



Exploring Woodland in Cheung Chau (1 day)

Group no.:

Course Date:

Objective	S
Knowledge:	- To understand the characteristics of abiotic and biotic
	components of a woodland ecosystem
	- To understand the structure of woodland and the
	characteristics of plants in woodland
Skills:	- To collect data collection of vegetation and soil
	- To compare and analyze primary data
Attitude: -	To cherish the interdependence of human and natural environment
-	To nurture students' concern of the tropical rainforest and
	awareness of the importance of protection of tropical rainforest
	on safeguarding national ecological security.

EQUIPMENT & MATERIALS CHECKLIST

FIELDWORK

	Equipment/ materials	Quantity (each group)
1.	measuring tape (50m)	1 (share)
2.	measuring tape (30m)	1
3.	meter ruler	1
4.	Vernier Calliper	1
5.	grid quadrat	1
6.	trowel	1
7.	Abney level / distance meter (range-finder)	1
8.	sample soil bottle	2 (share)
9.	densiometer	1
10.	soil temperature and moisture meter	1
11.	gloves	1 pair
12.	clipboard	1

L	LABORATORY WORK & DATA PROCESSING				
	Equipment / Materials	Quantity (each group)			
1.	soil NPK test kit	2 (share)			
2.	distilled water	2 (share)			



Relevance to the DSE geography curriculum

Disappearing Green Canopy – Who should pay for the massive deforestation in rainforest regions?

----- STAGE 1: PLANNING & PREPARATION -----

Key point of fieldwork: Linkages of abiotic and biotic components of woodland ecosystem, the structure of woodland and the characteristics of plants in woodland

What data to collect? (Prior knowledge)

Refer to the module of "Disappearing Green Canopy" in the textbook and study Figure 1. Choose the letters from dotted boxes and put into suitable boxes in Figure 1.



Figure 1 Nutrient cycle in a woodland



Knowledge re-cap: What are the relationships between the components of

woodland ecosystem?

Select ONE biotic and abiotic component from Figure 1 and explain their relationships to growth of vegetation.

> To set the enquiry question

- Relationship between vegetation and soil in a woodland ecosystem.
- What is the structure of a woodland? What are the characteristics of plants?

> Hypothesis

- 1. The higher the canopy density, the <u>higher / lower</u> the soil moisture will be.
- 2. If vegetation is <u>dense / sparse</u>, the soil fertility will be <u>higher / lower</u>.

> When to collect	data?		Why is weather information important to the topic and safety?
Date:	Time:	to	0
Cloud cover: <u>clear sk</u>	y / few clouds / scattered clo	ouds / overcast s	<u>sky</u>
Weather warning and si	gnals within last 2 days:		
□Strong Monsoon Sign	al CRainstorm Warnings		Cyclone Warning Signals
□Thunderstorm warnir	g		
Precipitation within las	2 days: <u>heavy rain / d</u>	rizzle / neve	er rain
What are the mericonducting such a	t and demerit of field study today?	Ę	Is it appropriate of choosing this field site to conduct this fieldwork?
What are the location	nal characteristics of the fie	eld site below? (Complete the form below.
Study area	Chi Ma H	ang (refer to th	ne map on p.14)
Locational			
characteristics			

Hint: relief/ accessibility/

Human activities...

What data to collect?

Refer to the information on p.3, match the following research items with the appropriate primary data collection method and the equipment.

	Research items	Primary data collection methods * (You may choose more than one options)	Equipment (refer to p.3)	Need to take sample? (v/x)	Operational precautions
	Canopy density				
	Tree height				
	Crown width				
	Tree circumference				
Vegetation	Shrub height				
	Undergrowth cover				
	Other characteristics of				
	plants: roots/ leaves/				
	lianas				
	Vertical stratification				
Soil	Soil fertility				
	Soil moisture				

* A - measurement, B - counting, C - drawing field sketches, D- observation, E - scoring, F - others

Risk assessment

Suggest TWO precautions for fieldwork in a woodland.

• STAGE 2: DATA COLLECTION •



Transect section (circle where appropriate)

0-4m / 4-8m / 8-12m / 12-16m / 16-20m / 20-24m / 24-28m / 28-32m / 32-36m / 36-40m / 40-44m / 44-48m



- 1. Set a 50m transect line in the studied woodland.
- 2. Examine **trees** which canopy lie within the 0.5m radius circle of every 2 metre along the transect line (See Figure 2).
 - Measure the tree circumference, Tree height, Crown width and corresponding positions on the transect line.
 - Examine the **canopy density** (%) of trees every 2 metres along the transect line.
- 3. Examine **shrubs** at same interval as tree measurement.
 - Measure the Height and corresponding positions on the transect line.
- 4. Examine the **undergrowth cover** (%) at every 2 metres along the transect line.
- 5. Identify the characteristics of plants from the whole transect.
- 6. Record the data on Table 1 and 2 (p. 8-9).



Figure 3 Measuring tree height with an Abney level



1. Vegetation survey

1.1 Tree, shrub and undergrowth

				,	Tree				Shrub	Undergrowth
Transect position (m)	Distance from tree (D)	Elevation angle (α)	Height from eye of observer to the ground (H1) (m)	D x tan α (H2)	Total height (H1 + H2) (m)	Crown width (m)	Tree circumference (cm)	Canopy density (%)	Shrub height (cm)	Undergrowth cover (%)

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Table 1Data record sheet for vegetation survey

1.2 Other characteristics of plants

Identify the characteristics of plants from the whole transect and record in Table 2.

Characteristics of plants	Rough amount (circle the appropriate)
Drip-tips	None / Few / Many
Buttress roots	None / Few / Many
Stem flowers	None / Few / Many
Climbers / Stranglers	None / Few / Many
Moss and Fern	None / Few / Many
Lichen & fungi (e.g. mushrooms)	None / Few / Many

What sampling method used?

Table 2Other plant characteristics in the studied woodland

Part 2: Abiotic components (Soil)

2. Soil survey

2.1 Soil fertility

From the whole transect, take ONE bottleful of soil sample from **two locations with contrasting vegetation density** respectively. Carry out labwork and record the result in Table 3, 4 and 5.

	🗆 Sampl	e A :r	n 🛛 Sample l	B:m
In charge 🗹	Assessment score	0 mark	1 mark	2 marks
	Nitrogen (N)	Low	Medium	High
DPhosphorus (P)		Low	Medium	High
Potassium (K)		Low	Medium	High
	Total score	0 – 1 mark	2-3 marks	4–6 marks
	Soil fertility	Low	Medium	High

Loval of soil fostility	Sample A / B
Level of son fertility	Low / Medium / High

Table 3Soil fertility result

2.2 Soil texture

Using the feel method, examine the soil texture of the soil sample.

Soil texture	Sample A / B
Son texture	Sandy / Silty / Clayey

Table 4Soil texture result

2.3 Soil moisture

Measure the soil moisture within your transect section every 2 metres.

Transect location (m)	Soil moisture (%)

Table 5 Soil moisture record

----- STAGE 3: DATA PROCESSING & PRESENTATION ------

Collect and integrate the data from all groups and fill in the corresponding data sheets. Present the processed data with appropriate diagrams.

Vegetation survey

1.1 Trees and shrubs

Using the graph paper provided, draw a dendrograph to show the structure of the studied woodland. Data of tree height, crown width, tree circumference and shrub height (p.8) should be included.

1.2 Canopy density

Summarize the canopy density data (p.8) from all groups and present with appropriate statistical diagrams.

Transect location (m)	Canopy density (%)	Transect location (m) (con't)	Canopy density (%) (con't)

Table 6Result of canopy density of the whole transect



1.3 Undergrowth cover

Summarize the undergrowth cover data (p.8) from all groups and present with appropriate statistical diagrams.

Transect location (m)	Undergrowth cover (%)	Transect location (m) (con't)	Undergrowth cover (%) (con't)

Table 7Result of undergrowth cover of the whole transect

1.4 Other characteristics of plants

Summarize the characteristics of plants of the studied woodland (p.9) in the box below.

The major characteristics of plants are as follows:

Soil study

2.1 Soil fertility

Summarize the soil fertility data (p.9) from all groups and compare the soil fertility level of two soil samples.

Dense vegetation (Soil Sample <u>A/B</u>)		Sparse vegetation (So	oil Sample <u>A / B</u>)
Transect location (m)	Level of soil fertility	Transect location (m)	Level of soil fertility

Table 8Comparison of soil fertility

2.2 Soil texture

Summarize the soil texture data (p.9) from all groups and compare the soil texture of two soil samples.

Soil toyturo	Sample A	Sample B
Son texture	Sandy / Silty / Clayey	Sandy / Silty / Clayey

Table 9Comparison of soil texture

2.3 Soil moisture

Summarize the soil moisture data (p.9) from all groups and present with appropriate statistical diagrams.

Transect location (m)	Soil moisture (%)	Transect location (m) (con't)	Soil moisture (%) (con't)

Table 10Result of soil moisture of the whole transect

----- STAGE 4: INTERPRETATION & CONCLUSION ------

Discussion Questions

- 1. Is your hypothesis valid or not? Explain the reasons with reference to the data collected. Explain any other factors which might support your conclusion.
- 2. Using the data collected, describe and explain the structure and the characteristics of plants of the studied woodland. How far is it similar to that of a rainforest?

------ STAGE 5: EVALUATION ------

Fieldwork

 Review the advantages and difficulties/ limitations of sampling method and data collection methods. Suggest the ways to improve the validity and reliability of data and information.

Further investigation

- 1. According to the findings of studies today, suggest one relevant topic about woodland for further investigation. Explain your planning of field study.
 - Key point of fieldwork/ topic
 - Date/ time of fieldwork
 - Location of fieldwork
 - Data to be collected
 - Sampling methods & quantity of samples
 - Primary data collection method(s) and equipment needed



Exploring woodland in Cheung Chau

My Field Trip Diary

- Related modules: <u>Disappearing Green Canopy</u>
- Key point of fieldwork/topic: To study the relationships between vegetation and soil in a woodland ecosystem/ To investigate the structure and the characteristics of plants of a woodland.
- Date: ______ (Weekday/ Public holiday)
 Time: ______ Field site: ______
 Is the above planning appropriate for the fieldwork?
- Primary data:

Data collection method	Data collected	Equipment/ Material (if any)	Merit/Limitation of the data collection method	Suggestion for improvement (give explanations)
Measurement			(give examples)	(give explanations)
Observation				
Counting				
Ullestionnaire/				
Other (if any)				



Secondary data:

Data collected	Use	Data obtained from
Apart from the above, what other	secondary data could be used for fu	rther 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		