

SEACAP 21/004

**Mainstreaming Slope Stability Management – Hazard and
Risk Assessment – to Laos Practitioners**

Theme 5

**Slope Instability Hazard and
Risk**

'Simple' Definition of Landslide Hazard and Risk

- **Landslide hazard defines the potential of a landslide to cause damage over a given time, for example the life of a road**
- **Landslide risk defines the potential or actual losses that might result as a result of these landslide hazards occurring. These losses are usually measured in economic terms, but social losses (injury/fatality and loss of livelihood) can also occur.**

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Table 7.1. Crude landslide expenditure per kilometre, by Province

Province	Cost (US\$M) per province			Three year expenditure US\$ (M)	Road Network (KM)	US\$/KM
	2004 to 05	2005 to 06	2006 to 07			
Phongsaly	0.1	0.4	0.8	1.3	474	7,913
Louang Namtha	0.0	0.1	0.1	0.2	302	2,310
Bokeo	0.0	-	-	0.0	169	219
Houaphan	0.4	0.2	0.8	1.4	446	9,720
Oudomxai	0.6	0.3	0.0	0.9	314	8,339
Luang Prabang	0.3	0.6	0.6	1.4	610	7,045
Xiangkhouang	0.9	0.3	0.1	1.2	464	8,064
Xaignabouli	0.3	0.4	-	0.7	540	3,723
Xaisomboun	0.5	-	-	0.5		na
Vientiane	1.5	0.9	0.3	2.6	650	12,053
Borikhamxai	0.1	0.0	-	0.2	510	898
Khammouan	-	-	0.2	0.2	422	1,136
Total	4,652	3,098	2,789			

Source: MPWT & Scott Wilson analysis

From SEACAP 21/003 Feasibility Study Report

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1. Most below-road failures requiring retaining wall stabilisation measures are likely to cost in the region of US \$ 30 to 90,000, with the average around \$ 50,000.
2. Above-road failures requiring only bio-engineering measures are likely to cost in the region of US \$ 15 to 20,000. Of this, approximately half is for small structures, such as drains and check dams.
3. Above-road failures requiring retaining walls as well as bio-engineering measures are likely to cost in the region of US \$ 40,000.
4. Measures directed at improving only surface drainage close to the road, per location, are likely to cost in the region of US \$ 5 to 10,000.

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Table 8.4. Approximate costs of the SEACAP 21 slope stabilisation trials, 2006-07 and 2007-08

Road & location km	Above road US\$	Below road US\$	Total US\$	Type	Comments
13N, 238.0	13,519	6,053	19,573	Bio	Above road failure with loose fill below road, 40m x 25m
316.6	12,466	5,093	17,559	Bio	Above road failure with loose fill below road
337.7	8,001	6,946	14,947	Bio	Above road failure with loose fill below road
242.6		33,506	33,506	Geo	Below road failure 80m x 35m - erosion protection layer
254.0	198	66,173	66,371	Geo	Below road failure, wall 52m long and 6m high
260.3	2,949	4,091	7,040	Geo	Above/below road failure - temporary stabilisation measures
287.2		27,952	27,952	Geo	Below road failure, wall 60m long and 3m high
317.9	14,790		14,790	Geo	Above/below road failure - temporary stabilisation measures
332.7	32,927	5,092	38,019	Geo	Above road failure 50m x 50m, with wall 50m long & 4m high
336.4	2,787		2,787	Geo	Below road failure - improvements to road drainage only
339.9	34,873	2,671	37,544	Geo	Above road failure 40m x 40m, with wall 40m long & 4m high
7, 3.3	1,417	90,780	92,197	Geo	Below road failure, wall 65m long and 6m high
7, 6.1	2,814	51,552	54,366	Geo	Below road failure, wall 40m long and 6m high