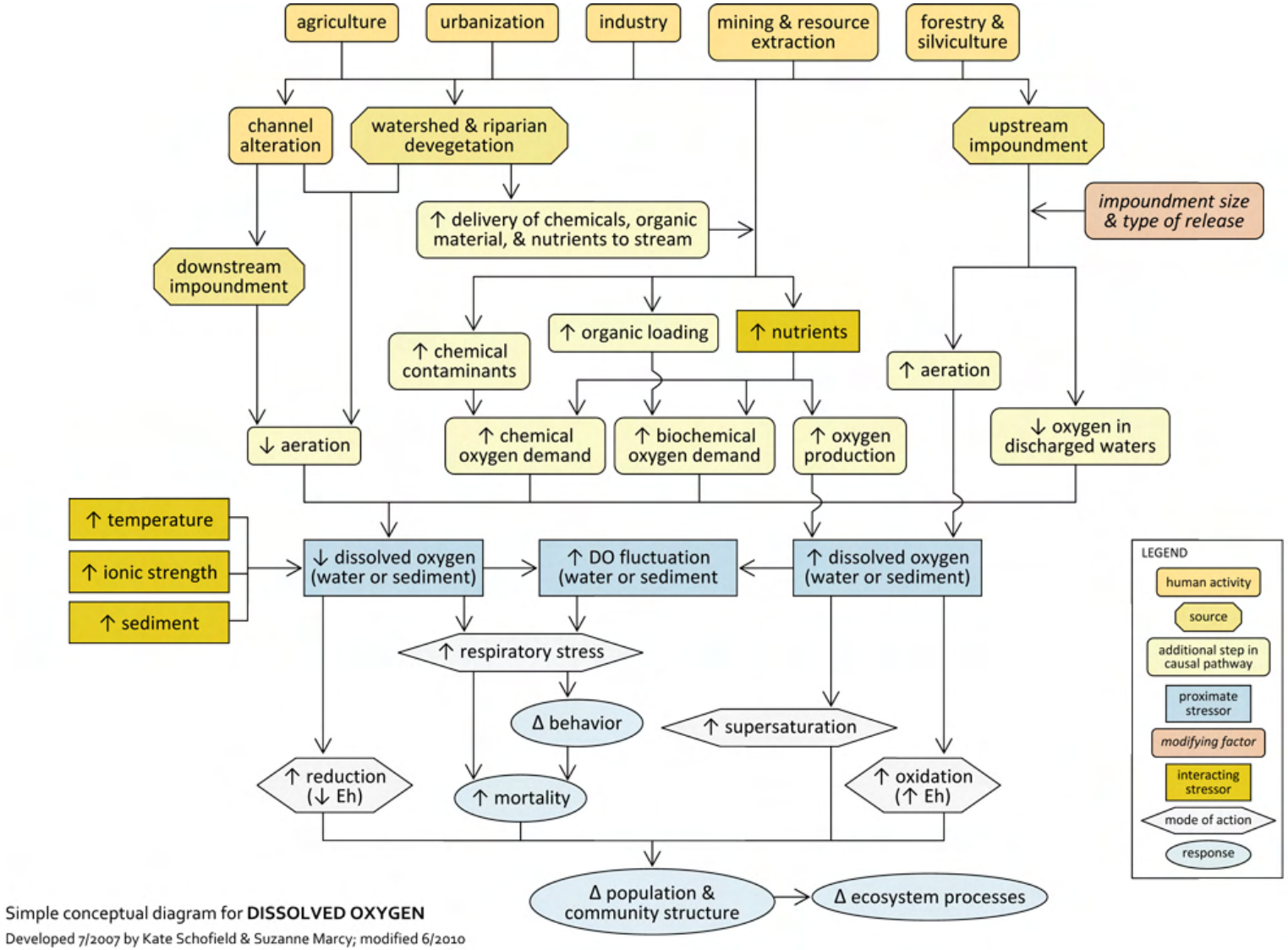


Figure 5.10: Revitalisation of Tai Wai Nullah

Visualisation of the revitalisation project from Drainage Service Department

References

	Drainage Services Department. (2015). ***Guidelines on Environmental and Ecological Considerations for River Channel Design (Drainage Services Department Practice Note No. 1/2015, Version No. 1)*****. https://bit.ly/31bsPiS.**
	Drainage Services Department. (2019). ***Project Profile for Revitalisation of Tai Wai Nullah*****. https://bit.ly/39cOXy1.**
	Topick.hket.com (2019). 《大圍明渠活化 市區首條「親水」渠》. https://bit.ly/3chAra5. (Chinese Version Only)
	United States Environmental Protection Agency (EPA). ***Simple conceptual diagram for dissolved oxygen*** **[Diagram]. https://bit.ly/3lOw4qi.**

Study area

Upper Shing Mun Reservoir (Tai Shing Stream to Pineapple Dam)	Shing Mun River (Tai Wai Nullah)
16/2/2021	16/2/2021
https://youtu.be/Zd1OM8SPzx0	https://youtu.be/wrE0M_dAYN0

5/11/2020	5/11/2020
https://youtu.be/XCHErmXGNSA	https://youtu.be/Q5R-JtQ2maU