Workshop-cum-Guided field-trip to Lam Tsuen River Catchment

16 December 2017
How to conduct fieldwork along Lam Tsuen River

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Hong Kong Geographical Association
About Lam Tsuen River Field Study

Relevance to the DSE Geography curriculum

- This field study is related to ‘Managing Rivers and Coastal Environments – A continuing challenge’ (Compulsory Part)

Objectives

- To investigate the characteristics of different courses of the river;
- To examine various strategies of channel management works; &
- To investigate how channel management works affect the ecology and the landscape of the areas along the river.
(A) Characteristics of different courses of the river
   a. Upper course – Ng Tung Tsai Fall
   b. Middle course
   c. Lower course
   d. Estuary – Kwong Fuk Bridge

(B) Channel management works
   a. Channelisation
   b. Hard engineering strategies
   c. Ecological enhancements in channelisation work

(C) How channelised work affect the ecology & landscape
   a. Eco-system services
   b. Land uses
Effect of channelisation on:

A. river channel  
B. river bed  
C. capacity, hydraulic efficiency and discharge of the river
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Block revetment</td>
<td><img src="image1" alt="Block revetment" /></td>
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<tr>
<td></td>
<td>(舖磚塊)</td>
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<tr>
<td>2</td>
<td>Gabion wall</td>
<td><img src="image2" alt="Gabion wall" /></td>
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<tr>
<td></td>
<td>(石籠牆)</td>
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<tr>
<td>3</td>
<td>Concrete cover</td>
<td><img src="image3" alt="Concrete cover" /></td>
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<tr>
<td></td>
<td>(舖混凝土)</td>
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<tr>
<td>4</td>
<td>Stone pitching retaining wall</td>
<td><img src="image4" alt="Stone pitching retaining wall" /></td>
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<td></td>
<td>(石砌護土牆)</td>
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</tbody>
</table>
Pre-requisite knowledge:
Hard engineering strategies

Costing

Different types of hard engineering strategies

Intended effects (major purposes)
What type of hard engineering strategies employed in channelisation and river bank protection work here?

Shing Mun River Channel, Tai Wai
### Pre-requisite knowledge: Eco-designs in channelisation work

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Image 1</th>
<th>Image 2</th>
<th>Image 3</th>
<th>Image 4</th>
<th>Image 5</th>
<th>Image 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grasscreting along channel embankment</td>
<td><img src="image1.png" alt="Grasscreting" /></td>
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<tr>
<td>2</td>
<td>Reinforcing <em>grass lining</em> in gabions</td>
<td><img src="image2.png" alt="Reinforcing gabions" /></td>
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<tr>
<td>3</td>
<td>Unlined channel bed and embankment</td>
<td><img src="image3.png" alt="Unlined channel" /></td>
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<td>4</td>
<td>Creating shallow pond</td>
<td><img src="image4.png" alt="Shallow pond" /></td>
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<tr>
<td>5</td>
<td>Creating wetland habitats</td>
<td><img src="image5.png" alt="Wetland habitats" /></td>
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<tr>
<td>6</td>
<td>Building flow deflector</td>
<td><img src="image6.png" alt="Flow deflector" /></td>
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</tbody>
</table>
Pre-requisite knowledge: Eco-system services

Provisioning
Goods or products produced by ecosystems

Regulating
Natural processes regulated by ecosystems

Cultural
Non-material benefits obtained from ecosystems

Supporting
Functions that maintain all other services
Pre-requisite knowledge:
Eco-system services

Provisioning Services
- Food Production
- Water
- Wood and Fiber
- Fuel

Supporting Services
- Nutrient Cycling
- Soil Formation
- Primary Production
- Habitat Provision

Cultural Services
- Spiritual
- Aesthetic
- Educational
- Recreational

Regulating Services
- Climate Regulation
- Flood Regulation
- Water Purification

Source: Millennium Ecosystem Assessment, 2005.
ECOSYSTEM SERVICES

Provisioning
- Food
- Fresh water
- Wood and fiber
- Fuel
- ...

Supporting
- Nutrient cycling
- Soil formation
- Primary production
- ...

Regulating
- Climate regulation
- Flood regulation
- Disease regulation
- Water purification
- ...

Cultural
- Aesthetic
- Spiritual
- Educational
- Recreational
- ...

LIFE ON EARTH - BIODIVERSITY

CONSTITUENTS OF WELL-BEING

Security
- Personal safety
- Secure resource access
- Security from disasters

Basic material for good life
- Adequate livelihoods
- Sufficient nutritious food
- Shelter
- Access to goods

Freedom of choice and action
- Opportunity to achieve what an individual values doing and being

Health
- Strength
- Feeling well
- Access to clean air and water

Good social relations
- Social cohesion
- Mutual respect
- Ability to help others

Source: Millennium Ecosystem Assessment

ARROW'S COLOR
Potential for mediation by socioeconomic factors
- Yellow: Low
- Brown: High

ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being
- Dash: Weak
- Solid: Strong
Conducting Enquiry Field Study

1. Planning & preparation
2. Data collection
3. Data processing, analysis & presentation
4. Interpretation & conclusion
5. Evaluation
Conducting Enquiry Field Study: (1) Planning & preparation

(A) **Background information:**

About Lam Tsuen River: Topography, land uses, etc.

(B) **Knowledge recap:** Channelisation works

(C) **Enquiry questions:**

(1) How do the channel management works vary along the course of the river?

(2) How do the channel management works affect the ecology and the landscape of the areas along the river?
Conducting Enquiry Field Study: (2) Data collection

The Field Study Sites

Site S1: Ng Tung Chai Fall
Site A: Chai Kek
Site B: Fong Ma Po
Site C: Chuen Pei Lung
Site D: Tai Po Tau Pumping Station
Site E: Tai Po Tau Shui Wai
Site S2: Kwong Fuk Bridge
Conducting Enquiry Field Study: (2) Data collection

Planning & preparation

Data collection

Data processing & presentation

Interpretation & conclusion

Evaluation

Measuring channel characteristics

Chai Kek
Conducting Enquiry Field Study: (2) Data collection

- Planning & preparation
- Data collection
  - Measuring river velocity
- Data processing & presentation
- Interpretation & conclusion
- Evaluation

Chai Kek
Conducting Enquiry Field Study: (2) Data collection

The instrument:
Channel Management Record Form
Conducting Enquiry Field Study: (3) Data processing & presentation

<table>
<thead>
<tr>
<th>Field sites</th>
<th>Ng Tung Chai</th>
<th>Chai Kek</th>
<th>Fong Ma Po</th>
<th>Chuen Pei Lung</th>
<th>TPT Pump Station</th>
<th>TPT Shui Wai</th>
<th>Kwong Fuk Bridge</th>
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<tbody>
<tr>
<td>Land use</td>
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<td>Eco-design</td>
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**Diagram:**

- **Elevation (m)**
- **Distance (m)**

- **A**
- **B**
Conducting Enquiry Field Study: (3) Data processing & presentation

### Complete the following table

<table>
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<tr>
<th>Field work site</th>
<th>Distance from river</th>
<th>Land use along the river</th>
<th>Hard management strategy employed</th>
<th>Ecosystem services brought by the management work</th>
<th>Remarks and comments</th>
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<tr>
<td>Ng Tung Chau</td>
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<td>(S1) Ng Tung Chau</td>
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Group discussion:

With reference to the information collected in the field, account for the variation of channel management works along Lam Tsuen River and their impacts on the environment.
Conducting Enquiry Field Study: (4) Interpretation & conclusion

Planning & preparation
- Data collection
- Data processing & presentation
- Interpretation & conclusion
- Evaluation

Channel management works
- Location
- Land use
- Intended effect? Flood control?
- Change in hydraulic efficiency, discharge, ...

Ecological enhancement
- Ecological enhancement

Ecosystem services
Conducting Enquiry Field Study: (5) Evaluation

- Suggest other data needed, account for problem in data collecting
- Room for improvement
- Getting people’s views & opinions about the channel management works
- Secondary data needed:
  Drainage Services Department – www.dsd.gov.hk
Conducting Enquiry Field Study: (5) Evaluation

- **Secondary data needed:**
  Drainage Services Department – [www.dsd.gov.hk](http://www.dsd.gov.hk)
Conducting Enquiry Field Study: (5) Evaluation

- **Secondary data needed:**
  - Historical maps and aerial photographs
  - *Comparison with the existing landscape & environment*
Conducting Enquiry Field Study: (5) Evaluation

- Other indicators:
Please note:

大埔頭抽水站附近的充氣尼龍堤壩
The inflatable fabridam near
Tai Po Tau Pumping Station
Please note:

Stone plaque commemorating the inauguration of the Plover Cove Water Scheme
Field sites **NOT** visited today

Ng Tung Chai Falls

- Bottom Fall at Ng Tung Chai
- Middle Fall at Ng Tung Chai
- Main Fall at Ng Tung Chai
Field sites NOT visited today

Kwong Fuk Bridge

Artificial channel at Tai Po New Town
(taken at Kwong Fuk Bridge)