



Malaysia
Hands On Trust

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VOLUME 2

**WATER MANAGEMENT CURRICULA USING
ECOHYDROLOGY AND INTEGRATED WATER
RESOURCES MANAGEMENT**

**Highland Drainage, Debris and Mudflow, Sediment
Erosion and Landslide Control**

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GENERAL BACKGROUND

- ◆ Construction activities typically are initiated with a clearing and grading activities thus will leads to remove the original vegetation from the site.
- ◆ In Malaysia, particularly in Kuala Lumpur and in the neighbouring urban centers of the Klang valley, urban development was particularly rapid in the late 1970s and 1980s.
(DID, 2000)



GENERAL BACKGROUND

- ◆ Construction sites in Malaysia usually involve bare eroding slopes and drains choked with sediment.



Highland development has been rapid in the last two decades in Malaysia and has resulted in acute environmental problems in many locations such as Penang, Klang Valley and other strong growth areas. Apart from urban expansion, development has also occurred in inland hilly areas as well as near coastlines and on islands for resort purposes. Planning and achieving sustainable development in such environment is particularly important in such environment is particular important in regard to drainage, flash flood, erosion and sediment and slope stability management.

This module is suitable for undergraduate/ engineers/ local authorities



MODULE OBJECTIVE

- i. Understand the concept and overview on highland drainage, mudflow, debris, sediment erosion and landslide control.
- ii. Evaluate the method in control sediment erosion and landslide
- iii. Apply the concepts and mitigation method in order to control sediment, erosion and landslide.

LEARNING OUTCOME

- i. Understand the concept of highland drainage, mudflow, and debris.
- ii. Identify the integration of highland drainage, mudflow, and debris with sediment, erosion and landslide.
- iii. Identify the best management practices for sediments, erosion and landslide

Chapter	Content
Highland drainage, mudflow and debris; Introduction	Overview on highland drainage, mudflow and debris.
Highland drainage, mudflow and debris; Current practices	Increase surface runoff and impacts; increase runoff infiltration and impacts
Highland drainage, mudflow and debris; recommendation practices	Design and planning requirements surface runoff control; minimizing erosion, infiltration and slope failure

<p>Sediment Erosion control: regulatory overview</p>	<p>Submission requirements for construction activity; who should obtain approval; minimum requirements of ESCP.</p>
<p>Sediment Erosion control: generic guidelines for ESCP</p>	<p>Minimizing soil erosion; preserving top soil and other asset; access routes and site management; drainage control runoff/management; drainage control/ runoff management; earthwork and erosion control; sediment prevention and control; slope stabilization; site maintenance</p>
<p>Sediment Erosion control: plan preparation stages</p>	<p>Planning phase; design phase; construction phase</p>
<p>Sediment Erosion control: Inspection and maintenance</p>	<p>Site inspection; monitoring; record keeping; plan review and modification</p>

Sediment Erosion control: the erosion and sediment control facilities	Seeding and planting; mulching; geotextile and mats
Sediment Erosion control: runoff management facilities	Earth bank; diversion channel; drainage outlet protection; temporary waterway crossing
Sediment Erosion control: sediment control facilities	Check dams; silt fence; sediment traps; sediment basin
Sediment Erosion control: case study	Current situation in local construction site
Landslide control: introduction	Basic principle of landslide; mechanics of landslide movement; factor affecting slope stability
Landslide control; measures for management and control of landslide hazard	Avoiding existing landslide and unstable slope; avoiding landslide caused by construction; prevention work; stabilization measures; protection works
Landslide control; landslide forecasting	Predicting where landslide will occur
Landslide control; landslide forecasting	Experience based on Malaysia case.

COURSE DURATION

Chapter	Duration
Highland drainage, mudflow and debris; Introduction	Day 1
Highland drainage, mudflow and debris; Current practices	Day 1
Highland drainage, mudflow and debris; recommendation practices	Day 1
Sediment Erosion control: regulatory overview	Day 2
Sediment Erosion control: generic guidelines for ESCP	Day 2
Sediment Erosion control: plan preparation stages	Day 2
Sediment Erosion control: Inspection and maintenance	Day 2

Chapter	Duration
Sediment Erosion control: the erosion and sediment control facilities	Day 3
Sediment Erosion control: runoff management facilities	Day 3
Sediment Erosion control: sediment control facilities	Day 4
Sediment Erosion control: case study	Day 4
Landslide control: introduction	Day 5
Landslide control; measures for management and control of landslide hazard	Day 5
Landslide control; landslide forecasting	Day 6
Activity	Day 6

ACTIVITY

Organized the activity with the residents who have the possibility being exposed with landslide. Landslide awareness can be considered is important in assessing the quality of life since the environment impact directly. The activities can be involved such as distribution of printed materials and planting the tree in order to maintain the green plants.

Printed materials such as posters, leaflets and illustrated booklet which contain the information on early warning of landslide and action need to be taken during the tragedy. Then after 3 months, the awareness survey should be conducted on the same residents to evaluate their awareness level on the landslide and actions need to be taken during the tragedy.

As for planting the tree, this will contribute the residents awareness that they have to maintain the green plants and seeking ways not to destroy the hilly areas reserves or increase the concrete building.

CHALLENGE

Housing and resort related developments are common activities on hillsides and their components include buildings roads, car parks and open space. Local standard practice often fails to take into account the natural features of the landscape. Hillside land offers greater opportunities than flat land for imaginative design and landscape planning. Thus, these activities contribute to the various environmental problems. Although there are a lot of policies and legislation for that kind of developments, still there is lacking in term of enforcement.

Since only a few numbers of tools for sediment erosion and landslide control available in market, therefore there is an opportunity to explore and develop the interactive software which covers the selection and prediction of sediment erosion and landslide control. These tools are important because it can save time and money.

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Thank You



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