Appendix 3-2 Slope inspection sheets for Rank C and B

Management office	Ratnapura											
Management number	A004-134	Route No	A004	Location(m)	134/15	to	134	Dista	nce	200 m	
Disaster	Rock fall	Name of Road		Landma	rk		latitude	N 06°37′20.18″	longitude	Е	080°39'32.17"	
Schematic sketch				Reporte	er's name :	M. Enokida						
1/5	de a co	1901	G.	Date o	f report:	24-Sep-12						
4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					Recorded Disaster: Rock Fall (Boulder Size). Failure Type: Rock Fall or Rock Slide (Wedge type slide). Geological Condition: Weathered Gneiss with dyke rich in feldspar, Trigger of Failure: (Supposed) Tremendous rainfall + open cracks, Description Featured Points: At the beginning part, the slope is rich in cracks and thus roc In contrast, at the ending part, outcrop is rather massive and thus wedge type supposed. Supposed countermeasures: For rock fall, ring net can be applied. For rock sli unstable part after detailed investigation can be applied.						pe rock slide can be	
2	(my	MAN		His	srtory	New failure Movement/extension						
	Location map (Scale: 1:10,000)				mated aster lume							
Thangamalewatta Aoragaswatta DEWAKANDA W	Rajaginyawatta Rajaginyawatta SELVAKANDA WATTA MILTAN	A004-196 81°0'22.63°E, 6°	Meenyabeddewatta Eru 44'50.26"N Eruwwadumpola Pahala	Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):							

Management Number	A004-134

Evaluator	M.Enokida
Organization	JICA Study Team

[Causes](A) Item factor category of score point score talus slope topography collapsed factor 3 or more correspondences clear convex break of slope 2 correspondences eroded toe of slope 1 correspondences Max=3 overhang, water catchment slope no correspondence 2 susceptible to erosion marked a little marked less strength with water Max=8 None 0 high density of cracks and a weak laye marked susceptible to erosion a little marked Max=12 12 fast weathering None dip slope of bedding plane It corresponds. Max=8 None 8 debris on impermeability bedrock marked a little marked The upper part is a hard /the toe of Max=6 slope is weak. None 4 instability Topsoil, detached rock and unsteady rock a little unstable Max=12 stability 12 notable spring waster spring water seepage Max=8 None bare land with minor vagetation surface condition intermediate (bare · grass · tree) Max=5 mainly structure, mainly tree 5 H≧50m 30≦H<50m 15≦H<30m Max=18 dip(i), height H<15m 8 i≧70° 45°≦i<70° Max=10 <45° 10 targeted slope (surface collapse small fallen rock gully erosion piping hole subsidence heaving bending of tree 2 or more correspondences clarity certain • unclarity Max=5 root-fallen tree-crack-open crack-anomaly of 5 None countermeasure) sum total 66 (A)

and alone			effectivene	ess	s of existing cour	nterme	asures				point((α)	check
cut slope	✓		Potential rockfall and slope failure are prevented enough, or, it is defended enough when it is generated.								×0		
natural slope	ntorol .	Potential rockfall as	•			bly pre	vented	, or it i	S		-20	0	
[Main slope disas	✓	Potential rockfall a	nd slope fa	ailu	re are partly pre		,			d	-10	0	
slope failure			when it is generated. However, it is not enough for the remaining factors. There is no countermeasure, or there is not effective even if countermeasures are not performed.						±0		✓		
[History](C)									su	m to	otal	(B)	66 T
[Level of disaster his	story			point	check						
There is a history about large fallen rocks and slope failures that were obstacles to the road traffic after construction of recent measures.												_	
		large fallen rocks an	•	ilur	es that gets to								
There is a history get to the road.	/ about	small fallen rocks ar	nd slope fai	ilur	es that did not		1						
No disaster recor	rds								(D)=MA	٩X(B,C)		
						>		L	Score in e		ation	(B)	
						(C)						(C)	36
							点	-	Score in e from histo		auon	(0)	0
									Among (B large one.	, ,),	(D)=N	IAX(B,C)
[Overall judgen	nent]				[Description]								
response			judgment										
The countermeas	sure wo	rk is necessary.	1										
		termeasure is not ections are needed.											
The countermeas	sure wo	rk is not necessary.											







Old falling rock



Condition of slope, there are a lot of cracks and floatstones.



Mark that comes off rock and fell

Management office	Ratnapura		General Info	, i i i i i i i i i i i i i i i i i i i) O.	.001						
Management number	A004-154	Route No	A004	Location(r	m)	154/7	to		Distance	100	m	
Disaster	Slope Failure	Name of Road		Landma	rk		latitude	N 06°42'07.21"	longitude	E 080°45'18.	40"	
Schematic sketch				Reporte	er's name :			M. Enokida				
				Date o	f report :	24-Sep-12						
				Desc	cription	Recorded Disaster: Damage on the pavement such as cracks and subsidence. Failure Type: Slope failure in the embankment slope, (possible) landslides involving the foundation of the embankment,. Geological Condition: Highly Weathered Gneiss, embankment material, (possibly) colluvium valley deposit at the foundation of the embankment, Trigger of Failure: (Supposed) Raise in ground water, changes in the weight balance for the possible landslide, Featured Points: It is not yet clear whether there is landslide at the foundation of the embankment. Thus further investigation and monitoring are required. According to unconfirmed information, there were some movements at the lower slope under gabion wall. The landform of the valley where the embankment sits on implies existence of small landslide the embankment was put on the head of the possible landslides, the landslide shall start its movement. There lacks however obious information which supports the movement or existe Supposed countermeasures: For slope failure in embankment, gentler gradient of slope or reinforcement by sorts of geotextile. For landslide, further investigation is required to set up appropriate countermeasures.					vium or r the under the dslides. t its existence	
				His	srtory	New failure Movement/extension						
C	ocation map (Scale: 1:10,000)			dis	Estimated disaster volume							
(max / 1 max /	123 2000/2000	A004-154		Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):							

Management Number	A004-154

necessary, regular inspections are needed.

The countermeasure work is not necessary.

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses](A)	_		
	Item	factor	actoriory of accre	noint	score
topography	collapsed factor	talus slope clear convex break of slope eroded toe of slope overhang, water catchment slope	category of score 3 or more correspondences 2 correspondences 1 correspondences no correspondence	point	Max=3
us	soil	susceptible to erosion less strength with water	marked a little marked None	√	Max=8 8
geological conditions	rock	high density of cracks and a weak laye susceptible to erosion fast weathering	marked a little marked None	/	Max=12 0
ologic	Ē	dip slope of bedding plane	It corresponds. None	1	Max=8 0
ge	structure	debris on impermeability bedrock The upper part is a hard /the toe of slope is weak.	marked a little marked None	1	Max=6 4
ion	Т	opsoil, detached rock and unsteady rock	instability a little unstable stability	\	Max=12 12
surface codition		spring water	notable spring waster seepage None	\	Max=8
ıns		surface condition	bare land with minor vagetation intermediate (bare grass tree) mainly structure, mainly tree	>	Max=5
figure		dip(i), height	H≧50m ± 30≦H<50m = 15≦H<30m H<15m	\	Max=18 5
,			ੇ ਫ਼ਿੰ=70° ਫ਼ਿੰ=45°≦i<70° i<45°	/	Max=10 5
anomaly	erosior root•fa	d slope (surface collapse small fallen rock gully piping hole subsidence heaving bending of tree llen tree crack open crack anomaly of rmeasure)	2 or more correspondences clarity certain unclarity None	√	Max=5 5
		sum total	51		(A)

			effectivenes	ss of existing cour	nterme	asures			point (a)	check
cut slope	✓		Potential rockfall and slope failure are prevented enough, or, it is defended enough when it is generated.						×0	
natural slope		Potential rockfall a	and slope fail		bly pre	vented,	or it is		-20	
[Main slope disa	asters					., .				
rockfall	1		Potential rockfall and slope failure are partly prevented, or it is partly defended when it is generated. However, it is not enough for the remaining factors.						-10	✓
slope failure			There is no countermeasure, or there is not effective even if countermeasures are not performed.						±0	
[History](C)								sum t	1	51
[HISIOTY](C)		Level of disaster hi	istory		point	check				
		t large fallen rocks ar affic after constructio	nd slope failu		P					
	•	t large fallen rocks a s no obstacle to traffic	•	ures that gets to		1				
There is a histo get to the road.	ry abou	t small fallen rocks a	nd slope fail	ures that did not						
No disaster rec	orde						([)=MAX	(B,C)	
TVO disaster rec					(C)			ore in evalu m cause	uation (I	3) 51
						点 点	_	ore in evalu m history	uation (0
								nong (B)&(0 ge one.	C), (C	0)=MAX(B,C)
Overall judge	mentl			[Description]						
response	- 12		judgment							
The counterme	asure w	ork is necessary.	1							
Though the ura	ent cou	ntermeasure is not								





Full view of the slope at the beginning side







Condition of slope

Situation under slope

Management office	Ratnapura		Conordi iiilo										
Management number	A004-173	Route No	A004	Location	(m)	173/11	to		Dista	nce	100 m		
Disaster	Slope Failure	Name of Road		Landma	ark		latitude	N 06°45'57.67"	longitude	Ε	080°51′27.54″		
Schematic sketch				Report	ter's name :	M. Enokida							
± 1 − 1 − 1 − 1 − 1 − 1 − 1 − 1 − 1 − 1	. 4	, 4	- A A I	Date	of report:			24-Sep-12					
				Des	scription	Recorded Disaster: Not clear but traces of collapse can be seen. Failure Type: Slope failure involving residual soil and weathered rock,. Geological Condition: Residual soil, highly weathered feldspar quartzite, Trigger of Failure: (Supposed) Rainfall, Featured Points: Pylons of high-tension cables are located adjacent to the shoulder of the slope. Thus retrogressive failure from the shoulder may damage the pylons. Supposed countermeasures: Gentler gradient of slope, or grating crib works and ground anchors.							
				H	isrtory		Ne	ew failure Movemer	nt/extensio	า			
Location map (Scale: 1:10,000)				di	timated saster olume								
Pusselia	A004 - 173 80°51'27.54"E, 6°45'57.67"N Ayalutalawa	A004 - 80°51'48'	74 3.97"E, 6°45'45.43"N	Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):								

Management Number	A004-173

The countermeasure work is not necessary.

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses](A)			
	Item	factor			
		lactor	category of score	point	score
topography	collapsed factor	talus slope clear convex break of slope eroded toe of slope overhang, water catchment slope	3 or more correspondences 2 correspondences 1 correspondences no correspondence	<u> </u>	Max=3 2
SU	soil	susceptible to erosion less strength with water	marked a little marked None	1	Max=8 8
geological conditions	rock	high density of cracks and a weak laye susceptible to erosion fast weathering	marked a little marked None	1	Max=12 6
eologic	a.	dip slope of bedding plane	It corresponds.	√	Max=8 8
g	structure	debris on impermeability bedrock The upper part is a hard /the toe of slope is weak.	marked a little marked None	√	Max=6 6
ion	Т	opsoil, detached rock and unsteady rock	instability a little unstable stability	1	Max=12 6
surface codition		spring water	notable spring waster seepage None	1	Max=8 0
ıns		surface condition	bare land with minor vagetation intermediate (bare grass tree) mainly structure, mainly tree	1	Max=5 3
igure		dip (i) 、height	H≧50m 30≦H<50m 15≦H<30m H<15m	<u> </u>	Max=18 12
ij			i≧70° ਉ 45°≦i<70° i<45°	1	Max=10 10
anomaly	targeted slope (surface collapse small fallen rock-gully erosion piping hole subsidence heaving bending of tree root-fallen tree crack open crack anomaly of countermeasure) 2 or more corresponder certain unclarity None			√	Max=5 5
	sum total 66				

										_
[Main check o	bject]	[Countermeasur	e](B)=(A)	+α or (A)×0						+
cut slope			effectivene	ess of existing cour	nterme	asures			point(a) check
		Potential rockfall a enough when it is		ilure are prevented	enoug	gh, or, it	is defen	ded	×0	
natural slope	/	Potential rockfall a considerably defer			bly pre	vented,	or it is		-20	
[Main slope disa rockfall	asters	Potential rockfall a	nd slope fa	ilure are partly pre					-10	
slope failure	1	when it is generate There is no counte are not performed.	rmeasure,	·					±0	1
								sum t		B) 66
[History](C)		Level of disaster his	etory		noint	check				
	•	t large fallen rocks an	d slope failu		point	CHECK				
	•	t large fallen rocks ar s no obstacle to traffic	•	ures that gets to						
There is a histo get to the road.	ry abou	t small fallen rocks ar	nd slope fai	lures that did not						
No disaster reco	ords))=MAX	· · · · · · · · · · · · · · · · · · ·	B)
					(C)			m cause	lation (66
						点 点		ore in evalu m history	uation (C) 0
								nong (B)&(0 ge one.	C), (I	D)=MAX(B,C
[Overall judge	ment]			[Description]						
response			judgment							
The countermea	asure w	ork is necessary.	1							
		ntermeasure is not pections are needed.								

Management Number A004-173 Photo sheet Date 24-Sep-12





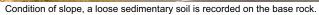


Full view of the slope from strat side

Full view of the slope from end side

Situation of slope head







Condition of slope, basement rock of dip slope structure

Management office	Ratnapura		General Inio		J., J.							
Management number	A004-174	Route No	A004	Location	(m)	175/1	to	175/3	Distan	се	100	m
Disaster	Slope Failure	Name of Road		Landma	ark		latitude	N 06°45'45.43"	longitude	E0	80°51'48.9	97"
Schematic sketch				Repor	ter's name :							
1	-A 45	h		Date	of report :			24-Sep-12				
		Hours of the state	30m	Des	scription	Recorded Disaster Failure Type: Slope Geological Condition Trigger of Failure: (Featured Points: S	: Not clear but e failure involvi on: Residual so (Supposed) Ra lope failure in v	this section, at 175/1 a t traces of collapse can ing residual soil and we oil, highly weathered ro ainfall, weathered rock, reman	n be seen. eathered rock ock, kable gully er	osion.		d
	1	(cilet.	1 4 1	Н	isrtory		New	failure Moveme	nt/extension			
Location map (Scal	e: 1:10,000)	einig	iampala Nasodi	di	timated saster olume							
Pussella	A004 - 173 80°51'27.54"E, 6°45'57.67"N Aralutalawa,	A004 - 1 80°51'48	74 3.97"E, 6°45'45.43"N	Proposed countermeasures	Type: Specifi-cation: Quantity Cost (million Birr):							

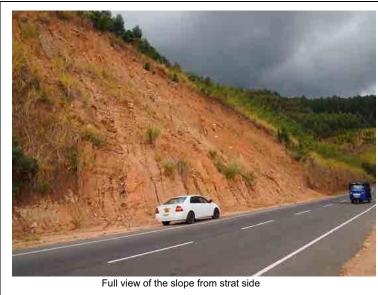
Management Number	A004-174

The countermeasure work is not necessary.

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses](A)			
	ltem	factor	category of score	point	score
topography	collapsed factor	talus slope 3 or more correspondences clear convex break of slope 2 correspondences eroded toe of slope 1 correspondences overhang, water catchment slope no correspondence			
us	soil	susceptible to erosion marked			
geological conditions	rock	high density of cracks and a weak laye susceptible to erosion fast weathering	marked a little marked None		Max=12
ologic	<u>e</u>	dip slope of bedding plane	It corresponds. None	1	Max=8 0
ge	structure	debris on impermeability bedrock The upper part is a hard /the toe of slope is weak.	marked a little marked None	1	Max=6 4
ion	Т	opsoil, detached rock and unsteady rock	instability a little unstable stability	\	Max=12 12
surface codition		spring water	notable spring waster seepage None	/	Max=8
sur		surface condition	bare land with minor vagetation intermediate (bare grass tree) mainly structure, mainly tree	>	Max=5 5
figure		dip(i)、height	H≥50m 30≦H<50m 15≦H<30m H<15m i≥70°		Max=18 12
			ਊ 45°≦i<70° i<45°	1	Max=10 5
anomaly	targeted slope (surface collapse small fallen rock gully erosion piping hole subsidence heaving bending of tree root fallen tree crack open crack anomaly of countermeasure) 2 or more correspondences clarity certain unclarity None				Max=5 5
		sum total	59		(A)

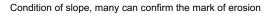
[Main check object]	[Countermeasur	•	ss of existing cour	ntarma	acuree			point(c	x) check
cut slope	Potential reakfall a					ic dofon	dod	point(c	d) CHECK
	Potential rockfall and slope failure are prevented enough, or, it is defended enough when it is generated.							×0	
natural slope	Potential rockfall a	and slope fai	lure are considera	bly pre	vented,	or it is		00	
[Main slope disasters]	considerably defer	nded when i	t is generated.					-20	
rockfall	Potential rockfall a when it is generate							-10	
slope failure	There is no counted are not performed	,	or there is not effe	ctive ev	en if co	unterme	asures	±0	1
									(B)
							sum t	otal	59
[History](C)	Level of disaster hi	story		point	check				
There is a history abou			ires that were	Pomit					
obstacles to the road tr									
There is a history abou	•	•	ures that gets to						
the road though there is									
There is a history abou get to the road.	t small fallen rocks a	nd slope fail	ures that did not						
No disaster records						([)=MAX	(B,C)	
				4 - 3			ore in evalu m cause	ation	(B)
				(C)					59
					点	_	ore in evalu m history	iation	(C) 0
					Ж	_	nong (B)&(0	2) (D)=MAX(B,C
							ge one.	,	0
								•	
[Overall judgement]			[Description]						
response		judgment							
The countermeasure w	ork is necessary.	1							
Though the urgent coul	ntermeasure is not								
necessary, regular insp	ections are needed.								





Full view of the slope from end side







Condition of slope, the slope on the start side is a slope of a steady sedimentary rock

Management office	Nuwara Eliya											
Management number	A005-043	Route No	A005	Location(m)	43/8	to	43/9	Distar	ice	50	m
Disaster	Rock Fall, Rock Slide	Name of Road		Landma	ırk <i>T</i>	all rock escarpment	latitude	N 07°03′53.46″	longitude	Ε	080°41′23.3	2"
Schematic sketch		^		Reporte	er's name :			Y Kawamura				
	M	W. Cit	>	Date o	of report :			25-Jul-12				
	Gentl	nt cross	Desc	Recorded Disaster: unclear, but small rock falls are confirmed during the site visit. Failure Type: Rock slide in weathered rock (feldspar quartzite), toppling may occur under this situation Geological Condition: Weathered rock rich in vertical open cracks, Trigger of Failure: (Supposed) Rainfall, Featured Points: There are two factors for possible hazards; fragile rock property and vertical open of Feldspar quartzite has relatively poor resistance property against weathering. At the site, outcrops me sound and strong. However with a hit of a rock hammer, surface of outcrop can be broken easily with Vertical cracks filled with clayey soil can be easily detected on site. Open vertical cracks as well. Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drawith rock bolts or removal of unstable parts.								
Kan		1 - 100	· ·	His	srtory		Nev	v failure Moveme	nt/extension			
Location map (Scale	: 1:10,000) Wewendanwatta A005-042 80°41'18.16	53"E, 7°4'4.093"N	1 3 3 40 40 10 10 10 10 10 10 10 10 10 10 10 10 10	dis	mated saster lume		damaged:	es, height form the roac up to a holizontal dista slope.		eters fr	om the road,	or up
sale(New Town)	A005-04	33 3.29"E, 7°3'53.19"N	050 050 050 050 050 050 050 050 050 050	Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):		parts (Rocl	κ): 5m * 5m * 5m * 3 sit	es, height fr	om the	road: 30m,	

Management Number	A005-043

Evaluator	Y Kawamura
Organization	JICA Study Team

[C	auses	J(A)			
	Item	factor	category of score	point	score
topography	collapsed factor	talus slope clear horseshoe break of slope eroded toe of slope overhang, water catchment slope	3 or more matches 2 matches 1 match None	/	Max=3 2
ns	soil	vulnerable to erosion less strength with water	marked a little marked None	/	Max=8 4
geological conditions	rock	dense cracks / weak layers / foliation vulnerable to erosion easy to be weathered	marked a little marked None	√	Max=12 12
ologic	<u>a</u>	dip slope of bedding plane or foliation	existing None	/	Max=8 0
e6	structure	debris on impermeable bedrock cap rocked weaker layer	marked a little marked None	√	Max=6 0
ion		Topsoil, loose rock and unstable rock	unstable moderate stable	√	Max=12 12
surface codition		spring water	notable spring waster seepage None	✓	Max=8 0
sur		surface condition	bare land with thin vagetation moderate (bare grass tree) mainly structure, mainly tree	✓	Max=5 5
figure		dip(i)、height	H≧50m 30≦H<50m 15≦H<30m H<15m	/	Max=18 12
1			i≧70° - 45°≦i<70° i<45°	/	Max=10 10
anomaly	targeted slope (surface collapse small fallen rock gully erosion piping hole subsidence heaving bending of tree fallen tree crack open crack anomaly of countermeasure) 2 or more matches 1 match None				Max=5 5
		sum total	62		(A)

aut alama	effectiveness of existing cou	effectiveness of existing countermeasures					
cut slope	Potential rockfall and slope failure are prevented enough, or, it is defended enough when it is generated.						
natural slope Potential rockfall and slope failure are moderately prevented, or it is modefended when it is generated.						-20	
rockfall 🗸	Potential rockfall and slope failure are partly pre when it is generated. However, it is not enough					-10	
slope failure	There is no countermeasure, or there is not effe are not performed.	ctive ev	en if c	ounterme	asures	±0	1
	00				sum t	otal (E	62
[History](C)		T		Ī			
	Level of disaster history	point	check				
,	arge rock falls and slope failures that blocked the bletion of latest countermeasure.	100					
There is a history of laroad but not blocked t	arge rock falls and slope failures that damaged the he traffic.	70	<				
There is a history abo damage the road.	ut small rock falls and slope failures that did not	40					
No disaster records		0		([)=MAX		
		ļ.,			ore in evalu	ation (E	
		(C)		_	m cause		62
			点		ore in evalu m history	ation (C) 0
					nong (B)&(0 ge one.	C), (D)=MAX(B

[Overall judgement]	
response	judgment
Countermeasures are necessary.	
Regular inspections are needed, in case countermeasures are not insalled.	1
Countermeasures are not necessary.	

[Description]			

Full view of the slope at the ending side



Full view of the slope at the beginning side



Condition of the slope, open cracks developed behind the rock mass almost perpendicularly.



Condition of the slope, Rock slide and rock fall are anticipated. Toppling may occur under certain condition.

Management office	Nuwara Eliya											
Management number	A005-044	Route No	A005	Location(m)	44/2	to	44/3	Distanc	е	50	m
Disaster	Rock Fall, Rock Slide	Name of Road		Landma	rk <i>T</i>	all rock escarpment	latitude	N 07°03'40,77"	longitude	E 08	80°41'33.7	9"
Schematic sketch				Reporte	er's name :			Y Kawamura				
		4/		Date o	f report:			25-Jul-12				
		Traces hocks	Desc	cription	Failure Type: Rock slide in Geological Condition: Wea Trigger of Failure: (Suppos Featured Points: There are Feldspar quartzite has rela sound and strong. Howeve Vertical cracks filled with c	weathered rock is sed) Rainfall, etwo factors atively poor reer with a hit o layey soil cares: Drainage	for possible hazards; fragile is esistance property against we farock hammer, surface of on be easily detected on site. Of ditches along the shoulder of	ock property and athering. At the outcrop can be but open vertical cra	d vertical o site, outcro roken easil cks as wel	open cracks. ops may be s ily with muffle II.	ed sound.	
Kerrely 44/2 Foliation Foliation					srtory	New failure Movement/extension						
Location map (Scale	+ Cracks then hang				mated easter lume			es, height form the road up to a holizontal distar		ers from	the road.	
ale(New Town)	A005-0 80°41'2	23.29"E, 7°3'53.19"N A005-044	12°E, 7°3'40.69°N	Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):		parts (Roc	k): 5m * 5m * 5m * 3 sit	es, height fro	m the ro	ad: 30m,	

Ма	nagement	Number	A005-044		E
[C	auses](A)		•	
	Item		factor	category of score	point
topography	collapsed factor	cle erc	us slope ar horseshoe break of slope oded toe of slope erhang, water catchment slope	3 or more matches 2 matches 1 match None	/
ons	soil	les	nerable to erosion s strength with water	marked a little marked None	1

structure

Appendix

valuation sheet (rockfall-slope failure)

Countermeasures are not necessary.

Evaluator	Y Kawamura
Organization	JICA Study Team

point(α)

×0

-20

-10

±0

sum total

(D)=MAX(B,C)

Score in evaluation from cause

Score in evaluation from history

Among (B)&(C), large one.

(B)

(B)

(C)

69

0

(D)=MAX(B,C)

69

check

score [Main check object] [Countermeasure](B)=(A)+ α or (A)×0 effectiveness of existing countermeasures cut slope Max=3 Potential rockfall and slope failure are prevented enough, or, it is defended enough when it is generated. 1 natural slope Potential rockfall and slope failure are moderately prevented, or it is moderately defended when it is generated. [Main slope disasters] Max=8 4 Potential rockfall and slope failure are partly prevented, or it is partly defended rockfall when it is generated. However, it is not enough for the remaining factors. dense cracks / weak layers / foliation marked vulnerable to erosion a little marked Max=12 There is no countermeasure, or there is not effective even if countermeasures slope failure are not performed. easy to be weathered None 12 dip slope of bedding plane or foliation existing Max=8 None 0 debris on impermeable bedrock marked a little marked [History](C) Max=6 cap rocked weaker layer None Level of disaster history point 4 check unstable There is a history of large rock falls and slope failures that blocked the 100 traffic even after completion of latest countermeasure. Topsoil, loose rock and unstable rock moderate Max=12 12 stable There is a history of large rock falls and slope failures that damaged the 70 road but not blocked the traffic. notable spring waster spring water seepage There is a history about small rock falls and slope failures that did not Max=8 40 damage the road. 4 bare land with thin vagetation No disaster records 0 surface condition moderate (bare grass tree) Max=5 (C) mainly structure, mainly tree 5 H≧50m 30≦H<50m 点 15≦H<30m Max=18 dip(i), height H<15m 12 i≥70° 45°≦i<70° [Overall judgement] Max=10 [Description] <45° 10 response judgment 2 or more matches targeted slope (surface collapse small fallen rock-gullyerosion piping hole subsidence heaving bending of tree match Max=5 Countermeasures are necessary. fallen tree · crack · open crack · anomaly of countermeasure) None 5 Regular inspections are needed, in case countermeasures are not insalled. sum total 69

(A)

Management Number A005-044 Photo sheet Date July 25, 2012





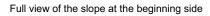


Full view of the slope at the ending side

Traces of rock slides

Sheeting joints notably developed parallel to the slope.







With foliation plunging to the slope, sheeting joints can form slip surfaces for rock slides.



Close up view of the left.
The sheeting joints have some aperture, making a rock mass apart from the out crop.

Management office	Nuwara Eliya												
Management number	A005-046	Route No	A005	Location(m)	46/5	to	46/6	Dista	nce	200	m	
Disaster	Rock Fall, Rock Slide	Name of Road		Landma	irk <i>T</i>	all rock escarpment	latitude	N 07°02'53.80"	longitude	Ε	080°41'55.54	"	
Schematic sketch				Reporte	er's name :	Y Kawamura							
			Rock with Crokes	Date o	of report:			25-Jul-12					
Gentle Vencioni Pslope Debris + fallen bonder						slide often occur during he. Failure Type: Rock slide in Geological Condition: Wea Trigger of Failure: (Suppos Featured Points: Rock wall Well developed foliation an	avy rains. weathered r thered rock r ted) Rainfall, with almost ad vertical cra es: Drainage	rich in vertical open cracks ald perpendicular slope. acks are primary causes of po ditches along the shoulder of	ong with foliati	ion, es		II rock	
	Vand.	V V	ery Steep Slope	His	srtory	y New failure Movement/extension							
Location map (Scale	Location map (Scale: 1:10,000)				mated saster lume			sites, height form the roa		lower st	eep slope.		
Malhewa 900 960	1046 1140 1140 1140 1140 1140	610	Kandamula A005-046 80°41'55.73"E, 7°2'54.11"N Rambodawatta	Proposed countermeasures	Specifi -cation:	Ring net:1,000m2 Dranage ditch (Surrou Or Deour of the road b	unding the	2 sites, Height from roa slope + vertical): 300m e jutting from the existing ply to this site, rock shed	ı road (Spo				

	nagement		A005-04	6		Ε	valuat
[C	auses](A)				I	
	Item		factor		category of score	point	score
ج	D	talus s	lope	3 c	or more matches		
topography	collapsed factor	clear h	orseshoe break of slope	2	matches		
lgo	ollapse factor	eroded toe of slope 1 mate		natch	1	Max=3	
top	S	overha	ing, water catchment slope	No	ne		1
		vulnera	able to erosion	ma	arked		
	soil	less st	rength with water	a li	ttle marked	1	Max=8
S				No	ne		4
tior		dense	cracks / weak layers / foliation	ma	arked	1	
ndi	rock	vulnera	vulnerable to erosion		a little marked		Max=12
8	2	easy to	be weathered	No	ne		12
gice		dip slo	pe of bedding plane or foliation	exi	existing		Max=8
geological conditions	<u>e</u>	None		1	0		
ge	structure	debris	on impermeable bedrock	ma	marked		
	str		kod wookor lovor		ttle marked	/	Max=6
		cap ro	cked weaker layer	No	ne		4
				un	stable	/	
		Topsoil, le	oose rock and unstable rock	mc	oderate		Max=12
ь				sta	ble		12
diti				no	table spring waster		
o o			spring water	se	epage	1	Max=8
surface codition				No	ne		4
sur				baı	re land with thin vagetatior	1	
			surface condition		derate (bare•grass•tree)		Max=5
				ma	inly structure, mainly tree	9	5
					H≧50m	1	
				height	30≦H<50m		
Ф				hei	15≦H<30m		Max=18
gure			dip(i), height		H<15m		18

i≧70° ⊖ 45°≦i<70° i<45°

None

sum total

2 or more matches 1 match

75

targeted slope (surface collapse·small fallen rock·gully-erosion·piping hole·subsidence·heaving·bending of tree-fallen tree·crack·open crack·anomaly of countermeasure)

ion sheet (rockfall-slope failure)

Evaluator	Y Kawamura
Organization	JICA Study Team

out along		effectiveness of existing of	ounterme	asures			point(α)	check
cut slope	<i></i>	Potential rockfall and slope failure are preven enough when it is generated.	ted enouç	gh, or, i	nded	×0		
natural slope Main slope disa	ately prev	ented,	or it is m	oderately	-20			
rockfall	✓	Potential rockfall and slope failure are partly purchase when it is generated. However, it is not enough					-10	
slope failure	1	There is no countermeasure, or there is not e are not performed.	ffective e	ven if c	ounterm	easures	±0	1
		00				sum t	otal (E	75
[History](C)			<u> </u>	T				
		Level of disaster history	point	check				
		ge rock falls and slope failures that blocked the etion of latest countermeasure.	100					
There is a histor road but not blo		ge rock falls and slope failures that damaged the etraffic.	9 70	✓				
There is a histor	•	small rock falls and slope failures that did not	40					
No disaster reco	ords		0		_(D)=MAX	(B,C)	
NO disaster rece	nus					core in evalu	ation (E	•
			(C)		-	om cause		75
				点		core in evaluom history	uation (C	0
				****	4	mong (B)&(0	C), (D)=MAX(B,C)

[Overall judgement]	
response	judgment
Countermeasures are necessary.	1
Regular inspections are needed, in case countermeasures are not insalled.	
Countermeasures are not necessary.	

Max=10 10

Max=5

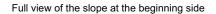
5

(A)

[Description]			

Management Number A005-046 Photo sheet Date July 25, 2012







Debris cleared up to the shoulder of the road



Full view of the slope at the ending side

Traces of rock fall or minor rock slides which occurred recently. The height from the road is around 30 meters.



Condition of the lower slope. From the shoulder of the road, very steep lower slope descends downward.



Close up view of the left. With foliation plunging to the slope, vertical cracks can form slip surfaces for rock slides.

Management office	Nuwara Eliya		General Info	Jimalio) i Oi	icci								
Management number	A005-063	Route No	A005	Location(r	m)	63/3	to		Distance		100			
Disaster	Slope Failure	Name of Road		Landma	rk		latitude	N 06°59'36.78"	longitude	E 080°4	14'53.13"			
Schematic sketch				Reporte	er's name :	M. Enokida								
				Date of	f report :			25-Sep-12						
	dich c		THE THE STATE OF T	Desc	cription	Failure Type: Rock situation. Geological Conditio Trigger of Failure: (Seatured Points: Thopen cracks. Feldspar quartzite houtcrops may be seoutcrop can be brok Vertical cracks filled Supposed counterm	tunclear, but salide in weather. The weathered supposed are two farms relatively put and as sound a sen easily with the with clayey sales.	small rock falls are contered rock (feldspar qua rock rich in vertical openinfall, actors for possible haza poor resistance property and strong. However wi	en cracks, rds; fragile rock / against weath th a hit of a roc ed on site. Ope	property a ering. At the chammer, n vertical c	r under this and vertical ne site, surface of cracks as w			
		11		His	srtory		New	failure Moveme	nt/extension					
Location map (Scale:	1:15,000)			dis	mated aster lume									
1 500 m	COS	A005-905		d counte	Type: Specifi -cation: Quantity Cost (million Birr):									

Management Number	A005-063

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses](A)					
	ltem	factor					
topography	collapsed factor	talus slope clear convex break of slope eroded toe of slope overhang, water catchment slop	oe	category of score 3 or more correspondences 2 correspondences 1 correspondences no correspondence	point	Max=3	
us	soil	susceptible to erosion less strength with water		marked a little marked None	√	Max=8 8	
geological conditions	rock	high density of cracks and a wear susceptible to erosion fast weathering	ak laye	marked a little marked None	/	Max=12 0	
ologic	e.	dip slope of bedding plane		It corresponds.		Max=8 0	
ð	structure	debris on impermeability bedrock marked The upper part is a hard /the toe of slope is weak. None		<i>\</i>	Max=6		
ion	Т	opsoil, detached rock and unsteady	rock	instability a little unstable stability	/	Max=12 6	
surface codition		spring water		notable spring waster seepage None	\	Max=8 8	
sur		surface condition		bare land with minor vagetation intermediate (bare grass tree) mainly structure, mainly tree	\	Max=5 5	
figure		dip(i)、height		H≧50m 30≦H<50m 15≦H<30m H<15m	>	Max=18 8	
ij				i≧70° 45°≦i<70° i<45°	\	Max=10 10	
anomaly	erosion root•fal	d slope (surface collapse small fallen ro piping hole subsidence heaving bend len tree crack open crack anomaly of measure)	2 or more correspondences clarity certain unclarity None	√	Max=5 5		
	sum total 52						

			effectivene	ss of existing cou	nterme	asures			point(α)	check
cut slope			Potential rockfall and slope failure are prevented enough, or, it is defended enough when it is generated.						×0	
natural slope	✓		<u> </u>							
[Main slope disa	asters]		Potential rockfall and slope failure are considerably prevented, or it is considerably defended when it is generated.							
rockfall		Potential rockfall as when it is generate							-10	
slope failure	1	There is no counte are not performed.	,	or there is not effe	ctive ev	en if co	ounterme	asures	±0	✓
[History](C)								sum t	otal	52
[i iiotoi y] (O)		Level of disaster his	story		point	check				
	•	large fallen rocks and	•							
		large fallen rocks an								
	•	no obstacle to traffic	•	ures triat gets to						
There is a historget to the road.	ry about	small fallen rocks ar	nd slope fail	ures that did not						
No disaster reco	ords) =MAX		3)
					(C)			m cause	Jation (C	52
						<u>_</u>	_	ore in evalum history	uation ((0
						点	_	ong (B)&(C) (D)=MAX(B,C)
								ge one.	J), (D	0
Overall judge	ment]			[Description]						
response	_		judgment							
The countermea	asure wo	ork is necessary.	1							
		termeasure is not ections are needed.								
The countermea	asure wo	ork is not necessary.								

Photo sheet Management Number 25-Sep-12 A005-063 Date



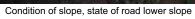




Full view of the slope from end side

Crack of retaining wall on part slope on road







Condition of slope, house under slope

Management office	Badulla	1	General Info	omalic	اک اار	ieei					
Management number	A005-091	Route No	A005	Location(m)	91+019	to		Distance	30	m
Disaster	Slope Failure (Collapse)	Name of Road		Landma	rk Signi	board "caution landslide"	latitude	N 06°54'12.76"	longitude	E 080°51'39.1	9"
Schematic sketch		À	-	Reporte	er's name :		<u> </u>	Y Kawamura			
		Cues	ss. Sec,	Date o	f report :			25-Jul-12			
		thered thered	per cracks subsidence	Desc	cription	Recorded Disaster: Every radue to the debris from the fa Failure Type: Slope failure in Geological Condition: Residing of Failure: Rainfall, radinger of Failures with exite. The actual gradient Gully erosion was also confill addition, many open cracic Successive slope failures with anticipated. Supposed countermeasures unstabe parts behind the ships of the sh	ilure. In residual soi ual soi and w ise in ground ter collection If slope is app of slope at the rmed. Its were confinite can enta Its Reshaping	Il and weathered rock. veathered rock. Il water level, g vally, parently too steep for the hea ne section is 80 ~ 90 degrees irmed behind the head scarp till retrogressive development the slope with stable angle of	ivily weathered rocks. tof failures behind torgrating cribs with	and residual soil co ne shoulder of the s ground anchors. Re	onfirmed a lope are moval of
	Ro	Rock Very steep slope Mit. + deep valley					New	r failure Movemer	nt/extension		
Location map (Scale	e: 1:10,000)	(B)	Valley Liyadipitar	dis	mated aster lume	Slope failure (collapse) Supposed area to be d			ning along the lo	wer slope.	
1270 1300 1300 Rajakaduruwelagama 1990	147g Paul	A005 - 091 80°51'23.65"E, 6°54'27	.73"N	Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):	Removal of Soil + Wea Concrete Crib + Ancho Dranage ditch (Surrour	r(L=20m):	510m2 + Vegetation:51	0m2		

Management Number	A005-091

Regular inspections are needed, in case countermeasures are not insalled.

Countermeasures are not necessary.

Evaluator	Y Kawamura
Organization	JICA Study Team

[C	auses](A)					
	Item	factor	category of score	point	score		
topography	collapsed	talus slope clear horseshoe break of slope eroded toe of slope overhang, water catchment slope	3 or more matches 2 matches 1 match None	/	Max=3		
JS	soil	vulnerable to erosion less strength with water	marked a little marked None	✓	Max=8		
geological conditions	rock	dense cracks / weak layers / foliation vulnerable to erosion easy to be weathered	marked a little marked None	✓	Max=12 12		
ologic	re J	dip slope of bedding plane or foliation	existing None	✓	Max=8 8		
A Geo	structure	debris on impermeable bedrock cap rocked weaker layer	marked a little marked None	/	Max=6		
on C		Topsoil, loose rock and unstable rock	unstable moderate stable	\	Max=12 12		
surface codition		spring water	notable spring waster seepage None	/	Max=8		
ins		surface condition	bare land with thin vagetation moderate (bare grass tree) mainly structure, mainly tree	\	Max=5 5		
figure		dip(i)、height	H≧50m 30≦H<50m 15≦H<30m H<15m		Max=18 5		
ij			i≧70° 45°≦i<70° i<45°	\	Max=10 10		
anomaly	targete erosior fallen ti	d slope (surface collapse small fallen rock gully piping hole subsidence heaving bending of tree ree crack open crack anomaly of countermeasure)	2 or more matches 1 match None	√	Max=5 5		
	sum total 71						

out along			effectivenes	ss of existing cou	nterme	asures			$point(\alpha)$	check
cut slope	✓	Potential rockfall enough when it is	•	ure are prevented	d enoug	jh, or, it i	s defen	ded	×0	
natural slope Main slope dis	asters	Potential rockfall defended when i	•	ure are moderate	ly prev	ented, or	it is mo	oderately	-20	
rockfall			•	ure are partly pre			-		-10	1
slope failure	1	are not performe		r there is not effe	ctive ev	en if cou	ınterme	asures	±0	
		00						sum t	otal (B	71
[History](C)									<u> </u>	
		Level of disaster l			point	check				
	,	ge rock falls and slo etion of latest count	•	it blocked the	100					
There is a historoad but not bl		ge rock falls and slo e traffic.	ope failures tha	at damaged the	70	✓				
There is a histodamage the ro	•	small rock falls an	d slope failure	s that did not	40					
No disaster red	cords				0		1)	O)=MAX		
					(C)			ore in evalu m cause	ation (B) 71
						_ 点	_	ore in evalu	ation (C	0
						ZIII.		nong (B)&(0	C), (D)	=MAX(B,C
Overall judg	ementl			[Description]			<u>. </u>		•	
,										

Management Number A005-091 Photo sheet Date July 25, 2012







Full view of the site

Condition of the slope. Heavily weathered condition are understood. Foliation and cracks developed densely and helped weathering proceed.

Open craks seen at the terraces on the upper slope.



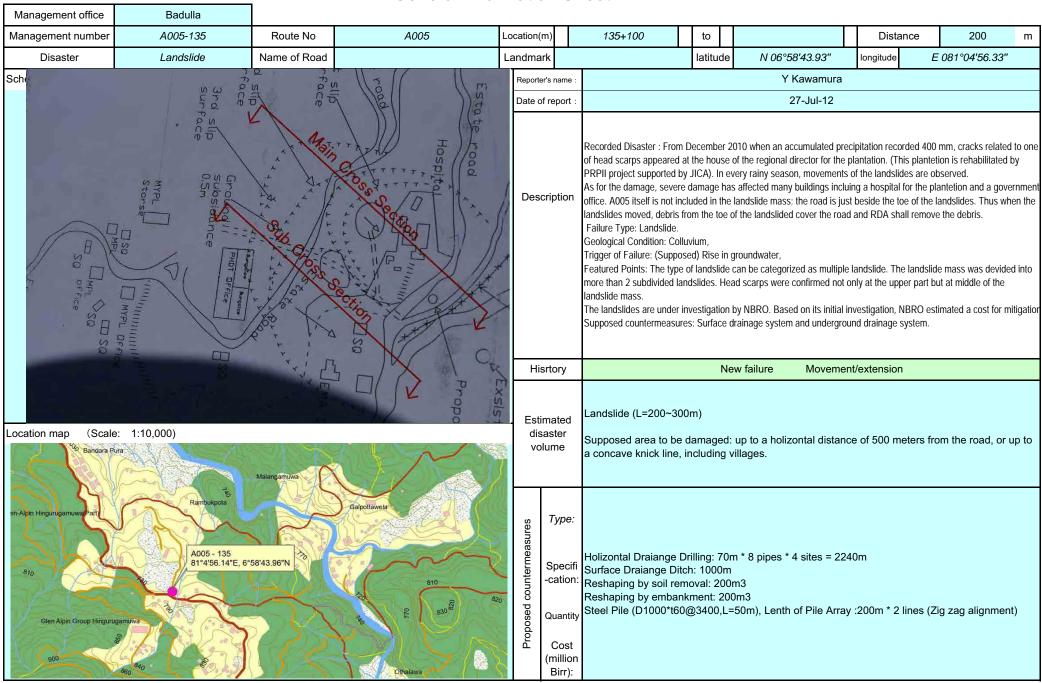




Open craks along with subsidence seen at the terraces .

Seen from the shoulder of the failure

Signboard warning the landslide



A005-135

Evaluation sheet (landslide)

Evaluator	Y Kawamura
Organization	JICA Study Team

[Causes] (A)

		Category	Check	score
	DI 1	clearly indentified		
	Photo interpretation	identified partially or unclearly	1	Max=30
	interpretation	unclearly identified		15
Topographical factor		large and new cracks, steps and subsidence	1	
	Surface	small and old cracks, steps and subsidence		
	anomalies	slight deformation		Max=30
		no anomalies		30
	0 1 1	fault, fracture zone, shear zone	1	
	Geological structure	dip slope		Max=18
	diadiaic	undip slope/ no characteristic feature		18
		colluvium	1	
		Gneiss		
		Charnokite		
	Main rock formation of	Quartzite		
Geological conditions	landslide body	Marble		
conditions		Schist		
		Serpentite		Max=7
		Granite		7
		much springs / much seepage		
	Hydrological	little springs /little seepage	1	
	feature	trace of water		Max=10
		no water observed		7
	•	sum total	77	(A)

[History] (B)

Category			Check	score
Records of Landslide	Existing record	obvious	✓	
	(documents or patrimony) Damage on road facilities and	slight		
		none		
		obvious	✓	
		slight		
		none		

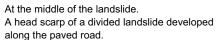
[Countermeasure] (c)

[Countermediano] (c)						
Category			score			
There is no countermeasure			±0			
Effectiveness of countermeasure	not working		±0			
	partially working		-20			
	completely working		×0			
•	77	(B)				

Monitoring			score
There is monitoring for la			
Monitoring devices			
Organization			

[Description]

[Description]		
0		





Toe of the landslide. Hospitals and houses were destructed by the landslide movement.



Toe of the landslide.

Debris from the landslide accumulated and closed the road when the landslide was activated.



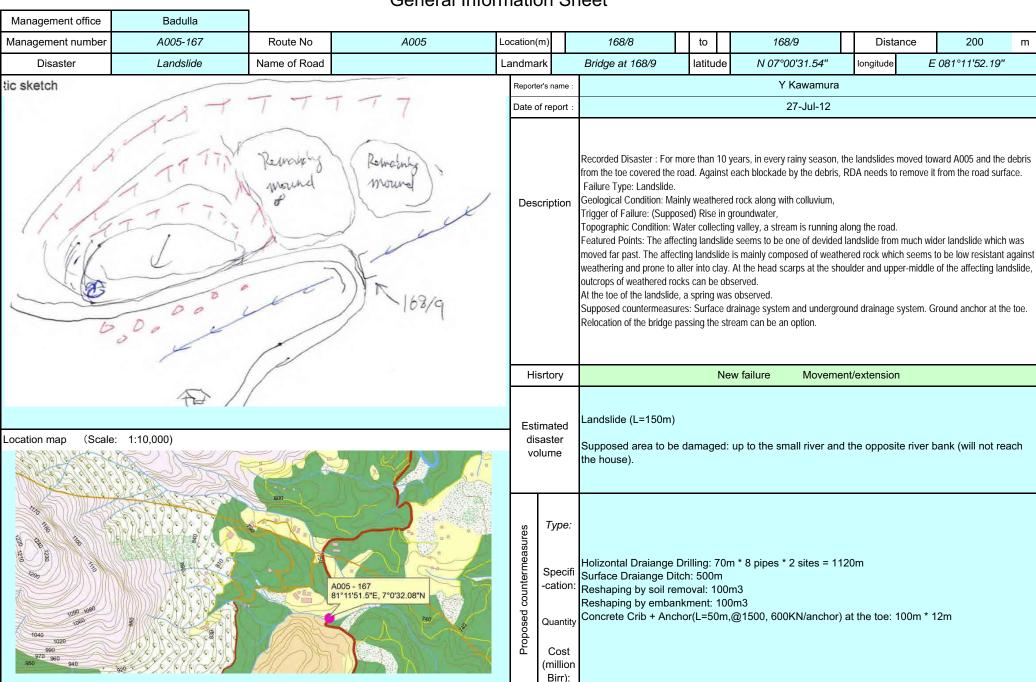
Cracks at the middle of landslide.



Seeing downward from the middle of the landslide. Houses may be affected by the landslide movements.



Escarpment of a divided landslide.



A005-167

Evaluation sheet (landslide)

Evaluator	Y Kawamura
Organization	JICA Study Team

[Causes] (A)

		Category	Check	score
	51	clearly indentified	1	
	Photo interpretation	identified partially or unclearly		Max=30
	interpretation	unclearly identified		30
Topographical factor		large and new cracks, steps and subsidence	1	
idotoi	Surface	small and old cracks, steps and subsidence		
	anomalies	slight deformation		Max=30
		no anomalies		30
	0 1 1	fault, fracture zone, shear zone	1	
	Geological structure	dip slope		Max=18
	diadaic	undip slope/ no characteristic feature		18
	Main rock formation of landslide body	colluvium	1	
		Gneiss	1	
		Charnokite		
0 1 1		Quartzite		
Geological conditions		Marble		
conditions		Schist		
		Serpentite		Max=18
		Granite		10
		much springs / much seepage	1	
	Hydrological	little springs /little seepage		
	feature	trace of water		Max=10
		no water observed		10
		sum total	98	(A)

[History] (B)

	Category			score
	Existing record	obvious	1	
	Damage on road facilities and	slight		
Records of		none		
Landslide		obvious	1	
		slight		
		none		

[Countermeasure] (c)

[esame:measure] (e)						
Category			score			
There is no countermeasure			±0			
Effectiveness of countermeasure	not working		±0			
	partially working		-20			
	completely working		×0			
	Score in evaluation from cause					

Monitoring			score
There is monitoring for la			
Monitoring devices			
Organization			

[Description]

[Description]		
0		

Appendix 3-2 33





Full view of the landslide

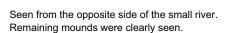
At the toe of the landslide, seepage of water was confirmed

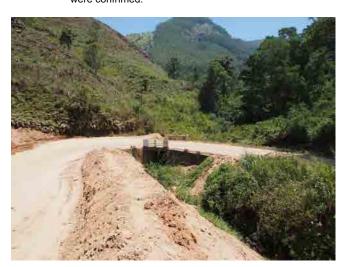
Head scarp Along the main head scarp, several divided head scarps were confrimed.



Open cracks were seen at the middle of the landslide.







The bridge and the cleaned up debris.

Amount of the debris is so big that the river course is about to be closed.

Management office	Kegalle		Gorioral inio								
Management number	A007-031	Route No	A007	Location((m)	31/1	to	31/2	Dist	ance	100 m
Disaster	Slope Failure	Name of Road	me of Road L		ark		latitude	N 06°59'45.99"	longitude	Е	080°21'05.82"
Schematic sketch				Report	er's name :			M. Enokida			
	17			Date o	of report :			25-Sep-12			
A A MITTING A P P P P P P P P P P P P P P P P P P			Recorded Disaster: Slope failure in lower slope moved away the shoulder. Cracks appear the payment. Failure Type: Slope failure in residual soil and weathered rock. Geological Condition: Residual soil and weathered rock. Trigger of Failure: (Supposed) Erosion of toe of the slope by Kelani River, and steeper gra of slope. Featured Points: Slope failure by river erosion. Supposed countermeasures: Retaining wall against the eriosion as well as to reinforce the slope.						and steeper gradient		
	1 1/1/		100	Hi	srtory	New failure Movement/extension					
Location map (Scale: 1:10,000)		dis	imated saster blume								
90 (2)	Kahatapanawa	007-031 D'2215.82"E, 6"59'45.99'N	Suspension Bridge	Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):						

Management Number	A007-031

Evaluator	M.Enokida
Organization	JICA Study Team

[Causes](A) Item factor category of score point score 3 or more correspondences talus slope topography collapsed factor clear convex break of slope 2 correspondences eroded toe of slope 1 correspondences Max=3 overhang, water catchment slope no correspondence 2 susceptible to erosion marked a little marked less strength with water Max=8 None 8 high density of cracks and a weak laye marked susceptible to erosion a little marked Max=12 fast weathering None 0 dip slope of bedding plane It corresponds. Max=8 None 0 debris on impermeability bedrock marked a little marked The upper part is a hard /the toe of Max=6 slope is weak. None 0 instability Topsoil, detached rock and unsteady rock a little unstable Max=12 stability 6 notable spring waster spring water seepage Max=8 None bare land with minor vagetation intermediate (bare · grass · tree) surface condition Max=5 mainly structure, mainly tree 3 H≧50m 30≦H<50m 15≦H<30m Max=18 dip(i), height H<15m 8 i≧70° 45°≦i<70° Max=10 <45° 10 targeted slope (surface collapse small fallen rock gully erosion piping hole subsidence heaving bending of tree 2 or more correspondences clarity certain • unclarity Max=5 root-fallen tree-crack-open crack-anomaly of 5 None countermeasure) sum total 42 (A)

[Main check object] [Countermeasure](B)=(A)+ α or (A)×0 effectiveness of existing countermeasure]						ntermeasures) check
cut slope		Potential rockfall a					t is defen	ded	<u> </u>	.,
natural slope	1	enough when it is	generated.						×0	
<u> </u>		Potential rockfall a	•		ıbly pre	vented	, or it is		-20	
[Main slope dis	asters]	considerably defer				it i-		fonded		
rockfall		when it is generate	•						-10	
slope failure	1	There is no counte are not performed.		or there is not effe	ctive e	ven if c	ounterme	asures	±0	1
									(B)
								sum f	total	42
[History](C)										
[i liotory](O)		Level of disaster his	story		point	check				
	•	t large fallen rocks and	•							
		affic after construction								
	•	t large fallen rocks an s no obstacle to traffic	•	ures that gets to						
		t small fallen rocks ar		ures that did not						
get to the road.	-		•							
No disaster rec	ords)=MAX	· / I.	
					(C)			ore in evalı m cause	uation (B) 42
					(0)			ore in eval	uation ((C)
						点		m history		0
								nong (B)&(C), (D)=MAX(B,C
							lar	ge one.		0
Overall judge	ementl			[Description]						
, ,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		judgment	[
response			Juagment							
The counterme	asure w	ork is necessary.	✓							
0 0		ntermeasure is not ections are needed.								
The counterme	asure w	ork is not necessary.								

Condition of slope, state of road lower slope

Photo sheet A007-031 Management Number 25-Sep-12 Date Full view of the slope from end side Full view of the slope from strat side

Condition of slope, state of road upper slope

Management office	Nuwara Eliya		General infor	mati	OH OH	icci								
Management number	A007-045	Route No	A007	Location	n(m)	45	to		Distance	200	m			
Disaster	Slope Failure	Name of Road		Landm	ark		latitude	N 06°59'36.70"	longitude	E 080°27'02	2.68"			
Schematic sketch	chematic sketch							M. Enokida						
						Date of report: 25-Sep-12 TRECOIDED DISASTELL OFFICIENT AMERICAN FORMATION OF STREET SECRET OFF STREET.								
2000 1 2000 1 2000 1 1 1 1 1 1 1 1 1 1 1					scription	colluvium Trigger of Failure: (\$ Featured Points: Bo Boulders were also were seen at the sh Supposed counterm countermeasures. B	fall, slope failin: At the ending a counterm fail fail fail fail fail fail fail fail	ure in colluvium. ng part, massive rock wantall, erosion, and develoen at the shoulder of opper slopes. In addition	with cracks, at the comment of op- cutting slope or , unstable parts uired to set up removal of bou	ne beginning pen cracks Imposed of controp with appropriate liders and unsigned.	Illuvium. th cracks table parts			
	00491	, 6		Н	Hisrtory New failure Movement/extension									
Location map (Scale: 1:10,000) Porwayerla				di	timated isaster olume									
A007 80°27 Geekiyanagedara	- 045 -2 68°E, 6°59'36.7°N	Sandasirigama S	Wetakeyadeniyawatta A007 - 047 80°2741.11″E. 6°59′29.81″N	Proposed countermeasures	Type: Specifi-cation: Quantity									
7427	Kallatranda		Wesimolandwalta		Cost (million Birr):									

Management Number	A007-045

The countermeasure work is not necessary.

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses	J(A)				
	tem	factor		anta nami af annu	n a in t	
topography	collapsed factor	talus slope clear convex break of s eroded toe of slope overhang, water catch	•	category of score 3 or more correspondences 2 correspondences 1 correspondences no correspondence	point	Max=3
ns	soil	susceptible to erosion less strength with wate	r	marked a little marked None	√	Max=8 8
geological conditions	rock	high density of cracks a susceptible to erosion fast weathering		marked a little marked None	1	Max=12 6
ologic	ıre	dip slope of bedding pl	ane	It corresponds. None	1	Max=8 0
ge	structure	debris on impermeabili The upper part is a har slope is weak.	•	marked a little marked None	/	Max=6
ion	T	opsoil, detached rock and	unsteady rock	instability a little unstable stability	/	Max=12 12
surface codition		spring water		notable spring waster seepage None	✓	Max=8 0
ıns		surface condition	on	bare land with minor vagetation intermediate (bare-grass-tree) mainly structure, mainly tree	>	Max=5 5
figure		dip(i)、height	H≧50m 30≦H<50m 15≦H<30m H<15m	<u> </u>	Max=18 5	
				i≥70° 45°≤i<70° i<45°	1	Max=10 10
anomaly	erosion root•fal	d slope (surface collapse sma · piping hole · subsidence · hea len tree · crack · open crack · an measure)	ving • bending of tree	2 or more correspondences·clarity certain·unclarity None	√	Max=5 5
			sum total	56		(A)

cut slope			effectivene	ess of existing cou	nterme	asures			point(a) check
<u> </u>		Potential rockfall a enough when it is		lure are prevented	d enoug	jh, or, it	is defend	ded	×0	
natural slope	✓	Potential rockfall a	nd slope fai	lure are considera	bly pre	vented,	or it is		-20	
[Main slope disa	asters]	considerably defer	nded when i	t is generated.					-20	
rockfall		Potential rockfall a when it is generate	•						-10	
slope failure	1	There is no counter are not performed.		or there is not effe	ctive e	en if co	unterme	asures	±0	1
		<u> </u>							((B)
								sum t	otal	56
[History](C)										1
[i iistory](C)		Level of disaster his	storv		point	check				
There is a histo	ry abou	it large fallen rocks an		ires that were	F					
obstacles to the	road to	raffic after construction	of recent r	neasures.						•
	•	it large fallen rocks ar	•	ures that gets to						
		s no obstacle to traffic								
There is a histo get to the road.	ry abou	it small fallen rocks a	nd slope fail	ures that did not						
get to the road.							([)=MAX	(B.C.)	
No disaster rec	ords							ore in evalu		(B)
					(C)			m cause		56
						L		ore in evalu	ation	(C)
						点	fro	m history		0
								ong (B)&(0	C), (D)=MAX(B,C
							iar	ge one.		0
Overall judge	ment]			[Description]						
response			judgment							
The counterme	asure w	ork is necessary.	1							
Though the ura	ent cou	ntermeasure is not								
		pections are needed.								







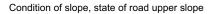


Full view of the slope from strat side

Full view of the slope from end side

Condition of slope, house under slope







Condition of slope, state of road upper slope

Management office	Nuwara Eliya										
Management number	A007-054	Route No	A007	Location	(m)	54/1	to		Distan	е	100 m
Disaster	Slope Failure	Name of Road		Landma	ark		latitude	N 06°59'15.85"	longitude	Ε	080°29'45.50"
Schematic sketch				Report	er's name :			M. Enokida			
		1	MAK	Date	of report :			25-Sep-12			
The state of the s						pavement. Failure Type: Slope Geological Condition Trigger of Failure: (\$ Featured Points: Th the upper slope. Supposed counterm	failure in resin: Residual s Supposed) Ratere were 2 sl neasures: Fur		eper gradient under the sho quired to set u	of sloulder a	pe. and another was in ropriate
1 1	-I		1	H	isrtory		New	failure Moveme	nt/extension		
Location map (Scale: 1:10,000)				di	iimated saster blume						
undugolla alalakoladeniya	Oinigeithena A007-0 80°2944 B0°2944 B0°2944 B0°2944	054 5.5°E, 6°59'15.85°N		Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):						

Management Number	A007-054

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses](A)		_		
	tem	factor		antagon, of coore	noint	20050
topography	collapsed factor	talus slope clear convex break of s eroded toe of slope overhang, water catchi	•	category of score 3 or more correspondences 2 correspondences 1 correspondences no correspondence	point	Max=3
ns	soil	susceptible to erosion marked				
geological conditions	rock	high density of cracks a susceptible to erosion fast weathering		marked a little marked None	/	Max=12 0
ologic	ē	dip slope of bedding pla	ane	It corresponds. None	1	Max=8 0
ge	structure	debris on impermeabili The upper part is a har slope is weak.		marked a little marked None	/	Max=6
ion	Т	opsoil, detached rock and	instability a little unstable stability	✓	Max=12 12	
surface codition	spring water			notable spring waster seepage None	1	Max=8
sur	surface condition			bare land with minor vagetation intermediate (bare-grass-tree) mainly structure, mainly tree	/	Max=5 3
figure		dip(i)、height	H≧50m 30≦H<50m = 15≦H<30m H<15m	<u> </u>	Max=18 8	
				i≧70° 45°≦i<70° i<45°	1	Max=10 10
anomaly	erosion root•fal	d slope (surface collapse sma i piping hole subsidence hear llen tree crack open crack an rmeasure)	ving · bending of tree	2 or more correspondences clarity certain unclarity None	√	Max=5 5
			sum total	48		(A)

			effectivene	asures			point(α)	check		
cut slope			Potential rockfall and slope failure are prevented enough when it is generated.				d enough, or, it is defended			
natural slope	✓	Potential rockfall a		lure are considera	hly pre	vented	or it is			
[Main slope disa	asters]	considerably defen	•		ibly pie	venteu	, 01 11 13		-20	
rockfall			Potential rockfall and slope failure are partly prevented, or it is partly defended when it is generated. However, it is not enough for the remaining factors.							
slope failure	1	There is no counte are not performed.	,	or there is not effe	ctive e	en if co	ounterme	asures	±0	✓
[History](C)								sum 1	total (E	48
[i iiotoi y] (O)		Level of disaster his	story		point	check				
	•	: large fallen rocks and	•							
	•	large fallen rocks an	•	ures that gets to						
There is a histo get to the road.	ry about	small fallen rocks ar	nd slope fail	ures that did not						
No disaster rec	ords) =MAX	- I.	3)
					(C)			m cause	uation (-	48
						点	_	ore in evalum history	uation ((0
						灬		ong (B)&(C) (E)=MAX(B,C
								ge one.	0),	0
[Overall judge	ment]			[Description]						
response			judgment							
The countermea	asure wo	ork is necessary.	1							
		ntermeasure is not ections are needed.								
The countermea	asure w	ork is not necessary.								

Management Number A007-031 Photo sheet Date 25-Sep-12

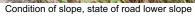




Full view of the slope from strat side

Full view of the slope from end side







Condition of slope, house under slope

	N E	1	General Info	IIIIau	ای اار	ieei						
Management office	Nuwara Eliya	Doute No.	4007	1 + : /		57/9	to		Dieten		200 m	
Management number	A007-057	Route No	A007	Location(57/9	to	N 0005014.4 FO!!	Distar			
Disaster	Slope Failure	Name of Road		Landma			latitude	N 06°58'14.53"	longitude	E 080°	230'44.03"	
Schematic sketch					er's name :			M. Enokida				
		-	*1-A	Date o	f report:			25-Sep-12				
old Landslide The state of the				Des	Recorded Disaster: Debris provided from the slope failure closs Failure Type: Slope failure in residual soil and weathered rock. Geological Condition: Residual soil and weathered gneiss rich the attention. Trigger of Failure: (Supposed) Rainfall, erosion, and steeper gr Featured Points: Springs were confirmed in the middle of the si Supposed countermeasures: Further investigation is required to countermeasures. Based on the site situation, however, draian ground anchors can be amongst the supposed.					ock. rich in cracks. Vertical cracks a er gradient of slope. ne slope at the beginning side. red to set up appropriate		
-		1012	100 m	His	srtory	New failure Movement/extension						
Location map (Scale	e: 1:10,000)			dis	mated aster lume							
				Proposed countermeasures	Type: Specifi -cation: Quantity Cost (million Birr):							

A007-057

Evaluation sheet (landslide)

Evaluator	M.Enokida
Organization	JICA Study Team

[Causes] (A)

		Category	Check	score
	Described about	exist clearly		
	Result of photo interpretation	exist but partial and not clear	1	Max=30
	interpretation	exist but not clear		15
Topographical factor		large and new cracks, steps and subsidence		
	Surface	small and old cracks, steps and subsidence	1	
	anomalies	slight deformation		Max=30
		no anomalies		20
	0 1	fault, fracture zone		
	Geological structure	dip slope		Max=18
	diadare	undip slope/ no characteristic feature	1	0
		colluvium	1	
		Gneiss		
		Charnokite		
	Main rock formation of	Quartzite		
Geological conditions	landslide body	Marble		
conditions	,	Schist		
		Serpentite		Max=18
		Granite		7
		much springs / much seepage		
	Hydrological	little springs /little seepage		
	feature	trace of water		Max=10
		no water observed	1	0
		sum total	42	(A)

[History] (B)

Category				score
	Existing record obvious			
	(documents or	slight	✓	
Records of	patrimony)	none		
Landslide	Damage on road facilities and	obvious		
		slight	1	
	houses	none		

[Countermeasure] (c)

	Category	Check	score
There is no countermea	✓	±0	
	No effect		±0
Effectiveness of countermeasure	Some effect		-20
	High effect		×0
	Score in evaluation from cause	42	(B)

	Check	score	
There is monitoring for la			
Monitoring devices			
Organization			

[Description]

Management Number	A007-057

Evaluator	M.Enokida
Organization	JICA Study Team

[C	auses](A)			
	Item	factor	category of score	point	score
topography	collapsed factor	talus slope clear convex break of slope eroded toe of slope overhang, water catchment slope	3 or more correspondences 2 correspondences 1 correspondences no correspondence	/	Max=3
ns	soil	susceptible to erosion less strength with water	marked a little marked None	√	Max=8 8
geological conditions	rock	high density of cracks and a weak laye susceptible to erosion fast weathering	marked a little marked None	/	Max=12 0
ologic	ē	dip slope of bedding plane	It corresponds. None	1	Max=8 0
ab	structure	debris on impermeability bedrock The upper part is a hard /the toe of slope is weak.	marked a little marked None	1	Max=6
ion	Т	opsoil, detached rock and unsteady rock	instability a little unstable stability	\	Max=12 12
surface codition		spring water	notable spring waster seepage None	/	Max=8
sur		surface condition	bare land with minor vagetation intermediate (bare · grass · tree) mainly structure, mainly tree	✓	Max=5 5
figure		dip(i)、height	H≧50m 30≦H<50m 15≦H<30m H<15m	/	Max=18 8
ij			i≧70° ਊ 45°≦i<70° i<45°	✓	Max=10 5
anomaly	erosior root•fa	d slope (surface collapse small fallen rock gully inpining hole subsidence heaving bending of tree llen tree crack open crack anomaly of measure)	2 or more correspondences clarity certain unclarity None	<u></u>	Max=5 5
	sum total 49				

			effectivene	ess (of existing cour	ntermeasures				point	(a)	check
cut slope		Potential rockfall as enough when it is	•	ilure	e are prevented	enou	gh, or, i	t is defe	nded	×0		
natural slope	/	Potential rockfall and considerably defen	•			bly pre	evented	, or it is		-20		
[Main slope dis rockfall	astersj	Potential rockfall as when it is generate	nd slope fa	ilure	are partly prev					-10		
slope failure	1	There is no counte are not performed.	rmeasure,	_						±0		✓
[History](C)									sum	total	(B)	49
[History](C)		Level of disaster his	story			point	check					
		t large fallen rocks and affic after construction	d slope failu			P						
	•	t large fallen rocks an s no obstacle to traffic	•	lures	s that gets to							
There is a histoget to the road.	•	t small fallen rocks ar	nd slope fai	lure	s that did not							
No disaster rec	ords							_(D)=MAX	(B,C)		
						(C)			core in eval om cause	uation	(B)	49
							点		core in eval om history	uation	(C)	0
									mong (B)&(arge one.	C),	(D)=N	MAX(B,C
[Overall judge	ement]			ſ	Description]			_				
response			judgment	Ī								
The counterme	asure w	ork is necessary.	1									
		ntermeasure is not pections are needed.										
The counterme	asure w	ork is not necessary.										

Photo sheet Management Number A007-057 25-Sep-12 Date







Full view of the slope from end side







Adjoining old collapse ground

		1	General Infor	mauc	اک الر	ieei					
Management office	Badulla	,									
Management number	A016-010	Route No	A016	Location(m)	10/12	to	11/2	Distance	200	m
Disaster	Landslide	Name of Road		Landma	rk Alley o	of drum cans along the shoulder	latitude	N 06°47'33.30"	longitude	E 080°58'24.67	7"
Schematic sketch		lane was	A		er's name :			Y Kawamura			
		garden >	M	Date o	f report:			27-Jul-12			
gross lavel. Grand Hapartale demage demage orien control con				Recorded Disaster: From 1996, landslide activities have been observed every 2 years. This landslide affects the road running at its middle and houses located downstream of its Failure Type: Landslide. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Rise in groundwater, Featured Points: When the toe of the landslide moves triggered by a rainfall, the body of landslide activities have been observed every 2 years. This landslide affects the road running at its middle and houses located downstream of its failure Type: Landslide. Featured Points: When the toe of the landslide moves triggered by a rainfall, the body of landslide activities have been observed every 2 years. This landslide affects the road running at its middle and houses located downstream of its failure Type: Landslide. Featured Points: When the toe of the landslide moves triggered by a rainfall, the body of landslide.							side the
		(年)		His	srtory		New	r failure Moveme	nt/extension		
Location map (Scale	e: 1:10,000)	Cross Seci		dis	mated aster lume	Landslide (L=500m) Supposed area to be d village up to the church				rer slope, includin	g the
1580	CAHAPA PARAMETER AND PARAMETER	80°58'24.8"E, 6'	A016 - 010 47'33.24"N	Proposed countermeasures	-cation:	Holizontal Draiange Drilling: 70m * 8 pipes * 3 sites = 1680m Surface Draiange Ditch: 1500m Reshaping by soil removal: 100m3 Reshaping by embankment: 100m3 Steel Pile (D1200*t60@2600,L=50m), Lenth of Pile Array :200m * 2 lines (Zig zag alignment) ost llion				ent)	

A016-010

Evaluation sheet (landslide)

Evaluator	Y Kawamura
Organization	JICA Study Team

[Causes] (A)

		Category	Check	score	
	51. /	clearly indentified	√		
	Photo interpretation	identified partially or unclearly		Max=3	
	interpretation	unclearly identified		30	
Topographical factor		large and new cracks, steps and subsidence	1		
iacioi	Surface	small and old cracks, steps and subsidence			
	anomalies	slight deformation		Max=3	
		no anomalies		30	
		fault, fracture zone, shear zone			
	Geological structure	din sione			Max=1
		undip slope/ no characteristic feature	1	0	
	Main rock	colluvium	1		
		Gneiss			
		Charnokite			
		Quartzite			
Geological conditions	formation of landslide body	Marble			
Conditions	, , , , , , , , , ,	Schist			
		Serpentite		Max=1	
		Granite		7	
		much springs / much seepage			
	Hydrological	little springs /little seepage	1		
	feature	trace of water		Max=1	
		no water observed		7	
		sum total	74	(A)	

[History] (B)

		Category	Check	score
	Existing record	obvious	✓	
	(documents or patrimony) Damage on road facilities and	slight		
Records of		none		
Landslide		obvious	✓	
		slight		
		none		

[Countermeasure] (c)

Category			score
There is no counterme	re is no countermeasure		±0
Effectiveness of countermeasure	not working		±0
	partially working		-20
	completely working		×0
	Score in evaluation from cause	74	(B)

Monitoring			score
There is monitoring for landslide			
Monitoring devices			
Organization			

[Description]

[Description]		
0		



Damage on the road at the middle of the landslide



Headscarp along the road shoulder at the ending side



Condition of the road around the head scarp at the ending side.



Subsidence on the road at the beginning side.



Tension cracks along the shoulder of the road at the beginning side.



Village developed downward of the toe of the landslide The debris is said to turn into mud flow when the landslide is activated, so the supposed affected area of the landslide can reach to the middle of the village, around the church.

Management office	Kandy										
Management number	A113-015	Route No	A113	Location	n(m)	16/5	to	16/6	Distanc	e 50	m
Disaster	Landslide	Name of Road		Landma	ark Alley	of drum cans along the shoulder	latitude	N 07°03'42.53"	longitude	E 080°32'15.	27"
Schematic sketch	Schematic sketch			Repor	ter's name	:		Y Kawamura			
				Date	of report			24-Jul-12			
Not med ABOI3 And hed years Pail ABOI3 And hed years Poll ABOIS And hed years Open crack when subsidence wh				scription	Recorded Disaster: Periodical records of landslide activity. In every rainy season, especially in December, gaps have developed on the pavement with an aperture of 4 ~ 6 inches (10 ~ 15cm). The gaps correspond to the head scarp of lower landslide. Failure Type: Landslide.						
15C1 //	11	7	5 los onghe	Н	lisrtory		New failure Movement/extension				
Shamfork	e: 1:10,000) Dodesbage Rord 8	Wer 1	610	di	timated isaster olume	Landslide (L=50+m) Supposed area to be	damaged:	up to the Mahaweli Rive	r.		
Weekanda Pala Iganuwa Road Insal Road		Malian A113 - 015 80°32'14.99"E, 7°3'4 Mallanda Bridge	Medagahawatura Medagahawatura Medagahawatura Say Say Say Say Say Say Say S	Proposed countermeasures	-catior	Holizontal Draiange D i Surface Draiange Dito : Reshaping by soil rem Reshaping by embanl Concrete Crib + Anch y Retaining wall along the	ch: 500m noval: 100 kment: 10 or(L=50m	0m3 ,@1500, 600KN/anchor)		lm * 12m	

A113-015

Evaluation sheet (landslide)

Evaluator	Y Kawamura
Organization	JICA Study Team

[Causes] (A)

		Category	Check	score
		clearly indentified		
	Photo interpretation	identified partially or unclearly	✓	Max=3
	interpretation	unclearly identified		15
Topographical factor		large and new cracks, steps and subsidence	✓	
factor	Surface	small and old cracks, steps and subsidence		
	anomalies	slight deformation		Max=3
		no anomalies		30
		fault, fracture zone, shear zone	1	
	Geological structure	dip slope		Max=1
		undip slope/ no characteristic feature		18
	Main rock	colluvium	✓	
		Gneiss		
		Charnokite		
0 1 1		Quartzite		
Geological conditions	landslide body	Marble		
oonditions	,	Schist		
		Serpentite		Max=1
		Granite		7
		much springs / much seepage		
	Hydrological	little springs /little seepage		
	feature	trace of water	1	Max=1
		no water observed		5
		sum total	75	(A)

[History] (B)

		Category	Check	score
	Existing record	obvious	✓	
	(documents or	slight		
Records of		none		
Landslide	facilities and	obvious	1	
		slight		
		none		

[Countermeasure] (c)

Category			score
There is no countermeasure		✓	±0
Effectiveness of countermeasure	not working		±0
	partially working		-20
	completely working		×0
	Score in evaluation from cause	75	(B)

	Monitoring	Check	score
There is monitoring for I	✓		
Monitoring devices	Piezometer		
Organization	RDA		

[Description]

[Description]		
0		





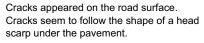


Damage on the road at the middle of the landslide

Piezometer installed at the lower part of the landslide.

Condition of the lower part of the landlisde.







Colluvium is disributed in the site.



Retaining wall along the road.

After the construction of this retainig wall, landslide of upper slope was said to be eased.

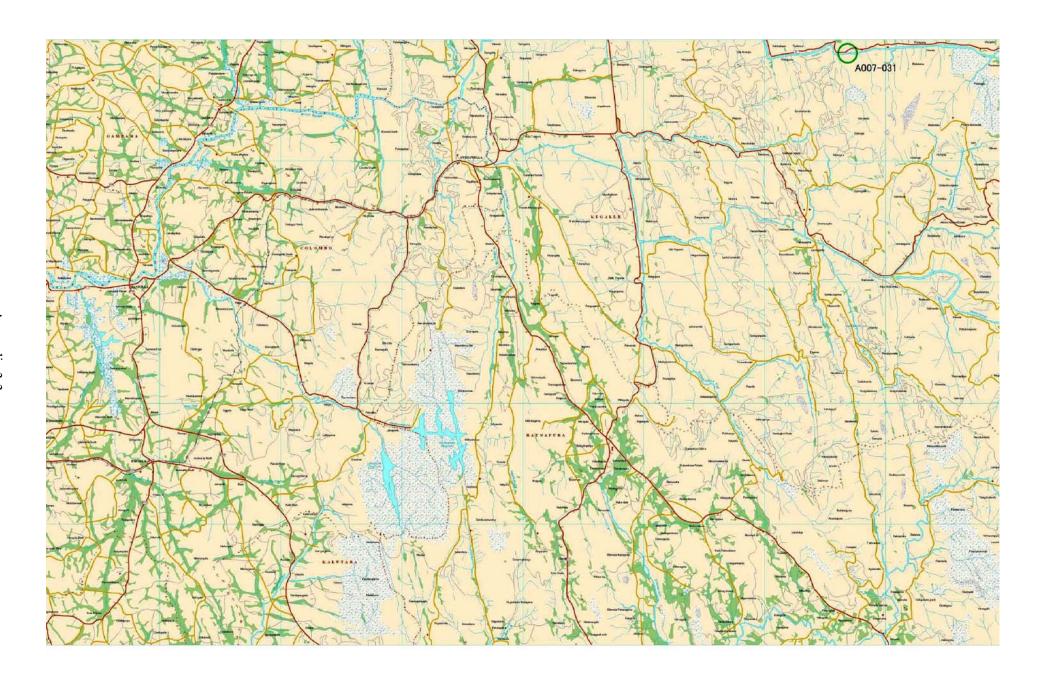
Appendix 3-3 Maps of prioritized section



61 Gampola

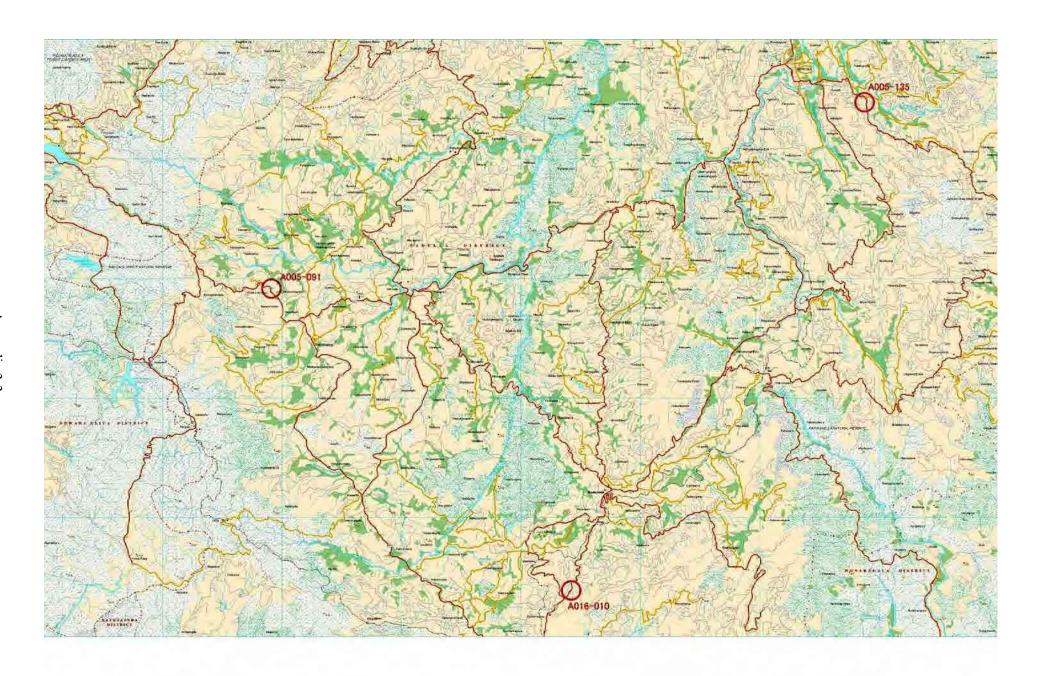


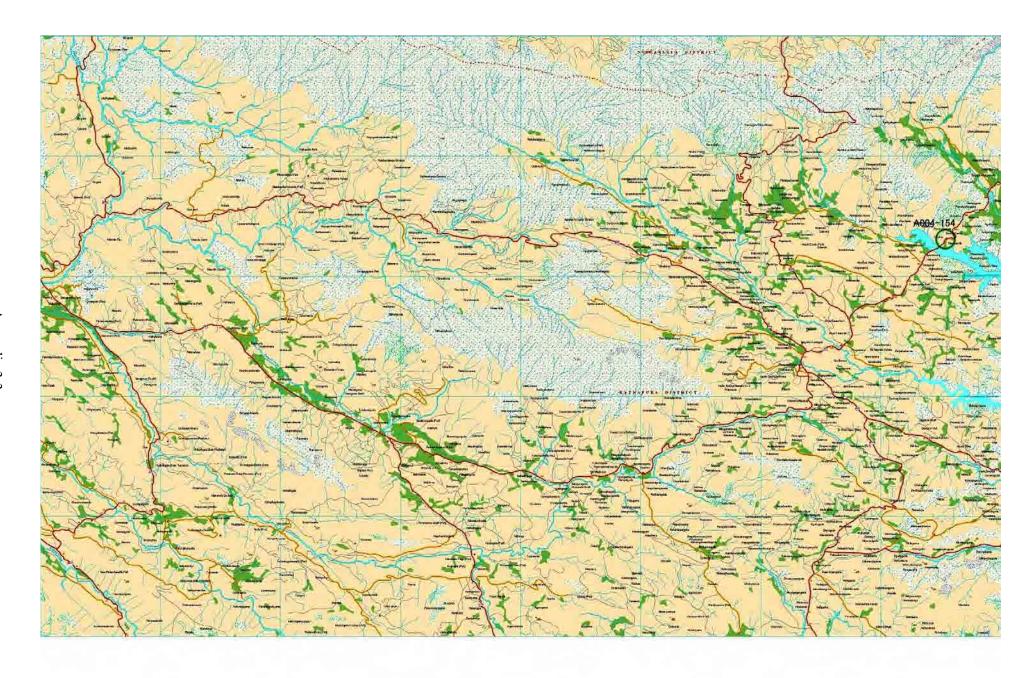
63 Bibile



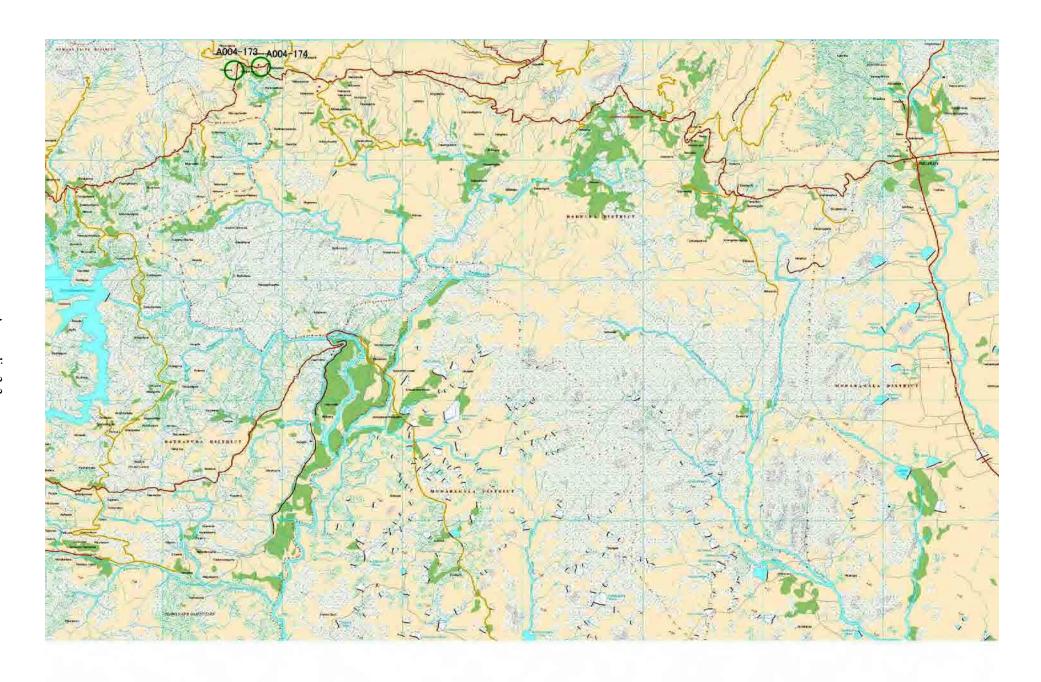
67 Avissawella







75 Balangoda



76 Haputale

Appendix 3-4 Photo reading and geological map information (Rank A, B, C)

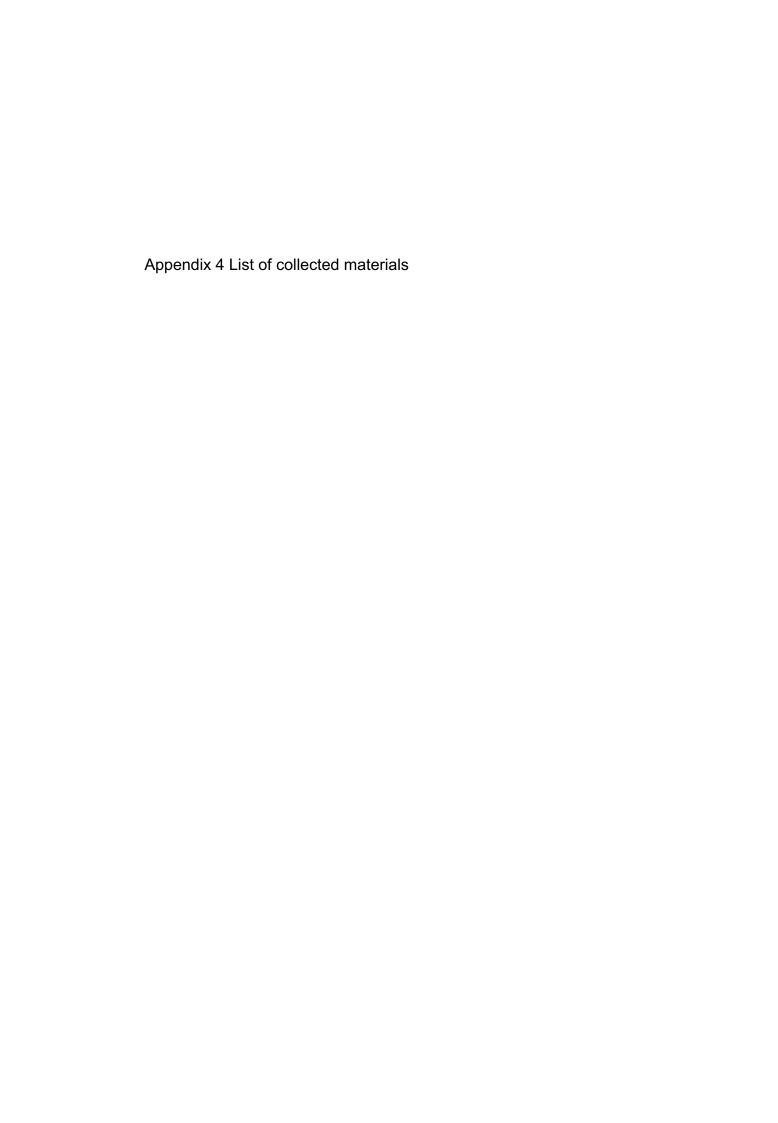
Photo Reading and Geological Map Information (Rank A, B, C)

NI-	Davida Na	Discours Town	Deal	Francisco Polista	District	Aeria	al Photos	Charles Control		Gelogical Map
No	Route No	Disaster Type	Rank	Featuring Points	District	Course	Number	Photo Reading	Number	Geological Condition
A004-134	A004	Rock Fall	В		Ratnapura	2001-05	162,163	Blocked by clouds. Some phto lineaments were read.	17	Pmgk ^b : Undifferentiated charnockitic biotite gneiss
A004-154	A004	Landslide?	А	Slope Failure in Embankment? Needs to be investigated.	Ratnapura	99-21	62,63	Shape of the landslide is unclear. But several small landslides were read along the valleys around the site. Convergence of photo lineaments was seen around the site.	17	Pmgga: Garnet - sillmanite - biolite gneiss, Pmg: Quartzites. Beside a shear zone and a fault inferred by aerial photos.
A004-162	A004	Debris Flow	Α	Debris Flow (L=8km)	Ratnapura	99-21	81,82,83	Sources of the debris flow were read in the mountain slopes located in the north of the site.	17	Pmgga: Garnet - sillmanite - biotite gneiss.
				,				The site is located at around the apex of the fan where the debris was accumulated.		Close to a shear zone and an axis of a overturned synform.
A004-173	A004	Slope Failure	В	Adjucent to a high-tension pylon	Badulla	99-21	208,209,210	Convergence of photo lineaments was seen around the site. In the upper mountain slope, a trace of collapse was read.	17	Pmgk: Charnockitic gneiss, Pmq: Quartzites, Pmgk ^b . Undifferentiated charnockitic biotite gneiss.
A004-174	A004	Slope Failure	В	2 major slope failures	Badulla	99-21	208,209,210	The site is surrounded by photo lineaments.	17	Pmgk: Charnockilic gneiss, Pmg: Quartziles, Pmgk ² : Undifferentiated charnockitic biotite gneiss, Pmgga: Garnet - sillmanite - biotite gneiss. Close to a probable thrust.
A004-185	A004	Landslide	А	Less Traffic	Badulla	99-21	215,216	Location shall be verified by geographical coordinate. Shape of the landslide is unclear.	17	Pmgk: Charnockitic gneiss, Pmq: Quartziles, Pmgk ² : Undifferentiated charnockitic biotite gneiss, Pmgga: Garnet - sillmanite - biotite gneiss. Close to a probable thrust.
A004-193	A004	Landslide	А	Less Traffic	Badulla	99-21	183,184	Location shall be verified by geographical coordinate. Shape of the landslide is unclear.	17	Pmgk ^b : Undifferentiated charnockitic biotite gneiss, Pmgga: Garnet - sillmanite - biotite gneiss. Convergence of 4 shear zones and faults inferred by aerial photos.
A004-196	A004	Landslide	А	Less Traffic (Not confirmed)	Badulla	99-21	219,220	Location shall be verified by geographical coordinate. Shape of the landslide is unclear.	17	Pmgk ⁸ : Undifferentiated charnockitic biotite gneiss, Pmgga: Garnet - sillmanite - biotite gneiss. Convergence of 4 shear zones and faults inferred by aerial photos.
A005-042	A005	Landslide	Α	Landslide (L=1km)	Nuwara Eliya	99-34	148, 149, 150, 151, 152	Shapes of landslides were unclear. Instad, traces of collapse and deeply erroded gullies were confirmed by photo reading.	14	Emgga: Garnet - sillmanite - biotite gneiss, Pmgk ^b : Undifferentiated charnockitic biotite gneiss, Pmg: Quartzites. Faults and a shear zone inferred by aerial photos.
A005-043	A005	Rock Fall, Rock Slide	В	Unstable rocks with open cracks	Nuwara Eliya	99-34	148, 149, 150, 151, 152	Photo lineaments were seen around the site.	14	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk ^b : Undifferentiated charnockitic biotite gneiss, Pmg: Quartizites. Faults and a shear zone inferred by aerial photos.
A005-044	A005	Rock Fall, Rock Slide	В	Unstable rocks with open cracks	Nuwara Eliya	99-34	148, 149, 150, 151, 152	Photo lineaments were seen around the site.	14	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk ^b : Undifferentiated charnocklitc biotite gneiss, Pmg: Quartzites. Faults and a shear zone inferred by aerial photos.
A005-046	A005	Rock Fall, Rock Slide	С	Unstable rocks with open cracks	Nuwara Eliya	99-34	148, 149, 150, 151, 152	Very steep slope. Photo lineaments were seen around the site.	14	Emgga: Garnet - sillmanite - biotite gneiss, Pmgk: Charnockitic gneiss, Pmq: Quartzites. Faults and a shear zone inferred by aerial photos.
A005-063	A005	Slope Failure	В		Nuwara Eliya	99-35	32,33,34	Small landslides were read as aligned terrace fields around the sites. Much larger landslides were read in the opposite side of the stream flown along the lower slope.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk: Charnockitic gneiss, Pmgk ^b : Undifferentiated charnockitic biotite gneiss.
		·						landsides were read in the opposite side of the stream flown along the lower slope. The site is surrounded by photo lineaments.		Close to a shear zone and a fault inferred by aerial photos.
A005-082	A005	Slope Failure	С	Former 2 sections were merged in to 1 section.	Nuwara Eliya	99-35	153,154,155	The axis of the valley which the site is facing corresponds to one of the bphoto lineaments.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Pmc: Marble, Close to shear zones inferred by aerial photos.
A005-091	A005	Slope Failure	С		Badulla	99-27	206,207	The site is surrounded by photo lineaments. Lateral displacement over a liniament was confirmed.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk: Charnockitic gneiss, Pmq: Quartzites. Close to shear zones inferred by aerial photos.
A005-135	A005	Landslide	С	Landslide (L=0.2 ~ 0.3km)	Badulla	99-28	53,54,55	Multiple Landslide, less clearly read, Other landslides were read in the upper slope but unclearly. This leads some possibilities of much larger landslide than currently expected. Divided landslides were seen in the lower slope.	17	Pmgk: Charnockilic gnelss, Pmg: Quartziles. Beside shear zones inferred by aerial photos.
A005-167	A005	Landslide	С	Landslide (L=0.1 ~ 0.2km) Detour by a bridge can be an option,	Badulla	99-17	35,36	Clearly read landslide. Another landslide was read on the west side but may not affect the road.	15	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk ^b : Undifferentiated charnocktiic biotite gneiss, Pmgk: Charnocktiic gneiss, <u>P</u> mg: Quartzites. A shear zone inferred by aerial photos.
A007-031	A007	Slope Failure	В	Eroded by Kelani River.	Kegalle	No Photo			16	Pmgga: Garnet - sillmanite - biotite gneiss, Faults inferred by aerial photos.
A007-042	A007	Landslide?	А	Landslide or Slope Fallure	Nuwara Eliya	99-35	04,05,06,07	Shape of a landslide was not read at the site. Several photo lineaments were read around the site. A trace of collapse was confirmed at the upper slope upstream.	17	Pmgga: Garnet - sillmanite - biotile gneiss, Convergence of shear zones and faults inferred by aerial photos.
A007-045	A007	Rock Fall, Rock Slide	В	Along with Slope Failure	Nuwara Eliya	99-35	04,05,06,07	Several lineaments were read around the site.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk: Charnockitic gneiss. Close to shear zones and faults inferred by aerial photos.
A007-047	A007	Landslide	А		Nuwara Eliya	99-35	04,05,06,07	Shape of the landslide is unclear. Photo lineaments were seen around the site.	17	Pmgga: Garnet - sillmanite - biolite gneiss, Pmgk ^k : Undifferentiated charnockitic biotite gneiss, Pmq: Quartzites. Close to a fault inferred by aerial photos.
A007-054	A007	Slope Failure	В		Nuwara Eliya	99-35	09,10	Convergence of photo lineaments was seen around the site.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk: Charnockitic gneiss. Close to a shear zone and a fault inferred by aerial photos.
A007-057	A007	Slope Failure	В		Nuwara Eliya	99-35	95,96	Blocked by clouds. Steep planer slope. Several photo lineaments were read around the site.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Close to shear zones and a fault inferred by aerial photos.
A007-069	A007	Landslide	А	Old road was moved away by the landslide.	Nuwara Eliya	99-35	195,196	Shape of the landslide is unclear, unable to read. Photo lineaments were seen around the site.	17	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk: Charnockitic gneiss. Close to shear zones inferred by aerial photos.
A016-010	A016	Landslide	С	Head scarp approaching to the road shoulder	Badulla	99-22	17,18	Clearly read landslide, localed in a rolling slope of colluvium provided by a huge collapse of mountain slope. In the lower slope, several small sized divided landslides were read. Several landslides were read in the upper slope. This leads some possibilities of far much larger landslide than currently expected.	17	Pmgga: Garnet - sillmanite - biolite gneiss, Pmgk: Charnockilic gneiss. Convergence of shear zones and faults inferred by aerial photos.
A021-020	A021	Landslide	Α	Land owner didn't allow RDA to investigate the site.	Kegalle	07-07	236,237,238	Shape of the landslide is unclear, unable to read. Convergence of photo lineaments was seen around the site.	13	Pmgr: Granite gneiss, Pmgh ^b . Hornblend - biotite gneiss. Surrounded by shear zones inferred by aerial photos and probable thrusts.
A026-027	A026	Rock Fall, Rock Slide	А		Kandy	No Photo			14	Pmgga: Garnet - sillmanite - biolite gneiss, Pmgk ^b : Undifferentiated charnockitic biolite gneiss, Pmc: Marble, Pmg: Quartzites. Faults and a shear zone inferred by aerial photos.
A026-029	A026	Rock Fall, Rock Slide	A		Kandy	No Photo			14	Pmgga: Garnet - sillmanite - biolite gneiss, Pmgk ³ : Undifferentialed charnockitic biolite gneiss, Pmc: Marble, Pmg: Quartitles. Faults and a shear zone inferred by aerial photos.
A026-036	A026	Slope Failure	A	Damage occurred during construction. Retaining wall was	Kandy	99-29	53,54	Trace of small collapse of mountain slope was read in the upper slope.	14	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk: Chamockitic gneiss.
A026-045	A026	Slope Failure	A	constructed.	Kandy	99-32	65,66,67	Photo lineaments were seen around the site. Photo lineaments were seen around the site.	14	Pmgga: Garnet - sillmanite - biotite gneiss, Pmgk ^b : Undifferentiated charnocktitic biotite
A026-048	A026	Slope Failure	A		Kandy	99-32	65,66,67	Terraced rice fields are on the upper slope where colluvium is supposed.	14	gneiss. Faults inferred by aerial photos. Pmgk ^b : Undifferentiated charnocktic biotite gneiss.
A026-049	A026	Slope Failure	A		Kandy	99-32	65,66,67	Photo lineaments were seen around the site. Trace of collapse of mountain slope was read in the upper slope. Photo lineaments were seen around the site.	14	Faults inferred by aerial photos. Pmgk th . Undifferentiated charnockitic biotite gneiss. Exults inferred by aerial photos.
A026-051	A026	Slope Failure	A	Damage occurred during construction. Retaining wall was	Kandy	99-32	65,66,67	Trace of collapse of mountain slope was read in the upper slope.	14	Faults inferred by aerial photos. Pmgk ^b : Undifferentiated charnocktic biotite gneiss. Faults inferred by aerial photos
A026-055	A026	Rock Fall,	A	constructed.	Kandy	99-32	47,48,49	Photo lineaments were seen around the site. Very steep planner slope. A counter of photo lineaments were seen around the site.	14	Faults inferred by aerial photos. Pmgk: Charnockitic gneiss. Shear zones inferred by aerial photos
A026-056	A026	Rock Slide Slope Failure	A		Kandy	99-32	47,48,49	A couple of photo lineaments were seen around the site. Very steep planner slope.	14	Shear zones inferred by aerial photos. Pmgk: Chamockitic gneiss, Pmgga: Garnet - sillmanite - biotite gneiss, Pmg: Quartzites. Change pages inferred by aerial photos.
A026-058	A026	Slope Failure	Α		Kandy	99-32	47,48,49	A couple of photo lineaments were seen around the site. Very steep planner slope. Trace of small collapse was read less clearly in the upper	14	Shear zones inferred by aerial photos. Pmgga: Garnet - sillmanite - biotite gneiss, Pmq: Quartzites, Pmghb: Hornblend - biotite
A026-060	A026	Rock Fall,	Α	Damage occurred during construction. Retaining wall was	Kandy	99-32	47,48,49	slope. A couple of photo lineaments were seen around the site. Very steep planner slope.	14	gneiss. Shear zones inferred by aerial photos. Pmgga: Garnet - sillmanite - biotite gneiss, Pmq: Quartzites, Pmghb: Hornblend - biotite
A113-010	A026	Rock Slide Landslide	Α Α	constructed.	Kandy	99-32	161,162	A couple of photo lineaments were seen around the site. Shape of a landslide was not read at the site.	14	gneiss. Shear zones inferred by aerial photos. Pmq: Quartzites.
A113-010	AIIO	Lai IUSIIG8	^		candy	/7°1U	101,102	Trace of collapse of mountain slope was read in the upper slope. Less clearly read landslide, located in a colluvium slope formed by a collapse of upper	14	Close to a probable thrust and an axis of antiform
A113-015	A113	Landslide		Involving road and residence.	Kandy	99-34	135,136	mountain slope. In the axis of the ridge of upper mountain, 2 cols were clearly read.	14	Pmghb + Pmgbh: Hornblend - biotite gneiss + Biotite hornblende gneiss. Beside a shear zone inferred by aerial photos.
			Α	Category A						

A Category A

B Category B

Category C



No.	date	Material name	Collected from	Format
1	20120618	Statistical Pocket Book - 2010	Department of Census & Statistics	Printed book
2		Sri Lanka Labour Force Survey AnnualReport -2010	Department of Census & Statistics	Printed book
3	20120618	Statistics on Vital Events2000-2010	Department of Census & Statistics	Printed book
4	20120618	Household Income and Expenditure Survey -2009/10	Department of Census & Statistics	Printed book
5	20120618	Road Atlas of Sri Lanka	Vijithayapa Bookshop	Printed book
6	20120618	Vijithayapa School Atlas	Vijithayapa Publications	Printed book
7	20120618	Sarasavi School Atlas	Sarasavi Publishers	Printed book
8		ADT Central, Sabragamuwa Provinces.pdf		
9		MCC Cen Sab Uva Wst		
10	20120620	Map: ADT Locations.jpg	Planning Division, RDA	DVD
11		Maps: Landslides in Badulla, Kandy, Matalre, Nuwara Eliya and Ratnapura		
12		Road Sections Affected by Landslides		
13	20120620	Hard copy of the maps of No.1 and No.8	Planning Division, RDA	Paper document
14	20120629	Guidelinses for Construction in Landslide Prone Areas, March 2003	NBRO	Paper document
15	20120629	Guidelinses for Construction in Landslide Prone Areas, 2009	NBRO	Paper document
16	20120702	VOC Data 2010	Planning Division, RDA	DVD
17	20120702	Wave of traffic volume(montyly and by day of the week)	Planning Division, RDA	Electronic file
18	20120704	20120704Traffic Growth Rate Calculation - 20071130	Planning Division, RDA	Electronic file
19	20120702	Hazard Map S=1:50,000	NBRO	JPG
20	20120614	Topographic Map S=1:50,000	Survey Department	Paper document
21	20120711	Topographic Map S=1:50,000	Survey Department	CD/JPG
22	20120711	Topographic Maps, S=1:10,000	Survey Department	CD (GIS)
23	20120614	Geological Map, Soil Map, Watershed Map	Survey Department	Paper document
24	20120712	Topographic Map S=1:250,000	Survey Department	Paper document
25	20120717	Geological Map of Sri Lanka	Geological Survey & Mines Bureau	Paper document
26		Metamorphic Map of Sri Lanka	GSMB	Paper document
27	20120717	Structual Map of Sri Lanka	GSMB	Paper document
28	20120717	Geological Map S=1:10,000	GSMB	Paper document
29	20120717	Geological Map of Central and Western Sri Lanka	GSMB	Paper document
30		Aerial Photo (62Pics)	Survey Department	Contact print
31		Aerial Photo (62Pics)	Survey Department	CD/TIFF
32		Index Map of Aerial Photos	Survey Department	Paper document
33	20120720	Geological Map S=1:10,000	GSMB	CD/TIFF
34	20120808	Project Proposal for Integrated Landslide Mitigation Project Phase 1 (Badulla, Kandy, Matale and Nuwara Eliya)	NBRO	PDF

No.	date	Material name	Collected from	Format	
35	20120809	Structual Map of Sri Lanka	GSMB	CD/TIFF	
36		Geological Map of Central and Western Sri Lanka	GSMB	CD/TIFF	
37	20120815	Aerial Photo (12Pics)	Survey Department	Contact print	
38	20120815	Aerial Photo (12Pics)	Survey Department	CD/TIFF	
39	20120802	Met Data for 12 Met Stations	Department of Meteorology	Excel file	
40	20120816	Earthquake Records	GSMB and other authorities	Excel file	
41	20120816	National Atral of Sri Lanka	Survey Department	Paper document	
42 20120914 Projects Summary, Emanating for		Projects Summary, Emanating from National Physical Plan 2011-2030	National Physical Planning Department, Ministry of Construction, Engineering Services, Housing and Common Amenities	Printed book	
43		National Physical Plannning Policy & Plan	Engineering Services, Housing and	Printed book	
44		National Road Master Plan Summary	RDA	Printed book	
45		National Road Master Plan 2008-2012 Executive Summary	RDA	Printed book	
46		National Road Master Plan 2008-2017 Investment Plan	RDA	Printed book	
47		20120918 RDC SocioEconomic Data	Various sources	CD	
48		20120926 RDC SE Data	Various sources	Electronic file	
49		20120927 RDC SE Data	Various sources	Electronic file	
50		Boundary maps of Sri Lanka - District and Division	Various sources	CD	
51		Tourist Guide Map of Matale District	Various sources	Printed book	
52		Tourist Guide Map of Nuwara Eliya District	Various sources	Printed book	
53		Annual Report-2011	NBRO	Printed book	
54	20120928	Road Maintenance Manual-1989	RDA	Printed book	
55		Annual Report 2010	RDA	Printed book	