

JAPAN INTERNATIONAL COOPERATION AGENCY

**The Data Collection Survey on Road
Protection against Natural Disaster
(Landslide-Disaster)**

**FINAL REPORT (2/2)
Appendix**

December, 2012

**KOKUSAI KOGYO CO., LTD.
ORIENTAL CONSULTANTS CO., LTD.
JAPAN CONSERVATION ENGINEERS CO., LTD.**

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Appendix 1-1 Landslide location

FROM
(RATNAPURA, ~~RA~~ RDA)

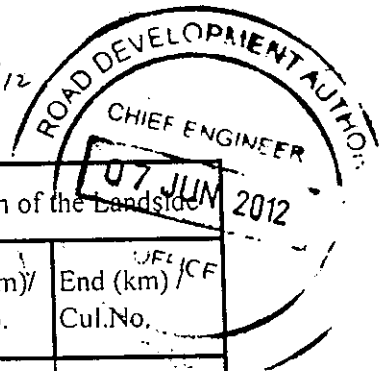
4/JUL/12

LOCATIONS OF LAND SLIDES OCCURRED

Route No	Name of the Road	Year of Last Landslide recorded	Location of the Landslide	
			Start (km)	End (km)
EE Division - Ratnapura				
B 160	Idangoda - Ayagama Road	2003	14/5	14/6
B 181	Kalawana - Deepdeen - Rakwana Road	2008	8/1	8/2
B 265	Malwala - Carney Road	2011	3/1	3/2
B 265	Malwala - Carney Road	2011	13/3	13/4
B 390	Ratnapura - Palawela - Karawita Road	2011	3/4	3/6
B 390	Ratnapura - Palawela - Karawita Road	2011	4/1	4/2
B 391	Ratnapura - Wewelwatta Road	2011	6/1	6/2
B 391	Ratnapura - Wewelwatta Road	2012	7/3	7/4
B 391	Ratnapura - Wewelwatta Road	2010	12/3	12/4
B 391	Ratnapura - Wewelwatta Road	2010	18/10	19 km Post
EE Division - Pelmadulla				
AA 004	Colombo - Ratnapura - Wellawaya - Betticaloa Road	2003	163	167
AA 004	Colombo - Ratnapura - Wellawaya - Betticaloa Road	2009	130	140
B 339	Oluganthota - Pinnawala - Bogawanthalawa Road	2003	24	29
B 124	Kirimetithenna - Galgoda - Weligepola Road	2007	9	10
B 593	Pambahinna - Kumbalgama - Rajawaka - Kapugala Road	2010	7	9
EE Division - Embilipitiya				
AA 017	Galle - Deniyaya - Madampe Road	2007	87	88

FROM KEGALLE RDA

6/JUL/12



LOCATION OF LAND SIDE OCCURRED - RUWANWELLA EE's DIVISION

Route No	Name of the Road	Year of last landside recorded	Location of the Landside	
			Start (km)/ Cul. No.	End (km)/ Cul.No.
AA007	Awissawella - Hatton - Nuwaraeliya	2005	3/1	3/2
AA007	Awissawella - Hatton - Nuwaraeliya	2009	25/8	
AA007	Awissawella - Hatton - Nuwaraeliya	2011	27/6	27/7
AA007	Awissawella - Hatton - Nuwaraeliya	2010	29/1	
AA007	Awissawella - Hatton - Nuwaraeliya	2010	29/10	
AA007	Awissawella - Hatton - Nuwaraeliya	2007	31/1	31/2
AA007	Awissawella - Hatton - Nuwaraeliya	2011	36/5	36/6
AA021	Kegalle- Bulathkohupitiya - Karawanella	2006	19+800	20+000
B482	Yatiyanthota - Poonagala - Meenagala	2010	4+000	
B482	Yatiyanthota - Poonagala - Meenagala	2010	7+000	8+000
B482	Yatiyanthota - Poonagala - Meenagala	2010	10+000	17+000
B482	Yatiyanthota - Poonagala - Meenagala	2010	21+000	23+000
B358	Parussella - Panapitiya	2010	3/8	3/10

RIVER VALLEY SIDE
 @ TRUSI 03
 @ DIVISION
 @ FROSION
 @

6/JUL

FROM
KEGALLE, RDA, 6/JUL/12

Route No	Name of the Road	Year of last landside Recorded	Location of the land side	
			Start(km)	End(km)
1	Colombo - Kandy Road (A - 001) (Gabion wall)	2012	58/4	58/5
2	Colombo - Kandy Road (A - 001) (Proposed for R/W)	2011	93 k.m. post	94/1
3	Warakapola - Ruwanwella Road (B - 457)	2011	8/6	8 k mpost
4	Warakapola - Ruwanwella Road (B - 457)	2011	8 k m post	9/1
5	Warakapola - Kandalama Road (B - 456)	2012	2/7	2/8
6	Galigamuwa - Ruwanwella Road (B - 127)	2011	5/10	5/11
7	Galigamuwa - Ruwanwella Road (B - 127)	2011	5/8	5/9
8	Nelundeniya - Tuntota - Galapitamada Road (B-540)	2011	2/4	2/5
9	Nelundeniya Alawwa Road (B - 539)	2011	2/3	2/4
	001	2010	80/10	
10	Colombo - Kandy (A001)	2010	80/3	80/4 - RHS
	E. ENG			
	PRAPAT KUMARASERI			
	PRABHATHA			

DEC.
R.W PLANNED
EMBANK.

SLIDE
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10

Appendix 1-2 Locations of landslides occurred by districts

Locations of Land Slide Occurred in Kandy, Matale, Nuwara Eliya and Badulla Districts

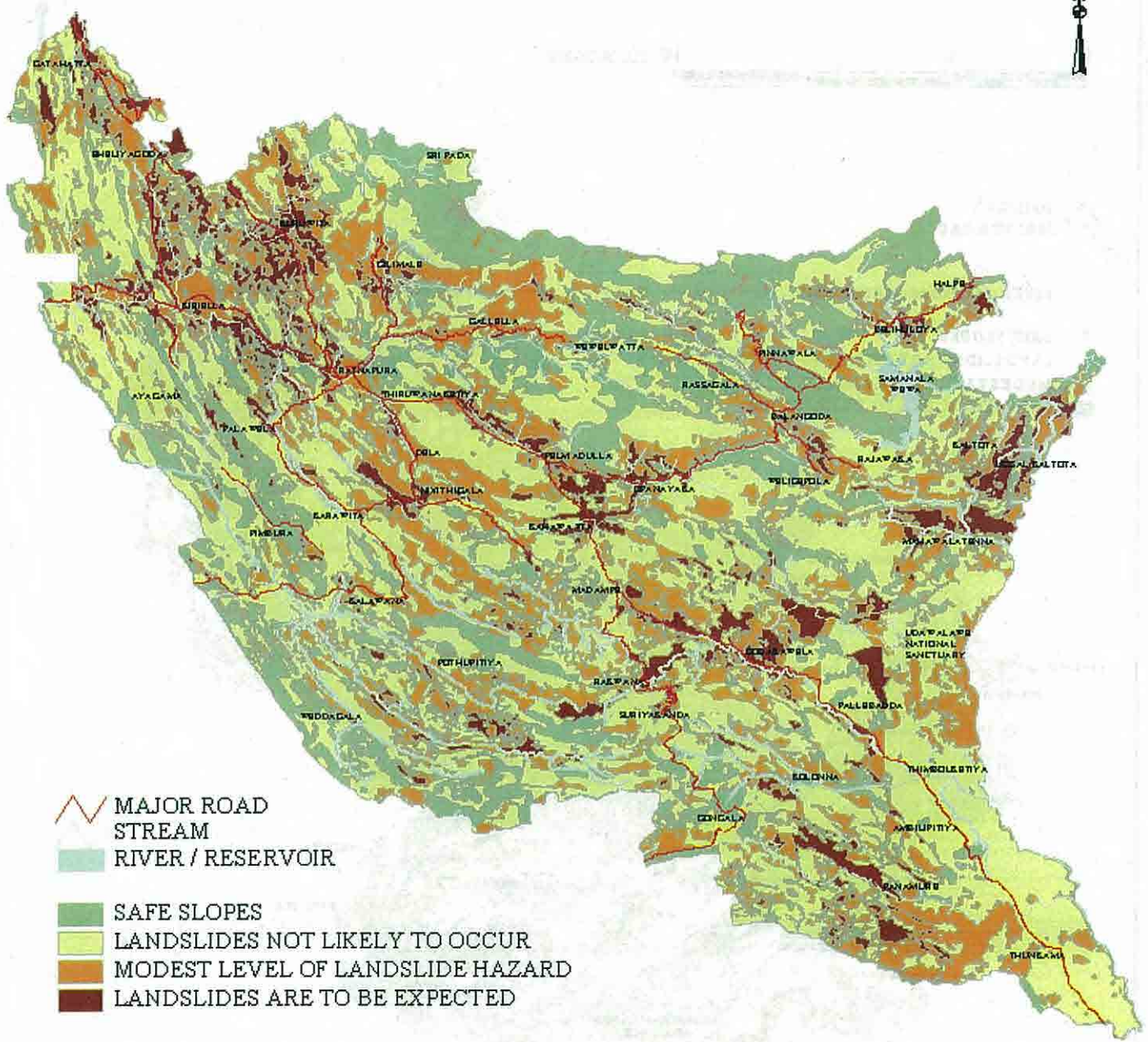
Route No	Name of the Road	Year of Landslide	Location		EE Division	District	Province
			Start (km)	End (km)			
A004	Colombo-Ratnapura-Wellawaya-Batticaloa Road (Marangahawela Land Slide)	2009	130.00	140.00	Pelmadulla	Ratnapura	Sabaragamuwa
A004	Colombo-Ratnapura-Wellawaya-Batticaloa Road (Marangahawela Land Slide)	2003	163.00	167.00	Pelmadulla	Ratnapura	Sabaragamuwa
A004	Colombo-Ratnapura-Wellawaya-Batticaloa Road (Marangahawela Land Slide)	2000	168+450	168+850	Bandarawela	Badulla	Uva
A004	Colombo-Ratnapura-Wellawaya -Batticaloa Road (Rose Garden Land Slide)	2000	174+100	175+000	Bandarawela	Badulla	Uva
A004	Colombo-Ratnapura-Wellawaya -Batticaloa Road (Pahala Viharagala Land Slide)	2000	185+000	186+000	Bandarawela	Badulla	Uva
A004	Colombo-Ratnapura-Wellawaya -Batticaloa Road (Leemastota Land Slide)	2011	193+000	193+800	Bandarawela	Badulla	Uva
A004	Colombo-Ratnapura-Wellawaya-Batticaloa Road (Nakatiya Land Slide)	1999	196+300	196+800	Bandarawela	Badulla	Uva
A005	Peradeniya-Badulla-Chenkaladi	2010	15.00	16.00	Pilimatalawa	Kandy	Central
A005	Peradeniya-Badulla-Chenkaladi	2011	42.00	45.00	Nuwara Eliya	Nuwara Eliya	Central
A005	Peradeniya-Badulla-Chenkaladi	2011	61.00	62.00	Nuwara Eliya	Nuwara Eliya	Central
A005	Peradeniya-Badulla-Chenkaladi	2011	74.00	75.00	Nuwara Eliya	Nuwara Eliya	Central
A005	Peradeniya-Badulla-Chenkaladi	2011	104.00	105.00	Nuwara Eliya	Nuwara Eliya	Central
A005	Peradeniya-Badulla-Chenkaladi Road (Moretota Land Slide)	2010	119+300	119+360	Bandarawela	Badulla	Uva
A005	Peradeniya-Badulla-Chenkaladi (2nd Mile Post Land Slide)	2011	135+200	135+700	Bandarawela	Badulla	Uva
A005	Peradeniya-Badulla-Chenkaladi Road (Lunugala Land slide)	2012	167+497	167+541	Bandarawela	Badulla	Uva
A007	Avissawella-Hatton-Nuwara Eliya	2011	47.00	48.00	Norwood	Nuwara Eliya	Central
A007	Avissawella-Hatton-Nuwara Eliya	2011	55.00	58.00	Norwood	Nuwara Eliya	Central
A009	Kandy-Jaffna Road	2010	17.00	18.00	Kundasale	Kandy	Central
A010	Katugastota - Kurunegala - Puttlam	2010	11.00	16.00	Kandy	Kandy	Central
A016	Beragala-HaliEla Road (Kahagolla Land slide)	1988	0+500	2+000	Bandarawela	Badulla	Uva
A016	Beragala-HaliEla Road (Kahagolla Land slide)	2012	6+570	14+900	Bandarawela	Badulla	Uva
A017	Galle - Deniyaya - Madampe	2007	87.00	88.00	Embilipitiya	Ratnapura	Sabaragamuwa
A026	Kandy-Mahiyanganaya-Padiyatalawa road	2007	29.00	31.00	Kundasale	Kandy	Central
A026	Kandy-Mahiyanganaya-Padiyatalawa road	2007	37.00	39.00	Kundasale	Kandy	Central
A026	Kandy-Mahiyanganaya-Padiyatalawa road	2012	45.00	55.00	Kundasale	Kandy	Central
AB13	Gampola - Nawalapitiya	2010	29.00	30.00	Pilimatalawa	Kandy	Central
B036	Badulla-Karamatiya-Andaulpotha Road	2010	9+500	9+590	Bandarawela	Badulla	Uva
B071	Carolina - Norton-Wanarajah	2011	2.00	8.00	Norwood	Nuwara Eliya	Central








Route No	Name of the Road	Year of Landslide	Location		EE Division	District	Province
			Start (km)	End (km)			
B097	Demodera-Spring valley Badulla Road	2010	10+074	10+239	Bandarawela	Badulla	Uva
B122	Galagedara - Rambukkana	2010	0	0+150	Kandy	Kandy	Central
B149	Hatton-Maskeliya-Delhouse	2011	Culvert No. 1/6	Culvert No. 1/8	Norwood	Nuwara Eliya	Central
B149	Hatton-Maskeliya-Delhouse	2011	Culvert No. 30/5	Culvert No. 30/6	Norwood	Nuwara Eliya	Central
B160	Idangoda - Ayagama	2003	14.00	15.00	Ratnapura	Ratnapura	Sabaragamuwa
B181	Kalawana - Depdene - Rakwana	2008	8.00	9.00	Ratnapura	Ratnapura	Sabaragamuwa
B195	Kandy - Kirimetiya	2010	14+100	14+200	Kandy	Kandy	Central
B195	Kandy - Kirimetiya	2010	8+150	8+250	Kandy	Kandy	Central
B205	Katugastota-Madawela-Bambaralia Road	2007	26.00	27.00	Kundasale	Kandy	Central
B252	Lindula End of Agrass	2011	1.00	2.00	Nuwara Eliya	Nuwara Eliya	Central
B252	Lindula End of Agrass	2011	18.00	19.00	Nuwara Eliya	Nuwara Eliya	Central
B265	Malwala - Carney	2011	3.00	4.00	Ratnapura	Ratnapura	Sabaragamuwa
B265	Malwala - Carney	2011	13.00	14.00	Ratnapura	Ratnapura	Sabaragamuwa
B252	Lindula End of Agrass	2011	20.00	21.00	Nuwara Eliya	Nuwara Eliya	Central
B274	Matale- Illukubbura -Lagala	2011	10.0	12.0	Matale	Matale	Central
B319	Nawalapitiya-Ginigathhena	2011	10.00	11.00	Norwood	Nuwara Eliya	Central
B328	Norton-Maskeliya	2011	0.00	2.00	Norwood	Nuwara Eliya	Central
B328	Norton-Maskeliya	2011	Culvert No. 8/7	Culvert No. 8/9	Norwood	Nuwara Eliya	Central
B339	Olugantota - Pinnawala - Bogowantalawa	2003	24.00	29.00	Pelmadulla	Ratnapura	Sabaragamuwa
B360	Passara-Madolsima-Matigathhenna Road(Madolsima Land Slide)	2011	23+300	23+450	Bandarawela	Badulla	Uva
B364	Peradeniya - Deltota - rikillagaskada	2011	39.00	41.00	Hanguranketha	Nuwara Eliya	Central
B365	Peradeniya - Halloluwa - Katugastota	2010	3+700	4+200	Kandy	Kandy	Central
B369	Pitiyagedara-Wattegama-Iriyagasthenna Road	2007	0.00	1.00	Kundasale	Kandy	Central
B390	Ratnapura - Palawela - Karawita	2011	3.00	4.00	Ratnapura	Ratnapura	Sabaragamuwa
B390	Ratnapura - Palawela - Karawita	2011	4.00	5.00	Ratnapura	Ratnapura	Sabaragamuwa
B391	Ratnapura - Wewelwatte	2011	6.00	7.00	Ratnapura	Ratnapura	Sabaragamuwa
B391	Ratnapura - Wewelwatte	2012	7.00	8.00	Ratnapura	Ratnapura	Sabaragamuwa
B391	Ratnapura - Wewelwatte	2010	12.00	13.00	Ratnapura	Ratnapura	Sabaragamuwa
B391	Ratnapura - Wewelwatte	2010	18.00	19.00	Ratnapura	Ratnapura	Sabaragamuwa
B412	Thawalamthenna - Thalawakele	2011	13.00	14.00	Nuwara Eliya	Nuwara Eliya	Central

Route No	Name of the Road	Year of Landslide	Location		EE Division	District	Province
			Start (km)	End (km)			
B412	Thawalamthenna - Thalawakele	2011	16.00	17.00	Nuwara Eliya	Nuwara Eliya	Central
B412	Thawalamthenna - Thalawakele	2011	22.00	23.00	Nuwara Eliya	Nuwara Eliya	Central
B413	Tennekumbura - Rikillagaskada - Ragala	2011	Culvert No. 44/1	Culvert No. 44/3	Hanguranketha	Nuwara Eliya	Central
B413	Tennekumbura - Rikillagaskada - Ragala	2011	Culvert No. 45/6	Culvert No. 45/7	Hanguranketha	Nuwara Eliya	Central
B413	Tennekumbura - Rikillagaskada - Ragala	2011	Culvert No. 46/8	Culvert No. 46/9	Hanguranketha	Nuwara Eliya	Central
B413	Tennekumbura - Rikillagaskada - Ragala	2011	Culvert No. 50/6	Culvert No. 50/8	Hanguranketha	Nuwara Eliya	Central
B413	Tennekumbura - Rikillagaskada - Ragala	2011	Culvert No.70/11	Culvert No.71/1	Hanguranketha	Nuwara Eliya	Central
B492	Kandehandiya - Adikaigama - Randenigala	2011	Culvert No.13/3	Culvert No.13/4	Hanguranketha	Nuwara Eliya	Central

Appendix 1-3 Hazard maps by NBRO

MAP OF LANDSLIDE HAZARD ZONES - RATNAPURA DISTRICT



-  MAJOR ROAD
-  STREAM
-  RIVER / RESERVOIR
-  SAFE SLOPES
-  LANDSLIDES NOT LIKELY TO OCCUR
-  MODEST LEVEL OF LANDSLIDE HAZARD
-  LANDSLIDES ARE TO BE EXPECTED



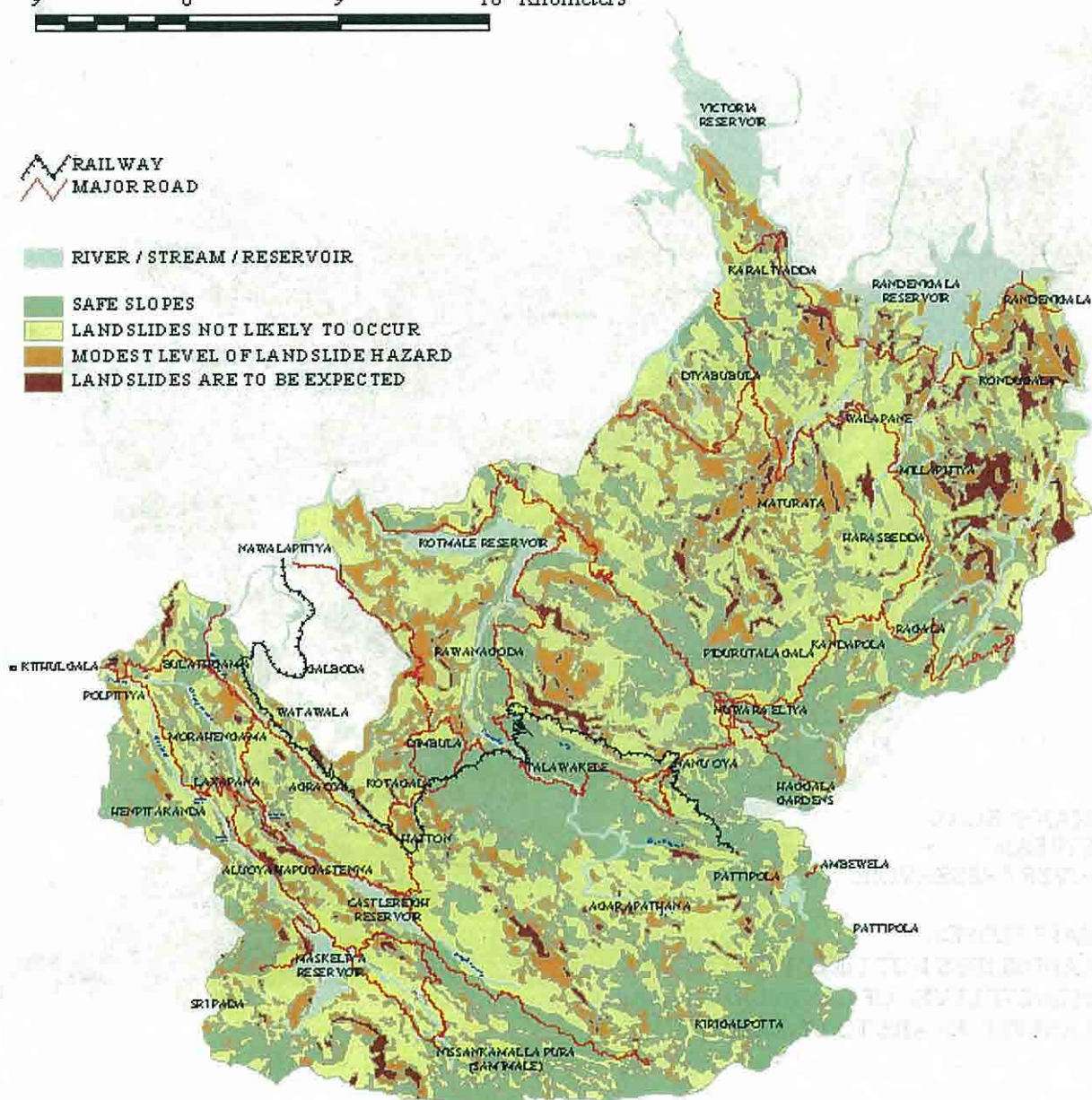
MAP OF LANDSLIDE HAZARD ZONES - NUWARA ELIYA DISTRICT



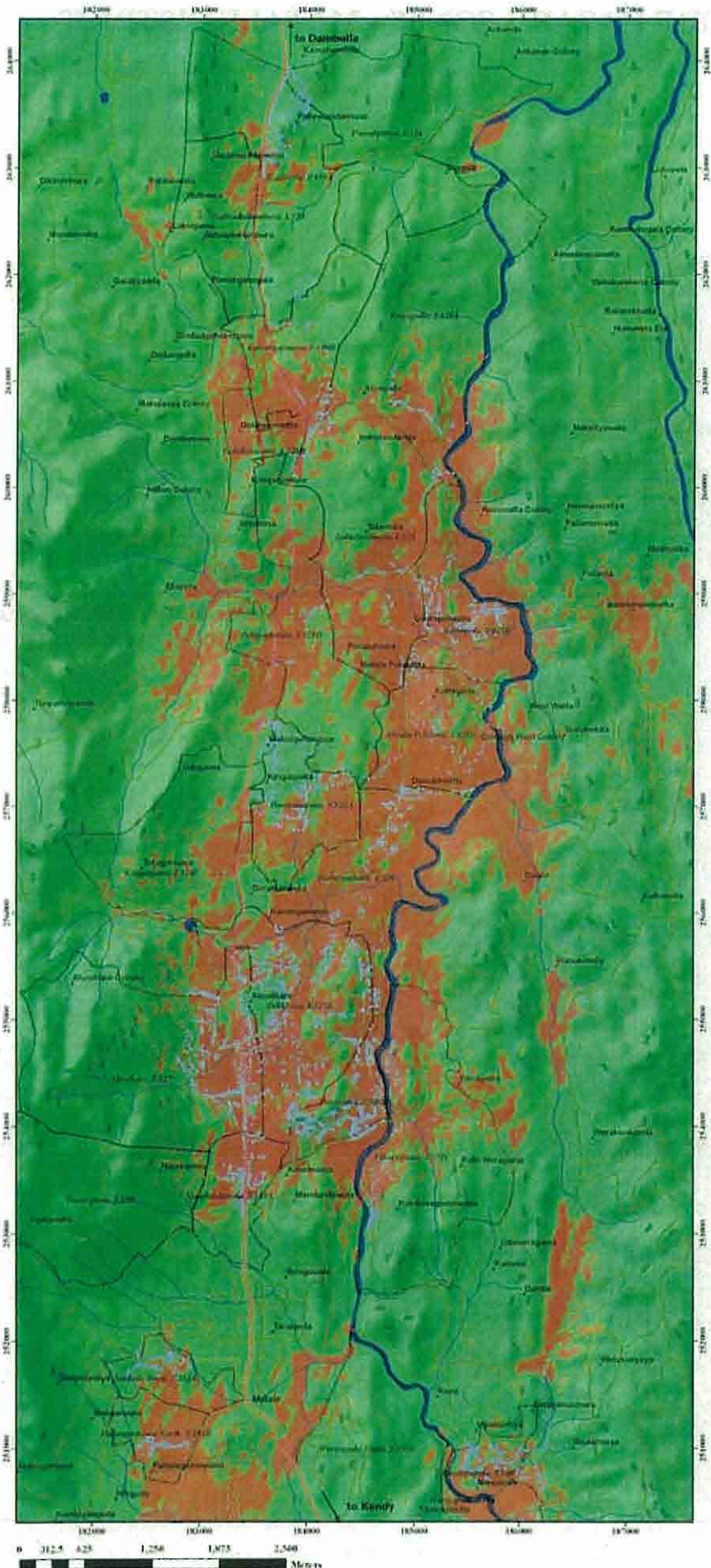
9 0 9 18 Kilometers

RAILWAY
 MAJOR ROAD

- RIVER / STREAM / RESERVOIR
- SAFE SLOPES
- LANDSLIDES NOT LIKELY TO OCCUR
- MODEST LEVEL OF LANDSLIDE HAZARD
- LANDSLIDES ARE TO BE EXPECTED



HAZARD ZONATION MAP OF GROUND SUBSIDANCE IN MATALE



Project Area in the map of Sri Lanka



Grassland Division of the Study Area

121224 Galle (area 4271) 12480000 23000 24300
 2104 Kandy (area 1270) 12480000 23000 24300
 2104 Kandy (area 1270) 12480000 23000 24300
 2104 Kandy (area 1270) 12480000 23000 24300
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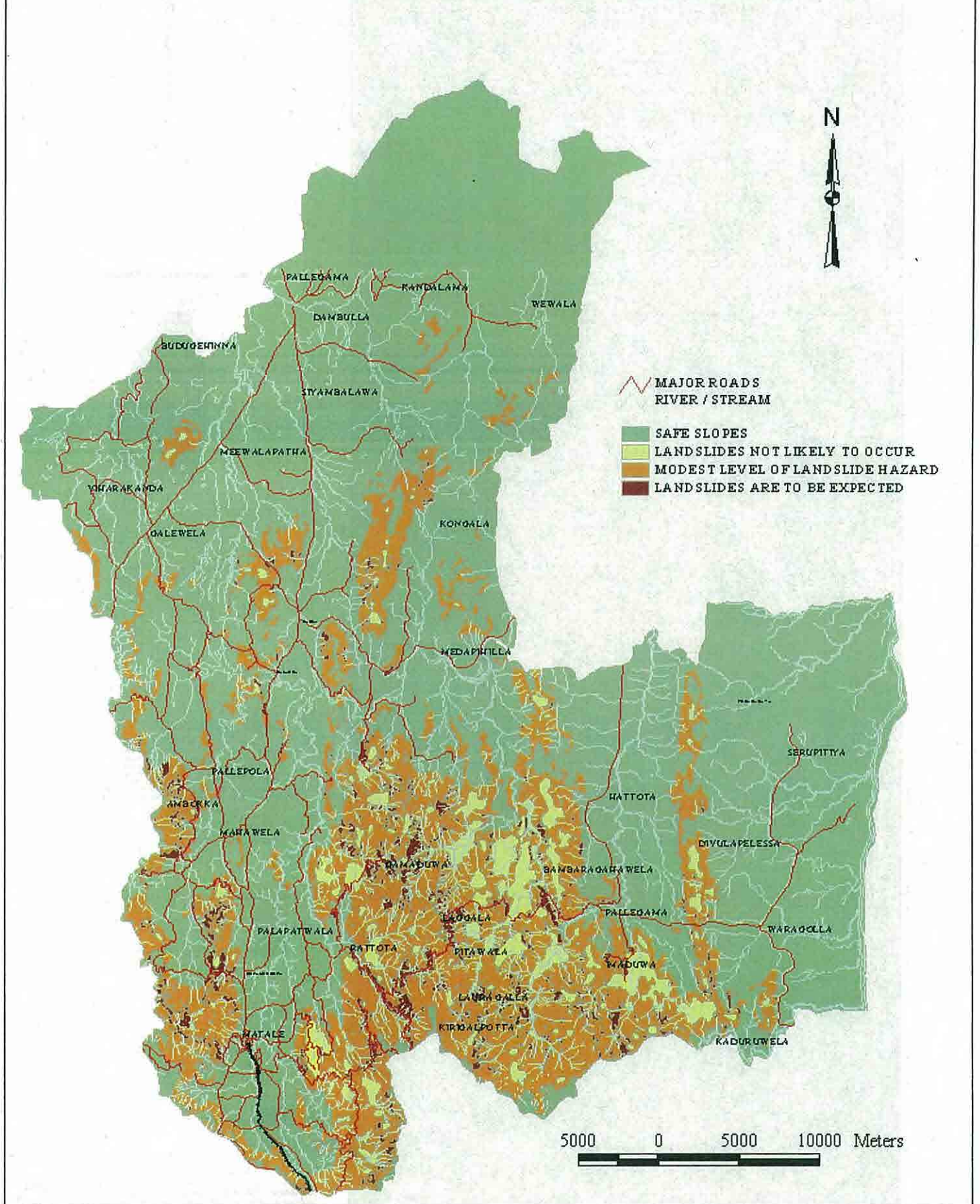
Hazard Level

- Potential Hazardous Area Due To Ground Subsidence
- Potential Low Hazard Risk Area Due To Ground Subsidence

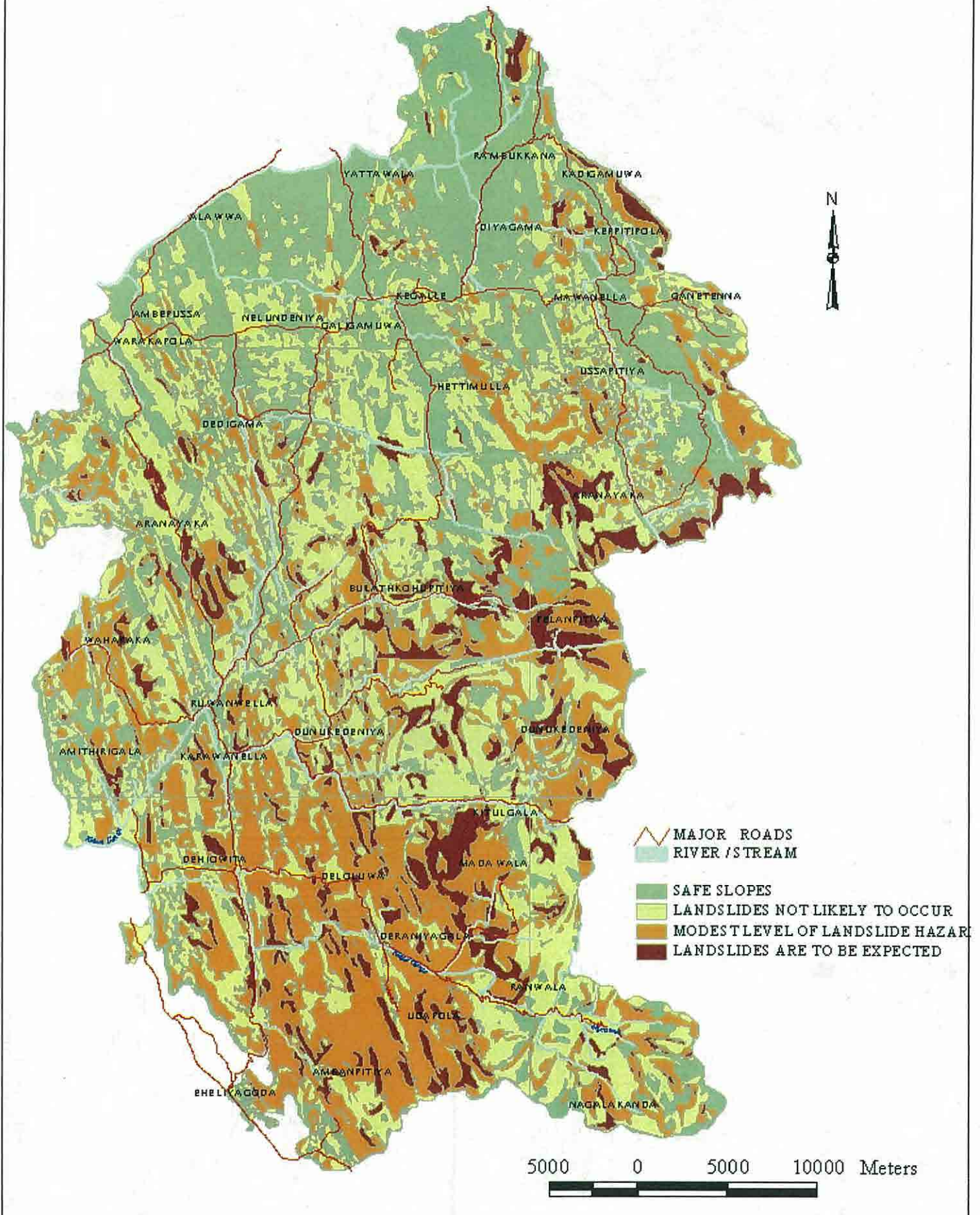
Other

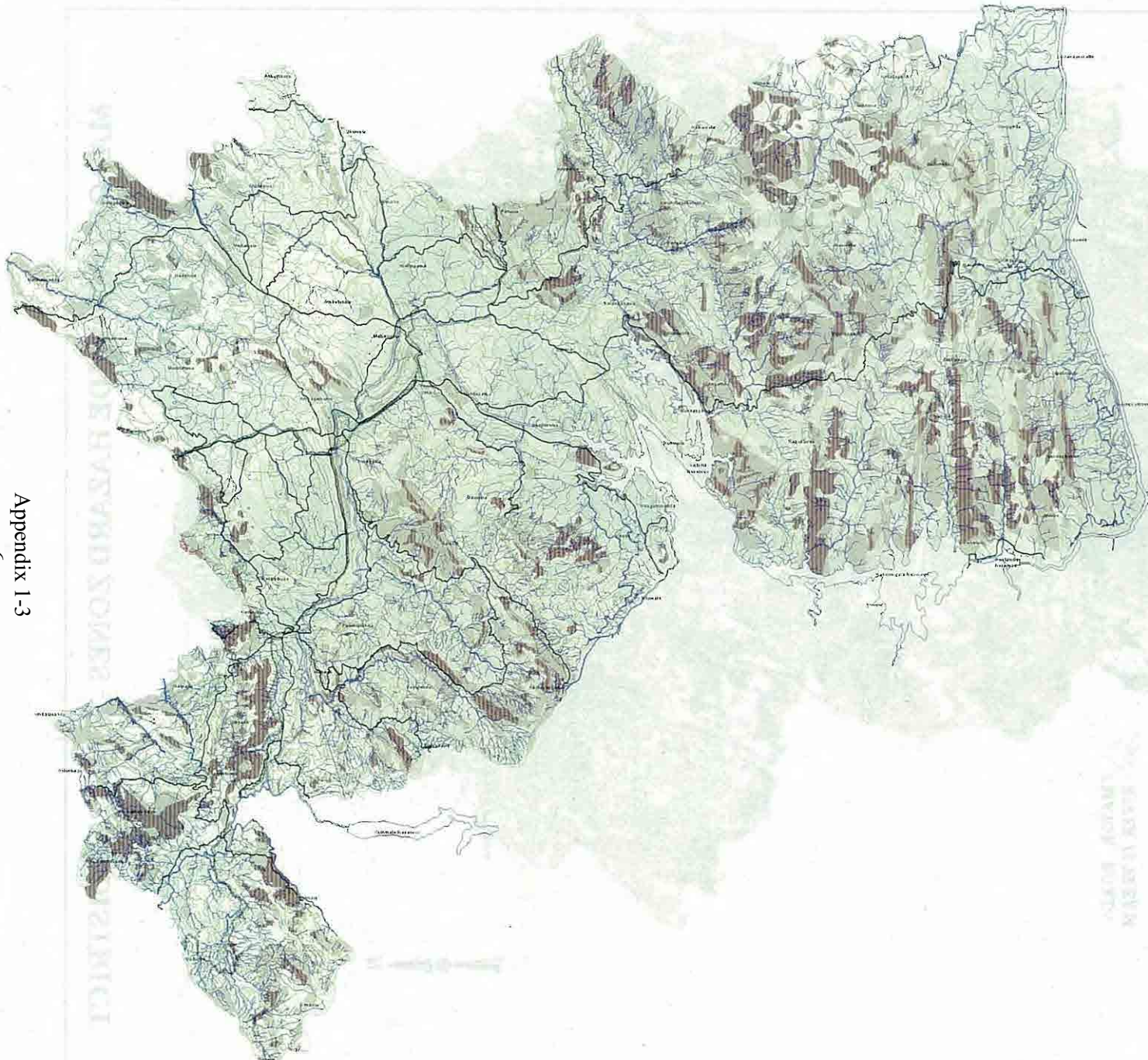
- Home Location
- AP
- Road Bank
- Location
- GND Delineation
- Water Channel

MAP OF LANDSLIDE HAZARD ZONES - MATALE DISTRICT



MAP OF LANDSLIDE HAZARD ZONES - KEGALLE DISTRICT





LANDSLIDE HAZARD ZONATION MAP KANDY DISTRICT

LEGEND

LANDSLIDE HAZARD POTENTIAL	ZONAL SIGNIFICANCE	
	Landslide or rock fall zones	Large scale landslide zones are high potential zones. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality.
	Moderate to high landslide hazard zones	Medium scale landslide zones are high potential zones. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality.
	Landslide or rock fall zones	Small scale landslide zones are high potential zones. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality.
	Landslide or rock fall zones	Very low landslide potential zones are high potential zones. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality. They are characterized by high landslide frequency, high landslide intensity and high landslide mortality.

TOPOGRAPHICAL LEGEND

Subsoil	
Secondary road	
Water	
High level stream	
Low level stream	
Waterfall	
Rocky stream	



NOTE
 The map displays the zonation of landslide hazard zones in the Kandy District. The map is based on the data of the Landslide Hazard Zonation Mapping Project (LHZM) conducted by the National Building Research Organisation (NBRO) in 2008. The map is based on the data of the Landslide Hazard Zonation Mapping Project (LHZM) conducted by the National Building Research Organisation (NBRO) in 2008. The map is based on the data of the Landslide Hazard Zonation Mapping Project (LHZM) conducted by the National Building Research Organisation (NBRO) in 2008.



LANDSLIDE HAZARD MAPPING PROJECT Phase III		
INFERRED MAP OF LANDSLIDE HAZARD ZONES		
SCALE 1:100,000	DATE 2010/2011	REVISION
LANDSLIDE STUDIES & SERVICES DIVISION		DESIGNER
HUMAN SETTLEMENTS DIVISION		OFF DESIGN & OUTGOING
COMPUTER DIVISION		DATA USE & SHARING
		THE APPLICATION
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NATIONAL BUILDING RESEARCH ORGANISATION 541, Zambezi Road, Colombo 10, Sri Lanka Tel: +94 11 722 2026, Fax: +94 11 722 2027 Website: www.nbro.gov.lk		

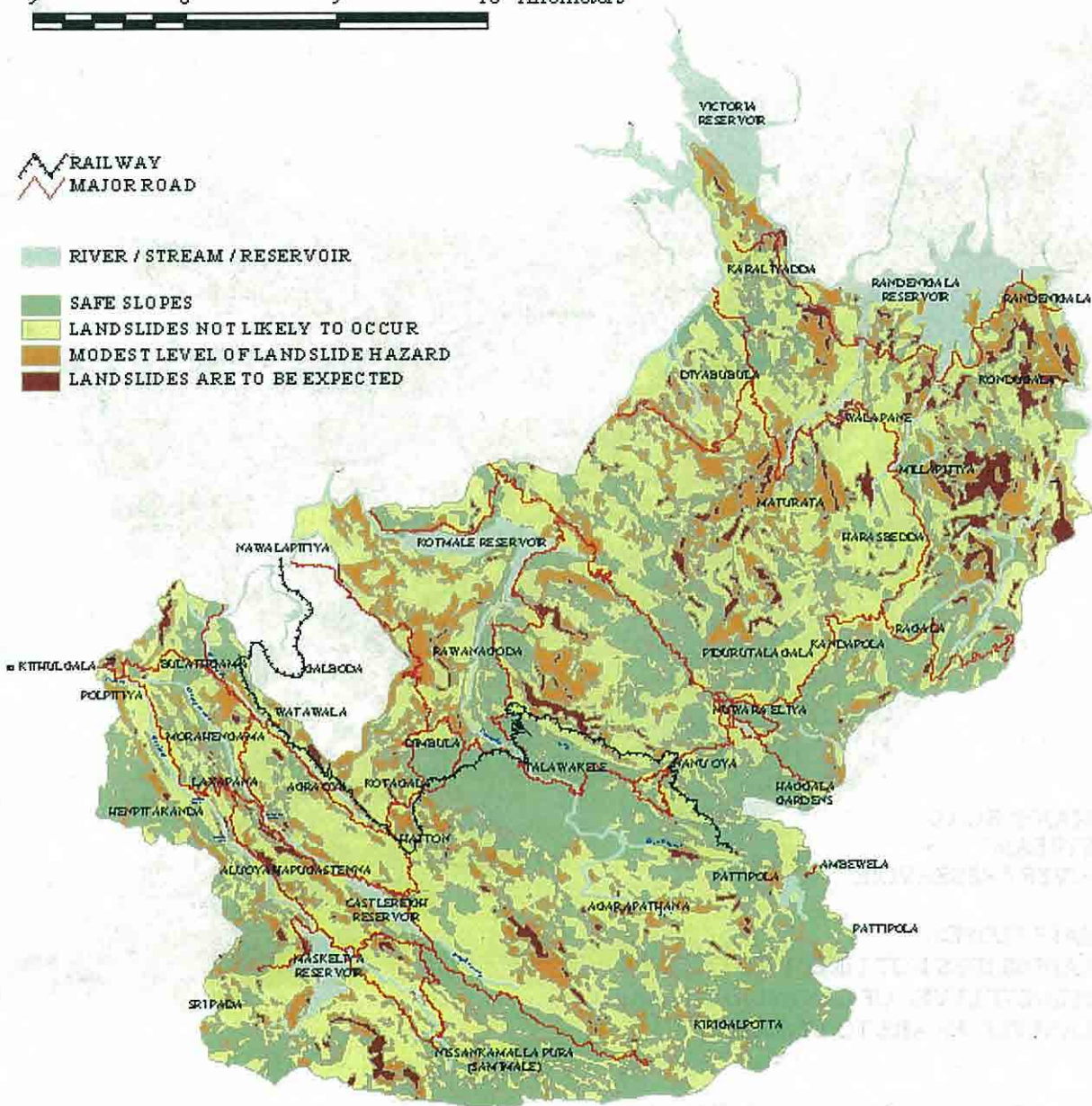
MAP OF LANDSLIDE HAZARD ZONES - NUWARA ELIYA DISTRICT



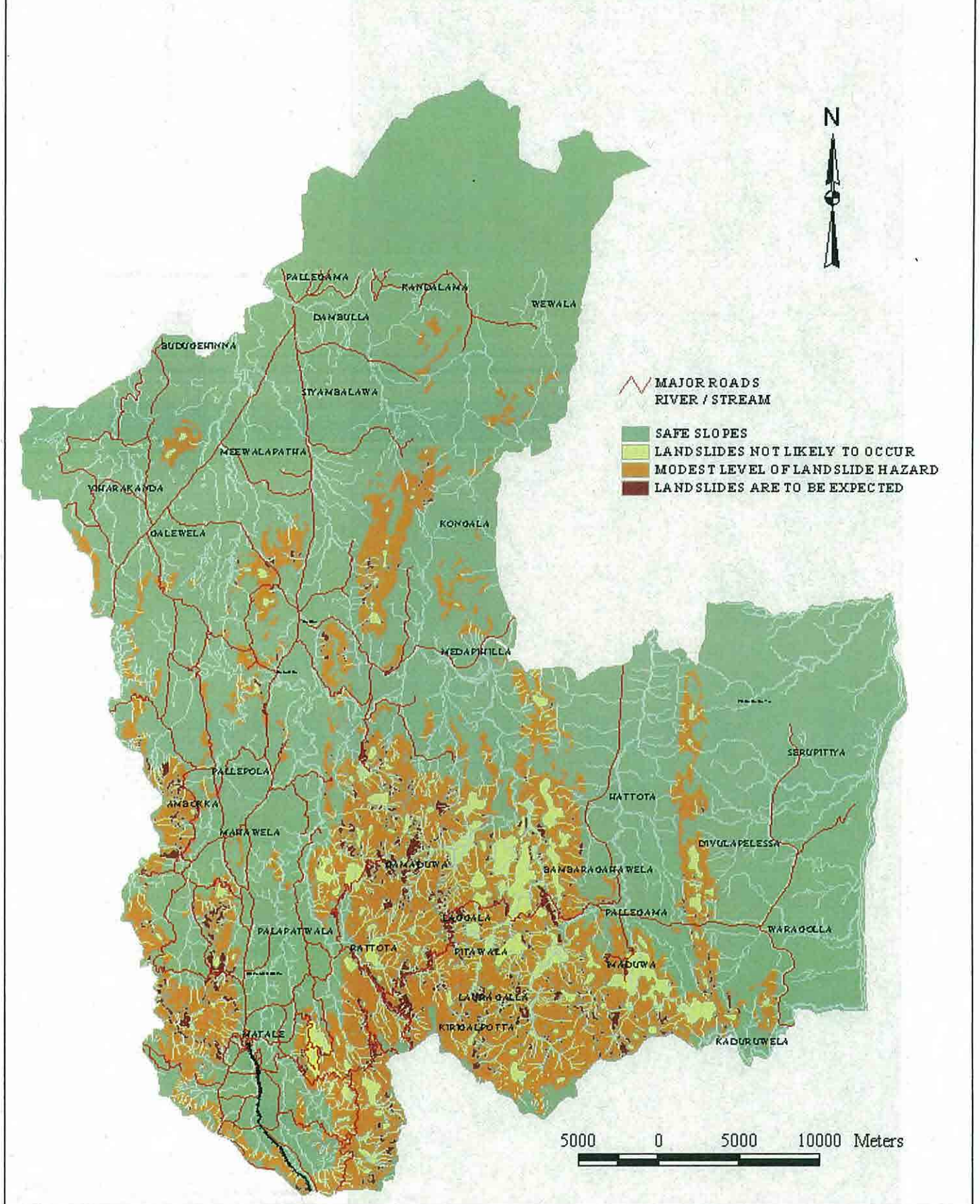
9 0 9 18 Kilometers

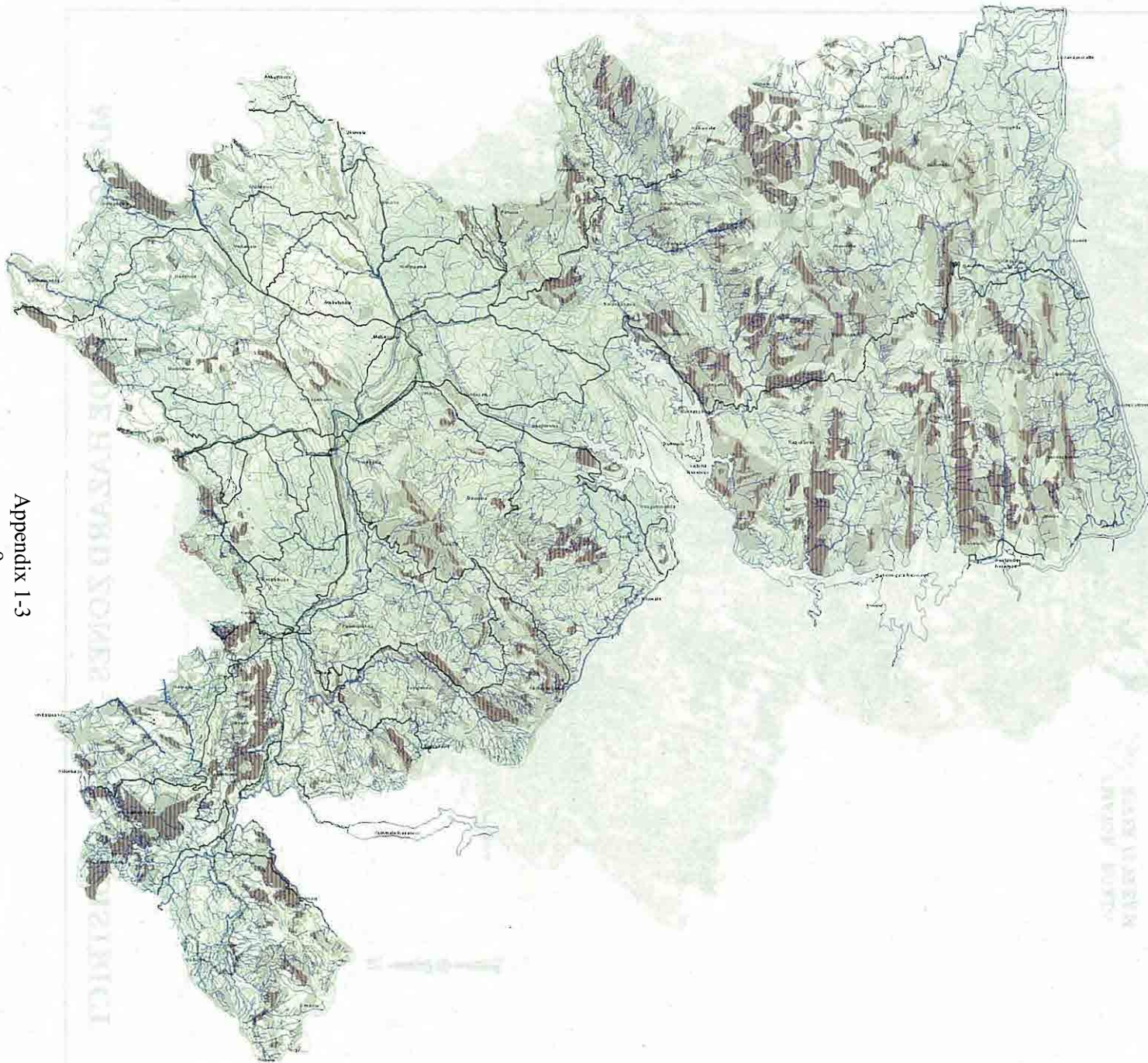
RAILWAY
 MAJOR ROAD

- RIVER / STREAM / RESERVOIR
- SAFE SLOPES
- LANDSLIDES NOT LIKELY TO OCCUR
- MODEST LEVEL OF LANDSLIDE HAZARD
- LANDSLIDES ARE TO BE EXPECTED



MAP OF LANDSLIDE HAZARD ZONES - MATALE DISTRICT





LANDSLIDE HAZARD ZONATION MAP KANDY DISTRICT

- LEGEND**
- | LANDSLIDE HAZARD POTENTIAL | ZONAL SIGNIFICANCE |
|---|--|
| Landslide or rock fall zones | Large scale landslide zones are high potential zones. These zones are characterized by high landslide frequency and high potential for loss of life and property. These zones are characterized by high landslide frequency and high potential for loss of life and property. |
| Moderate to high landslide hazard zones | Medium scale landslide zones are high potential zones. These zones are characterized by high landslide frequency and high potential for loss of life and property. These zones are characterized by high landslide frequency and high potential for loss of life and property. |
| Landslide or rock fall zones | High degree of landslide risk. High potential for loss of life and property. High potential for loss of life and property. |
| Landslide or rock fall zones | Low degree of landslide risk. High potential for loss of life and property. High potential for loss of life and property. |

- TOPOGRAPHICAL LEGEND**
- | | |
|----------------|--|
| Subsoil | |
| Secondary road | |
| Water | |
| High Voltage | |
| Other | |
| Other | |
| Other | |

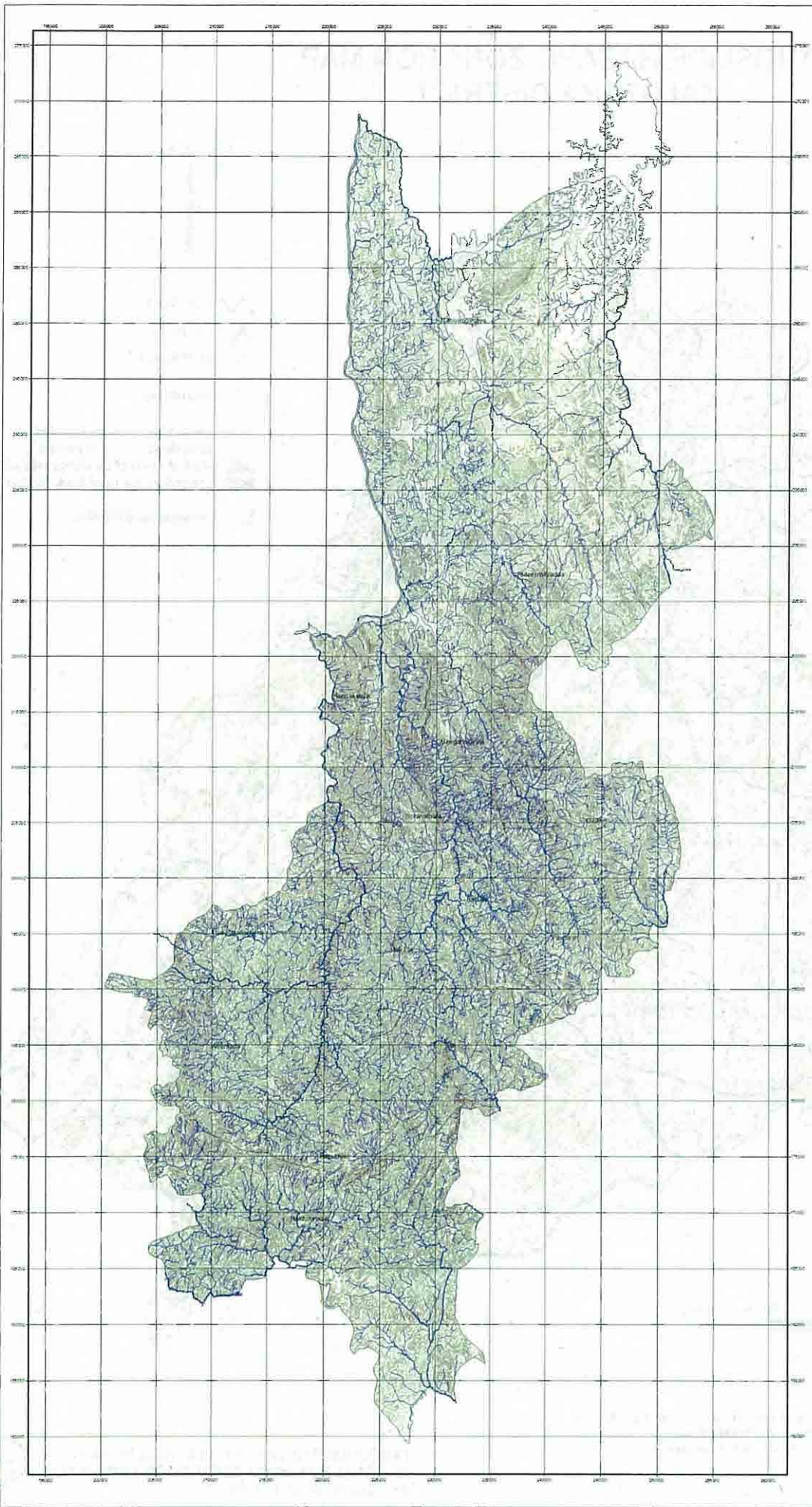


Extracted from a 1:50,000 Scale Landslide Hazard Zonation Map published by HERO.

Note:
This map is prepared by the National Building Research Organisation (NBRO) as a part of the National Building Research Organisation (NBRO) Landslide Hazard Zonation Mapping Project. The map is prepared by the National Building Research Organisation (NBRO) as a part of the National Building Research Organisation (NBRO) Landslide Hazard Zonation Mapping Project. The map is prepared by the National Building Research Organisation (NBRO) as a part of the National Building Research Organisation (NBRO) Landslide Hazard Zonation Mapping Project.



LANDSLIDE HAZARD MAPPING PROJECT		
Phase III		
INFERRED MAP OF LANDSLIDE HAZARD ZONES		
SCALE 1:100,000	DATE 2010/2011	REVISION
LANDSLIDE STUDIES & SERVICES DIVISION		DESIGNER
HUMAN SETTLEMENTS DIVISION		OFF DESIGN & OUTGOING
COMPUTER DIVISION		DATA USE & MAINTENANCE
		THE APPLICATION
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**PRELIMINARY HAZARD ZONATION MAP
BADULLA DISTRICT**

LEGEND

LANDSLIDE HAZARD ZONATION	ZONAL SIGNIFICANCE
	These areas are highly susceptible to landslides. These areas are highly susceptible to landslides. These areas are highly susceptible to landslides.
	These areas are moderately susceptible to landslides. These areas are moderately susceptible to landslides. These areas are moderately susceptible to landslides.
	These areas are not susceptible to landslides. These areas are not susceptible to landslides. These areas are not susceptible to landslides.
	These areas are highly susceptible to landslides. These areas are highly susceptible to landslides. These areas are highly susceptible to landslides.



This map is a part of the progress of the National Building Research Organisation (NBRO) under the National Building Research Project. Although the project is still in progress, the map is intended to provide a preliminary view of the landslide hazard zonation in the Badulla District. The map is based on the data collected during the field visits and the analysis of the topographic maps. The map is intended to provide a preliminary view of the landslide hazard zonation in the Badulla District. The map is based on the data collected during the field visits and the analysis of the topographic maps.



LANDSLIDE HAZARD MAPPING PROJECT
Phase III

INFERRED MAP OF LANDSLIDE HAZARD ZONES

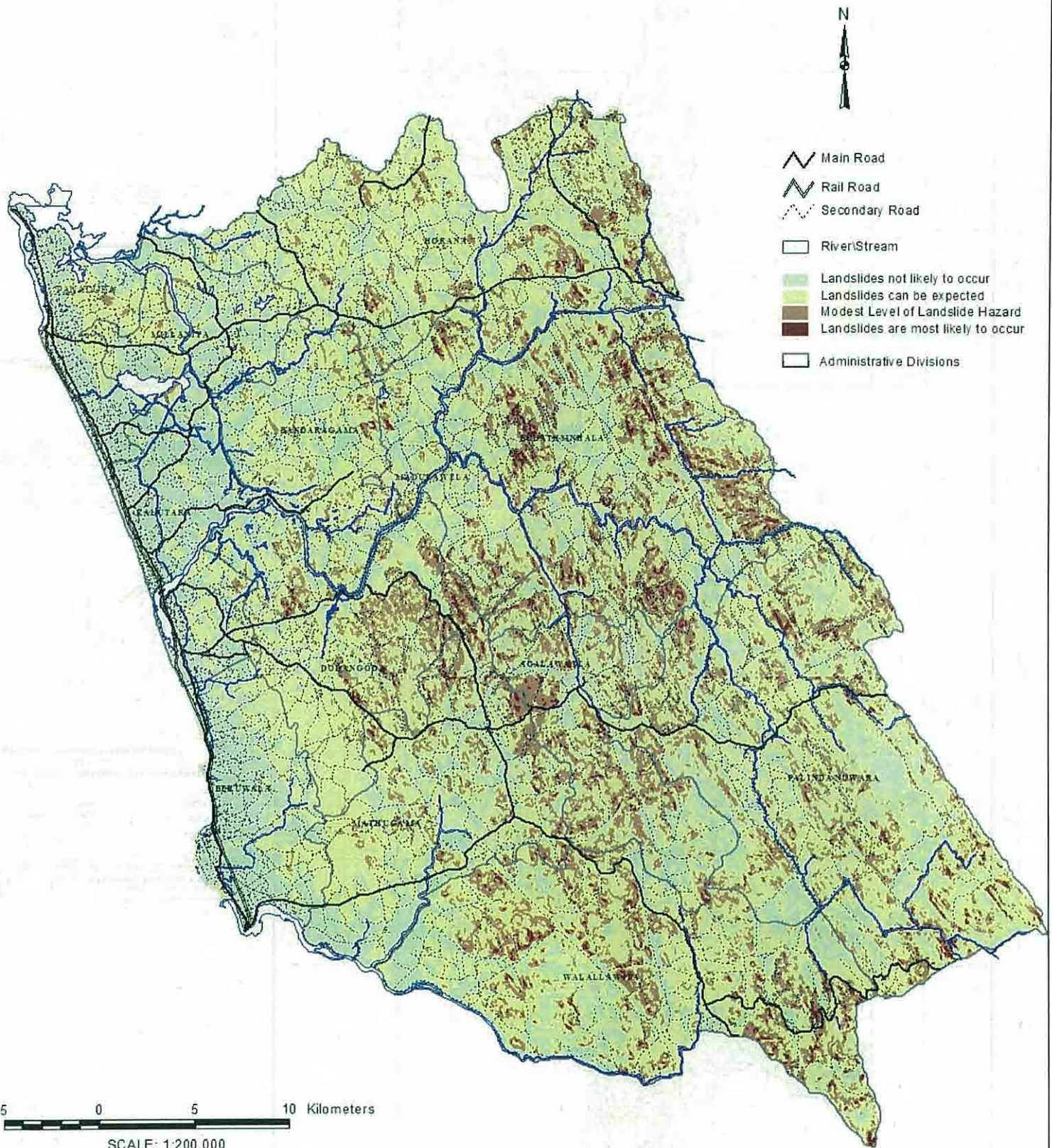
SCALE 1:150,000	DATE 18.08.2005	REVISION
LANDSLIDE STUDIES & REPAIRS DIVISION	GEOLOGY	
SCALE 1:150,000	SCALE RANGE & CATEGORY	
COMPUTER DIVISION	LAND USE & MANAGEMENT	
	GIS APPLICATION	

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Team Leader, Landslide Hazard Mapping Project

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DIRECTOR GENERAL (NBRO)

NATIONAL BUILDING RESEARCH ORGANISATION
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LANDSLIDE HAZARD ZONATION MAP KALUTARA DISTRICT



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LANDSLIDE STUDIES AND SERVICES DIVISION
 NATIONAL BUILDING RESEARCH ORGANISATION
 99/1 Jawatta Road Colombo 05



Appendix 2-1 Screening process

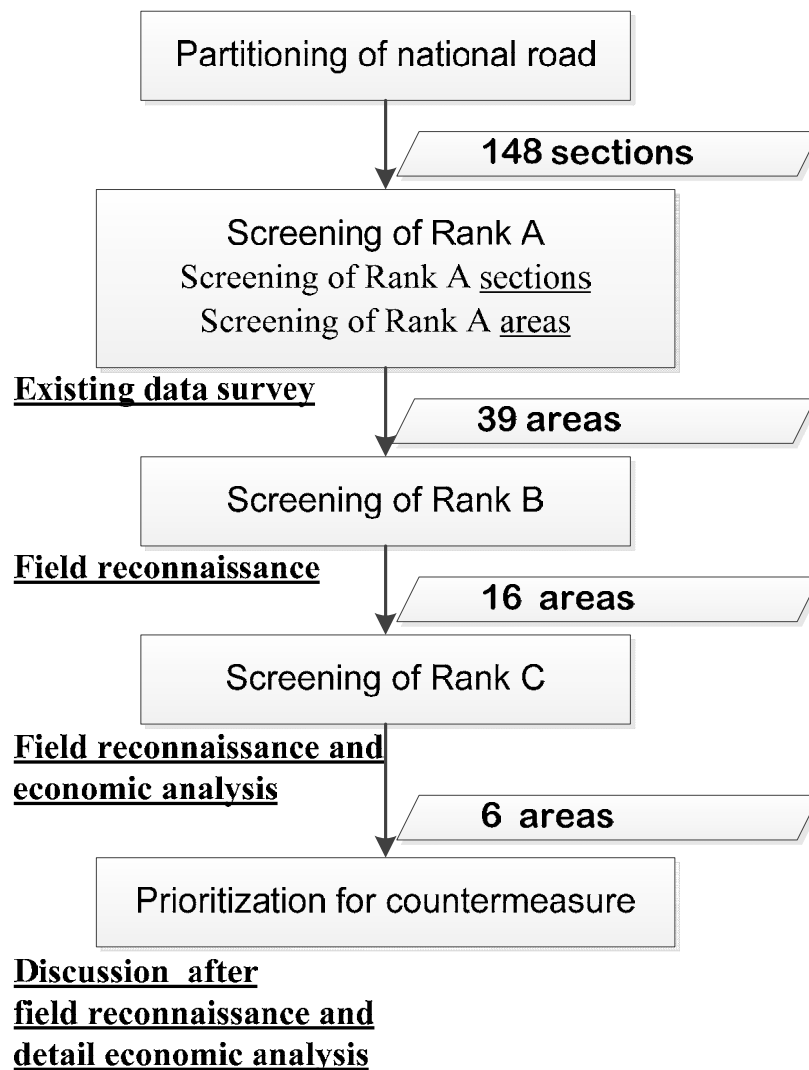


Figure: Flowchart of screening of Rank A, B and C

Table: Screening process for target areas

Stage	Target areas	Description	Quantity
stage.0	All "A roads" in 7 provinces	Partitioning of national road: "A roads" in 7 districts are divided into short sections as a unit of intercity road around 3-10km length among all roads (10,000km) around the country which have potential landslide disasters.	148 sections
stage.1			
stage.1-1	Rank A sections	A simple scoring method using several indicators is adopted (The indicators are composed of disaster records, a natural condition and social conditions). The full score by the indicators is 40, and a section where the sum is 22 points (55 %) or more by the method is a Rank A section.	
stage.1-2	Rank A areas	Rank A areas were selected based on the site checks by professional engineers who has affluent experience more than 20 years on landslide disaster. The check points are classified for each disaster type, slope failure/rockfall, landslide and debris flow.	39 areas
stage.2	Rank B areas	Site investigation by using site investigation sheet: slope type, slope height, main composition of slope, condition of slope, possible disaster, landslide surface anomalies, installed countermeasure , environmental issue (more than 50 scores on the sheet)	16 areas
stage.3	Rank C areas	Scoring by inspection sheet which calculates the danger of the slope itself and evaluates the hazard on slope in Rank B (16 areas). The areas which are more than 70 scores on the inspection sheet are Rank C.	6 areas

Appendix 2-2 Risk analysis for Rank A

Table: Score and selected senctions of Rank A

NO	DISTRICT	City/Town		Kilometer Post		Distance (km)	Disaster record	Rainfall condition	Traffic amount	Detour	Sum
		St.	En.	St.	En.						
A001	Kegalle	Province boundary	Junction of B457	55.682	56.855	1.173	0	4	4	4	12
A001	Kegalle	Junction of B457	Ambepussa	56.855	59.175	2.320	0	4	4	7	15
A001	Kegalle	Ambepussa	Nelundeniya	59.175	66.401	7.226	0	4	4	4	12
A001	Kegalle	Nelundeniya	Galigomuwa	66.401	71.998	5.597	0	4	4	4	12
A001	Kegalle	Galigomuwa	Kegalla	71.998	77.634	5.636	0	4	4	4	12
A001	Kegalle	Kegalle	Junction of B199	77.634	81.612	3.978	0	4	4	4	12
A001	Kegalle	Junction of B199	Mawanella	81.612	90.489	8.877	0	4	4	4	12
A001	Kegalle	Mawanella	District boundary	90.489	98.812	8.323	0	3	4	4	11
A001	Kandy	District boundary	Kadugannawa	98.812	100.209	1.397	0	3	4	4	11
A001	Kandy	Kadugannawa	Junction of B6	100.209	104.270	4.061	0	3	4	4	11
A001	Kandy	Junction of B6	Peradeniya	104.270	109.434	5.164	0	3	4	4	11
A001	Kandy	Peradeniya	Kandy	109.434	115.880	6.446	0	3	8	7	18
A002	Kalutara	District boundary	Panadura	22.000	26.657	4.657	0	4	10	4	18
A002	Kalutara	Panadura	Wadduwa	26.657	32.663	6.006	0	4	6	4	14
A002	Kalutara	Wadduwa	Kalutara	32.663	42.134	9.471	0	4	6	4	14
A002	Kalutara	Kalutara	Paiyagala	42.134	50.000	7.866	0	4	6	4	14
A002	Kalutara	Paiyagala	Beruwara	50.000	55.000	5.000	0	4	6	4	14
A002	Kalutara	Beruwala	Province boundary	55.000	60.505	5.505	0	4	6	4	14
A004	Ratnapura	Province boundary	Getahetta	63.680	65.500	1.820	0	6	4	7	17
A004	Ratnapura	Getahetta	Eheliyagoda	65.500	70.949	5.449	0	6	4	7	17
A004	Ratnapura	Eheliyagoda	Parakaduwa	70.949	78.000	7.051	0	8	4	4	16
A004	Ratnapura	Parakaduwa	Pussella	78.000	81.200	3.200	0	8	4	7	19
A004	Ratnapura	Pussella	Kuruwita	81.200	86.900	5.700	0	8	4	7	19
A004	Ratnapura	Kuruwita	Ratnapura	86.900	95.115	8.215	0	8	4	4	16
A004	Ratnapura	Ratnapura	Tiruwanaketiya	95.115	103.942	8.827	0	6	4	4	14
A004	Ratnapura	Tiruwanaketiya	Pelmadulla	103.942	118.521	14.579	0	6	4	7	17
A004	Ratnapura	Pelmadulla	Opanayaka	118.521	128.300	9.779	0	6	2	10	18
A004	Ratnapura	Opanayaka	Balangoda	128.300	143.331	15.031	10	6	2	10	28
A004	Ratnapura	Balangoda	Samanala wewa bridge	143.331	153.000	9.669	0	4	2	10	16
A004	Ratnapura	Samanalawewa bridge	Belihul oya	153.000	158.200	5.200	10	4	2	10	26
A004	Ratnapura	Belihul oya	Halpe	158.200	167.000	8.800	10	4	2	10	26
A004	Ratnapura	Halpe	Province boundary	167.000	168.363	1.363	0	4	2	10	16
A004	Badulla	Province boundary	Kalupahana	168.363	173.700	5.337	10	4	2	10	26
A004	Badulla	Kalupahana	Beragala	173.700	181.621	7.921	10	4	2	10	26
A004	Badulla	Beragala	Galkanda new	181.621	189.200	7.579	10	4	2	7	23
A004	Badulla	Galkanda new	Laymastotte	189.200	195.000	5.800	10	4	2	7	23
A004	Badulla	Laymastotte	Koslanda	195.000	199.373	4.373	10	4	2	7	23
A004	Badulla	Koslanda	District boundary	199.373	216.300	16.927	0	3	2	7	12
A005	Kandy	Peradeniya	Geliya	0.000	6.092	6.092	0	3	4	4	11
A005	Kandy	Geliya	Gampola	6.092	13.358	7.266	0	3	4	4	11
A005	Kandy	Gampola	Atabage oya bridge	13.358	20.188	6.830	10	3	4	4	21
A005	Kandy	Atabage oya bridge	Pussellawa	20.188	30.356	10.168	0	4	2	4	10
A005	Kandy	Pussellawa	District boundary	30.356	38.500	8.144	0	4	2	7	13
A005	Nuwaraeliya	District boundary	Nawakadadora	38.500	40.100	1.600	0	4	2	7	13
A005	Nuwaraeliya	Nawakadadora	Delunthalamada	40.100	45.100	5.000	10	4	2	7	23
A005	Nuwaraeliya	Delunthalamada	Ramboda	45.100	52.500	7.400	10	4	2	7	23
A005	Nuwaraeliya	Ramboda	Puha oya bridge	52.500	64.700	12.200	10	6	2	7	25
A005	Nuwaraeliya	Puha oya bridge	Nuwaraeliya	64.700	68.894	4.194	0	6	2	7	15
A005	Nuwaraeliya	Nuwaraeliya	Province boundary	68.894	78.477	9.583	10	4	2	7	23
A005	Badulla	Province boundary	Keppetipola	78.477	87.067	8.590	10	3	2	7	22
A005	Badulla	Keppetipola	Wellimada	87.067	93.923	6.856	10	3	2	7	22
A005	Badulla	Wellimada	Etampitiya	93.923	107.762	13.839	10	4	2	4	20
A005	Badulla	Etampitiya	Hali ela	107.762	117.511	9.749	0	3	2	4	9
A005	Badulla	Hali ela	Badulla	117.511	125.518	8.007	10	4	2	4	20
A005	Badulla	Badulla	Passara	125.518	140.184	14.666	10	4	2	7	23
A005	Badulla	Passara	Tennugewatta	140.184	153.100	12.916	0	4	2	10	16
A005	Badulla	Tennugewatta	Lunugala	153.100	172.100	19.000	10	3	2	10	25
A005	Badulla	Lunugala	District boundary	172.100	178.700	6.600	0	3	2	10	15
A006	Kegalle	Ambepussa	Province boundary	0.000	7.250	7.250	0	4	4	4	12
A006	Matale	Province boundary	Polgahawela	7.250	15.550	8.300	0	4	4	7	15
A006	Matale	Polgahawela	Bulugolla	15.550	21.560	6.010	0	4	4	4	12
A006	Matale	Bulugolla	Dambokka	21.560	27.930	6.370	0	4	4	4	12
A006	Matale	Dambokka	Kurunegala	27.930	36.176	8.246	0	4	4	4	12
A006	Matale	Kurunegala	Ibbagamuwa	36.176	46.980	10.804	0	4	4	4	12
A006	Matale	Ibbagamuwa	Province boundary	46.980	69.260	22.280	0	4	4	4	12
A007	Kegalle	Avissawella	Dehiowita	0.000	7.870	7.870	10	6	4	4	24
A007	Kegalle	Dehiowita	Karawanella	7.870	13.910	6.040	0	6	4	7	17

Table: Score and selected senctions of Rank A

NO	DISTRICT	City/Town		Kilometer Post		Distance (km)	Disaster record	Rainfall condition	Traffic amount	Detour	Sum
		St.	En.	St.	En.						
A007	Kegalle	Karawanella	Yatiantota	13.910	19.270	5.360	0	6	4	4	14
A007	Kegalle	Yatiantota	Kitulgala	19.270	37.200	17.930	10	8	2	10	30
A007	Kegalle	Kitulgala	Province boundary	37.200	41.300	4.100	0	10	2	10	22
A007	Nuwaraeliya	Province boundary	Junction of B189	41.300	43.150	1.850	10	10	2	10	32
A007	Nuwaraeliya	Junction of B189	Ginigathena	43.150	53.000	9.850	10	10	2	10	32
A007	Nuwaraeliya	Ginigathena	Junction of B71	53.000	58.040	5.040	10	10	2	10	32
A007	Nuwaraeliya	Junction of B71	Rozella	58.040	63.960	5.920	0	10	2	7	19
A007	Nuwaraeliya	Rozella	Hatton	63.960	72.000	8.040	10	8	2	7	27
A007	Nuwaraeliya	Hatton	Kotagala	72.000	74.670	2.670	0	6	2	7	15
A007	Nuwaraeliya	Kotagala	Dimbulla	74.670	82.120	7.450	0	6	2	4	12
A007	Nuwaraeliya	Dimbulla	Talawakele	82.120	88.410	6.290	0	6	2	7	15
A007	Nuwaraeliya	Talawakele	Lindula	88.410	92.370	3.960	0	6	2	7	15
A007	Nuwaraeliya	Lindula	Nanu oya	92.370	108.700	16.330	0	4	2	10	16
A007	Nuwaraeliya	Nanu oya	Junction of A5	108.700	116.920	8.220	0	4	2	10	16
A008	Kalutara	Panadura	Alubomulla	0.000	4.930	4.930	0	4	4	4	12
A008	Kalutara	Alubomulla	Bandaragama	4.930	9.870	4.940	0	4	4	4	12
A008	Kalutara	Bandaragama	Horana	9.870	18.270	8.400	0	4	4	4	12
A008	Kalutara	Horana	Kalupahana	18.270	24.900	6.630	0	6	4	4	14
A008	Kalutara	Kalupahana	Ingiriya	24.900	32.160	7.260	0	6	4	4	14
A008	Kalutara	Ingiriya	Province boundary	32.160	36.490	4.330	0	6	4	7	17
A008	Ratnapura	Province boundary	Nambapana	36.490	43.400	6.910	0	6	2	7	15
A008	Ratnapura	Nambapana	Idangoda	43.400	51.000	7.600	0	8	2	7	17
A008	Ratnapura	Idangoda	Gorakaela	51.000	57.200	6.200	0	8	2	7	17
A008	Ratnapura	Gorakaela	Kahangama	57.200	63.300	6.100	0	8	2	7	17
A008	Ratnapura	Kahangama	Ratnapura	63.300	68.900	5.600	0	8	2	4	14
A009	Kandy	Kandy	Katugastota	0.000	4.260	4.260	0	3	8	4	15
A009	Kandy	Katugastota	Akurana	4.260	10.600	6.340	0	3	4	4	11
A009	Kandy	Akurana	District boundary	10.600	17.100	6.500	10	3	4	4	21
A009	Matale	District boundary	Matale	17.100	25.300	8.200	10	3	4	4	21
A009	Matale	Matale	Palapatwela	25.300	32.540	7.240	0	3	4	4	11
A009	Matale	Palapatwela	Kavudupelella	32.540	38.800	6.260	0	3	4	4	11
A009	Matale	Kavudupelella	Madawala	38.800	42.700	3.900	0	3	4	4	11
A009	Matale	Madawala	Nalanda	42.700	49.200	6.500	0	3	2	4	9
A009	Matale	Nalanda	Naula	49.200	54.180	4.980	0	3	2	4	9
A009	Matale	Naula	Pannampitiya	54.180	64.000	9.820	0	2	2	4	8
A009	Matale	Pannampitiya	Dambulla	64.000	73.080	9.080	0	2	2	4	8
A009	Matale	Dambulla	Province boundary	73.080	75.000	1.920	0	2	2	4	8
A010	Kandy	Katugastota	Hedeniya	0.106	8.647	8.541	0	4	4	4	12
A010	Kandy	Hedeniya	Galagedara	8.647	13.697	5.050	10	3	2	4	19
A010	Kandy	Galagedara	Province boundary	13.697	16.368	2.671	10	3	2	4	19
A016	Badulla	Beragala	Haputale	0.000	6.570	6.570	10	4	2	10	26
A016	Badulla	Haputale	Bandarawela	6.570	16.630	10.060	10	4	2	7	23
A016	Badulla	Bandarawela	Junction of A23	16.630	25.130	8.500	0	3	4	7	14
A016	Badulla	Junction of A23	Demodara	25.130	30.080	4.950	0	3	4	7	14
A016	Badulla	Demodara	Hali ela	30.080	38.640	8.560	0	3	2	7	12
A017	Ratnapura	Province boundary	Hayes	86.700	96.500	9.800	10	4	2	10	26
A017	Ratnapura	Hayes	Suriyakanda	96.500	112.940	16.440	0	4	2	10	16
A017	Ratnapura	Suriyakanda	Rakwana	112.940	130.580	17.640	0	4	2	10	16
A017	Ratnapura	Rakwana	Madampe	130.580	143.270	12.690	0	6	2	4	12
A018	Ratnapura	Pelmadulla	Kahawatta	0.000	7.000	7.000	0	6	2	4	12
A018	Ratnapura	Kahawatta	Madampe	7.000	13.020	6.020	0	6	2	4	12
A018	Ratnapura	Madampe	Godakawela	13.020	20.900	7.880	0	6	2	4	12
A018	Ratnapura	Godakawela	Pallebedda	20.900	26.730	5.830	0	4	2	10	16
A018	Ratnapura	Pallebedda	Udawalawe	26.730	43.150	16.420	0	3	2	10	15
A018	Ratnapura	Udawalawe	Udagama	43.150	53.480	10.330	0	3	2	7	12
A018	Ratnapura	Udagama	Suriyawewa	53.480	66.260	12.780	0	2	2	7	11
A018	Ratnapura	Suriyawewa	Province boundary	66.260	68.750	2.490	0	2	2	7	11
A019	Kegalle	Province boundary	Kegalle	2.718	11.820	9.102	0	4	2	4	10
A021	Kegalle	Kegalle	Hettimulla	0.000	6.260	6.260	0	4	2	4	10
A021	Kegalle	Hettimulla	Undugoda	6.260	14.500	8.240	0	4	2	4	10
A021	Kegalle	Undugoda	Bulathkohupitiya	14.500	25.220	10.720	10	4	2	7	23
A021	Kegalle	Bulathkohupitiya	Ranawitiya	25.220	30.500	5.280	0	4	4	7	15
A021	Kegalle	Ranawitiya	Anguruwella	30.500	37.090	6.590	0	4	4	4	12
A021	Kegalle	Anguruwella	Karawanella	37.090	41.850	4.760	0	6	4	4	14
A022	Badulla	Tennugewatta	District boundary	0.000	6.000	6.000	0	4	2	10	16
A023	Badulla	District boundary	Ella	14.100	27.310	13.210	0	4	2	4	10
A023	Badulla	Ella	Junction of A16	27.310	30.390	3.080	0	3	2	7	12

Table: Score and selected senctions of Rank A

NO	DISTRICT	City/Town		Kilometer Post		Distance (km)	Disaster record	Rainfall condition	Traffic amount	Detour	Sum
		St.	En.	St.	En.						
A026	Kandy	Kandy	Junction of B311	0.000	4.550	4.550	0	3	6	4	13
A026	Kandy	Junction of B311	Junction of B256	4.550	14.260	9.710	0	4	4	4	12
A026	Kandy	Junction of B256	Hulu ganga bridge	14.260	17.800	3.540	0	4	4	7	15
A026	Kandy	Hulu ganga bridge	Meegahamaditta	17.800	25.300	7.500	0	4	4	7	15
A026	Kandy	Meegahamaditta	Medamahanuwara	25.300	32.800	7.500	10	4	2	7	23
A026	Kandy	Medamahanuwara	Hunnasgiriya	32.800	38.700	5.900	10	4	2	10	26
A026	Kandy	Hunnasgiriya	Madugoda	38.700	45.900	7.200	10	6	2	4	22
A026	Kandy	Madugoda	Umbugala	45.900	54.200	8.300	10	6	2	10	28
A026	Kandy	Umbugala	Hasalaka	54.200	64.800	10.600	10	6	2	10	28
A026	Kandy	Hasalaka	Province boundary	64.800	72.230	7.430	0	6	2	10	18
A026	Badulla	Province boundary	Belilgalla	72.230	84.742	12.512	0	4	2	7	13
A026	Badulla	Belilgalla	Province boundary	84.742	98.862	14.120	0	4	2	10	16
A113	Kandy	Gampola	Junction of B431	0.000	8.597	8.597	0	4	2	4	10
A113	Kandy	Junction of B431	Nawalapitiya	8.597	17.190	8.593	10	10	2	7	29

Disaster record	Disaster records in 1960s – 2012 [number]	<ul style="list-style-type: none"> 1 or more disaster: 10 points No disaster: 0 point
Rainfall condition	Annual average rainfall [mm/year]	<ul style="list-style-type: none"> 4,000-5,000 mm/year: 10 points 3,000-4,000 mm/year: 8 points 2,000-3,000 mm/year: 6 points 1,500-2,000 mm/year: 4 points 1,000-1,500 mm/year: 3 points -1,000 mm/year: 2 points
Traffic amount	Forecasted ADT: Average Daily Traffic (2012) [vehicle number]	<ul style="list-style-type: none"> 40,000-50,000: 10 points 30,000-40,000: 8 points 20,000-30,000: 6 points 10,000-20,000: 4 points -10,000: 2 points
Detour	Distance loss by using the detours between intercity [km]	<ul style="list-style-type: none"> 50km -: 10 points 20 – 50km: 7 points - 20km: 4 points

Appendix 2-3 List of Rank A, B, C

Table: List of candidates of Rank A areas

No.	Route No	Name	Kilometer Post		Disaster Type
			St.	En.	
1	A004	A004-134	134/15	134	Rock Fall
2	A004	A004-154	154/7		Landslide?
3	A004	A004-162	162/8		Debris Flow
4	A004	A004-173	173/11		Slope Failure
5	A004	A004-174	175/1	175/3	Slope Failure
6	A004	A004-185	185/6		Landslide
7	A004	A004-193	194/11		Landslide
8	A004	A004-196	196+300	196+800	Landslide
9	A005	A005-042	43/1	43/6	Landslide
10	A005	A005-043	43/8	43/9	Rock Fall/Rock Slide
11	A005	A005-044	44/2	44/3	Rock Fall/Rock Slide
12	A005	A005-046	46/5	46/6	Rock Fall/Rock Slide
13	A005	A005-063	63/3		Slope Failure
14	A005	A005-082	82+100	82+700	Slope Failure
15	A005	A005-091	91+019		Slope Failure
16	A005	A005-135	135+200	135+700	Landslide
17	A005	A005-167	168/8	168/9	Landslide
18	A007	A007-031	31/1	31/2	Slope Failure
19	A007	A007-042	42/14		Landslide?
20	A007	A007-045	45		Rock Fall/Rock Slide
21	A007	A007-047	47	48/1	Landslide
22	A007	A007-054	54/1		Slope Failure
23	A007	A007-057	57/9		Slope Failure
24	A007	A007-069	68	69/1	Landslide
25	A016	A016-010	10/12	11/1	Landslide
26	A021	A021-020	19+800	20+000	Landslide
27	A026	A026-027	27	28/1	Rock Fall/Rock Slide
28	A026	A026-029	29	30/1	Rock Fall/Rock Slide
29	A026	A026-036	36	37/1	Slope Failure
30	A026	A026-045	46/2	46/3	Slope Failure
31	A026	A026-048	48/9	48/10	Slope Failure
32	A026	A026-049	50/4	50/5	Slope Failure
33	A026	A026-051	51/1	51/2	Slope Failure
34	A026	A026-055	55/4	55/6	Rock Fall/Rock Slide
35	A026	A026-056	56		Slope Failure
36	A026	A026-058	58/2	58/4	Slope Failure
37	A026	A026-060	60/3	60	Rock Fall/Rock Slide
38	A113	A113-010	11/2	11/3	Landslide
39	A113	A113-015	16/5	16/6	Landslide

Table: List of candidates of Rank B areas



No.	Route No	Name	Name of road	Kilometer Post		Disaster Type
				St.	En.	
1	A004	A004-154	Colombo-Ratnapura-Wellawaya-Batticaloa Road	154/7		Slope Failure
2	A004	A004-173	Colombo-Ratnapura-Wellawaya-Batticaloa Road	173/11		Slope Failure
3	A004	A004-174	Colombo-Ratnapura-Wellawaya-Batticaloa Road	175/1	175/3	Slope Failure
4	A005	A005-043	Peradeniya-Badulla-Chenkaladi	43/9		Slope Failure (Rock Slide)
5	A005	A005-044	Peradeniya-Badulla-Chenkaladi	44/3		Slope Failure (Rock Slide)
6	A005	A005-046	Peradeniya-Badulla-Chenkaladi	46+600		Slope Failure (Rock Slide)
7	A005	A005-063	Peradeniya-Badulla-Chenkaladi	63/3		Slope Failure
8	A005	A005-091	Peradeniya-Badulla-Chenkaladi	91+019		Slope Failure
9	A005	A005-135	Peradeniya-Badulla-Chenkaladi	135+200	135+700	Landslide
10	A005	A005-167	Peradeniya-Badulla-Chenkaladi Road	167+497	167+541	Landslide
11	A007	A007-031	Avissawella-Hatton-Nuwara Eliya	31/1	31/2	Slope Failure
12	A007	A007-045	Avissawella-Hatton-Nuwara Eliya	45		Rock Fall, Rock Slide
13	A007	A007-054	Avissawella-Hatton-Nuwara Eliya	54/1		Slope Failure
14	A007	A007-057	Avissawella-Hatton-Nuwara Eliya	57/9		Slope Failure
15	A016	A016-010	Beragala-HaliEla Road	10		Landslide
16	A113	A113-015	Gampola - Nawalapitiya	16/5	16/6	Landslide

Table: List of Rank C areas



No.	Route No	Name	Name of road	Kilometer Post		Disaster Type
				St.	En.	
1	A005	A005-046	Peradeniya-Badulla-Chenkaladi	46+600		Slope Failure (Rock Slide)
2	A005	A005-091	Peradeniya-Badulla-Chenkaladi	91+019		Slope Failure
3	A005	A005-135	Peradeniya-Badulla-Chenkaladi	135+200	135+700	Landslide
4	A005	A005-167	Peradeniya-Badulla-Chenkaladi Road	167+497	167+541	Landslide
5	A016	A016-010	Beragala-HaliEla Road	10		Landslide
6	A113	A113-015	Gampola - Nawalapitiya	16/5	16/6	Landslide

Appendix 3-1 Slope investigation sheets

Survey of road slope face

	A004-Km134	Date of investigation:	4-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location (latitude,longitude) :	N 06°37'20.18", E 080°39'32.17"	
Name of Road:		Location(start, end)(km):	134/15 (km) - 134 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m) :	25	Slope height or length(m) :	10	5
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input checked="" type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			0
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			10
Possible disaster	<input checked="" type="checkbox"/> rock fall <input type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			20
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Ratnapura District, Pelmadulla EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			50
				sum Total (B)
				50
Location map				Environmental issue
Comment concerning slope situation	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, Featured Points: At the beginning part, the slope is rich in cracks and thus rock fall may occur. In contrast, at the ending part, outcrop is rather massive and thus wedge type rock slide can be supposed. Supposed countermeasures: For rock fall, ring net can be applied. For rock slide, removal of unstable part after detailed investigation can be applied.			50

Survey of road slope face

	A004-Km154	Date of investigation:	4-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location(latitude,longitude):	N 06°42'07.21", E 080°45'18.40"	
Name of Road:		Location(start, end)(km):	154/7 (km) - (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Embankment)			0
Slope width(m):	25	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			20
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			10
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input type="checkbox"/> No countermeasure/ no effect <input checked="" type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			-10
maintenance entity in the vicinity	RDA Ratnapura District, Pelmadulla EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			50
				sum Total (B)
				40
Location map	 Reduced scale(1 :)			Environm ental issue 40
Comment concerning slope situation	<p>Recorded Disaster : Damage on the pavement such as cracks and subsidence.</p> <p>Failure Type: Slope failure in the embankment slope, (possible) landslides involving the foundation of the embankment.,</p> <p>Geological Condition: Highly Weathered Gneiss, embankment material, (possibly) colluvium or valley deposit at the foundation of the embankment,</p> <p>Trigger of Failure: (Supposed) Raise in ground water, changes in the weight balance for the possible landslide,</p> <p>Featured Points: It is not yet clear whether there is landslide at the foundation of the embankment. Thus further investigation and monitoring are required.</p> <p>According to unconfirmed information, there were some movements at the lower slope under the gabion wall.</p> <p>The landform of the valley where the embankment sits on implies existence of small landslides. If the embankment was put on the head of the possible landslides, the landslide shall start its movement. There lacks however obvious information which supports the movement or existence of the landslide.</p> <p>Supposed countermeasures: For slope failure in embankment, gentler gradient of slope or reinforcement by sorts of geotextile. For landslide, further investigation is required</p>			

Area Km 154/2
Emble

005

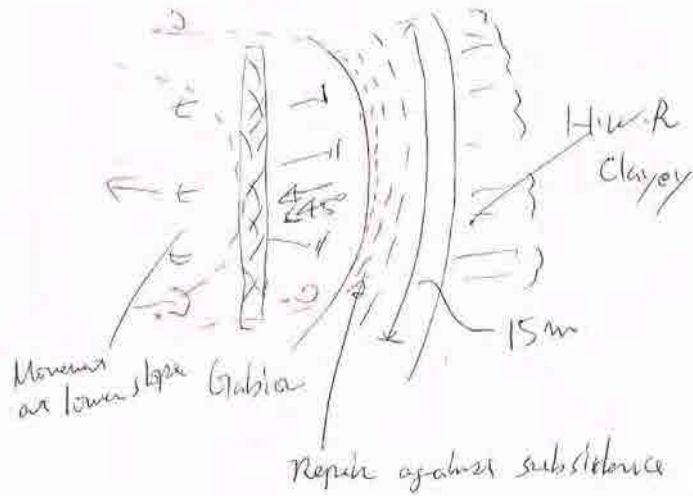
N 060° 42' 07.21"
E 080° 45' 18.90"
563m

急勾配地帯
基礎が深い

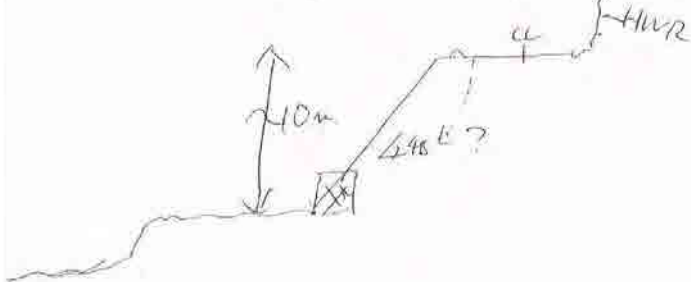
地帯の跡地?

↑
PCC等の粘土供給



Con B





斜手の詳細不明、元々何の勾配




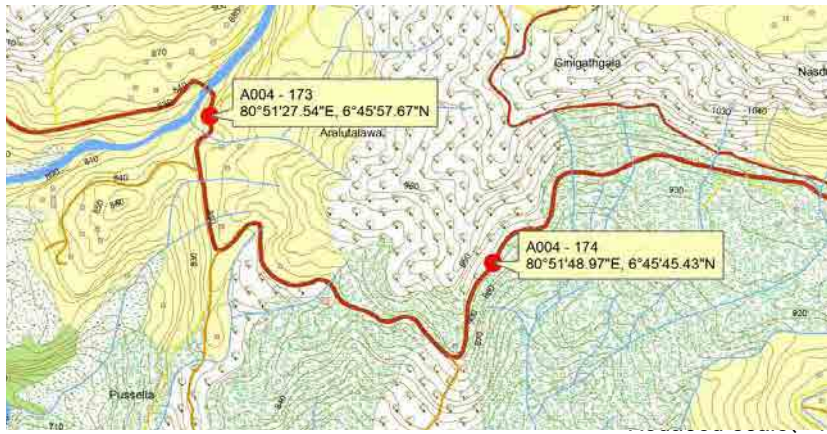
Survey of road slope face

	A004-Km162	Date of investigation:	4-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location(latitude,longitude):	N 06°43'19.04", E 080°47'51.99"	
Name of Road:		Location(start, end)(km):	162/8 (km) - (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Debris Flow)			0
Slope width(m):		Slope height or length(m):		5
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(Traces of debris flow)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input checked="" type="checkbox"/> other(Debris flow)			5
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Ratnapura District, Pelmadulla EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			25
				sum Total (B)
				25
				Environmental issue
25				
Location map				Reduced scale(1 :)
Comment concerning slope situation	<p>Recorded Disaster : Debris flow in 2003. The source of the debris flow lay at 8km upstream of the river.</p> <p>Failure Type: Debris flow involving big boulder, the diameter of which exceeds 5m, Geological Condition: Colluvium or debris flow deposit, Trigger of Failure: (Supposed) Tremendous amount of rainfall triggered collapse in the middle of the mountain,</p> <p>Supposed countermeasures: Special investigation against debris flow is recommended before setting up appropriate countermeasures.</p>			



Survey of road slope face

	A004-Km173	Date of investigation:	4-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location(latitude,longitude):	N 06°45'57.67", E 080°51'27.54"	
Name of Road:		Location(start, end)(km):	173/11 (km) – (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	25	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			110
				sum Total (B)
				110
Location map				Environm ental issue
Comment concerning slope situation	<p>Recorded Disaster : Not clear but traces of collapse can be seen.</p> <p>Failure Type: Slope failure involving residual soil and weathered rock., Geological Condition: Residual soil, highly weathered feldspar quartzite, Trigger of Failure: (Supposed) Rainfall,</p> <p>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.</p> <p>Supposed countermeasures: Gentler gradient of slope, or grating crib works and ground anchors.</p>			110



Survey of road slope face

	A004-Km174	Date of investigation:	4-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location(latitude,longitude):	N 06°45'45.43", E 080°51'48.97"	
Name of Road:		Location(start, end)(km):	175/1 (km) - 175/3 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	30	Slope height or length(m):	20	8
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			60
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			123
				sum Total (B)
				123
				Environmental issue
123				
Location map				
Comment concerning slope situation	<p>There are 2 slope failure sites in this section, at 175/1 and 175/3; 175/1 is larger.</p> <p>Recorded Disaster : Not clear but traces of collapse can be seen.</p> <p>Failure Type: Slope failure involving residual soil and weathered rock.,</p> <p>Geological Condition: Residual soil, highly weathered rock,</p> <p>Trigger of Failure: (Supposed) Rainfall,</p> <p>Featured Points: Slope failure in weathered rock, remarkable gully erosion.</p> <p>Supposed countermeasures: Gentler gradient of slope, or grating crib works and ground anchors.</p>			



Survey of road slope face

	A004-Km185	Date of investigation:	22-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location(latitude,longitude):	N06°45'13.75", E80°56'23.95"	
Name of Road:		Location(start, end)(km):	185/6 (km)- (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m):	50	Slope height or length(m):	?	5
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(minor settlement)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input checked="" type="checkbox"/> no anomalies			-20
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input type="checkbox"/> No countermeasure/ no effect <input checked="" type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			-10
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			10
				sum Total (B)
				0
				Environmental issue
			0	
Location map	 <p>Reduced scale(1:)</p>			
Comment concerning slope situation	<p>Recorded Disaster : Minor settlement of the road surface.</p> <p>Failure Type: Landslide.</p> <p>Geological Condition: Colluvium,</p> <p>Trigger of Failure: (Supposed) Rise in groundwater,</p> <p>Featured Points: Retaining wall by gabion was installed on some parts of the toe.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system.</p>			



Survey of road slope face

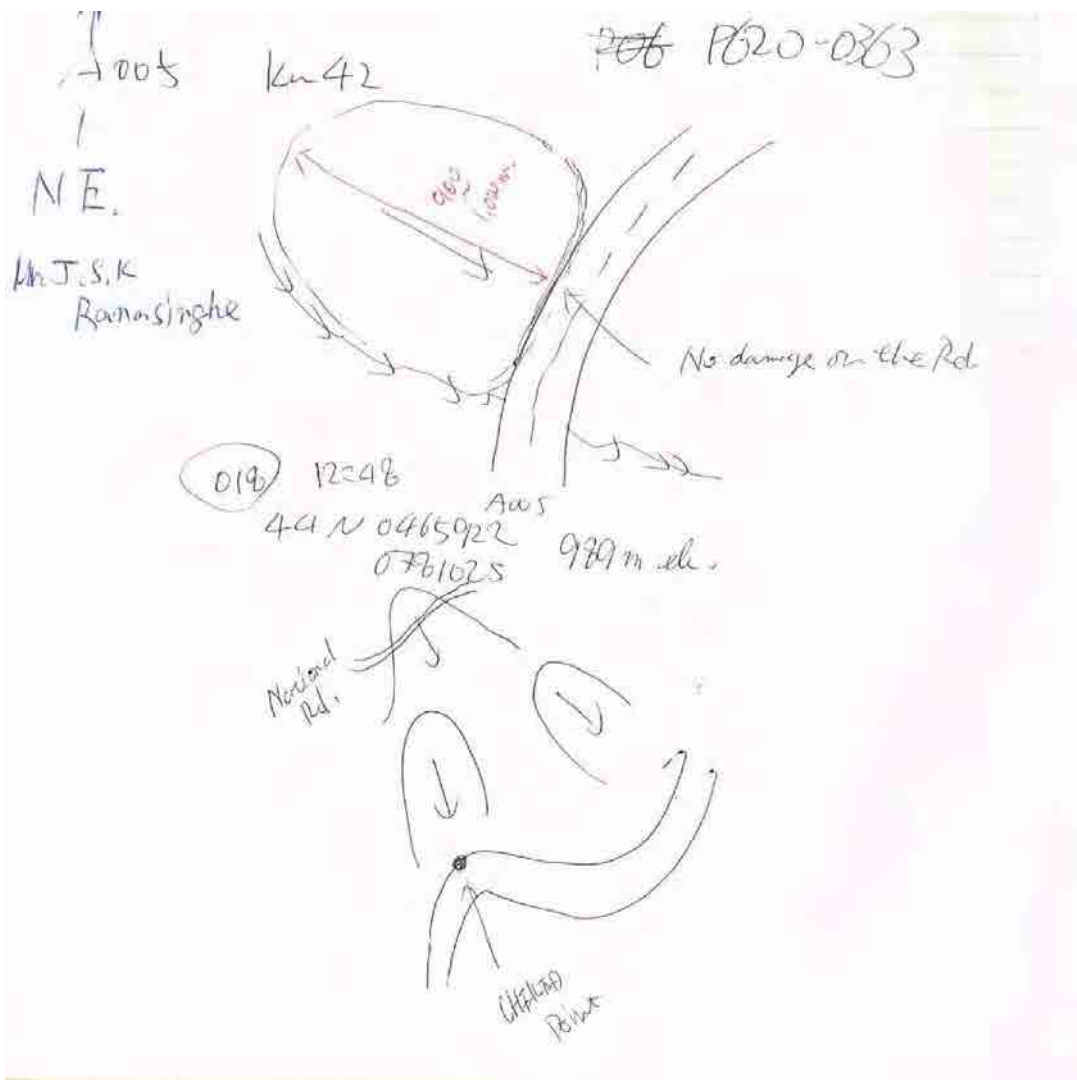
	A004-Km194	Date of investigation:	22-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A004	Location(latitude,longitude) :	N06°45'18.64", E80°59'38.63"	
Name of Road:		Location(start, end)(km):	194/11 (km)- (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m) :	50	Slope height or length (m) :	?	5
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(minor settlement)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input checked="" type="checkbox"/> no anomalies			-20
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			10
				sum Total (B)
				10
Location map				Environmental issue
Comment concerning slope situation	<p>Recorded Disaster : Since 2007 (or 2008), during every rainy season, debris from the toe of the landslide has covered the road. Thus RDA needs to keep readiness to immediately respond to the road closing debris.</p> <p>Failure Type: Landslide. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Rise in groundwater,</p> <p>Featured Points: 13houses are located downstream of the toe of the landslide.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system.</p>			10

Survey of road slope face


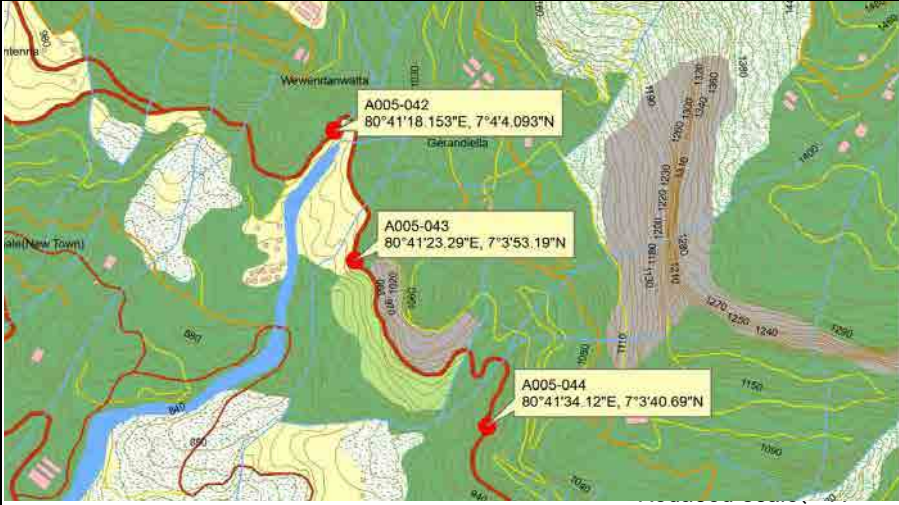
	A004-Km196	Date of investigation:	17-Sep-12	Score
Investigator name:	S. Gamage	Research company name:	RDC/JICA Study Team	
Route No:	A004-Km196	Location (latitude,longitude) :	N 06, 44' 50.26" : E 81, 00' 22.63"	
Name of Road:		Location(start, end)(km):	195+900 (km)- 195+950 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m) :	70	Slope height or length(m) :	40	20
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			20
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other (Minor Settlement)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input checked="" type="checkbox"/> no anomalies			-20
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			30
				sum Total (B)
				30
Location map				Environm ental issue
Comment concerning slope situation	<p>Recorded Disaster : First landslie occured in 19 Nov 1997(according to residents). In that slide 06 houses were destroyed, The previous bridge (Iron bridge) was thrown away & cultivations in downstam areas were destroyed. After major slide, in some rainy seasons, small sliding/collapsing/flowing debris takesplace. Insted of previous bridge on this A004 road, culvert has been constructed on filled ground.</p> <p>Failure Type: Landslide. Geological Condition: Mainly weathered rock (Fractured Zone) along with colluvium, Natural Stream present. Flows along this fractured zone. Trigger of Failure: (Supposed) Rise in groundwater, Topographic Condition: Water collecting valley (formed probably because of fractured zone) , The stream is running accross the road.</p> <p>Featured Points: The affecting landslide seems to be one of devided landslide from much wider series of landslides. Which is mainly composed of weathered rock which seems to be low resistant because of weathering and prone to alter into clay. At the head scarps at the shoulder and upper-middle of the affecting landslide, outcrops of weathered rocks At the toe of the landslide, some springs were observed.</p>			30

Survey of road slope face


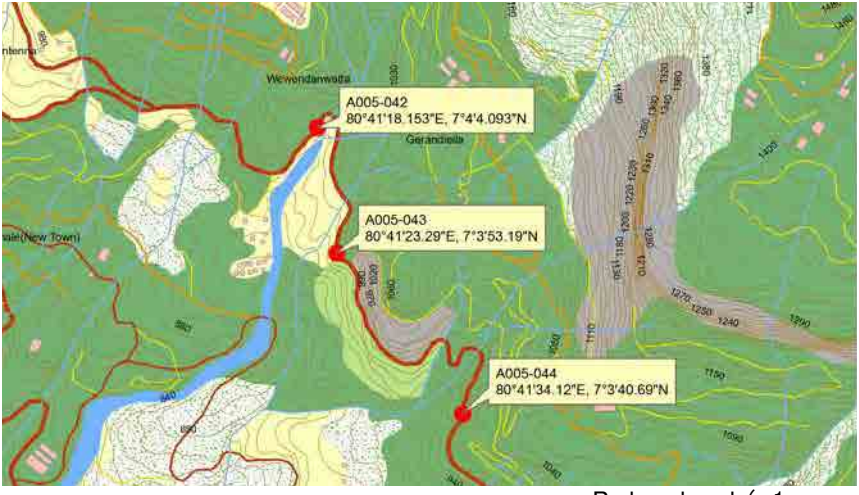
	A005-Km042	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude) :	N 07°04'04.70", E 080°41'23.24"	
Name of Road:		Location(start, end)(km):	43/1 (km)- 43/6 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m) :	200	Slope height or length(m) :	1,000	-30
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(houses)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input checked="" type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			30
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			25
				sum Total (B)
				25
				Environmental issue
25				
Location map				
Comment concerning slope situation	<p>Recorded Disaster : Periodical records of landslide activity. No damage on A005 but local residences and public building locating around the head scarp were damaged by the landslide. Another national road running around the head scarp was also damaged.</p> <p>Failure Type: Landslide. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Rise of groundwater,</p> <p>Featured Points: The landslides at this location is composed of 3 blocks of landslides; 1 upper landslide and 2 lower landslides. The 2 lower landslides face the road of A005 and divided by a ridge of base rock. The landslides are under investigation by NBRO. The total length of the landslides is estimated to be 900 ~ 1,000m. No damage has been reported so far, but blockade by debris from the toe of the lower landslide can be considered as possible damage.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system</p>			





Survey of road slope face

	A005-Km043	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude):	N 07°03'53.46", E 080°41'23.32"	
Name of Road:		Location(start, end)(km):	43/8 (km) - 43/9 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	50	Slope height or length (m):	30	12
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			5
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			30
Possible disaster	<input checked="" type="checkbox"/> rock fall <input type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			20
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			82
				sum Total (B)
				82
Location map				Environmental issue
Comment concerning slope situation	<p>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,</p> <p>Featured Points: There are two factors for possible hazards; fragile rock property and vertical open cracks. Feldspar quartzite has relatively poor resistance property against weathering. At the site, outcrops may be seen as sound and strong. However with a hit of a rock hammer, surface of outcrop can be broken easily with muffled sound. Vertical cracks filled with clayey soil can be easily detected on site. Open vertical cracks as well.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Fixed with rock bolts or removal of unstable parts.</p>			82



Survey of road slope face

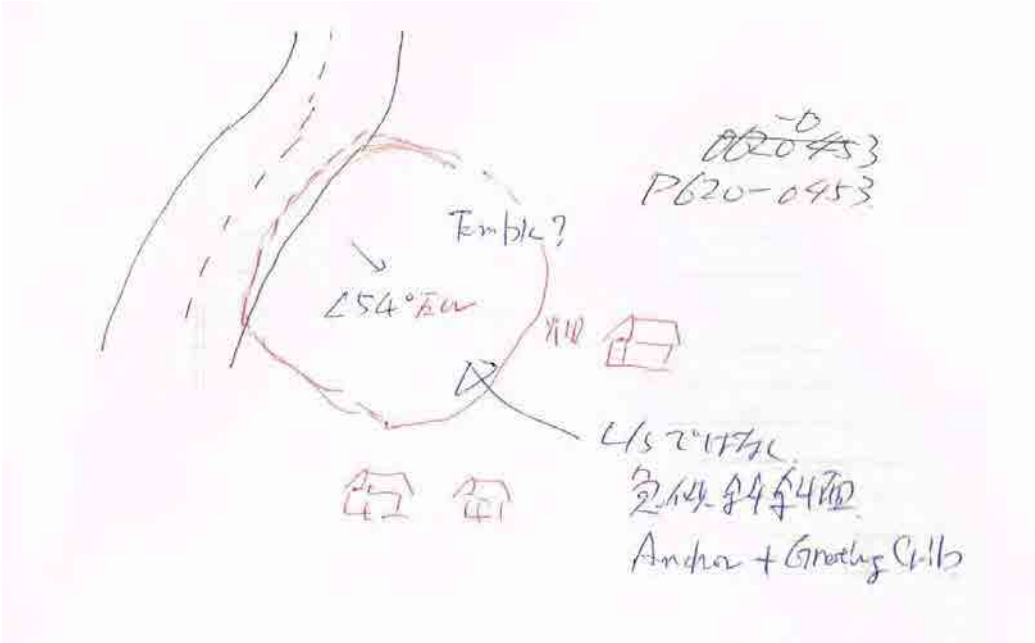
	A005-Km044	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location (latitude, longitude):	N 07°03'40.77", E 080°41'33.79"	
Name of Road:		Location (start, end) (km):	44/2 (km) - 44/3 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	50	Slope height or length (m):	30	12
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			5
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			30
Possible disaster	<input checked="" type="checkbox"/> rock fall <input type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			20
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			82
				sum Total (B)
				82
				Environmental issue
82				
Location map				Reduced scale(1:)
Comment concerning slope situation	<p>Same situation can be seen at Km 46/5.</p> <p>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,</p> <p>Featured Points: There are two factors for possible hazards; fragile rock property and vertical open cracks. Feldspar quartzite has relatively poor resistance property against weathering. At the site, outcrops may be seen as sound and strong. However with a hit of a rock hammer, surface of outcrop can be broken easily with muffled sound. Vertical cracks filled with clayey soil can be easily detected on site. Open vertical cracks as well.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Fixed with rock bolts or removal of unstable parts.</p>			

Survey of road slope face



	A005-Km046	Date of investigation:	25-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude):	N 07°02'53.80", E 080°41'55.54"	
Name of Road:		Location(start, end)(km):	46/5 (km) – 46/6 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	200	Slope height or length (m):	50+	18
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input checked="" type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			5
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			30
Possible disaster	<input checked="" type="checkbox"/> rock fall <input type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			20
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			88
				sum Total (B)
				88
Location map				Reduced scale(1:)
Comment concerning slope situation	<p>Recorded Disaster : unclear, but traces of rock failure were confirmed during the site visit. Rock fall and small rock slide often occur during heavy rains. Failure Type: Rock slide in weathered rock, rock fall. Geological Condition: Weathered rock rich in vertical open cracks along with foliation, Trigger of Failure: (Supposed) Rainfall,</p> <p>Featured Points: Rock wall with almost perpendicular slope. Well developed foliation and vertical cracks are primary causes of possible failures..</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Removal of unstable parts and installation of ring net.</p>			

Survey of road slope face


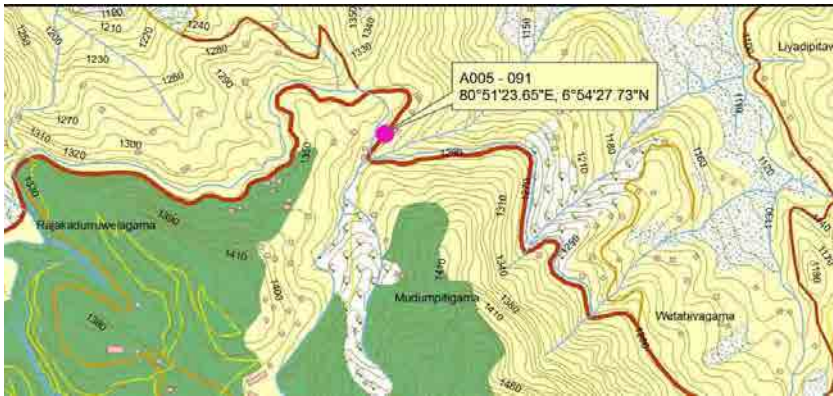
	A005-Km063	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude):	N 06°59'36.78", E 080°44'53.13"	
Name of Road:		Location(start, end)(km):	63/3 (km)- (km)	
type:	<input type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			10
Slope width(m):	10	Slope height or length(m):	5	5
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			10
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			55
				sum Total (B)
				55
Location map				Environmental issue
Comment concerning slope situation	<p>Recorded Disaster : Damage at shoulder, subsidence and cracks on the pavement.</p> <p>Failure Type: Slope Slope failure. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Relaxed shoulder caused by a too steep gradient of slope as 54 degrees,</p> <p>Featured Points: Steep slope composed of colluvium declines from the shoulder of the road. It is likely that the damage was caused by loose shoulder relaxed by the too steep gradient of slope.</p> <p>Supposed countermeasures: Drainage system along the shoulder, retaining wall or grating cribs with ground anchor if necessary.</p>			55





Survey of road slope face

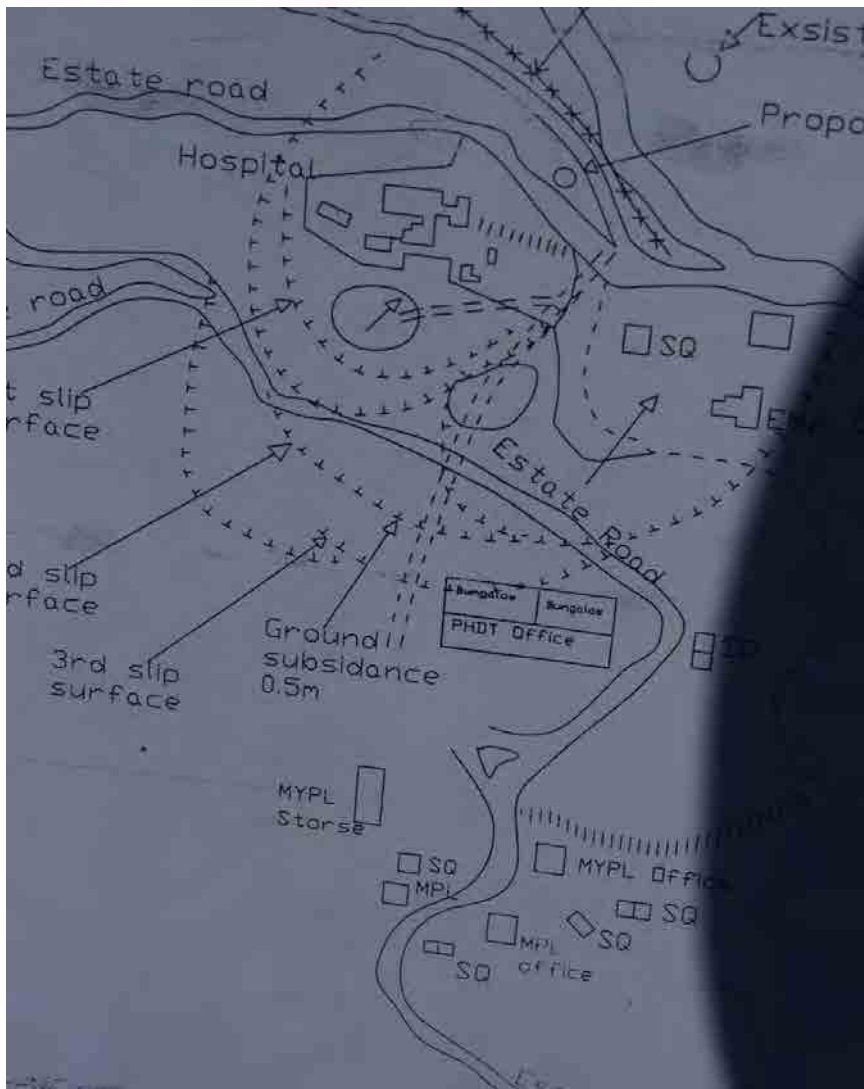
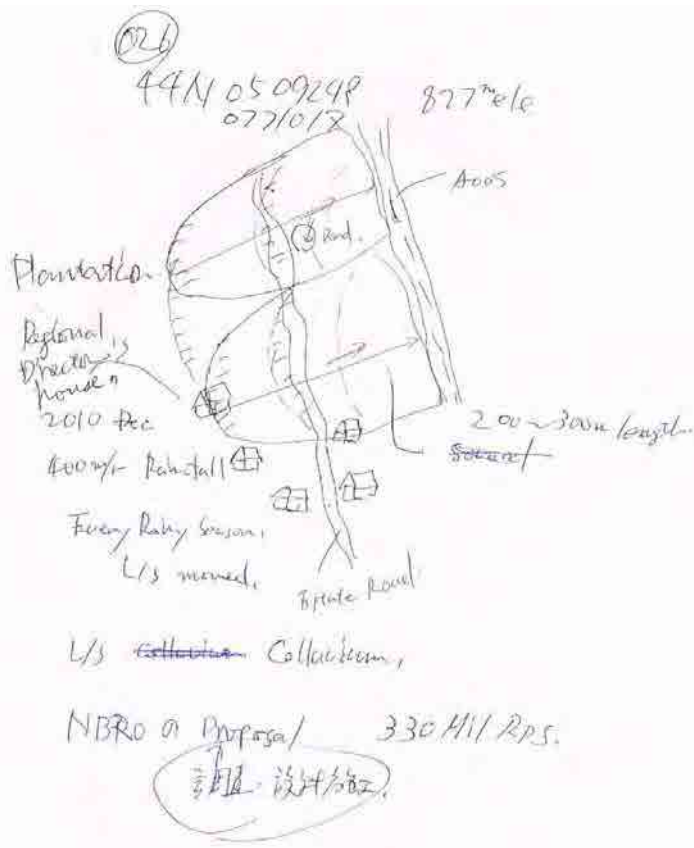
	A005-Km082-2	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude):	N 06°55'48.32", E 080°49'02.33"	
Name of Road:		Location(start, end)(km):	(km) - 82+700 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	200	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			110
				sum Total (B)
				110
				Environmental issue
0				
Location map				
Comment concerning slope situation	<p>Recorded Disaster : Slope failures were seen at the site. Failure Type: Slope failure in weathered rock. Geological Condition: Weathered rock and residual soil. Trigger of Failure: (Supposed) Rainfall,</p> <p>Featured Points: Gradient of slope is apparently too steep for the heavily weathered gneiss confirmed at the site. The heavily weathered gneiss showed fragile strength property. Gully erosion was also confirmed. Successive slope failures which can entail retrogressive development of failures behind the shoulder of the slope are anticipated.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Reshaping the slope with stable angle or grating cribs with ground anchors.</p>			

Survey of road slope face



	A005-Km091	Date of investigation:	21-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location (latitude, longitude):	N 06°54'12.76", E 080°51'39.19"	
Name of Road:		Location (start, end)(km):	91+019 (km) – (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	30	Slope height or length (m):	15	8
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other (open crack at shoulder)			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District, Nuwara Eliya EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			113
				sum Total (B)
				113
				Environmental issue
				113
Location map				Reduced scale(1:)
Comment concerning slope situation	<p>Recorded Disaster : Every rainy season, slope failures have occurred. In January 2007, the road was closed for 2 days due to the debris from the failure. Failure Type: Slope failure in residual soil and weathered rock. Geological Condition: Residual soil and weathered rock. Trigger of Failure: Rainfall, rise in ground water level, Topographic Condition: Water collectiong vally,</p> <p>Featured Points: Gradient of slope is apparently too steep for the heavily weathered rock and residual soil confirmed at the site. The actual gradient of slope at the section is 80 ~ 90 degrees. Gully erosion was also confirmed. In addition, many open cracks were confirmed behind the head scarp. Successive slope failures which can entail retrogressive development of failures behind the shoulder of the slope are anticipated.</p> <p>Supposed countermeasures: Reshaping the slope with stable angle or grating cribs with ground anchors. Removal of unstahe parts behind the shoulder. Drainage ditches along the shoulder of the slope along with vertical drainage.</p>			

Survey of road slope face

	A005-Km135	Date of investigation:	22-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude) :	N 06°58'43.93", E 081°04'56.33"	
Name of Road:		Location(start, end)(km):	135+100 (km)- (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m) :	200	Slope height or length(m) :	200 ~ 300	15
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(debris)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input checked="" type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			30
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			70
				sum Total (B)
				70
				Environmental issue
				70
Location map				
Comment concerning slope situation	<p>Recorded Disaster : From December 2010 when an accumulated precipitation recorded 400 mm, cracks related to one of head scarps appeared at the house of the regional director for the plantation. (This plantation is rehabilitated by PRPII project supported by JICA). In every rainy season, movements of the landslides are observed.</p> <p>As for the damage, severe damage has affected many buildings including a hospital for the plantation and a government office. A005 itself is not included in the landslide mass; the road is just beside the toe of the landslides. Thus when the landslides moved, debris from the toe of the landslides cover the road and RDA shall remove the debris.</p> <p>Failure Type: Landslide. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Rise in groundwater,</p> <p>Featured Points: The type of landslide can be categorized as multiple landslide. The landslide mass was divided into more than 2 subdivided landslides. Head scarps were confirmed not only at the upper part but at middle of the landslide mass. The landslides are under investigation by NBRO. Based on its initial investigation, NBRO estimated</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system.</p>			



Survey of road slope face

	A005-Km167	Date of investigation:	22-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A005	Location(latitude,longitude):	N 07°00'31.54", E 081°11'52.19"	
Name of Road:		Location(start, end)(km):	168/8 (km) – 168/9 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m):	100	Slope height or length(m):	150	20
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			20
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(debris)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other(10
Landslide surface anomalies	<input checked="" type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			30
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			80
				sum Total (B)
				80
				Environmental issue
80				
Location map				Reduced scale(1 :)
Comment concerning slope situation	<p>Recorded Disaster : For more than 10 years, in every rainy season, the landslides moved toward A005 and the debris from the toe covered the road. Against each blockade by the debris, RDA needs to remove it from the road surface.</p> <p>Failure Type: Landslide. Geological Condition: Mainly weathered rock along with colluvium, Trigger of Failure: (Supposed) Rise in groundwater, Topographic Condition: Water collecting valley, a stream is running along the road.</p> <p>Featured Points: The affecting landslide seems to be one of devided landslide from much wider landslide which was moved far past. The affecting landslide is mainly composed of weathered rock which seems to be low resistant against weathering and prone to alter into clay. At the head scarps at the shoulder and upper-middle of the affecting landslide, outcrops of weathered rocks can be observed. At the toe of the landslide, a spring was observed.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system. Ground anchor at the toe. Relocation of the bridge passing the stream can be an option.</p>			

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(27)

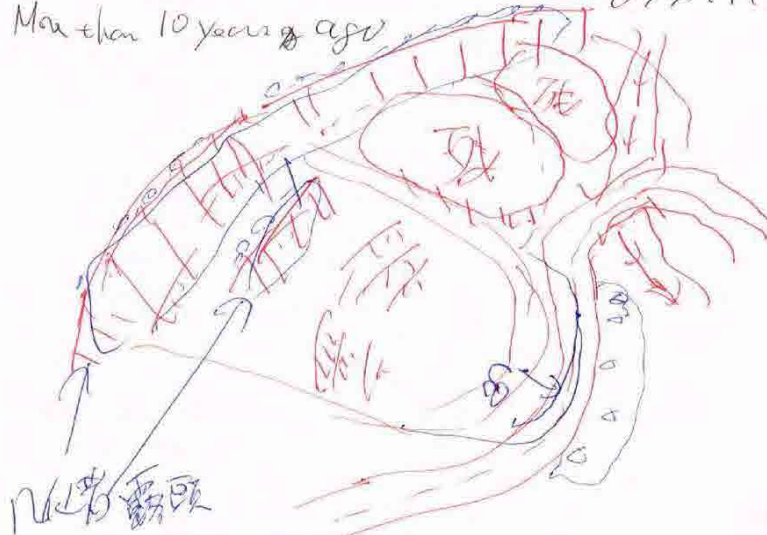
Frang Rainy Season

44N 0522030

0724441

783^m elev,

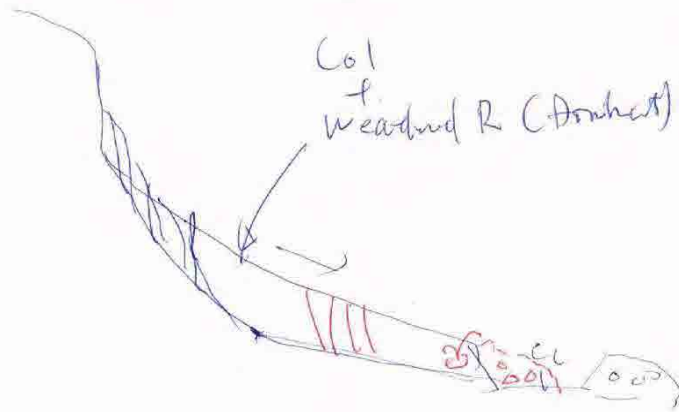
More than 10 years ago





Frang day in rainy season,

RDA needs to remove debris from the toe of



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Survey of road slope face

	A007-Km031	Date of investigation:	6-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°59'45.99", E 080°21'05.82"	
Name of Road:		Location(start, end)(km):	31/1 (km) - 31/2 (km)	
type:	<input type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			10
Slope width(m):	5	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kegalle District, Ruwanwella EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph 			105
				sum Total (B)
				105
				Environmental issue
105				
Location map	 <p style="text-align: right;">Reduced scale(1:)</p>			
Comment concerning slope situation	<p>Recorded Disaster : Slope failure in lower slope moved away the shoulder. Cracks appeared on the pavement.</p> <p>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 gradient of slope.</p> <p>Featured Points: Slope failure by river erosion.</p> <p>Supposed countermeasures: Retaining wall against the erision as well as to reinforce the slope.</p>			



Survey of road slope face

	A007-Km042	Date of investigation:	5-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°59'26.42", E 080°26'22.61"	
Name of Road:		Location(start, end)(km):	42/14 (km) - (km)	
type:	<input type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			10
Slope width(m):	15	Slope height or length(m):	15	8
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(Tension Crack)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other(Debris Flow)			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input checked="" type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			-10
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District,			sum Total (A)
Slope situation (photograph)	Situation photograph			33
				sum Total (B)
				33
Location map				Environmental issue
Comment concerning slope situation	<p>Recorded Disaster : In 1989 and between 2005 and 2007, the landslide moved and the road was closed for several days. Landslide activities were seen during the rainy season. Damage on the pavement, possibly caused by infiltration of water to the pavement structure. Traces of slope failures on the slopes.</p> <p>Failure Type: Landslide or slope failure. Further investigation is required. Geological Condition: Residual soil and colluvium or valley deposit. Trigger of Failure: (Supposed) Raise in ground water.</p> <p>Featured Points: It is said to be landslide activities in 1989 and between 2005 and 2007. Thus another landslide activity is anticipated by local people. It is not clear, however, that the damage was caused by landslide or slope failure, because there was not clear evidence of landslide activities. There were, however, a lot of cracks on the pavement which imply infiltration of water to the pavement structure. This damage suggests high ground water level at this location. Based on the site situation, debris flow can be a possible disaster. Topographic Feature: Valley type landform with a stream.</p> <p>Supposed countermeasures: Further investigation is required to set up appropriate countermeasures. Based on the site situation, however, surface drainage system and underground drainage can be amongst appropriate countermeasures.</p>			33

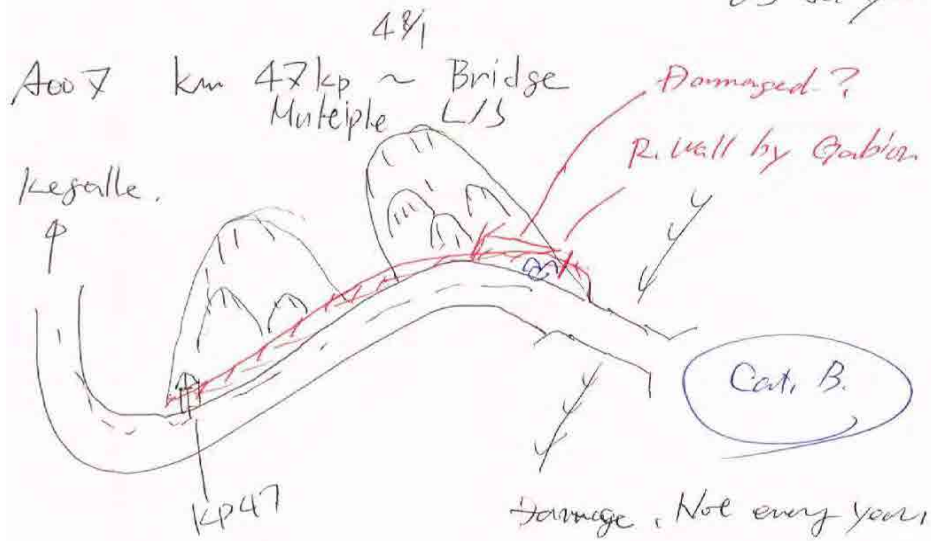
Survey of road slope face

	A007-Km045	Date of investigation:	5-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°59'36.70", E 080°27'02.68"	
Name of Road:		Location(start, end)(km):	45 (km) – (km)	
type:	<input type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			10
Slope width(m):	50	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input checked="" type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			35
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			30
Possible disaster	<input checked="" type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			20
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District,			sum Total (A)
Slope situation (photograph)	Situation photograph			100
				sum Total (B)
				100
				Environmental issue
				100
Location map				
Comment concerning slope situation	<p>Recorded Disaster : Unclear. Fallen boulders, however, were seen on site.</p> <p>Failure Type: Rock fall, slope failure in colluvium.</p> <p>Geological Condition: At the ending part, massive rock with cracks, at the beginning part, colluvium..</p> <p>Trigger of Failure: (Supposed) Rainfall, erosion, and development of open cracks..</p> <p>Featured Points: Boulders were seen at the shoulder of cutting slope composed of colluvium. Boulders were also seen in the upper slopes. In addition, unstable parts of outcrop with cracks were seen at the shoulder of rocky slope.</p> <p>Supposed countermeasures: Further investigation is required to set up appropriate countermeasures. Based on the site situation, however, removal of boulders and unstable parts of rock can be amongst countermeasures along with fixing unstable parts with rock bolts or other fixing methods.</p>			

Survey of road slope face

	A007-Km047	Date of investigation:	5-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°59'29.81", E 080°27'41.11"	
Name of Road:		Location(start, end)(km):	47kp (km) – 48/1 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope)			0
Slope width(m):	50	Slope height or length(m):	15	8
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(damage at gabion)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input checked="" type="checkbox"/> no anomalies			-20
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input type="checkbox"/> No countermeasure/ no effect <input checked="" type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			-10
maintenance entity in the vicinity	RDA Nuwara Eliya District,			sum Total (A)
Slope situation (photograph)	Situation photograph 			13
				sum Total (B)
				3
				Environm ental issue
				3
Location map				
Comment concerning slope situation	<p>Recorded Disaster : Not every year, during rainy season. A part of gabion wall seemd to have been damaged and reconstructed.</p> <p>Failure Type: Multiple landslide. Geological Condition: (Probably) Colluvium. Trigger of Failure: (Supposed) Raise in ground water.</p> <p>Featured Points: Multiple landslide. According to the vegetation on the slope, groundwater level is supposed to be hgh. In addition, a spring were seen on the toe of the slope. Topographic Feature: Valley type landform with a stream.</p> <p>Supposed countermeasures: Further investigation is required to set up appropriate countermeasures. Based on the site situation, however, surface water drainge system and underground drainage can be amongst the supposed countermeasures.</p>			



05 July 2022




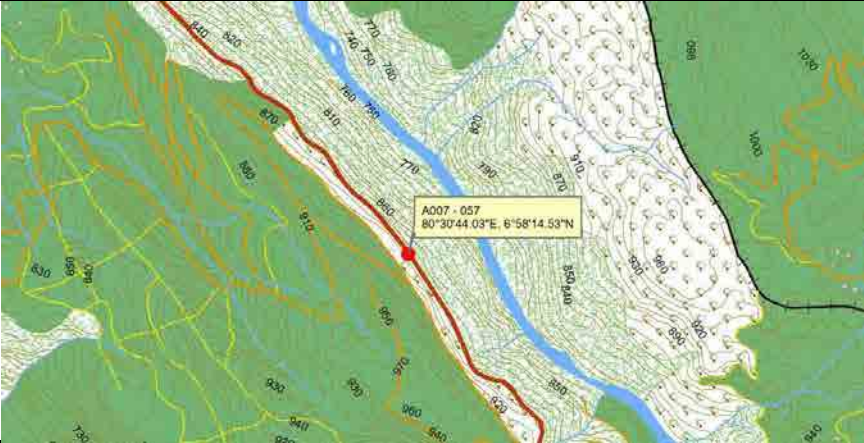
016 1125249
~ 06° 59' 29.81"
E 080° 27' 41.11"
375m

Detailed Investigation is required,
very High water level (according to the
Vegetation)



Survey of road slope face

	A007-Km054	Date of investigation:	5-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°59'15.85", E 080°29'45.50"	
Name of Road:		Location(start, end)(km):	54/1 (km) – (km)	
type:	<input type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			10
Slope width(m):	10	Slope height or length(m):	20	8
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			20
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District,			sum Total (A)
Slope situation (photograph)	Situation photograph			73
				sum Total (B)
				73
				Environmental issue
73				
Location map				
Comment concerning slope situation	<p>Recorded Disaster : Shoulder of the road collapsed. Cracks developed on the nearby pavement.</p> <p>Failure Type: Slope failure in residual soil. Geological Condition: Residual soil. Trigger of Failure: (Supposed) Rainfall, erosion, and steeper gradient of slope.</p> <p>Featured Points: There were 2 slope failures; one was under the shoulder and another was in the upper slope.</p> <p>Supposed countermeasures: Further investigation is required to set up appropriate countermeasures. Based on the site situation, however, grating cribs with ground anchors can be amongst the supposed.</p>			

Survey of road slope face

	A007-Km057	Date of investigation:	5-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°58'14.53", E 080°30'44.03"	
Name of Road:		Location(start, end)(km):	57/9 (km) – (km)	
type:	<input type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			10
Slope width(m):	20	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District,			sum Total (A)
Slope situation (photograph)	Situation photograph			105
				sum Total (B)
				105
				Environmental issue
Location map				105
Comment concerning slope situation	<p>Recorded Disaster : Debris provided from the slope failure closed the road.</p> <p>Failure Type: Slope failure in residual soil and weathered rock. Geological Condition: Residual soil and weathered gneiss rich in cracks. Vertical cracks attract the attention. Trigger of Failure: (Supposed) Rainfall, erosion, and steeper gradient of slope.</p> <p>Featured Points: Springs were confirmed in the middle of the slope at the beginning side.</p> <p>Supposed countermeasures: Further investigation is required to set up appropriate countermeasures. Based on the site situation, however, drainage system and grating cribs with ground anchors can be amongst the supposed.</p>			

Survey of road slope face

	A007-Km069	Date of investigation:	5-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A007	Location(latitude,longitude):	N 06°54'34.27", E 080°34'10.74"	
Name of Road:		Location(start, end)(km):	68kp (km) - 69/1 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope)			0
Slope width(m):	10	Slope height or length(m):	30	8
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(damage on the road)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input checked="" type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			-10
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Nuwara Eliya District,			sum Total (A)
Slope situation (photograph)	Situation photograph			23
				sum Total (B)
				23
				Environm ental issue
23				
Location map				
Comment concerning slope situation	<p>Recorded Disaster : Landslide in the lower slope moved and the foundation of the old road was moved away.</p> <p>Failure Type: Landslide. Geological Condition: (Probably) Colluvium. Trigger of Failure: (Supposed) Erosion at the toe of the landslide. Raise in ground water.</p> <p>Featured Points: The stream eroded the toe of landslide and activated the landslid. The moved landslide mass closed the stream and then created a pond. The watercourse of the stream was bended and circumnavigated the toe of the landslide. At the same time, the head scarp appeared crossing the old road and the foundation of the old roas was moved away along with the subsidence of the head. Topographic Feature: Located at the slope surrounding the ridge.</p> <p>Supposed countermeasures: It is obious that the further erosion of the toe will reactivate the landslide movement. Thus counter-erosion shall be installed. Reinforcement to shoulder behind the head scarp may be considered.</p>			

A007 km 69, 69/1

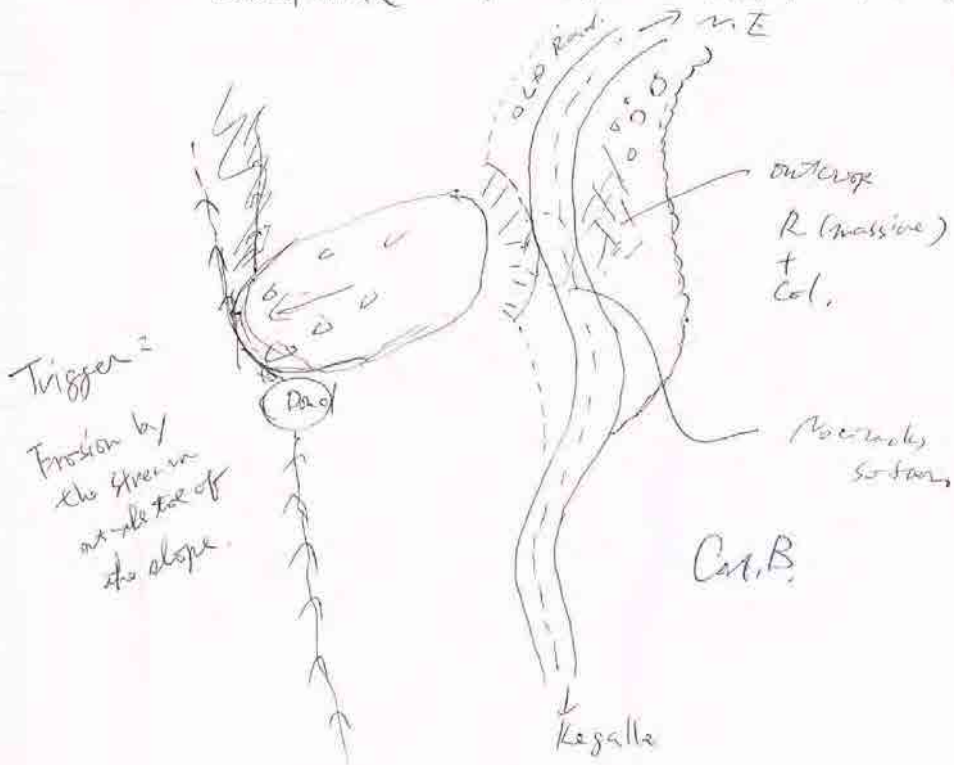
Landslide

021


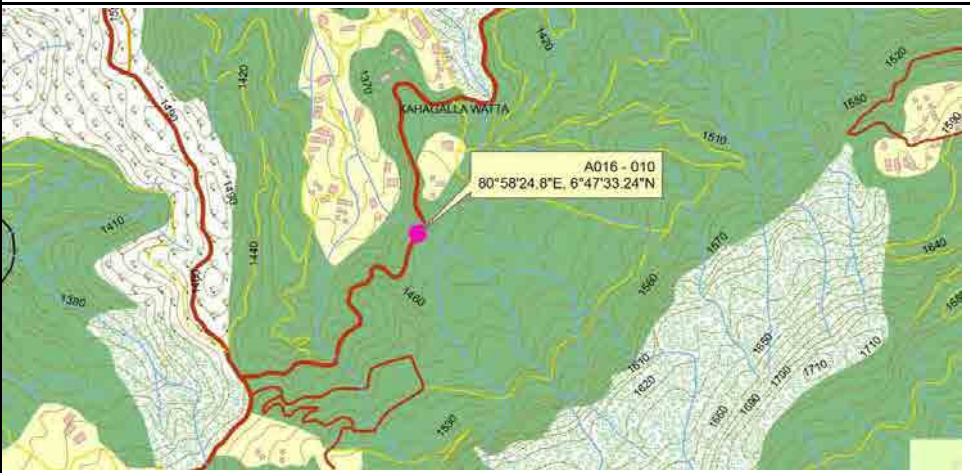
14-08-29

N 06° 54' 39.27"

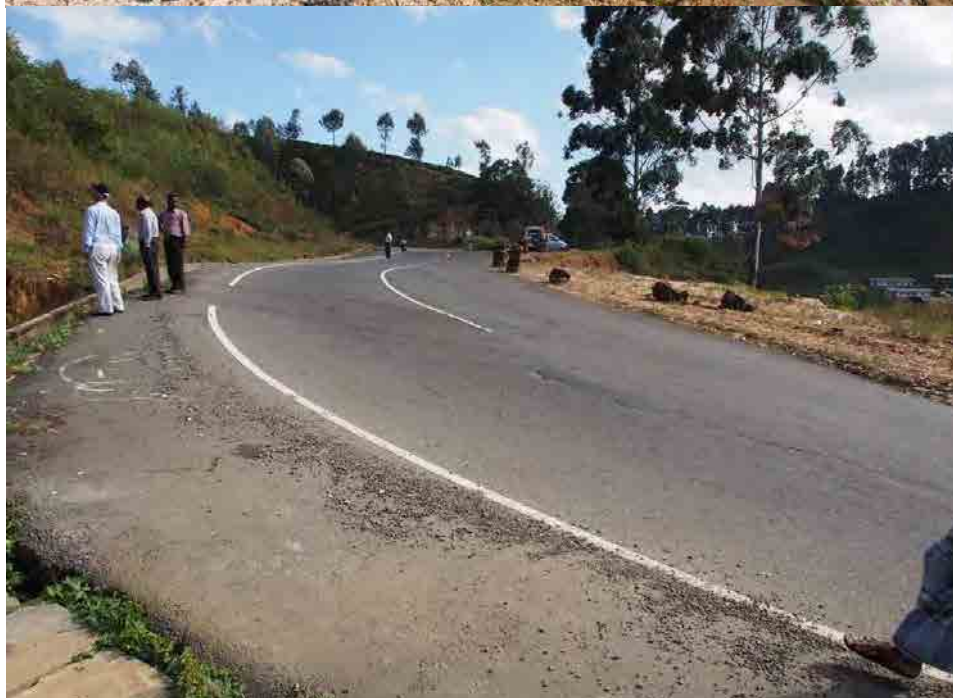
E 080° 34' 10.74" 1175 m.




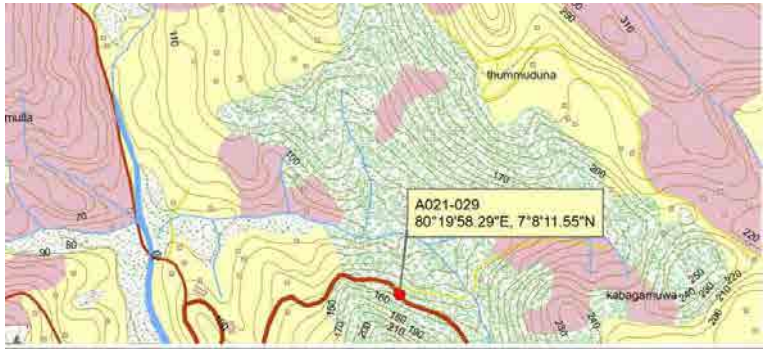
Survey of road slope face

	A016-Km010	Date of investigation:	22-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A016	Location(latitude,longitude):	N 06°47'33.30", E 080°58'24.67"	
Name of Road:		Location(start, end)(km):	10/12 (km) - 11/1 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m):	200	Slope height or length(m):	500	15
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(debris)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input checked="" type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			30
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Badulla District, Bandarawela EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			70
				sum Total (B)
				70
Location map				70
	Reduced scale(1 :)			Environmental issue
Comment concerning slope situation	<p>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 toe.</p> <p>Failure Type: Landslide. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Rise in groundwater,</p> <p>Featured Points: When the toe of the landslide moves triggered by a rainfall , the body of landslide at the toe turns into fluid and strikes the houses with a high speed movement. A head scarp of a devided landslide locates just beside the road shoulder and poses a threat of subsidence or collapse of the foundation of the road. The initial investigation by NBRO was done in 2001 or 2002. The 2nd investigation was in 2011. The thickness of the landslide is said to be 20 meters or more. An improvement of the road was completed in 2009 ~2010.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system. Ground anchor or pile works to support the sholder affected by the devided landslide..</p>			70


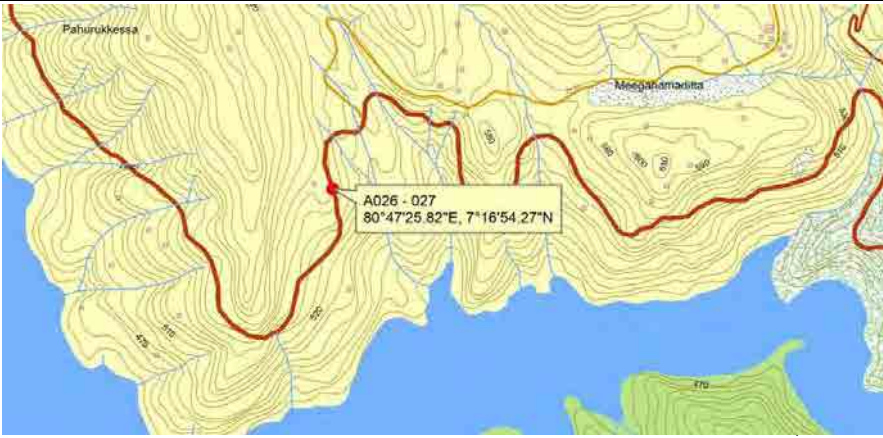
☆ Alb Kulo 15-37 2009 old improvement Corp.
 (28) 44N 0496 009 869m ele
 0750/69
 every 2 years.
~~the monument.~~
 2002 Interchange (for 2002) (200)
 2011 Interchange (200)
 2020 4/11/2022
 1996 2/1/97
 止路気取仕成使




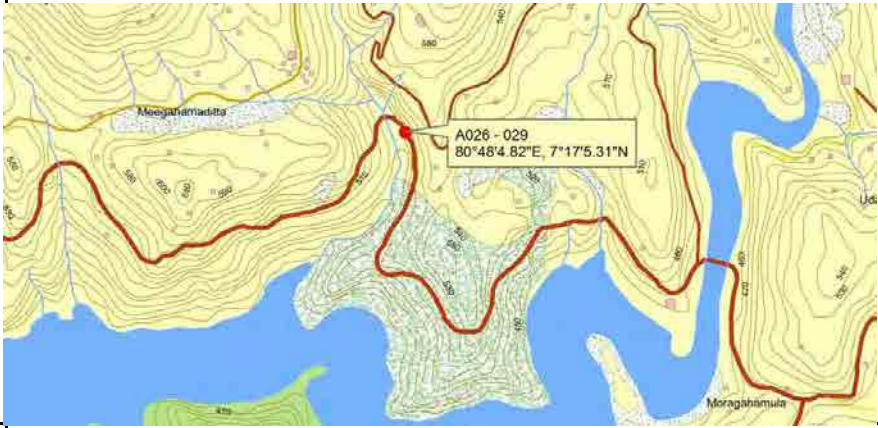
Survey of road slope face

	A021-Km020	Date of investigation:	6-Jul-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A021	Location(latitude,longitude):	N 07°08'11.55", E 080°19'58.29"	
Name of Road:		Location(start, end)(km):	19+800 (km) - 20 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural slope)			0
Slope width(m):	10	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(Cracks on the road)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kegalle District, Ruwanwella EE Division,			sum Total (A)
Slope situation (photograph)				30
				sum Total (B)
				30
Environmental issue				30
Location map				Reduced scale(1:)
Comment concerning slope situation	<p>Recorded Disaster : From 2006, when plenty rainfall provided, the landslide moved. Debris provided from the toe of the landslide blocked the road.</p> <p>Failure Type: Landslide Geological Condition: (Probably) Colluvium. Trigger of Failure: (Supposed) Raise in groundwater.</p> <p>Featured Points:Land owner has not allowed RDA to access the slope. No investigation results are available.</p> <p>Supposed countermeasures: Further investigation is required to set up appropriate countermeasures. Based on the site situation, however, surface draiange system and underground drainage can be amongst the supposed.</p>			



Survey of road slope face

	A026-Km027	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°16'54.22", E 080°47'25.90"	
Name of Road:		Location(start, end)(km):	27KP (km) – 28/1 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	12	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			30
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			30
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)				105
				sum Total (B)
				105
				Environmental issue
Location map				0
Comment concerning slope situation	<p>Recorded Disaster : Jan 2007, during rainy season Failure Type: Slope Failure involving Rock Sliding, Geological Condition: Residual soil, Highly weathered ~ weathered rock with cracks, Supposed countermeasures: Fixed with rock bolts or removal of unstable parts.</p>			


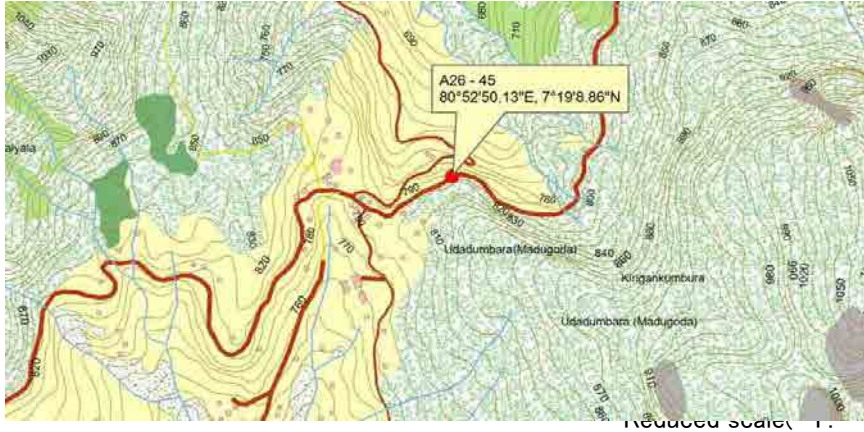
Survey of road slope face

	A026-Km029	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°17'05.31", E 080°48'04.82"	
Name of Road:		Location(start, end)(km):	29KP (km) - 30/1 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	27	Slope height or length(m):	15	8
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			5
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(Dip Slope)			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			30
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			78
				sum Total (B)
				78
Location map				Environm ental issue
Comment concerning slope situation	<p>Recorded Disaster : Jan 2007, during rainy season Failure Type: Rock Sliding, Geological Condition: Highly foliated Gneiss, Dip slope condition, Topographic Condition: Water collectiong vally,</p> <p>Supposed countermeasures: Fixed with rock bolts or removal of unstable parts.</p> <p>Note: From Km 29~ Km 31, overhanging rocks rocks were seen remaining unstable at shoulder of slopes.</p>			0


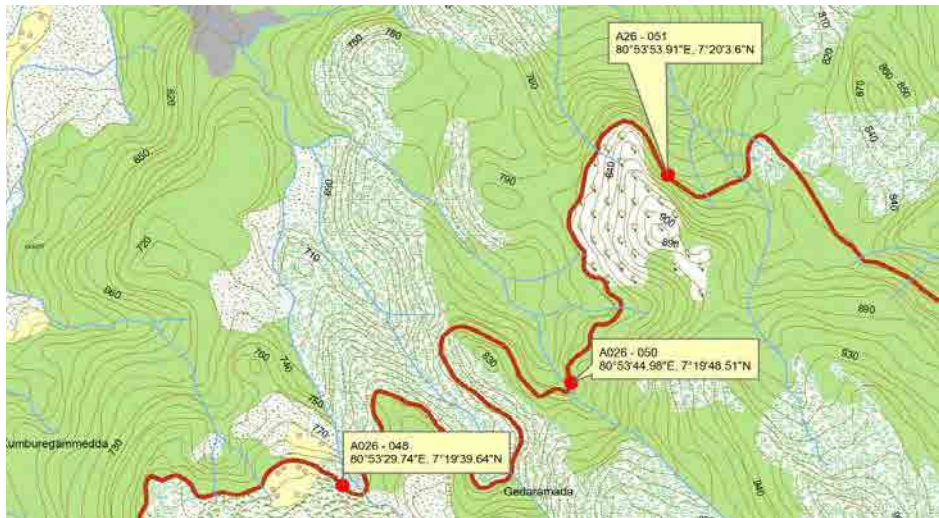
Survey of road slope face

	A026-Km036	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°17'27.48", E 080°49'33.72"	
Name of Road:		Location(start, end)(km):	36KP (km) - 37/1 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	20	Slope height or length(m):	15	8
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			20
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(Retaining Wall)			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input type="checkbox"/> No countermeasure/ no effect <input checked="" type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			-10
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			78
				sum Total (B)
				68
				Environmental issue
0				
Location map				
Comment concerning slope situation	<p>Recorded Disaster : 2011, during construction by Keangnam, slope of overburden collapsed after cutting with almost vertical angle. After removing deposits of the collapsed overburden, retaining well was constructed.</p> <p>Failure Type: Slope failure in residual soil, Geological Condition: Residual soil, weathered rock Trigger of Failure: Construction, Topographic Condition: Water collectiong vally,</p> <p>Featured Points: After the construction of the retaining wall, the failure was settled. Gradient of Slope is too steep for residual soil.</p> <p>Supposed countermeasures: (If additional countermeasures are required) Drainage ditches along the shoulder of the slope along with vertical drainage. Removal of deposits and reshaping of the slope with stable angle.</p>			


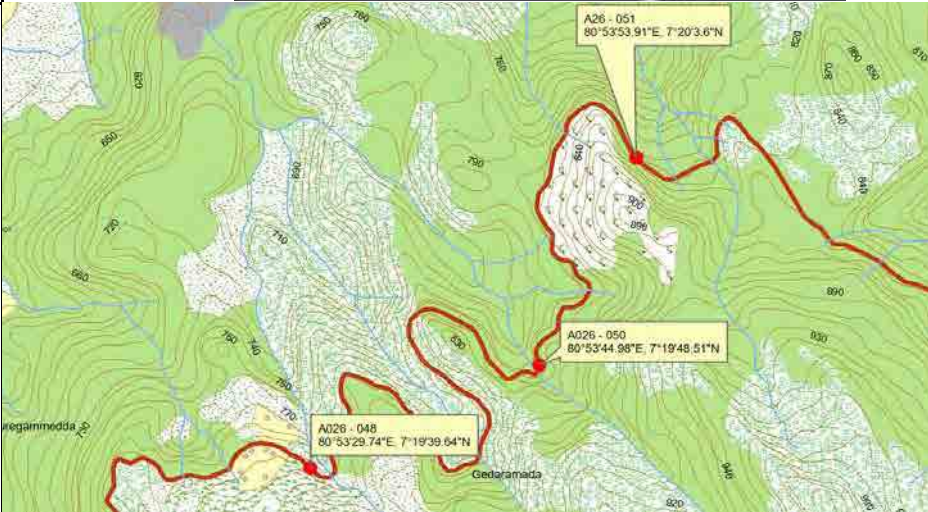
Survey of road slope face

	A026-Km045	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°19'09.05", E 080°52'50.27"	
Name of Road:		Location(start, end)(km):	46/2 (km) – 46/3 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	50	Slope height or length(m):	15	8
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			113
				sum Total (B)
				113
				Environmental issue
Location map				0
Comment concerning slope situation	<p>Recorded Disaster : 2010, during construction by Keangnam. Failure Type: Slope failure in residual soil and weathered rock, Geological Condition: Residual soil, weathered rock (Garnet biotite Gneiss) with dip slope condition, Trigger of Failure: Construction, Topographic Condition: Ridge,</p> <p>Featured Points: Gully erosion is seen on the slope surface of residual soil. Dip slope condition in weathered rock part. Gradient of Slope is too steep for residual soil.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Reshaping the slope with stable angle or retaining methods such as anchoring or R/B with grating cribs.</p>			


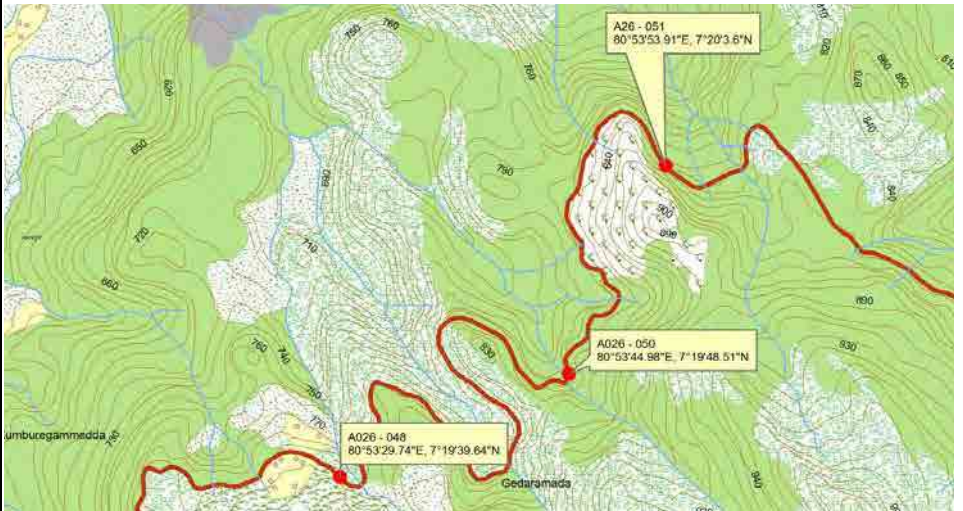
Survey of road slope face

	A026-Km048	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°19'39.96", E 080°53'29.85"	
Name of Road:		Location(start, end)(km):	48/9 (km) - 48/10 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	20	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			80
				sum Total (B)
				80
Location map				Environm ental issue
	Reduced scale(1:)			0
Comment concerning slope situation	<p>Recorded Disaster : 2011, rainy season, Failure Type: Slope failure in residual soil and weathered rock, Geological Condition: Residual soil, weathered rock (very weak and fragile), Topographic Condition: Valley,</p> <p>Featured Points: A fresh failure was seen at the site. Gradient of Slope is too steep for residual soil and weathered rock.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Reshaping the slope with stable angle or retaining methods such as anchoring or R/B with grating cribs.</p>			


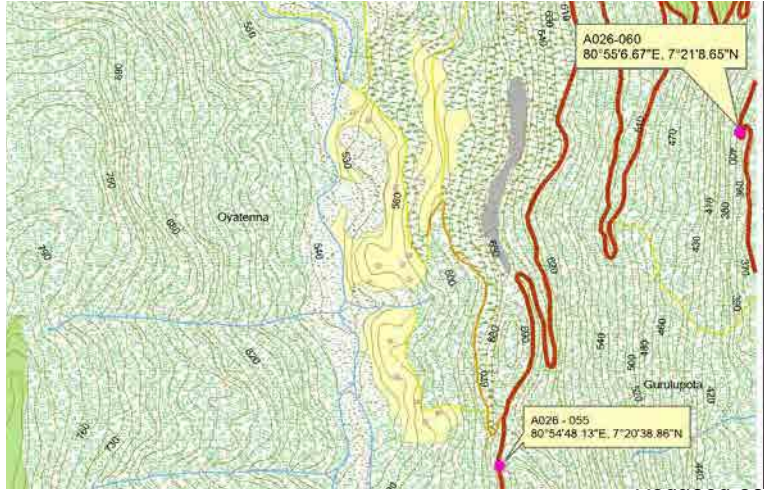
Survey of road slope face

	A026-Km049	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°19'49.20", E 080°53'45.15"	
Name of Road:		Location(start, end)(km):	50/4 (km) - 50/5 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	20	Slope height or length(m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			80
				sum Total (B)
				80
				Environmental issue
0				
Location map				
	Reduced scale(1:)			
Comment concerning slope situation	<p>Recorded Disaster : 2011, rainy season, Failure Type: Slope failure mainly in weathered rock, involving very thin residual soil. Geological Condition: Weathered rock (very weak and fragile), Topographic Condition: Valley,</p> <p>Featured Points: Gradient of Slope is too steep for fragile weathered rock at the site.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Reshaping the slope with stable angle or retaining methods such as anchoring or R/B with grating cribs.</p>			


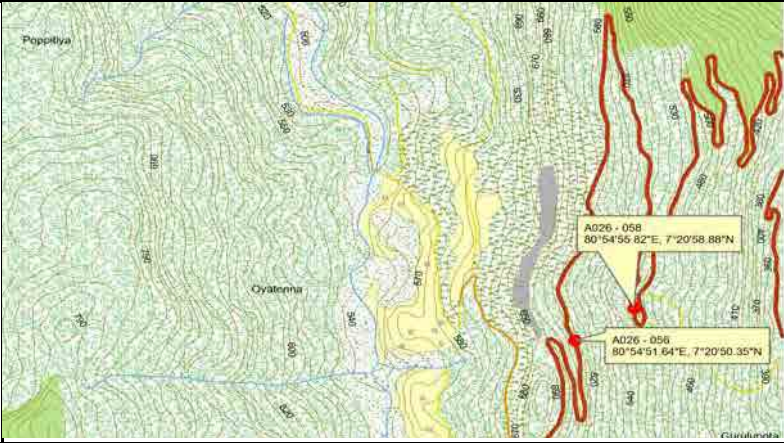
Survey of road slope face

	A026-Km051	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location (latitude, longitude):	N 07°20'03.27", E 080°53'54.43"	
Name of Road:		Location (start, end) (km):	51/1 (km) - 51/2 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	10	Slope height or length (m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			20
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			105
				sum Total (B)
				105
				Environmental issue
			0	
Location map				
			Reduced scale(1 :	
Comment concerning slope situation	<p>Recorded Disaster : 2011, during construction by Keangnam, Failure Type: Slope failure in colluvium. Geological Condition: Colluvium, Trigger of Failure: Rainfall, construction, Topographic Condition: Valley,</p> <p>Featured Points: Gully erosion was observed on site. Retaining wall at the toe of the slope seems to be demolished. Gradient of Slope is too steep for colluvium.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Reshaping the slope with stable angle or retaining methods such as anchoring with grating cribs.</p>			



Survey of road slope face

	A026-Km055	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°20'38.84", E 080°54'48.04"	
Name of Road:		Location(start, end)(km):	55/4 (km)- 55/6 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	100	Slope height or length(m):	15	8
Main composition of slope	<input type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			5
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input checked="" type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			30
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			30
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			88
				sum Total (B)
				88
				Environm ental issue
0				
Location map				scale(1:)
Comment concerning slope situation	<p>Recorded Disaster : 2010 ~ 2011, during construction, after rain, Failure Type: Slope failure (Rock Sliding) in weathered rock, rock fall. Geological Condition: Rock (charnokite) with cracks including vertical open crack, Trigger of Failure: Rainfall, construction,</p> <p>Featured Points: Weathering developed along the cracks and altered rock rody along the cracks. Amongst the cracks developed vertically, some cracks show wide opening or are filled with clay rich soil. Thus rock sliding is anticipated in this section along with rock fall from the shoulder of the slope.</p> <p>Supposed countermeasures: Fixed with rock bolts or removal of unstable parts.</p>			


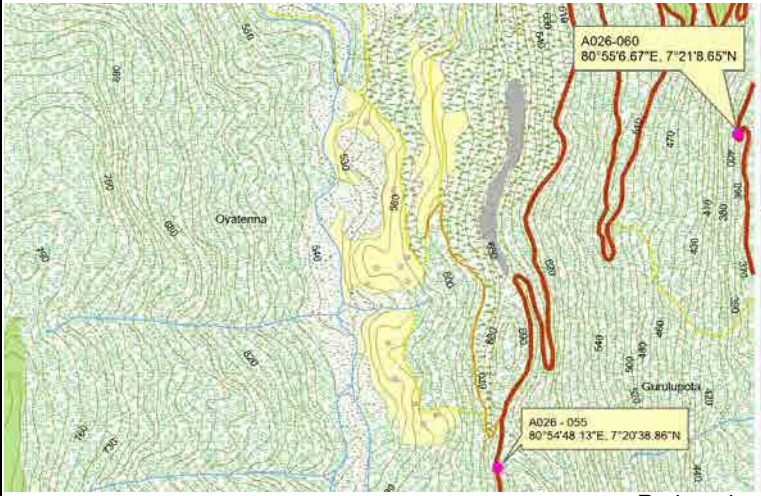
Survey of road slope face

	A026-Km056-C02	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°20'50.30", E 080°54'51.48"	
Name of Road:		Location(start, end)(km):	56/1 (km) - 56/2 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	15	Slope height or length (m):	10	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			35
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			90
				sum Total (B)
				90
				Environmental issue
			0	
Location map				
Comment concerning slope situation	<p>Located at the No.2 curve of 19 bends (hair pin curves).</p> <p>Recorded Disaster : unclear Failure Type: Slope failure in colluvium. Geological Condition: Thin colluvium, weathered rock (charnokite), Trigger of Failure: (Supposed) Rainfall, construction,</p> <p>Featured Points: It is highly probable that thin colluvium remained on the slope collapsed due to construction and rainfall. Still remaining thin colluvium can be observed at the shoulder of the slope along with at the left side boundary of the existing failure. Gradient of Slope is too steep for colluvium.</p> <p>Supposed countermeasures: Removal of the remaining colluvium on the slope. Drainage ditches along the shoulder of the slope along with vertical drainage.</p>			



Survey of road slope face

	A026-Km058-C04	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°20'58.84", E 080°54'55.76"	
Name of Road:		Location(start, end)(km):	58/2 (km) - 58/4 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width (m):	15	Slope height or length (m):	7	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			20
Condition of slope	<input checked="" type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			50
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			15
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			105
				sum Total (B)
				105
				Environmental issue
			0	
Location map				e(1:)
Comment concerning slope situation	<p>Located at the No.4 curve of 19 bends (hair pin curves).</p> <p>Recorded Disaster : unclear Failure Type: Slope failure in weathered rock and residual soil. Geological Condition: Weathered rock, residual soil, Trigger of Failure: (Supposed) Rainfall, construction,</p> <p>Featured Points: It is highly probable that highly weathered rock part along with residual soil caused failure due to construction and rainfall. Gully erosion is observed on the slope surface. Gradient of Slope is too steep for weathered rock at the site.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Reshaping the slope with stable angle or retaining methods such as anchoring with grating cribs.</p>			

Survey of road slope face

	A026-Km060-C14	Date of investigation:	19-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A026	Location(latitude,longitude):	N 07°21'08.45", E 080°55'06.39"	
Name of Road:		Location(start, end)(km):	60/3 (km) - 60 (km)	
type:	<input checked="" type="checkbox"/> cut slope <input checked="" type="checkbox"/> collapse <input type="checkbox"/> quarry <input type="checkbox"/> other()			15
Slope width(m):	15	Slope height or length(m):	7	5
Main composition of slope	<input checked="" type="checkbox"/> soil and residual soil <input checked="" type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input type="checkbox"/> colluvium			25
Condition of slope	<input type="checkbox"/> remarkable erosion <input checked="" type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input type="checkbox"/> other()			20
Possible disaster	<input type="checkbox"/> rock fall <input checked="" type="checkbox"/> collapse <input checked="" type="checkbox"/> rock mass failure <input type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			30
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			
Environmental issue	<input checked="" type="checkbox"/> exist <input type="checkbox"/> no exist			0
Installed countermeasure	<input type="checkbox"/> No countermeasure/ no effect <input checked="" type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Kundasale EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			95
				sum Total (B)
				95
				Environmental issue
0				
Location map				Reduced scale(1:)
Comment concerning slope situation	<p>Located at the No.14 curve of 19 bends (hair pin curves).</p> <p>Recorded Disaster : unclear Failure Type: Dip slope failure (rock slide) in weathered rock. Geological Condition: Weathered rock, residual soil, Trigger of Failure: (Supposed) Rainfall, construction,</p> <p>Featured Points: Dip slope structure is posing threats of rock slide to the road. Although retaining wall is constructed and covers some parts of the toe, remaining bodies at the shoulder can be possible hazards. In addition, a wide band of argillization is observed filing a vertical crack behind a big rock body located in the middle of the slope.</p> <p>Supposed countermeasures: Drainage ditches along the shoulder of the slope along with vertical drainage. Fixed with rock bolts or removal of unstable parts.</p>			

Survey of road slope face

	A113-Km010	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A113	Location(latitude,longitude):	N 07°05'43.49", E 080°33'20.69"	
Name of Road:		Location(start, end)(km):	11/2 (km) - 11/3 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Embankment)			0
Slope width(m):	5	Slope height or length(m):	10	5
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium <input checked="" type="checkbox"/> Embankment			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(deformation)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input type="checkbox"/> small and old cracks <input checked="" type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			-10
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input type="checkbox"/> No countermeasure/ no effect <input checked="" type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			-10
maintenance entity in the vicinity	RDA Kandy District, Pilimalawa EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			20
				sum Total (B)
				10
				Environmental issue
Location map				scale(1:)
Comment concerning slope situation	<p>Recorded Disaster : Periodical records of landslide activity. In every rainy season, gaps have developed on the pavement The gaps correspond to the head scarp of lower landslide.</p> <p>Failure Type: Landslide. Geological Condition: Embankment, original ground is supposed to be colluvium, Trigger of Failure: (Supposed) Rise of groundwater, Construction,</p> <p>Featured Points: Single isolated landslide causes damage on the road surface. The landslide is said to be caused by embankment construction. A railway track runs parallel to the road but no damage is reported at the track. The size of the landslide is supposed to be relatively small.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system. Counter embankment if necessary.</p>			

A03 Km 11/3 L/S Freely Rains Season
L/S moves,

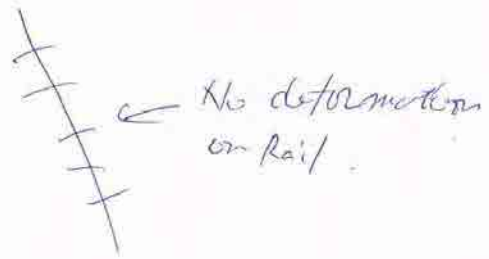
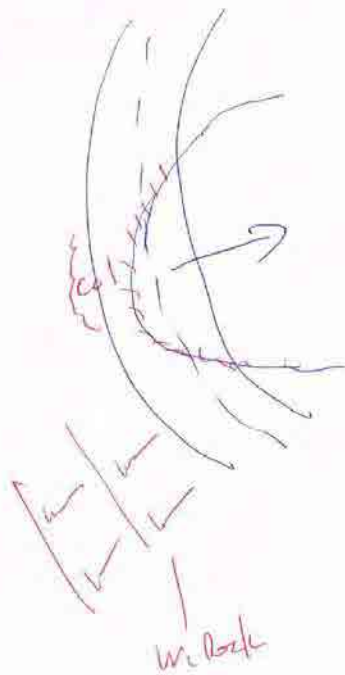
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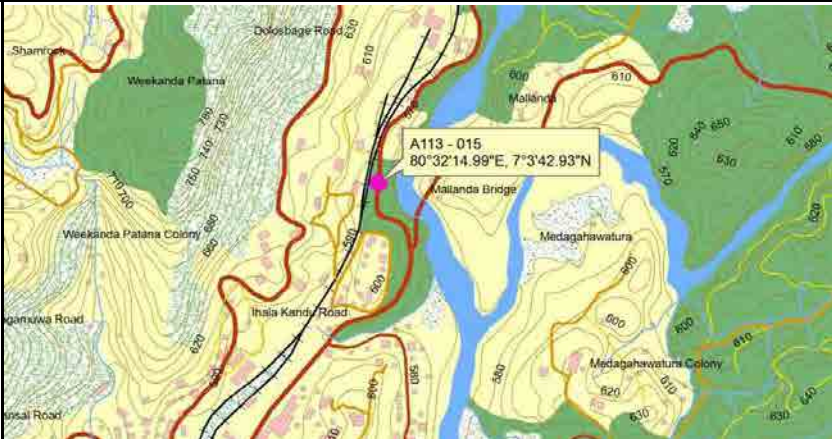
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Embankment Part



Caused by Embk construction,

Survey of road slope face

	A113-Km015	Date of investigation:	20-Jun-12	Score
Investigator name:	Kawamura	Research company name:	JICA Study Team	
Route No:	A113	Location(latitude,longitude):	N 07°03'42.53", E 080°32'15.27"	
Name of Road:		Location(start, end)(km):	16/5 (km)- 16/6 (km)	
type:	<input type="checkbox"/> cut slope <input type="checkbox"/> collapse <input type="checkbox"/> quarry <input checked="" type="checkbox"/> other(Natural Slope ?)			0
Slope width(m):	50+	Slope height or length(m):	50+	20
Main composition of slope	<input type="checkbox"/> soil and residual soil <input type="checkbox"/> weathered rock <input type="checkbox"/> rock <input type="checkbox"/> composite <input checked="" type="checkbox"/> colluvium			15
Condition of slope	<input type="checkbox"/> remarkable erosion <input type="checkbox"/> traces of collapse <input type="checkbox"/> cracks <input type="checkbox"/> No damage <input checked="" type="checkbox"/> other(deformation)			0
Possible disaster	<input type="checkbox"/> rock fall <input type="checkbox"/> collapse <input type="checkbox"/> rock mass failure <input checked="" type="checkbox"/> slide <input type="checkbox"/> nothing <input type="checkbox"/> other()			10
Landslide surface anomalies	<input type="checkbox"/> large and new cracks <input checked="" type="checkbox"/> small and old cracks <input type="checkbox"/> slight deformation <input type="checkbox"/> no anomalies			20
Environmental issue	<input type="checkbox"/> exist <input checked="" type="checkbox"/> no exist			1
Installed countermeasure	<input checked="" type="checkbox"/> No countermeasure/ no effect <input type="checkbox"/> Some effect <input type="checkbox"/> High effect <input type="checkbox"/> Completely effect			0
maintenance entity in the vicinity	RDA Kandy District, Pilimalalawa EE Division,			sum Total (A)
Slope situation (photograph)	Situation photograph			65
				sum Total (B)
				65
				Environmental issue
65				
Location map				
Comment concerning slope situation	<p>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.</p> <p>Failure Type: Landslide. Geological Condition: Colluvium, Trigger of Failure: (Supposed) Rise of groundwater,</p> <p>Featured Points: The landslides at this location involve not only road, but houses and railway. Two landslides are confirmed so far. The upper landslide is said to have been stabilized by the retaining wall constructed along the railway. The head scarp of the upper landslide may be located under the passage paved with concrete slab. The lower landslide still shows periodical movement during rainy seasons and damages the A-113 road with subsidence and open gaps which reaches 15cm. 3 piezometers were placed and observed by RDA.</p> <p>Supposed countermeasures: Surface drainage system and underground drainage system. Pile works or ground anchors to retain the road. Retaining wall against erosion by the Mahaweli river.</p>			

