


Erosion and Sediment Control in Malaysia – What next?



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19/9/17 SWaM

Relative Annual Rates of Erosion (US data)

	Soil Loss tons/ac	Relative to Forest
Natural Forest	0.04	1
Grassland	0.38	10
Abandoned mines	3.75	100
Cropland	7.50	200
Harvested Forest	18.75	500
Active Surface Mining	75.00	2000
Construction Sites	76.00	2000

What has ASM got to do with this?

There are other major sectors to move into:

- Plantations
- Mining
- Sand Mining
- Agriculture
- Logging
- Highways
- Construction Industry

What is wrong with this Bauxite Mine?

1. No ESCP
2. Dump trucks everywhere, carrying soil in tyres
3. Exit point not controlled
4. No drainage control, etc



What is this ESCP?

1. Dump trucks only move along defined gravel road (GR)
2. Stockpiles (SP) moved to loading pt by conveyor belts (CB)
3. Loading Point (LP) using Dropped Chute



4. Exit point controlled by wash trough (WT)
5. Buffer zone of retained trees/vegetatn (BZ)
6. Drainage to sediment ponds (DG)



1. Plantations

- Malaysia land area 33 M ha
- >6 M ha. Plantations ~ 18 % total
- 20-25 year lifespan
- i.e. 5%(0.3 M ha) being replanted every year.
- massive top-soil losses (from m to cm.)



Massive Topsoil losses every replanting



River Sedimentation



Soil Erosion in Oil Palm Area

2. Mining



Sungai Besi
Huge Open Cast Tin Mine.

Number of mines
1974 - 1,000
2001 - 46



Tin Production

1985 - 36,900
1999 - 7,340
2000 - 6,307
2001 - 4,973 tons

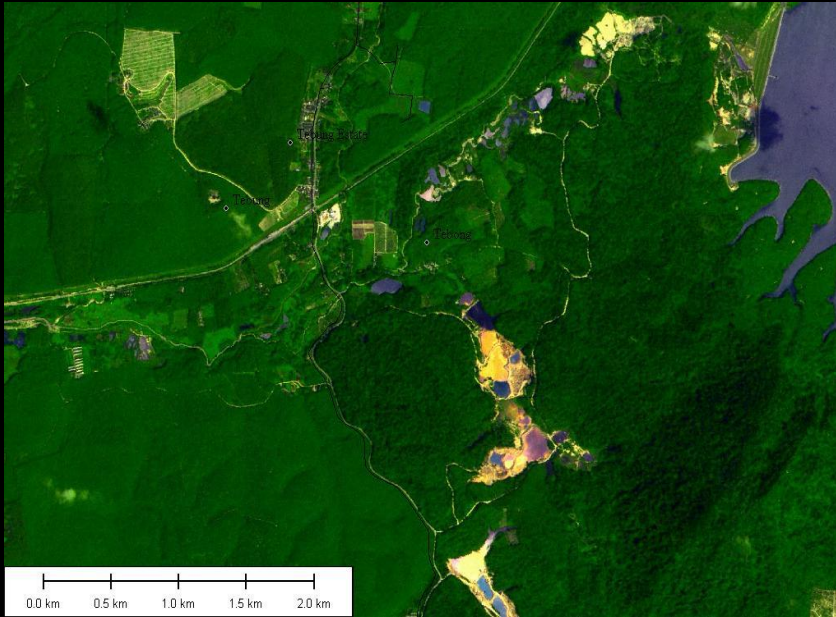
3. Hill Sand Mining



- Massive hill cutting and sand washing
- Pristine upstream waters heavily sedimented



Sg Batang Melaka and Sg Kesang Hill Sand Mining



5. Highland Agriculture



Hill devastation to
plant Tomatoes –
Cameron Highlands



Lojing – an environmental disaster



Severely eroding
steep slopes



Heavy Sedimentation in Sg
Belatop, tributary of Sg Nenggiri

6. Logging

Conventional tractor-crawler
– 95% of Peninsular logging

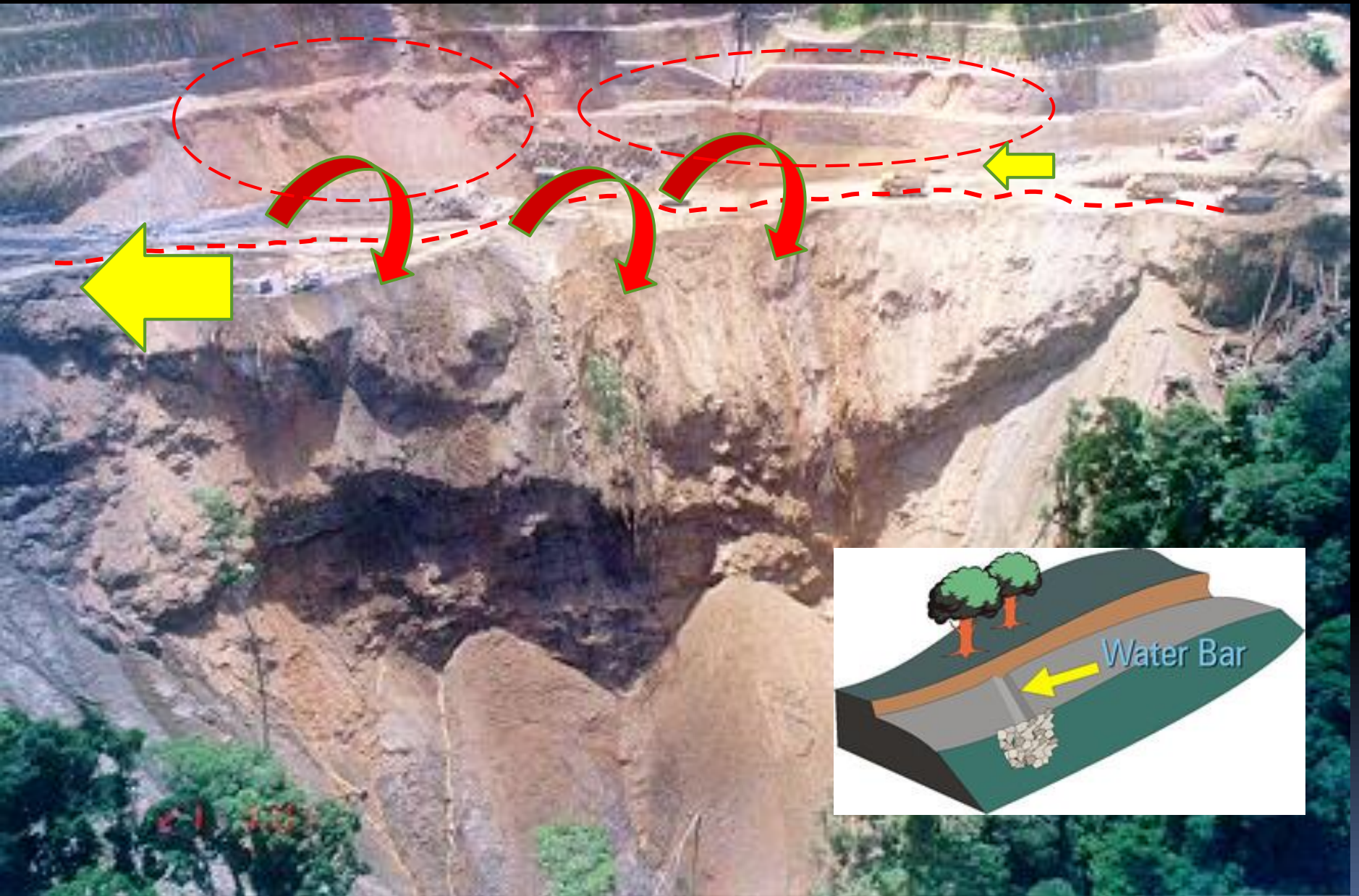
Poor Erosion control



7. Highways



Massive landslides – Zero fundamentals in ESC



Horrendous
sedimentation at
downstream
Water treatment
plant

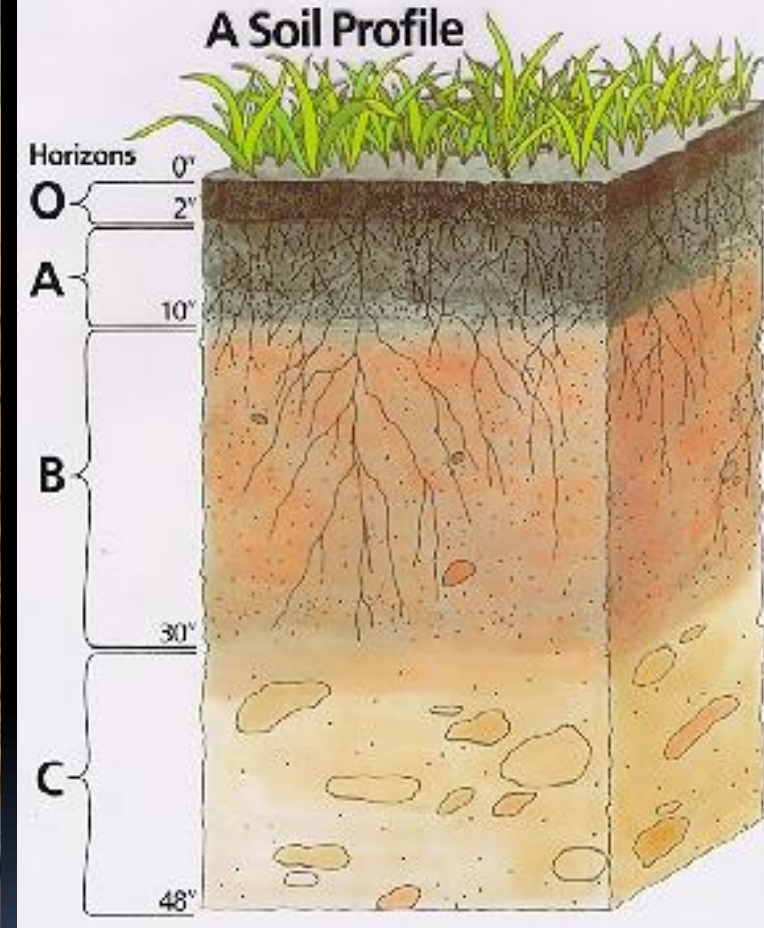


7. Housing



- Approx. 1000 projects a yr. for Klang valley

- Klang Valley up to 500 t/ha/yr soil loss
 - Av. 30 t/ha/yr
 - Cameron Highlands av. 120 t/ha/yr
 - Natural forest < 0.5 t/ha/yr
- 26/10/2006 10:54



Vital Topsoil lost in earthworks. The sponge for storm water, pollution filter, nutrient for plant growth, medium for soil ecology

Consequences



Enormous cost to rehabilitate rivers and coasts.



Loss of aquatic and marine habitat – depletes fish catch, affects recreation, quality of life, tourism etc



CONSEQUENCES



Increased Flash Floods in Urban Areas

Tender docs by JKR already modified to include list of BMPs in BQ – not lump sum item for ESC measures



Chapter 6.0

Bill of Quantities (BQ)

Item No.	DESCRIPTION OF WORKS	UNIT	QTY	RATE	AMOUNT	
					(RM)	SEN
10.7	<u>SEDIMENT CONTROL Silt Fence</u>	m				
10.7	<i>i) Construction of 1.0m high silt fence including non- woven geotextile and wooden post with dimension as specified and shown in the drawing or as directed by the S.O./P.D.*</i>					
.1						
	<i>ii) Maintenance of silt fence as specified or as directed by the S.O./P.D.*</i>	m				

RECOMMENDATIONS

Action	Organizations in charge
<p><i>1. ESCPs to be prepared by Certified Professionals who will be <u>totally responsible</u> for them ie, "Self Regulation".</i></p>	<p>1. DID 2. DOE</p>
<p><i>2. Agencies involved in large earthworks to get Certified Professionals</i></p>	<p>1. DID 2. PWD 3. DOE 4. MHA 5. DOF</p>
<p><i>3. Agencies involved in earthworks enforcement to get Certified Inspectors</i></p>	<p>1. DOE 2. DOF 3. Local Authorities (LA) 4. DMG</p>
<p><i>4. ESCPs to be required for Agriculture, Mining, Plantation and Logging sectors</i></p>	<p>1. DOE 2. DOF 3. DID 4. DMG</p>

RECOMMENDATIONS cont..

Action	Organizations in charge
<i>5. Land Conservation Act to be activated in all States</i>	<ol style="list-style-type: none">1. NWRC – thro'NRE2. SEPU3. JKPTG4. DID5. DOE
<i>6. Land Conservation Act to be enforced by a Technical Agency not Land Office</i>	<ol style="list-style-type: none">1. SEPU2. SS3. DID
<i>7. Institutions in all States to look after Rivers and Water Resources</i>	<ol style="list-style-type: none">1. SEPU2. SS3. DID
<i>8. Sand Mining to be properly regulated</i>	<ol style="list-style-type: none">1. SEPU2. SS3. DID

RECOMMENDATIONS cont..

Action	Organizations in charge
<i>9. Hill Sand Mining to be terminated</i>	<ol style="list-style-type: none">1. SS2. DOE3. DID4. DOF
<i>10. All new contracts to follow latest JKR contract docs (2010) where Best Mgt Practices (BMP) are listed and costed for item by item in BQ. NOT as a Lump Sum item as before.</i>	<ol style="list-style-type: none">1. PWD2. DID3. MHW4. LA5. CIDB
<i>11. ESC courses to be made mandatory for earthworks contractors</i>	<ol style="list-style-type: none">1. CIDB
<i>12. DID to abandon the practice of River Berm clearing & maintain rivers thro' floating dredgers</i>	<ol style="list-style-type: none">1. DID

RECOMMENDATIONS cont..

Action	Organizations in charge
<i>13. River banks to be rehabilitated with greenery</i>	1. SEPU 2. DID
<i>14. Mulching to be widely promoted.</i>	1. SEPU 2. LA 3. DID 4. DOA
<i>15. Maintenance grass cutting to be reformed</i>	1. SEPU 2. LA
<i>16. Turfing to follow international practice – Top soil to be laid in first and graded before turfing.</i>	1. DID 2. PWD 3. MHA 4. LA

Action	Organizations in charge
<p><i>17. ESCP to be promoted to Sabah & Sarawak through establishment of MSO Sarawak and MSO Sabah – who will regulate ESC professionals (ECI, CISEC etc registrants) in their own states.</i></p>	<p>1. SEPU 2. DID</p>
<p><i>18. ESC Manual to be written for Sabah and Sarawak – through consultancy study (as was done for Pen Malaysia).</i></p>	<p>1. SEPU 2. LA 3. DID 4. DOA</p>
<p><i>19. Sabah and Sarawak to adopt new Peninsular system of "Self Regulation" of ESCP plans. Workshop to be organized in each state to brief approach.</i></p>	<p>1. SEPU 2. LA</p>
<p><i>20. Extensive training and promotion of Certified Professionals to be done for both states.</i></p>	<p>1. DID 2. PWD 3. MHA 4. LA</p>