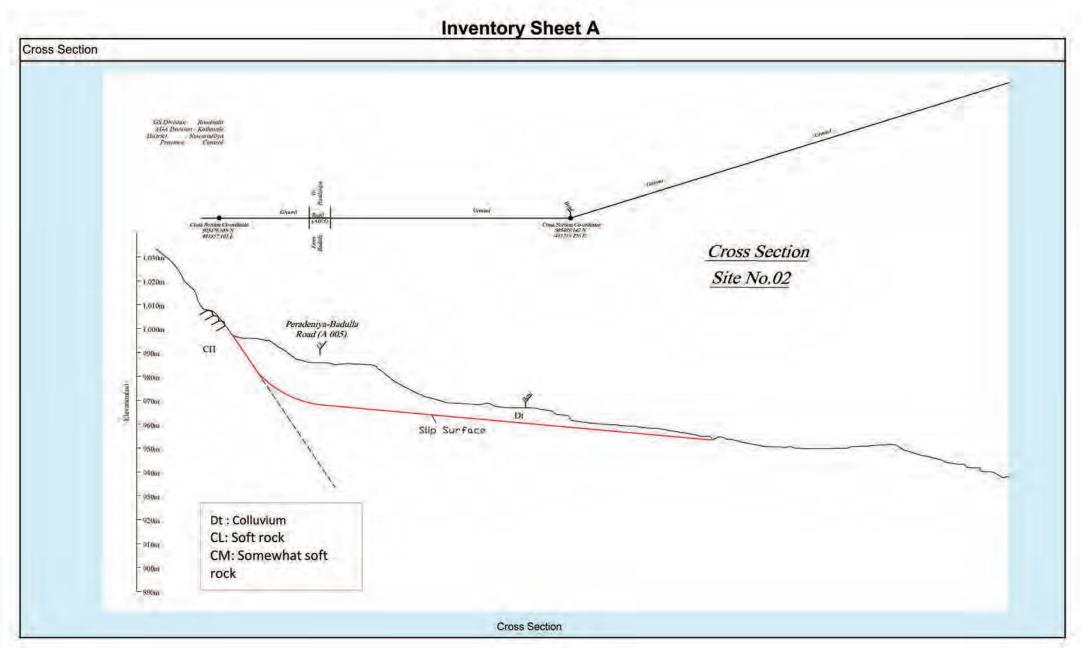
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Site No.		2	Disaste	r Type	Landsl		tion Sta		End	46/3	latitude	7°02'57.7"N	longitude	80°41'57.8"E
Main body	Both	Traffic control		Hourly	mm	Traffic volume	Week day	4442/12h	holiday	e II	Bus	s route	Deto	our
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	Don	10) } } \	3711	8	. 2/115	1/2	E HUSSIM					5	5	
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						Plan Plan								
						T. A. SANTA								



Site No.		2		h	nventor	y Sheet	В	Checked by	Yang Pucai	ji T
					(Land	dslide)		Organization	JICA Survey Te	eam
actor] (A)						(0	C)=MAX(A,B)			
Item		Check Point		check	score	C	core evaluated from	cours	(A)	38
1 and bas	A scarp, hilly top	ography or gentle slope,	Clear	30	15	30	core evaluated from	cause		30
Landslide Topography		our lines, bulge on river bank	Fairly clear	(15)	13	S	core evaluated from	history	(B)	100
, op og op, o	is observed.		Unclear	1	(30)		core evaluated from	Thistory		100
		Fault, shered zone		18		Δ,	mong (B)&(C), large	one	(C)=M	AX(A,B)
	- 7 - 1	Volcanic alteration zone		(18)			mong (b)&(c), large	one.		100
	Geological	Dip slope		14	18					
	structure	Opposite dip slope		7		[C	Countermeasure] (D)	= (c) + a or (c) x 0		-+
		Intrusive structure, Cap rock	structure	3				Category	point (a	) check
Geological		Others		0	(18)	No	o countermeasure		±0	1
conditions		Mesozoic/palaeozonic format	tions	7			or attached at	No effect	±0	
	Geological	Tertiary formation (sedimend	ary rocks)	7	0		ffectiveness of ountermeasure	Slight effect	-30	
	meterial	Quarternary formation (muds	tone, etc)	3			dinemicasure	High effect	x0	
		Others (Volcamic rock, Ignec	us rock)	3	(7)	·		Total	(D)	100
	Carina Mater	Present		(5)	5			Total		100

(5)

38

## [History] (B)

Spring Water

Absent

Item	Check Point		check	score
Landslide history	Record (documental or patrimony)	Present Absent	100	100 (100)
	Scarp in slope,	Clear	100	
Landslide deformation	Bulge and depression, Subsidence, Upheaval and cracks on road surface,	Fairly clear	75	75
	Deformation of countermeasure works	Unclear	0	(100)
	Total		(B)	100

Total

## [Description]

Steep slope consisting of relatively fresh rock are observed in section of 10 to 25 meters from the road. Talus deposits are distributed with thickness 3 to 15 meters between steep slope and the road. Debris likely moves toward the road in case of heavy rainfall.

June 26, 2019

Date

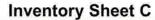
Site No.

2

P1 Cracks across the road due pressumably to landslide movement



P3 The lower slope the landslide below the road



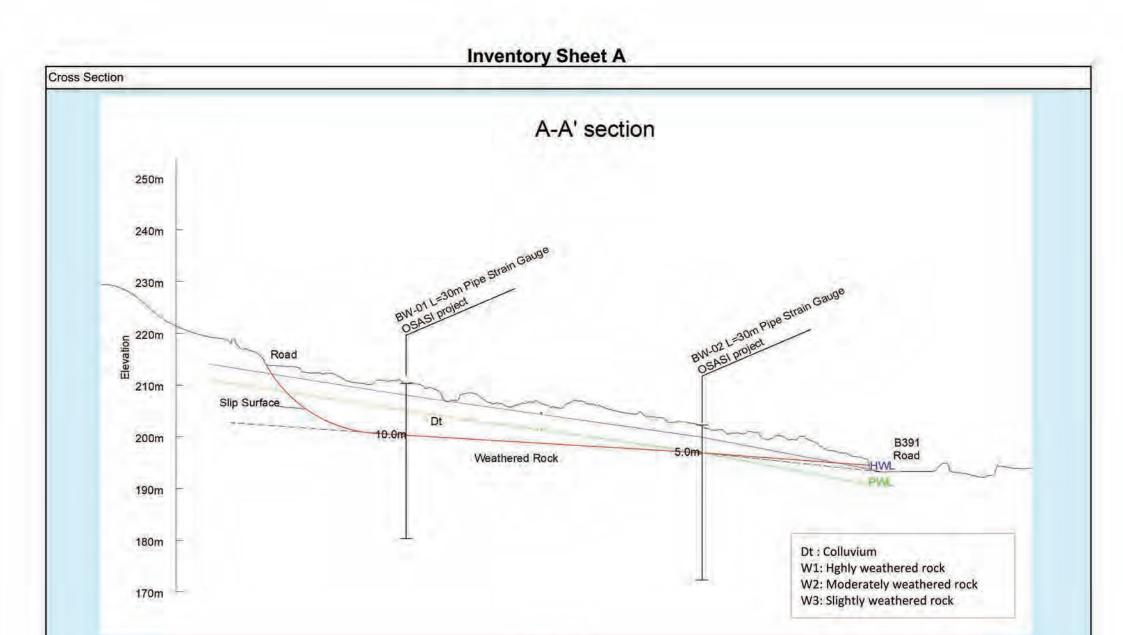


P2 Cracks across the road



P4 A public restaurant within the landslide

District	Ratnapura	Management	office	Ratnap	ura	Road No	B-391	Ro	ad Name			Ratna	pura - V	Vewalwatta	Road		
Site No.		4	Disaste	er Type	Landsli	de L	ocation	Start	11.9 km	End	12.0 km	latitude	6° 42	23.7"N	longitude	80° 2	28' 2.2"
Main body	Mountain side	Traffic control		Hourly	mm		ıme Week	day 2	2333/12h	holida	/	В	us route		Deto	our	
po map/Sketc	ń												_			_	
						47.00	_				_						
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10	() Sign / 1 3 mg	THE SHIP	1625A		23 /		D C 1	Ly			The co				3		
li i	Ser John S.	SAME SE	ME TO MT 405 ALT TO		3,47		JE JAC	100		A M			3	######################################			
1	STATE OF THE STATE OF	11/12			BISS	377			Sil		0		1515	17/			
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Cross Section

Site No.		4		li	rvento	Sheet B	Checked by	Yang Puca	ai
					(La	ide)	Organization	JICA Survey	eam
actor] (A)						(C)=MAX(A,B)	1		
Item		Check Point		check	score	Score evaluated from cause		(A)	60
Landslide Topography		oography or gentle slope, our lines, bulge on river bank	Clear Fairly clear	30	30	The second second second		(B)	100
ropograpity	is observed.		Unclear	7	(30)	Score evaluated from history			100
		Fault, shered zone		18		Among (B)&(C), large one.		(C)=N	AX(A,
	- 100	Volcanic alteration zone		(18)	100	Among (B)a(C), large one.			100
	Geological	Dip slope		14	18			- 2	
	structure	Opposite dip slope		7		[Countermeasure] (D) = (c) +	α or (c) x 0		
		Intrusive structure, Cap rock	structure	3	100	Cate	egory	point (	a) che
Geological		Others		0	(18)	No countermeasure		±0	1
conditions		Mesozoic/palaeozonic forma	tions	(7)	1707		effect	±0	
	Geological	Tertiary formation (sedimend	ary rocks)	$\vee$	7	Effectiveness of countermeasure Slig	ht effect	-30	
	meterial	Quarternary formation (muds	tone, etc)	3		Hig	h effect	x0	
		Others (Volcamic rock, Igned	ous rock)	0	(7)		+0.007	(D)	400
	and all applicati	Present		(5)	5		Total		100
	Spring Water	Absent		V	(5)				
		Total		1	60	[Description]			
istory] (B)		Check Point		check	score	Dimension of landslide is 50n instruments of extentin meter monitor the movement of slid	as well as inclinome		
Landslide history	Record (d	ocumental or patrimony)	Present Absent	100	100 (100)	144000000000000000000000000000000000000			
	Scarp in slope,	ALCO TO THE RESIDENCE OF THE PERSON OF THE P	Clear	100					
Landslide deformation	Bulge and depre Subsidence, Upheaval and c	ession, racks on road surface,	Fairly clear	75	100				
		countermeasure works	Unclear	0	(100)				
		Ac-		(B)					





P3 The erosion condition of a mountain stream within the landslide

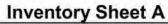


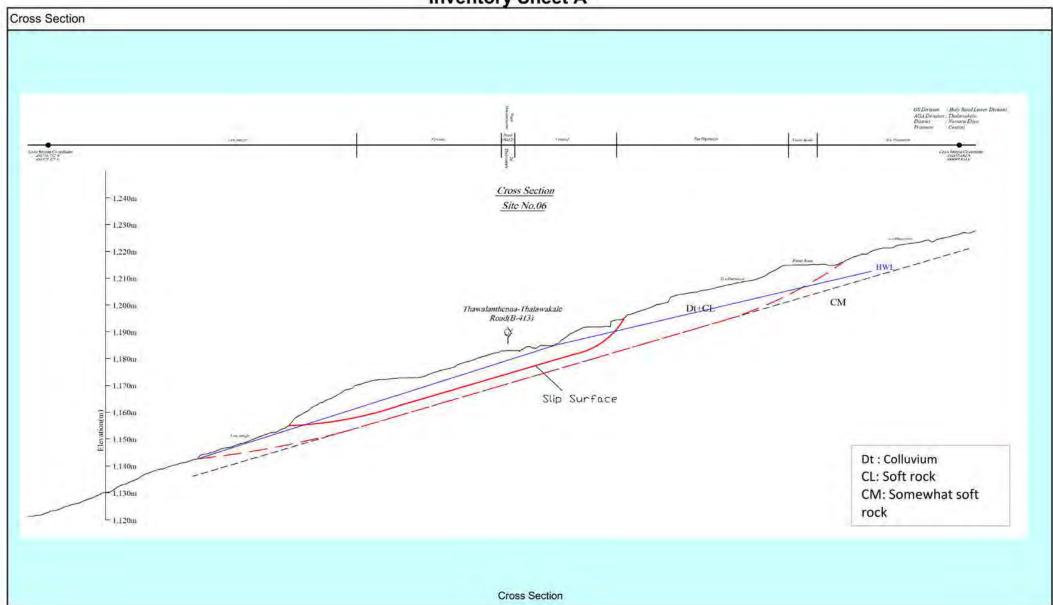
P2 Planned location of horizaontal drain boreholes



P4 The landslide toe along the road side ditch

		The second second		7.00 (a. a. 100 - 0.0			neet A		on a Killian and a second						
District	Nuwara Eliya	Management		Nuwara	- 1199-50A	Road No		-	ad Name		NAME OF THE OWNER, WHEN		henna-Thalawa	The second	
Site No.		6	Disaster		Landsli	- 1	ocation			End	30/11	latitude	6°57'12/0"N		80°39'6.9"E
Main body	Both	Traffic control		Hourly	mm	Traffic vol	ume Week	day	1774/12h	holiday	Ž.	Bus	route	Deto	ur
po map/Sket	ch						1.								
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	11/18/11-11		15	9/1	(2)	9/12	1216	$\gg$	\$ Ju	1/1/	1		SU(1)	1	
	M SHAREXX	131 11 6			177	797	1/7	VI)	A	MI				1/197	
		11/12/11	1	15/1	)	14 1		H	Ma	417/		L	Miller	有	
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			2)////	(3/1/2 B)	118	3111	14		(17-)	$\langle \rangle \rangle$	717		9		
		27 W 72 75	1715		185 1	1	37 ((	- )/X	111	11	1/	11			
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Site No.		6		- 11	iventoi	Sheet B	Checked by	Yang Pucai	
					(Lar	slide)	Organization	JICA Survey Te	eam
actor] (A)	_					(C)=MAX(A,B)		7	
Item		Check Point		check	score	Score evaluated from cause		(A)	56
Landslide Topography		oography or gentle slope, our lines, bulge on river bank	Clear Fairly clear	30	30	Score evaluated from history		(B)	100
	is observed.	Terra appropriate	Unclear	7	(30)			(0)-14	A 32 / A P
		Fault, shered zone Volcanic alteration zone		18		Among (B)&(C), large one.		(C)=M/	100
	0.000	Dip slope		(14)	14				100
	Geological structure	Opposite dip slope		4	14	[Countermeasure] (D) = (c) +	a ar (a) × 0		
	ou doud!o	Intrusive structure, Cap rock	structure	3			egory	point (a	che
Geological		Others	Structure	0	(18)	No countermeasure	gory	±0	1
conditions	-	Mesozoic/palaeozonic forma	tions	(7)	(1.0)	CALL TO MAKE AND ASSESSMENT OF YORK	effect	±0	
	Geological	Tertiary formation (sedimend		$\mathbf{\mathcal{Y}}$	7	Effectiveness of Slig	ht effect	-30	
	meterial	Quarternary formation (muds		3		I Icountermeasure	h effect	x0	
		Others (Volcamic rock, Igned		0	(7)		-5.D.T.	(D)	
		Present		(5)	5		Total		
	Spring Water	Absent		0	(5)				
		Total			56	[Description]			
istory] (B)						Abnormalities of subsidences Scars due to failures are also cultivated for tea plantation a	observed upper side		
Item		Check Point		check	score	California particular an	ound the one.		
Landslide	Record (d	ocumental or patrimony)	Present Absent	100	100 (100)				
history					11 -				
history	Scarp in slope,	onelon.	Clear	(100)	500				
history  Landslide deformation	Bulge and depre Subsidence,	ession, racks on road surface,	Clear Fairly clear	75	100				
Landslide	Bulge and depre Subsidence, Upheaval and c			)	100				





P3 A residential house damaged by landslide movement

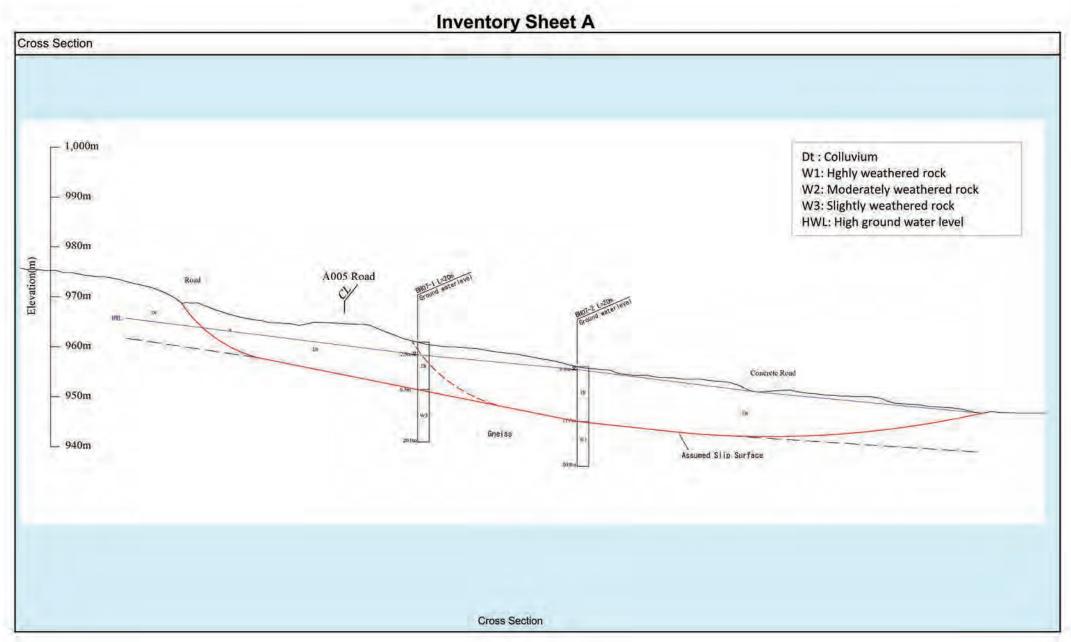


P2 Crack and subsidence across the road, showing the landslide boundary



P4 Whole view of the landslide slope looking from the opposite bank

					mve	ntory	Sne	et A							
District	Kandy	Management	office	Kadugar	nawa	Road I	No A	N-005	Road Na	me	I	Peradeniya	- Badulla - Ch	enkaladi roa	d
Site No.		7	Disaste	r Type	Landsl	ide	Locat	ion S	tart 30	9 End	30/11	latitude	7° 6'22.60"N	longitude	80°38'13.50"E
Main body	Both	Traffic control		Hourly	mm	Traffic v	olume	Week da	y 4442/1	2h holid	iy	Bu	s route	Deto	ur
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	~~~~	100	118/		13) /	$MA_{\bullet}$	1/	1 4	M		1 /	1	311/2		
			11/1/	1 1 2		7 (1)		1	//0		1	8	11/	$\sim$	
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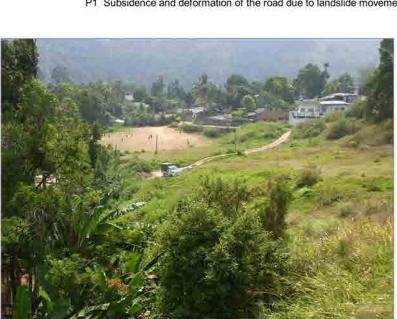


Site No.		7		li	nventory	Sheet B	Checked by	Yang Pucai	
		-			(Land	slide)	Organization	JICA Survey Te	am
actor] (A)						(C)=MAX(A,B)	L		
Item		Check Point		check	score	Score evaluated from caus	0	(A)	60
Landslide Topography		pography or gentle slope, our lines, bulge on river bank	Clear Fairly clear Unclear	(30) 7	30 (30)	Score evaluated from histo		(B)	100
		Fault, shered zone	Ontorour	(18)	(00)	100000000000000000000000000000000000000		(C)=MA	AX(A.
		Volcanic alteration zone		100		Among (B)&(C), large one.			100
	Geological	Dip slope		14	18				
	structure	Opposite dip slope		7		[Countermeasure] (D) = (c)	+ a or (c) x 0		-+
		Intrusive structure, Cap rock	structure	3		Ca	ategory	point (a	chec
Geological		Others		0	(18)	No countermeasure		±0	
conditions		Mesozoic/palaeozonic forma	tions	(7)			lo effect	±0	
	Geological	Tertiary formation (sedimend	ary rocks)	$\sim$	7	Effectiveness of countermeasure	light effect	-30	1
	meterial	Quarternary formation (muds	tone, etc)	3		H	ligh effect	x0	
		Others (Volcamic rock, Igned	ous rock)	9	(7)	-	Total	(D)	70
	Spring Water	Present Absent		(5)	5 (5)		Total		70
		Total		U	60	[Description]			
istory] (B)		Check Point		check	score	Abnormalities of subsidence properties belong to church NBRO and monitoered from	. Holes for groundwater		
Landslide history	Record (d	ocumental or patrimony)	Present Absent	100	100 (100)				
	Scarp in slope,		Clear	100					
Landslide deformation	Bulge and depre Subsidence, Upheaval and c	racks on road surface,	Fairly clear	75	100				
	Deformation of	countermeasure works	Unclear	0	(100)				

**Inventory Sheet C** Site No. 7 Date



P1 Subsidence and deformation of the road due to landslide movement



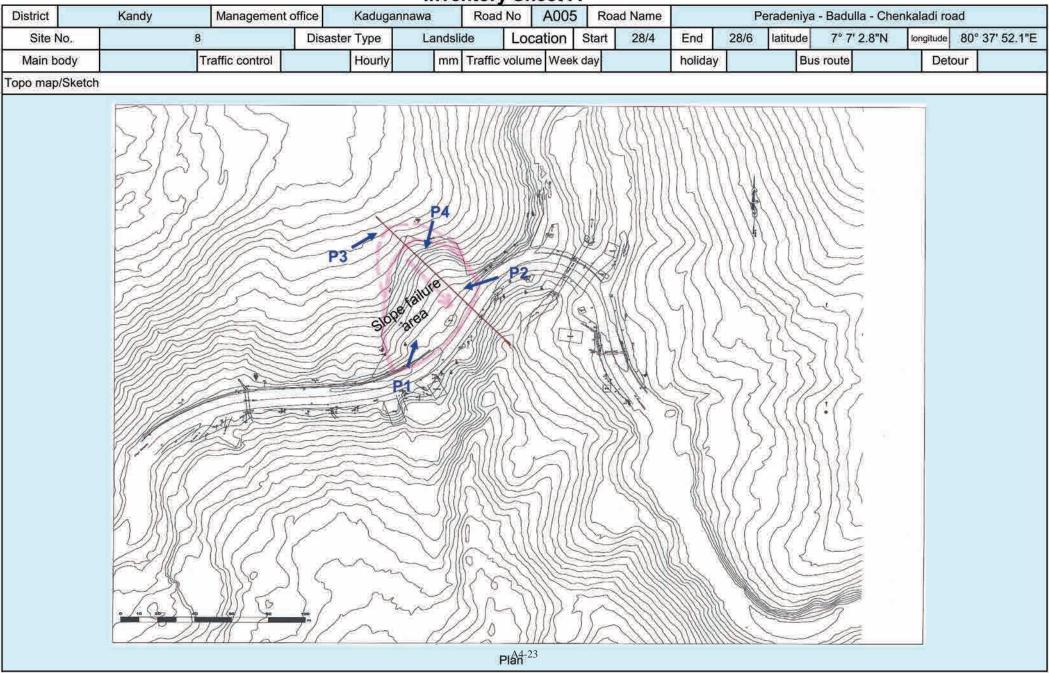
P3 Whole view of the landslide area looking from upper slope.

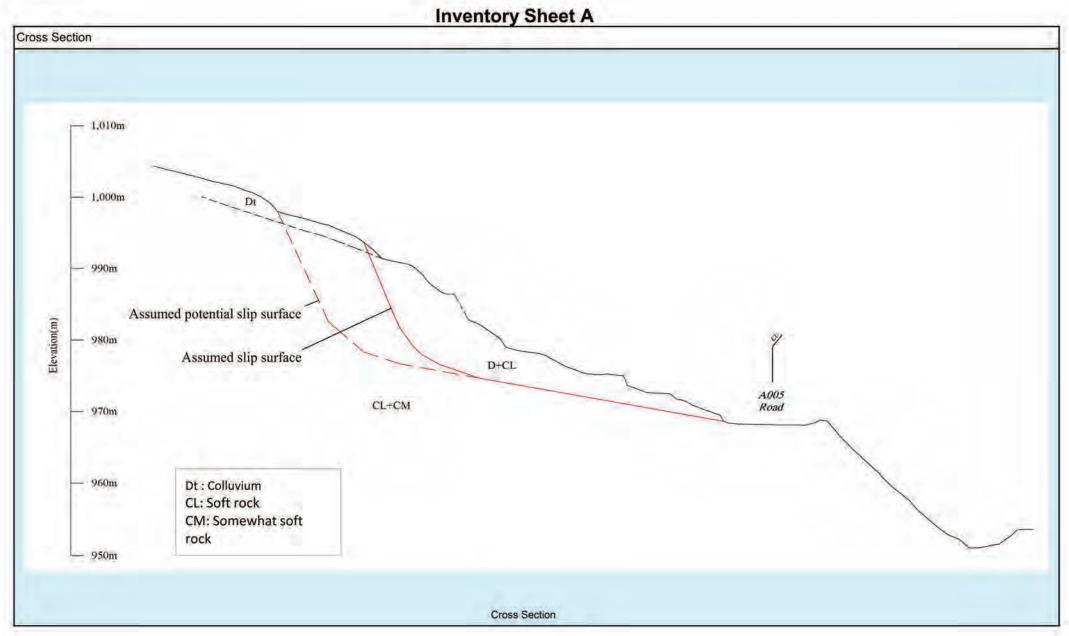


P2 Depression occurring on the upper slope of the landslide area



P4 Whole view of landslide area looking upper slope from down slope





					(Lan	lide)	Organization	JICA Sui	vey Te	eam
actor] (A)					V.	(C)=MAX(A,B)	[Vinesan services]	101,010,010,00	V 65 6 7 9	12000
Item		Check Point		check	score			10	A)	40
Landslide		pography or gentle slope, our lines, bulge on river bank	Clear Fairly clear	30	30	Score evaluated from cause		- 1	B)	48
Topography	is observed.	out mice, bulge of five bulk	Unclear	7	(30)	Score evaluated from history			<b>D</b> /	75
		Fault, shered zone		18		Annual Invatory Court State		(	C)=M/	AX(A,E
		Volcanic alteration zone		(18)		Among (B)&(C), large one.				75
	Geological	Dip slope		14	18			- "		
	structure	Opposite dip slope		7		[Countermeasure] (D) = (c) +	α or (c) x 0			-
		Intrusive structure, Cap rock	structure	3		Cate	egory	p	oint (a)	check
Geological		Others		0	(18)	No countermeasure			±0	1
conditions	40 0 0 1	Mesozoic/palaeozonic forma	tions	7		No i	effect		±0	
	Geological	Tertiary formation (sedimend	lary rocks)	7	0	1 Icountermeasure	ht effect	- 10	-30	
	meterial	Quarternary formation (muds	stone, etc)	3		High	h effect		x0	
		Others (Volcamic rock, Igned	ous rock)	0	(7)		sum total	ζ	D)	75
	Spring Water	Present		)	0		out total			0.7
	SEPTIME 11 SEPTIME	Absent		(0)	(5)					
		sum			48	[Description]				
		L			148	[Dossing.com				
listory] (B)		44								
Item		Check Point		check	score					
Landslide history	Record (d	locumental or patrimony)	Present Absent	0	(100)					
	Scarp in slope,	and the second	Clear	100						
Landslide deformation	Bulge and depre Subsidence, Upheaval and c	ession, racks on road surface,	Fairly clear	75	75					
		countermeasure works	Unclear	0	(100)					
				(B)	1 11 11 11 11 11					



P1 Landslide occurring along road cut slope, due presumble to road excavation



P3 Topographic gap observed above the landslide area

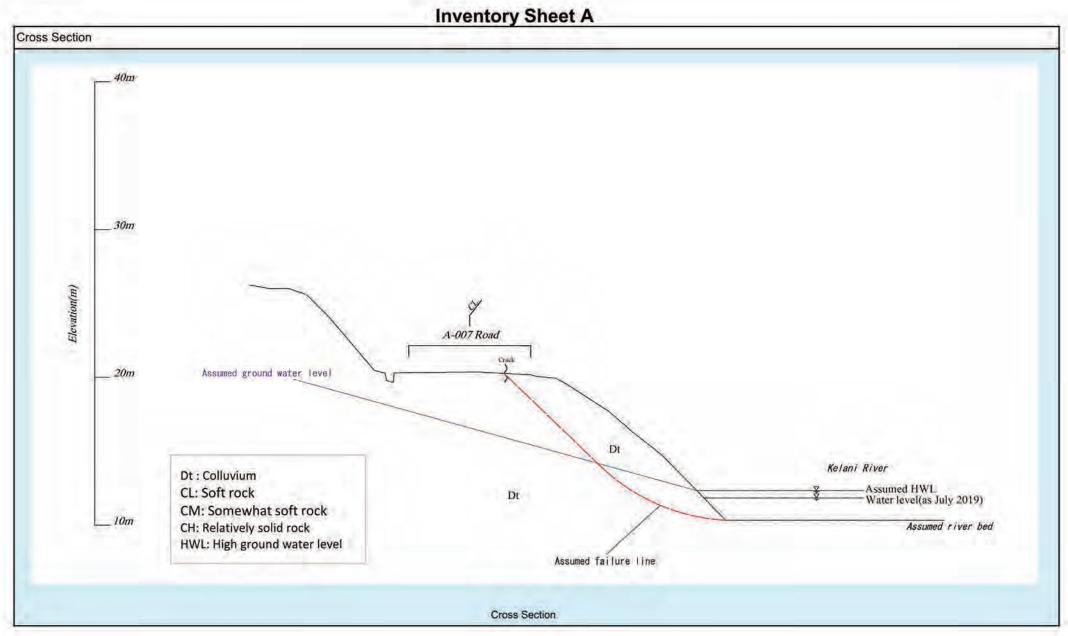


P2 Same as that in P1



P4 Whole view of the landslide area looking downslope from the landslide head

						itory Si				7					
District	Kegalle	Management	office	Ruwanwel	la	Road No	A-007	Roa	ad Name			Avissawe	ella - Hatton - N	luwaraeliya	ľ
Site No.		9	Disaster	Type S	Slope Fail	ure Loc	ation	Start	3/3	End	3/5	latitude	6°57'31.6"N	longitude	80°13'40.1"E
Main body	Vally side	Traffic control	Ž.	Hourly	mm	Traffic volum	Week	day 7	7718/12h	holiday		Bu	s route	Deto	our
Topo map/Sketch		.W -5-	- 1				-91	- 10		9				74.	
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[Cause] (Ai) Cause Classification Point score Item 3 G1: Talus slope G1 G2: Collapsed slope, Not G1 0 5 Clear knick line 3 G2 and G3 G3: Terrace scarp, Overhung slope 2 G2 or G3 Catachment slope, debris flow (6) No G2 and G3 D 8 Conspicuous Erodable soil (Mainly arenaceous soil) 8 Silty sand, silty clay, clay Slightly consequenous Cobble , pebble (8) 0 None 12 Conspicuous Jointed rock, 0 rocks that are weak against erosion and Slight conspicuous 6 char weathering. Ö (12) None Conspicuous 8 Dip slope (bedding, weak plane) Ö None 6 Conspicuous 6 Soft soil coverline baserock, Hard rock overlies weak rock, Slightly conspicuous 0 (14) None 12 Unstable 12 Surface soil, boulder, rock Slightly unstable 6 0 (12) Stabel Natural water spring 8 4 Spring water Water seepage scar (8) Nil U 5 No-vegitation, Grassland 3 3 Vegetation Complex (grass, structure) (5) Structure 18 H>30m 15 H<30, i > 30° i < 30°, 15<H<30m 10 i <30°, H<15m 5 15 Height (H), gradient (i) 18 H>50m 16 30<H<50m 12 15<H<30m (18) 10 H<15m Deformation of the survey slope More than one clear evidences 12 (small soil and rock falls, gully erosion, Obscure evidence scouring, depression, bulge, fallen tree, cracks, (18) 0 No evidence 5 More than one clear evidences Deformation of the adjacent slope Rock fall, collapse, cracks, bulge, and other Obscure evidence

No evidence

deformation)

Inventory Sheet B

Checked by Yang Pucai
Organization JICA Survey Team

[Countermeasure] (B) = (A) + $\alpha$  or (A) ×0 Well effective against the potential slope failure and rock fall. ×0 Effective but not completely against the potential rock fall and slope failure. -20-10Not completely protected from the potential slope failure and rock fall. No countermeasure was constructed, or the existing countermeasure cannot be expected effective. ±0 (B) Total 59 [History] (C) Disaster history point check The disaster has caused a traffic disturbance or closure after the 100 recent implementation of countermeasures. No trame disturbance has occurred but there is a record of 70 comparatively serious rock falls and slope failures that reached to the There is a record of rock falls and slope failures on a small scale that 40 that did not reach to the road. (D) = MAX (B,C) (B) 0 No disaster records Score from cause 59 (C) c) 40 Score from history 40 Among (B)&(C), large (D)=MAX(B,C)

[Description]

Relatively steep slope of 3 to 5m in heighet are observed along the road and slope failures of 5 to 15m in width confirmed at places in this section of the road. Total height of slope is less than 10m in almost all section of the road. The river of 15 to 20m wide flows around 10m below the road level along the road.

A4-29

(5)

59

0

Total

Date

P1 The deformation situation of the road surface on the valley side of the road



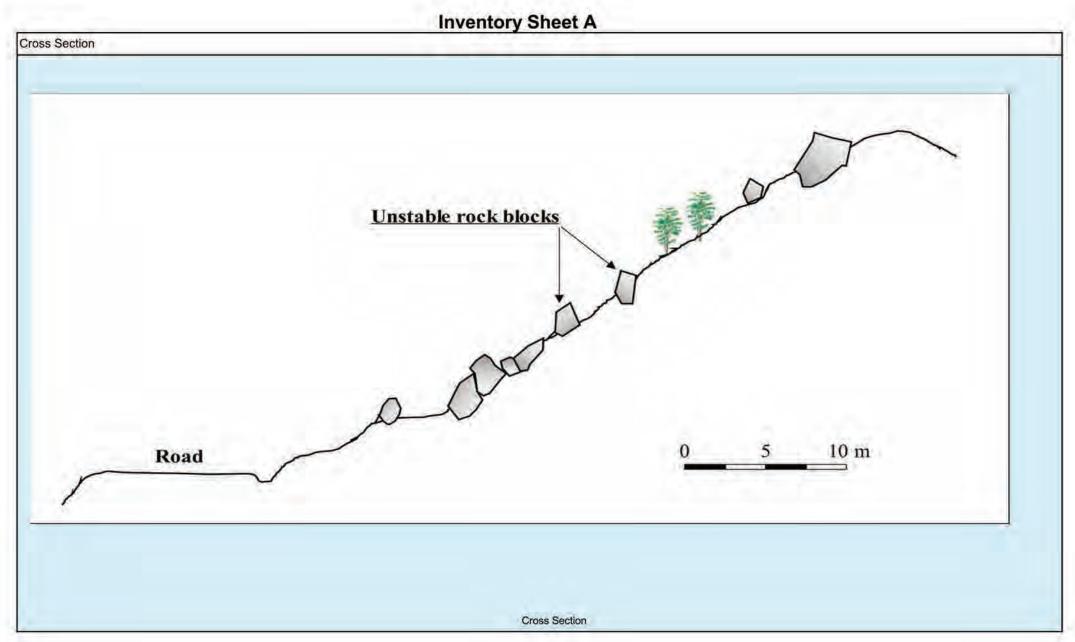


P3 Slope failure on the valley side, due presumably to the river erosion



P4 Road cut slope and its slope geology

			-			ntory			,								
District	Badulla	Management	A CONTRACTOR OF THE PARTY OF TH	Bandar	Managenesia	Road		A016	10.00	ad Name			_	eragala - H		Road	
Site No.		10	Disast	er Type	Rock f	all	Loca	tion	Start	3.85km	End	4.2km	latitude	6°45'3	33.9"N	longitude	80°56'49.1"E
Main body	Mountain side	Traffic control		Hourly	mm	Traffic	volume	Week o	lay 6	6200/12h	holiday	1	В	us route		Dete	our
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[Cause] (Ai) Cause Classification Point score 3 G1: Talus slope G1 Topography with factor of G2: Collapsed slope, Not G1 0 6 Clear knick line 3 G2 and G3 G3: Terrace scarp, Overhung slope G2 or G3 2 Catachment slope, debris flow Ö (6) No G2 and G3 Erodable soil (Mainly arenaceous soil) Conspicuous 8 4 Silty sand, silty clay, clay Slightly consequenous Cobble , pebble (8) 0 12 Conspicuous Jointed rock. 12 rocks that are weak against erosion and Slight conspicuous (12)weathering. 0 None Conspicuous 8 Dip slope (bedding, weak plane) None 14 Conspicuous 6 Soft soil coverline baserock, Hard rock overlies weak rock, Slightly conspicuous 0 (14)None Unstable 12 12 Surface soil, boulder, rock Slightly unstable 0 (12) Stabel Natural water spring 8 4 Spring water Water seepage scar (8) 5 No-vegitation, Grassland 3 Vegetation Complex (grass, structure) (5) Structure 18 H>30m 15 H<30, i > 30° i < 30°, 15<H<30m 10 5 15 1<30°, H<15m Height (H), gradient (i) 18 H>50m 16 30<H<50m 12 15<H<30m 10 (18) H<15m Deformation of the survey slope 12 More than one clear evidences 12 (small soil and rock falls, gully erosion, Obscure evidence scouring, depression, bulge, fallen tree, cracks (18) 0 No evidence More than one clear evidences Deformation of the adjacent slope Rock fall, collapse, cracks, bulge, and other Obscure evidence 3 deformation) (5) 0 No evidence (A)

Total

75

(Slope Failur • Rock Fall )

Checked by Yang Pucai

Organization JICA Survey Team

[Countermeasure] (B) = (A) + $\alpha$  or (A) ×0 Well effective against the potential slope failure and rock fall. ×0 -20 Effective but not completely against the potential rock fall and slope failure. Not completely protected from the potential slope failure and rock fall. -10±0 No countermeasure was constructed, or the existing countermeasure cannot be expected effective. (B) Total 75 [History] (C) Disaster history point check The disaster has caused a traffic disturbance or closure after the 100 recent implementation of countermeasures. No traffic disturbance has occurred but there is a record of 70 comparatively serious rock falls and slope failures that reached to the There is a record of rock falls and slope failures on a small scale that 40 that did not reach to the road. (D) = MAX (B,C) (B) 0 No disaster records Score from cause 75 (C) 70 Score from history 70 Among (B)&(C), large (D)=MAX(B,C)

[Description]

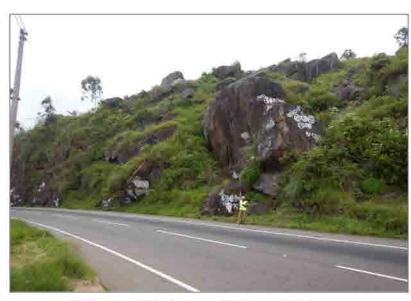
Steep to relatively steep slope consisting of relatively fresh rock are observed 20 to 35 meters from the road. Talus deposits are distributed thinly on gentler slopes. Bolders of diameter less than one meter are confirmed at places along the road. .Bolders of diameter more than one meter are also confirmed some places. along and below the road.

A4-33

Site No. Inventory Sheet C Date June 25, 2019



P1 Many unstable huge rock blocks and boulders observed on the slope above the road



P2 Close vies of P1, showing unstable huge rock blocks

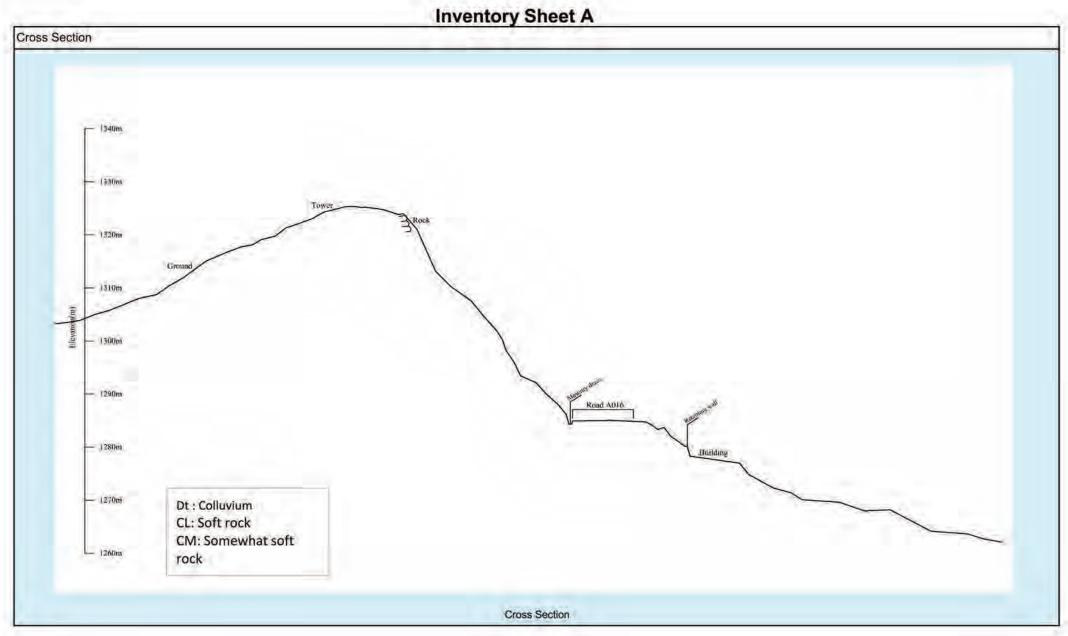


P3 Geology of the slope above the road consisting of colluvium and the underlying bedrock in which major joints dip out of the cut slope



P4 Local shallow failure occurring on the cut slope above the road

District	Badulla	Management	office	Banda		Road No			ad Name	×		Be	ragala -	Haliela F	Road	
Site No.	The state of the s	11	Disaste		Rock f		ation	-	eggs survented	End	5/4	latitude	B 14617	'39.8"N	longitude	80°56'54.2"E
Main body	Mountain side	Traffic control	•	Hourly	mm	Traffic volun	ne Week	day	6200/12h	holiday		В	ıs route		Deto	our
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[Cause] (Ai)

1	tem	Cause	1	Classification	Point	score
		C1 - Talua alana	G1		(3)	
Topography	of of	G2 : Collapsed slope,		G1	TO .	
	Topography with factor of	Clear knick line	-	and G3	3	6
ğ	pood h fa	G3 : Terrace scarp, Overhung slope	man.	or G3	2	7
1 1 1	Catachment slope, debris flow deposit		G2 and G3	(0)	(6)	
>		C 10177	-	nspicuous		(0)
Soil	pert	Erodable soil (Mainly arenaceous soil) Silty sand, silty clay, clay	diame	htly consequenous	<b>(8)</b>	8
	S	Cobble , pebble	Nor		0	(8)
5	-23	L. t. a.	-	rspicuous		· ·
5	Rock character	Jointed rock, rocks that are weak against erosion and		ht conspicuous	(12)	12
3	Ro	weathering.			onione.	(10)
g	ō	modification g.	Nor		0	(12
Geological conditions	m m	Dip slope (bedding, weak plane)	· ····	nspicuous	(8)	
200	Geological Structure		No		D	14
응원	olog	Soft soil coverline baserock,		nspicuous	<b>6</b>	
1	SS	Hard rock overlies weak rock, Others		htly conspicuous	0	
	2-1	Others	Nor	127		(14
				stable	(12)	12
uo	Surface soil, boulder, rock		htly unstable	б		
			Sta	- 1,	0	(12
BO			Nat	ural water spring	8	4
Surface codition	Spring water	Wa	ter seepage scar	(4)		
			Nil		0	(8)
			No-	vegitation, Grassland	5	3
		Vegetation	Cor	nplex (grass, structure)	(3)	3
			Str	ucture	7	(5)
			П	H>30m	18	
			-	H<30, i > 30°	(15)	
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Geometry		Height (H), gradient (i)	П	H>50m	18	
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Defor		mation of the survey slope	Mo	re than one clear evidences	(12)	
	(smal	soil and rock falls, gully erosion,		scure evidence	18	12
aisc		ing, depression, bulge, fallen tree, cracks,		evidence	0	(18
	etc.)	matica of the adjacent stars	-	re than one clear evidences	5	
		mation of the adjacent slope		scure evidence	(3)	3
(Rock fall, collapse, cracks, bulge, and other deformation)			******		18	(5)
	-9.011	Vincent A	INO	evidence	(A)	(5)

Total

75

Inventory	Sheet B
(Slope Failur	Rock Fall

Checked by	Yang Pucai	
Organization	JICA Survey Team	

[Countermeasure] (B) = (A) + $\alpha$  or (A) ×0 Well effective against the potential slope failure and rock fall. ×0 Effective but not completely against the potential rock fall and slope failure. -20Not completely protected from the potential slope failure and rock fall. -10±0 No countermeasure was constructed, or the existing countermeasure cannot be expected effective. (B) Total 75 [History] (C) Disaster history point check The disaster has caused a traffic disturbance or closure after the 100 recent implementation of countermeasures. No traffic disturbance has occurred but there is a record of 70 comparatively serious rock falls and slope failures that reached to the There is a record of rock falls and slope failures on a small scale that 40 that did not reach to the road. (D) = MAX (B,C) 0 No disaster records Score from cause 75 (C) (c) 70 Score from history 70 Among (B)&(C), large (D)=MAX(B,C) 75

## [Description]

Steep to relatively steep slope consisting of relatively fresh rock are observed 20 to 35 meters from the road. Talus deposits are distributed thinly on gentler slopes. Bolders of diameter less than one meter are confirmed at places along the road. Bolders of diameter more than one meter are also confirmed some places. along and below the road.

A4-37

Site No. 11	Inventory Sheet C	Date	June 25, 2019
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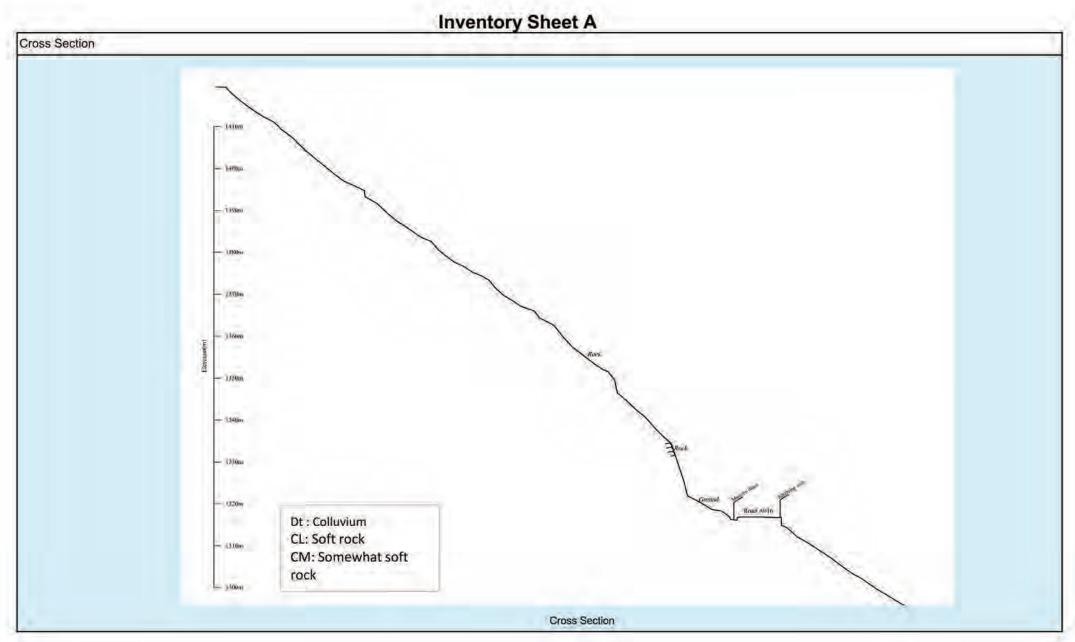


P1 Shallow failure on the cut slope above the road and some individual huge rock blocks on its upper natural slope



P2 Close view of P1, showing that shallow failure would contribute to potential for falling of huge rock block on its upper natual slope

					Inve	ntory	Sheet A	4							
District	Badulla	Management	office	Bandara		Road I			ad Name			Ber	agala - Haliela	Road	
Site No.		12	Disast	er Type	Rock f	all	Location	Start	5/6	End	5/8	latitude	6°45'42.9"N	longitude	80°57'01.3"E
Main body	Mountain side	Traffic control		Hourly	mm	Traffic v	olume Wee	k day	6200/12h	holiday		Bu	s route	Deto	our
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						4	A4-39 Pla								



[Cause] (Ai) Cause Classification Point score 3 G1: Talus slope G1 Topography with factor of G2: Collapsed slope, 0 Not G1 Clear knick line 6 3 G2 and G3 G3: Terrace scarp, Overhung slope G2 or G3 2 Catachment slope, debris flow Ö (6) No G2 and G3 8 Erodable soil (Mainly arenaceous soil) Conspicuous 8 Silty sand, silty clay, clay Slightly consequenous 4 Cobble , pebble (8) 0 12 Conspicuous Jointed rock. 12 rocks that are weak against erosion and Slight conspicuous (12)weathering. 0 None Conspicuous 8 Dip slope (bedding, weak plane) None 0 14 Conspicuous 6 Soft soil coverline baserock, Hard rock overlies weak rock, Slightly conspicuous None 0 (14) Unstable 12 12 Surface soil, boulder, rock Slightly unstable 0 (12) Stabel Natural water spring 8 4 Spring water Water seepage scar (8) 5 No-vegitation, Grassland 3 3 Vegetation Complex (grass, structure) (5) Structure 18 H>30m 15 H<30, i > 30° i < 30°, 15<H<30m 10 5 15 1<30°, H<15m Height (H), gradient (i) 18 H>50m 16 30<H<50m 12 15<H<30m 10 (18) H<15m Deformation of the survey slope 12 More than one clear evidences 12 (small soil and rock falls, gully erosion, Obscure evidence scouring, depression, bulge, fallen tree, cracks (18) No evidence 0 More than one clear evidences Deformation of the adjacent slope Rock fall, collapse, cracks, bulge, and other Obscure evidence 3 deformation) (5) 0 No evidence

Total

75

Inventory Sheet B (Slope Failure • Rock Fall ) Checked by Yang Pucai
Organization JICA Survey Team

[Countermeasure] (B) = (A) + $\alpha$  or (A) ×0 Well effective against the potential slope failure and rock fall. ×0 -20 Effective but not completely against the potential rock fall and slope failure. Not completely protected from the potential slope failure and rock fall. -10±0 No countermeasure was constructed, or the existing countermeasure cannot be expected effective. (B) Total 75 [History] (C) Disaster history point check The disaster has caused a traffic disturbance or closure after the 100 recent implementation of countermeasures. No traffic disturbance has occurred but there is a record of 70 comparatively serious rock falls and slope failures that reached to the There is a record of rock falls and slope failures on a small scale that 40 that did not reach to the road. (D) = MAX (B,C) 0 No disaster records Score from cause 75 (C) 70 Score from history 70 Among (B)&(C), large (D)=MAX(B,C) 75

[Description]

Next to the slope of site No. 11. Steep slope consisting mainly of weathered rock and overburden of debris are distributed along the road. Large boulders are scattered on the slope.

A4-41

Site No. 12 Inventory Sheet C Date June 25, 2019



P1 Unstable rock blocks and buoulders on the natural slope above the road, showing soure of further rockfalls



P2 Huge boulders dominated along the mountain stream

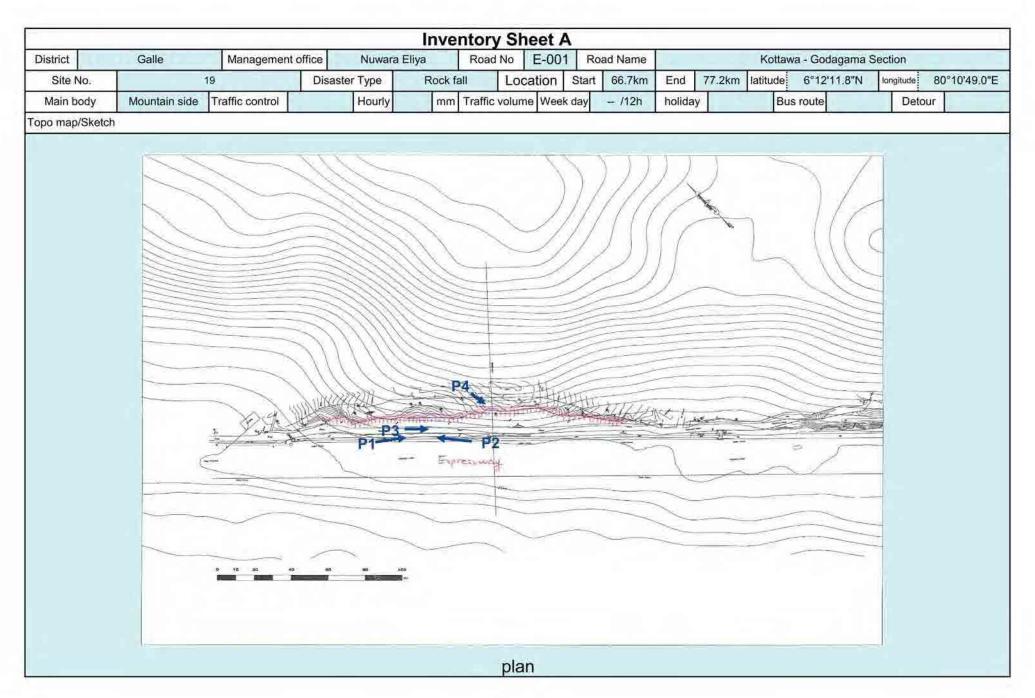


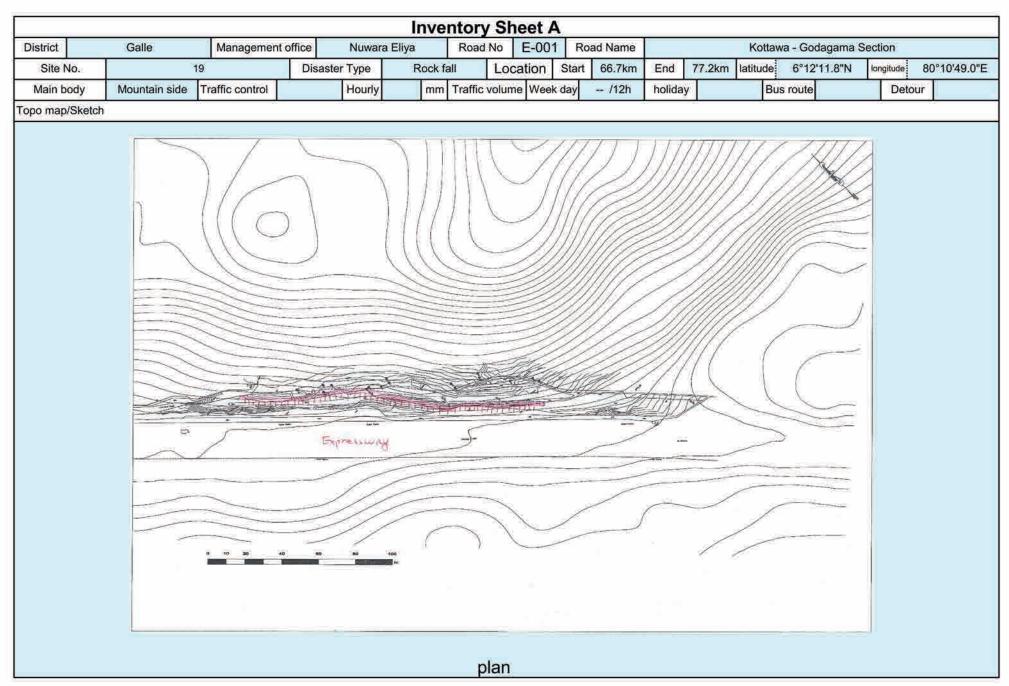
P3 Rock cut slope and its upper natural slope, showning fractured rock mass on the cut slope and unstable rock blocks on the upper natural slope

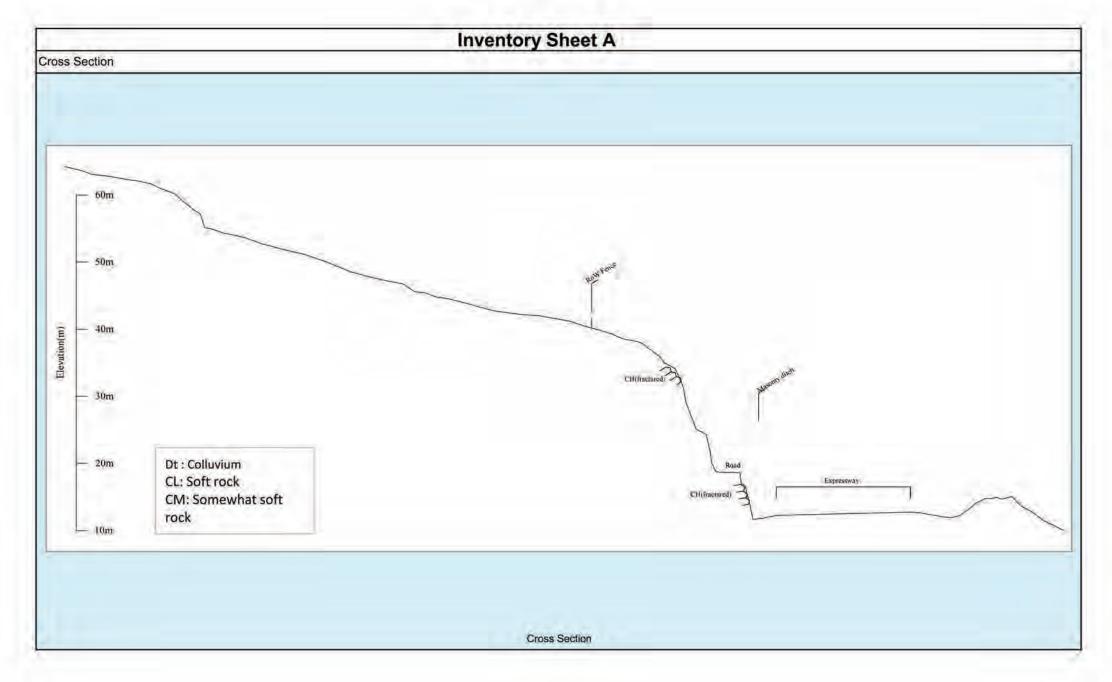


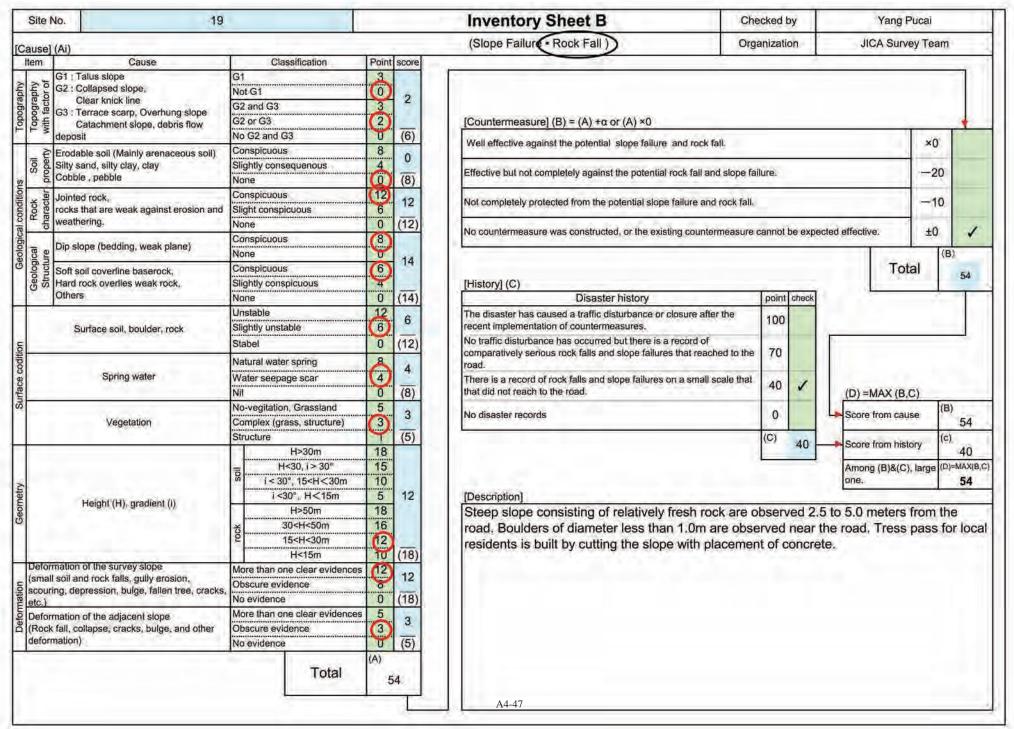
P4 A huge boulder falling and reaching the road (size: about 1 m in diameter)

**Inventory Sheet C** Site No. 12 Date June 25, 2019 P5: The surface failure of cut slope P7 : Recognize unsteady stones in patches P6: The cut slope of bedrock









Date

## 19 Site No.

P1 Huge rock blocks falling due to wedge rock fallure on the rock cut slope



P2 Major joints dipping adversely out of the cut slope, showing high potential for rockfall

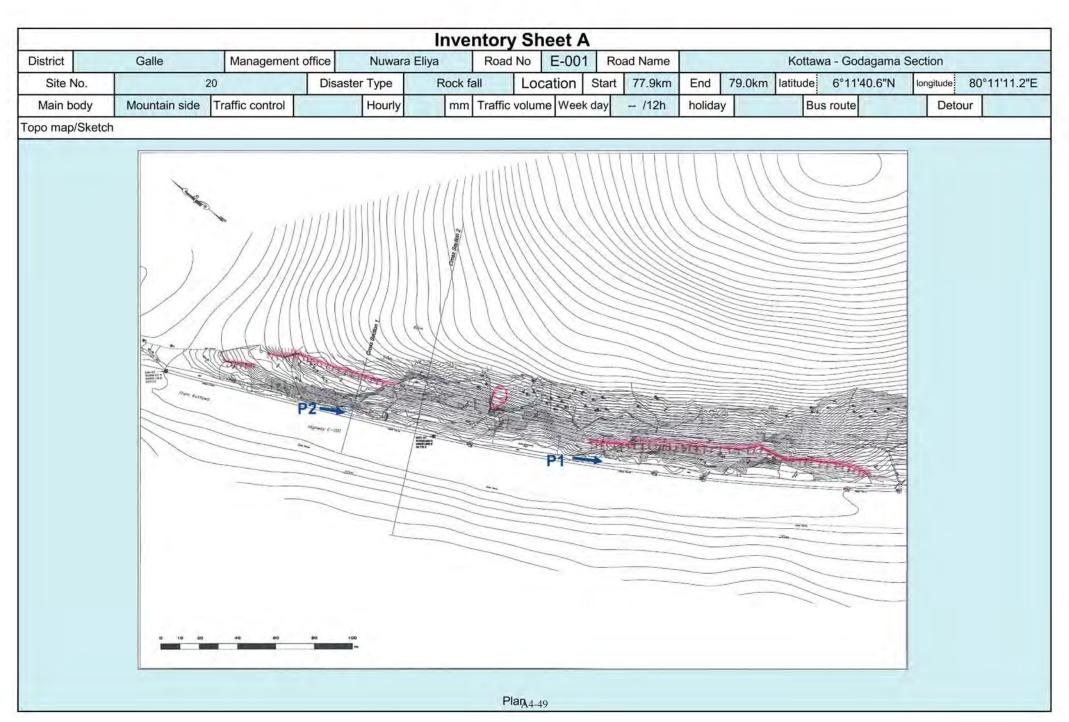
## **Inventory Sheet C**

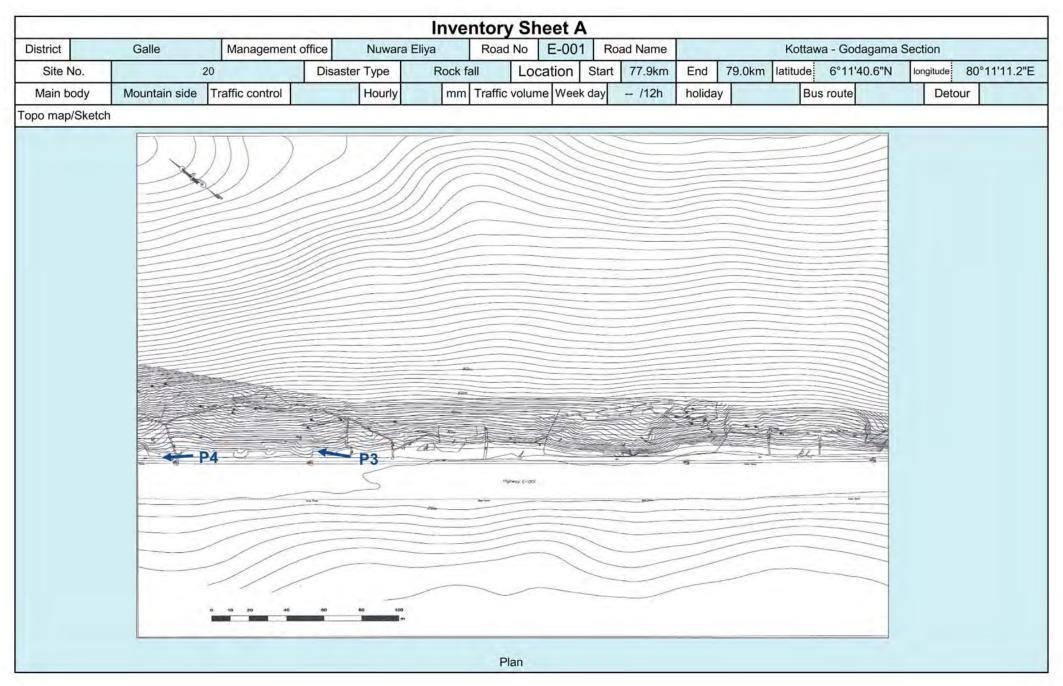


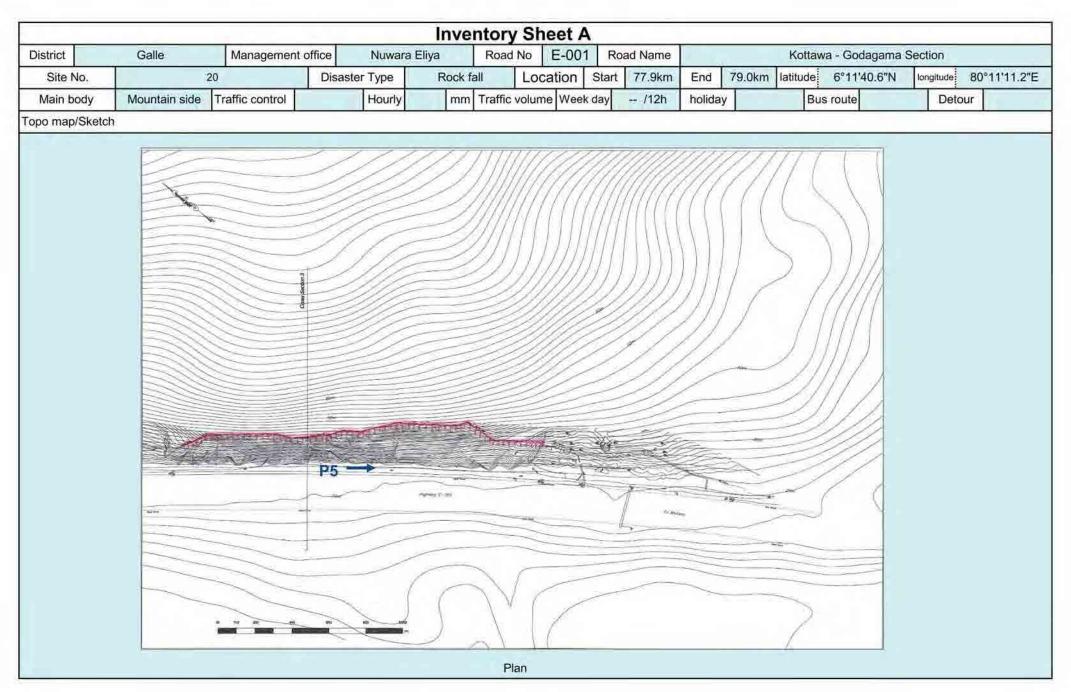
P3 A village road at the middle of rock cut slope, showing well-developed dip slope

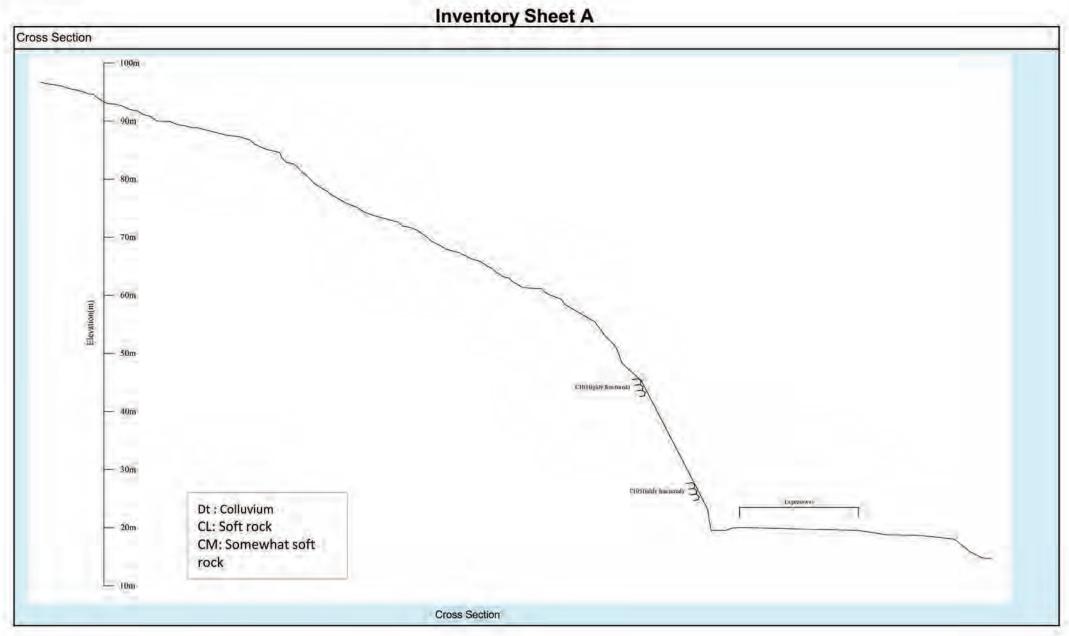


P4 Unstable stones (at max size, φ20×50×80cm), distributed around the ROW boundary fences of RDA





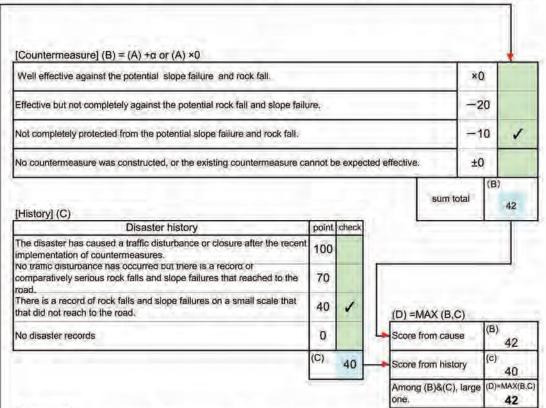




Structure character property factor of	Catachmeni deposit  Erodable soil (Mi Silty sand, silty of Cobble, pebble  Jointed rock, rocks that are we weathering.  Dip slope (bedding)	lope; line rp, Overhung slope t slope, debris flow ainly arenaceous soil) lay, clay	G1 Not G1 G2 and G3 G2 or G3 No G2 and Conspicuol Slightly con None Conspicuol Slight cons None Conspicuol Conspicuol Conspicuol Conspicuol Conspicuol Conspicuol Conspicuol Conspicuol	is sequenous is	Point 3 3 2 0 8 8 4 0 12	2 (6) 0 (8)					
character property	G2: Collapsed s Clear knick G3: Terrace sca Catachmen deposit Erodable soil (Ma Silty sand, silty of Cobble, pebble Jointed rock, rocks that are we weathering.  Dip slope (beddin Soft soil coverline Hard rock overlies	lope; line rp, Overhung slope t slope, debris flow ainly arenaceous soil) lay, clay	Not G1 G2 and G3 G2 or G3 No G2 and Conspicuou Slightly con None Conspicuou Slight cons None	is sequenous is	3 2 0 8 4 0	(6)					
character property	G3: Terrace sca Catachmeni deposit Erodable soil (Ma Silty sand, silty of Cobble, pebble Jointed rock, rocks that are we weathering. Dip slope (bedding Soft soil coverling	rp, Overhung slope t slope, debris flow ainly arenaceous soil) lay, clay eak against erosion and	G2 or G3 No G2 and Conspicuo. Slightly con None Conspicuo. Slight cons None	is sequenous is	8 4 0	(6)					
character property	Catachmeni deposit  Erodable soil (Ma Silty sand, silty of Cobble, pebble  Jointed rock, rocks that are we weathering.  Dip slope (beddin Soft soil coverline Hard rock overlies	t slope, debris flow ainly arenaceous soil) lay, clay eak against erosion and	No G2 and Conspicuou Slightly con None Conspicuou Slight cons None	is sequenous is	0 8 4 0	0					
character property	deposit  Erodable soil (Ma Silty sand, silty of Cobble, pebble  Jointed rock, rocks that are we weathering.  Dip slope (beddin Soft soil coverline Hard rock overlie	ainly arenaceous soil) lay, clay eak against erosion and	Conspicuou Slightly con None Conspicuou Slight cons None	is sequenous is	0 8 4 0	0					
character	Silty sand, silty of Cobble, pebble Jointed rock, rocks that are we weathering. Dip slope (beddir Soft soil coverling Hard rock overlies	lay, clay eak against erosion and	Slightly con None Conspicuou Slight cons None	sequenous	6	0					
character	Silty sand, silty of Cobble, pebble Jointed rock, rocks that are we weathering. Dip slope (beddir Soft soil coverling Hard rock overlies	lay, clay eak against erosion and	None Conspicuou Slight cons None	ıs	(O)	17.					
character	Jointed rock, rocks that are we weathering.  Dip slope (beddii Soft soil coverlini Hard rock overlie		Conspicuou Slight cons None	manuscriptor remains the re-		(8)					
H	rocks that are we weathering. Dip slope (beddin Soft soil coverline Hard rock overlie		Slight cons	manuscriptor remains the re-	(12)	100					
H	rocks that are we weathering. Dip slope (beddin Soft soil coverline Hard rock overlie		Slight cons	manuscriptor remains the re-		100					
H	weathering,  Dip slope (bedding)  Soft soil coverling  Hard rock overlie		None		6	12					
H	Soft soil coverling Hard rock overlie	ng, weak plane)	1.00	None							
Structure	Soft soil coverling Hard rock overlie	ng, weak plane)		ie	0	(12					
Structur	Hard rock overlie		None		8	1 3					
Struc	Hard rock overlie	Jointed rock. rocks that are weak against erosion and weathering.  Dip slope (bedding, weak plane)  Soft soil coverline baserock.			6	8					
5 00	C Agon of the control		Conspicuou								
		s weak rock,	Slightly con	spicuous	4	14.4					
	Others		None		(0)	(14					
	4040000	Alexandrois	Unstable	ayyy maamamaa	12	6					
	Surface soil	, boulder, rock	Slightly uns	(6)	-						
onliace control			Stabel		0	(12					
			Natural wat	8	4						
	Sprin	g water	Water seep	(4)							
			Nil	0	(8)						
			No-vegitation	(5)	5						
	Vege	etation	Complex (g	3	2						
			Structure	1	(5)						
			1	H>30m	18						
			=	H<30, i > 30°	15						
			S I<	30°, 15 <h<30m< td=""><td>10</td><td></td></h<30m<>	10						
	47 300 5 300	Carte Alexander		<30°, H<15m	5	12					
	Height (H)	, gradient (I)		H>50m	18	1					
			×	30 <h<50m< td=""><td>16</td><td></td></h<50m<>	16						
			Ş	15 <h<30m< td=""><td>(12)</td><td></td></h<30m<>	(12)						
			wintensone	H<15m	10	(18					
nf-	motion of the a	ou alaba	More than o	one clear evidences	12	The l					
	mation of the surv					8					
			***************		-	(18					
	7,212		1 CARACTER AND THE	8-	Carl Admini	(10					
		and the second s	***************************************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ALCOHOLD STATES	3					
	Control of the contro	uks, buige, and other			+	TEN					
Rock	ind sorti		ING evidenc	e	1	(5)					
Rock				- Augustian	(A)						
	fori ock	oression, bulge, falle formation of the adja	pression, bulge, fallen tree, cracks, etc.) formation of the adjacent slope ack fall, collapse, cracks, bulge, and other	oression, bulge, fallen free, cracks, etc.)  No evidence formation of the adjacent slope ock fall, collapse, cracks, bulge, and other Obscure evidence for the collapse of the	oression, bulge, fallen tree, cracks, etc.)  No evidence  formation of the adjacent slope  ock fall, collapse, cracks, bulge, and other  Obscure evidence	oression, bulge, fallen tree, cracks, etc.)  No evidence  Offormation of the adjacent slope ock fall, collapse, cracks, bulge, and other ormation)  No evidence  More than one clear evidences 5  Obscure evidence  No evidence  O  (A)					

## Inventory Sheet B

Checked by	Yang Pucai
Organization	JICA Survey Team



## [Description]

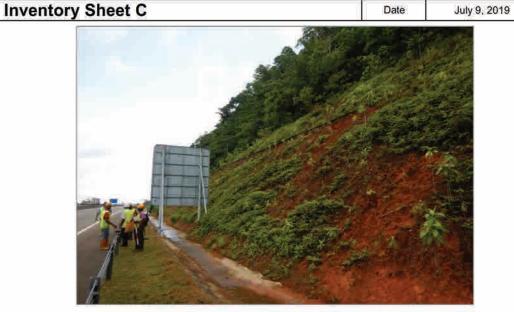
Steep slope of more than 10m in height without step cutting is observed in this setion. Shot creting as well as net are placed in a limited area. Boulders of less than 50cm are scattered at limited place. Slopes consisting of weathered rock are also observed in some section.



P1 Near-vertical rock cut slope, showing a dip slope formed by foliation joints



P2 Rockfalls with boulder size of about φ50α, occurring on the rock cut slope, and emergency nets installed by RDA



P3 Steep cut slope, showing strongly weathered rocks anddraingage channel installed on the cut slop



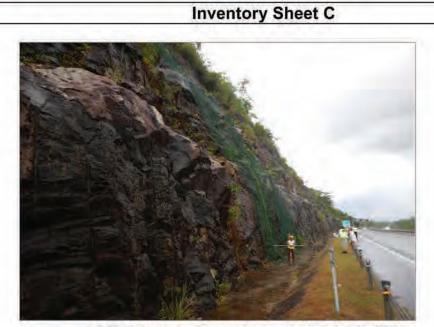
P4 Rock block of  $\phi60m$ , falling down from the road cut slope or its upper natural slope

20

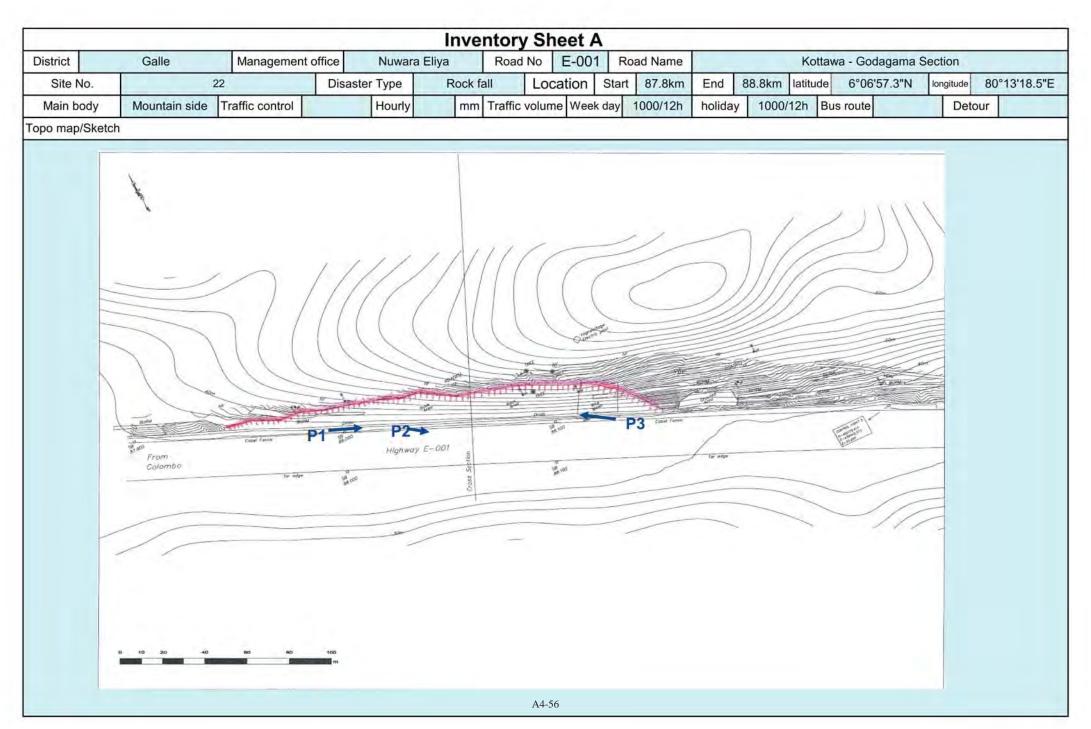
Site No.

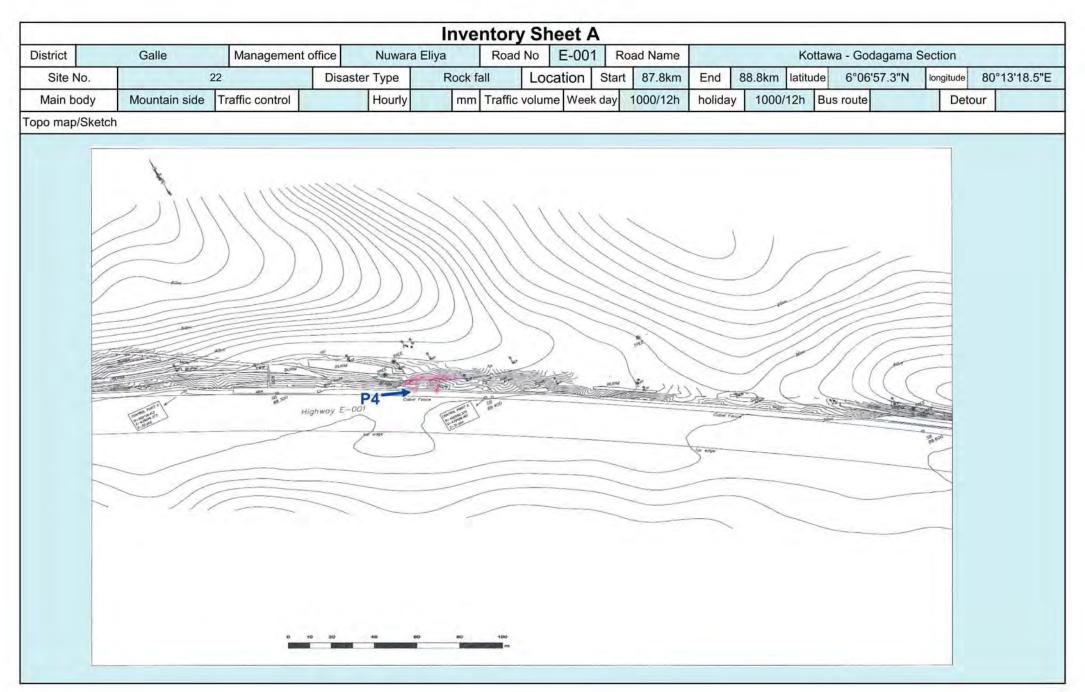
Date

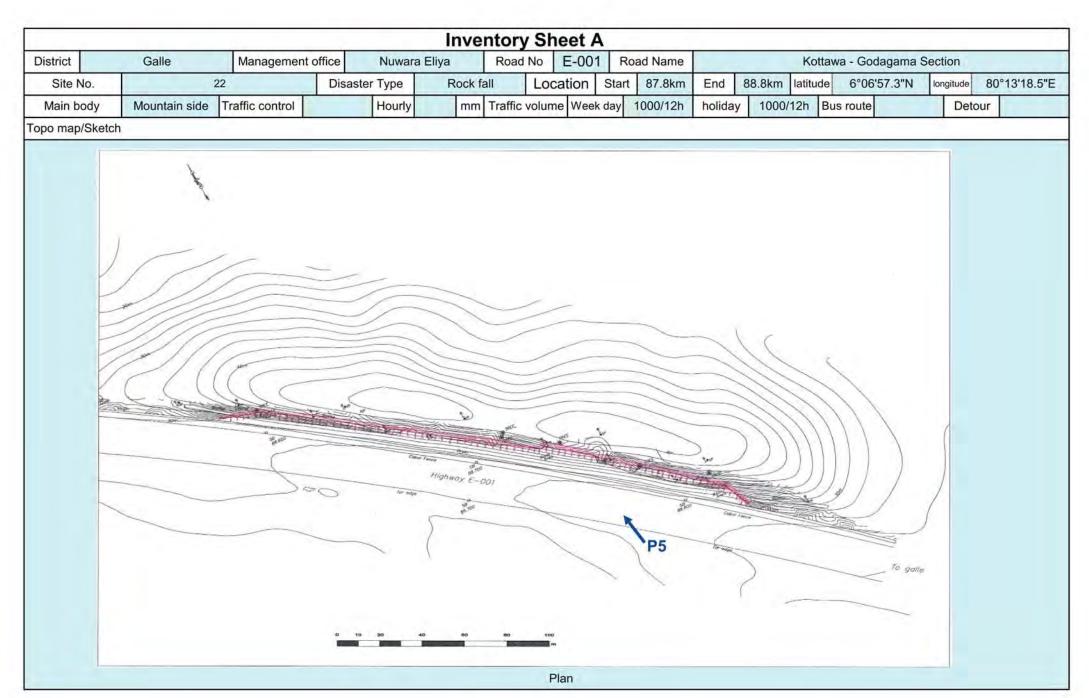
July 9, 2019

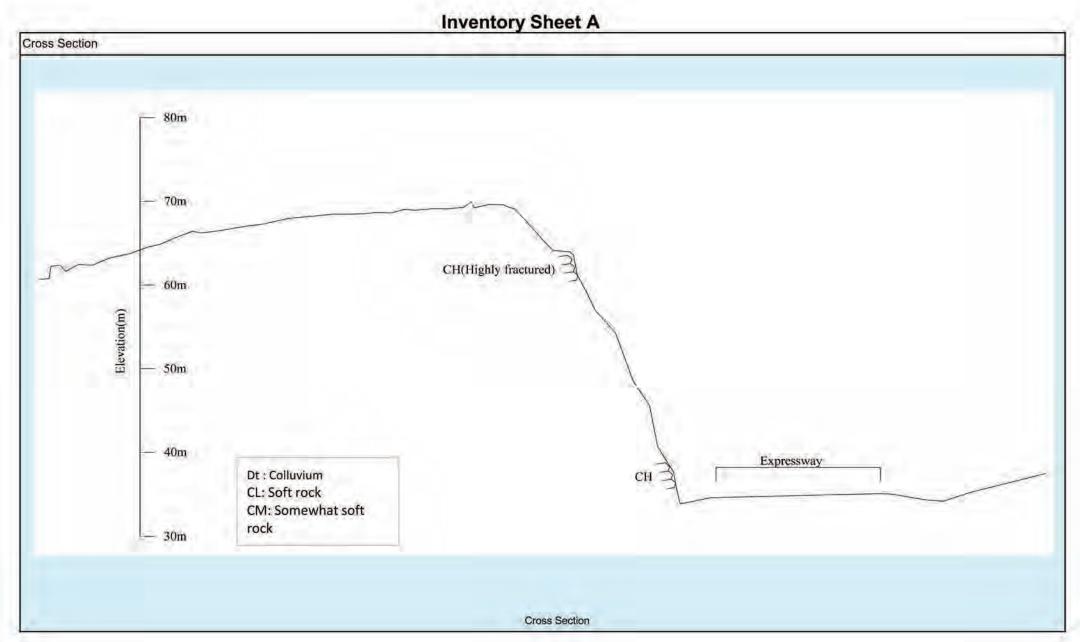


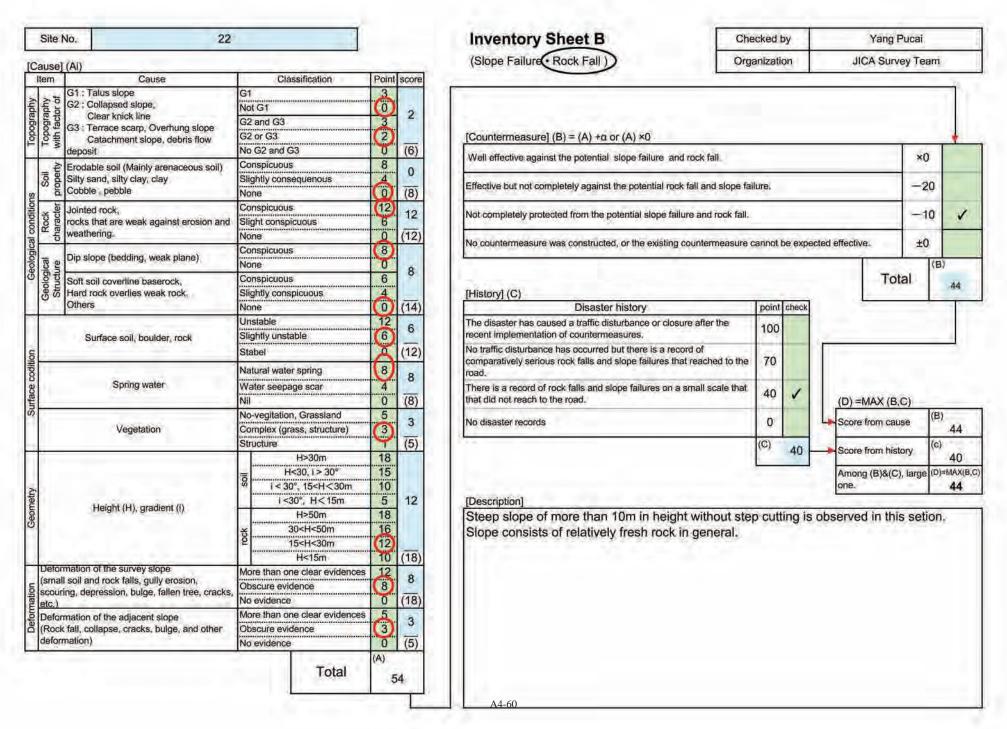
P5 Highly fractured rock mass and emergency nets installed by RAD



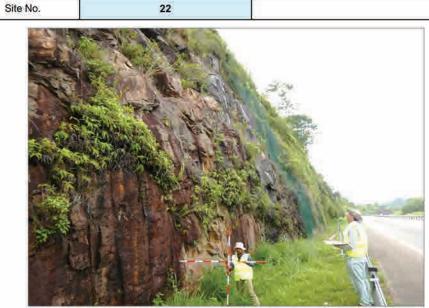








Date



P1 Steep road cut slope of highly fractured rocks, showing dip slope, RDA installed emergency nets after rockfalls



P2 Damaged condition of road surface by rockfall, showing rockfall reached the road



P3 Installed mortar spraying method for protecting shallow slope failure, of estimated depth of about



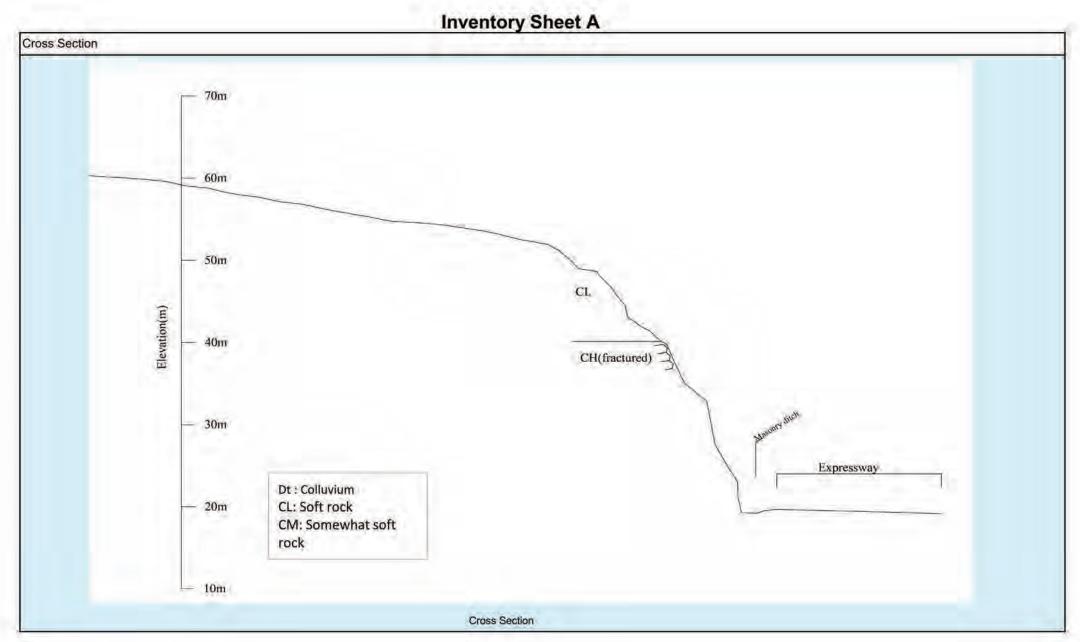
P4 Shallow slope failure occurring on strongly weathered with a dip slope

Site No. 22 Inventory Sheet C Date July 17, 2019



P5 Fractured rock slope, showing a dip slope - high potential for further rockfalls

				Inve	ntory Sh	neet A							
District	Galle	Management offi	ce Nuwara E	liya	Road No	E-001	Road Na	ne		Kottav	/a - Godagama	Section	
Site No.	3	23	Disaster Type	Rock fa	all Loc	cation	Start 89.3	km End	89.6km	latitude	6°06'33.0"N	longitude	80°13'50.1"
Main body	Mountain side	Traffic control	Hourly	mm	Traffic volun	ne Week d	lay /12	h holida	У	Bu	s route	Deto	ur
po map/Sketo	h												
		P	P3 P	P5	A4-63	Plan							



No. 23				Inventory Sheet B	Checke	110	-	Yang F		
e] (Ai)			-2	(Slope Failure · Rock Fall )	Organiz	ation		JICA Surv	y Team	ţ.
Cause	Classification	Point	score							
G1 : Talus slope G2 : Collapsed slope, Clear knick line G3 : Terrace scarp, Overhung slope Catachment slope, debris flow deposit	G1 Not G1 G2 and G3 G2 or G3	3 3 2	2	[Countermeasure] (B) = (A) +a or (A) ×0						
	CONTRACTOR CONTRACTOR		(6)	Well effective against the potential slope failure and rock fall.					×O	
Erodable soil (Mainly arenaceous soil) Sitty sand, sitty clay, clay Cobble , pebble	Conspicuous Slightly consequenous None	4	0 (8)		e failure.				-20	
Jointed rock, rocks that are weak against erosion and	Conspicuous Slight conspicuous	(12) 6	12	Not completely protected from the potential slope failure and rock	fall.				-10	0
Din slone (bedding, weak plane)	None Conspicuous None	(8)		No countermeasure was constructed, or the existing countermea	ure canno	ot be e	xpect	ted effective.	±0	3)
Soft soil coverline baserock, Hard rock overlies weak rock,	Conspicuous Slightly conspicuous	6		[History] (C)	i -			Tot	N. 1	4(
Omers	Social Control	_	(14)			int ch	eck			
Surface soil, boulder, rock	Slightly unstable	6	0	The disaster has caused a traffic disturbance or closure after the implementation of countermeasures.  No traffic disturbance has occurred but there is a record of	10			ŕ		
Spring water	Natural water spring Water seepage scar	8	4	road. There is a record of rock falls and slope failures on a small scale	not.		,	1000	40	
Vegetation	No-vegitation, Grassland Complex (grass, structure)	5	3	No disaster records	(	)			I/B	4(
	Structure  H>30m  H<30 i > 30°	18	(5)		(C	4	0		5	) 40 )=MAX
Maight (M) gradient (S)	i < 30°, 15 <h<30m< td=""><td>10 5</td><td>12</td><td>[Description]</td><td></td><td></td><td></td><td>one.</td><td>large</td><td>40</td></h<30m<>	10 5	12	[Description]				one.	large	40
negrit (n), gradient (i)	H>50m 30 <h>50m 15<h<30m H&lt;15m</h<30m </h>	18 16 12 10	(18)	are distributed, however masonry is placed in a						
ormation of the survey slope all soil and rock falls, gully erosion, scouring, ression, bulge, fallen tree, cracks, etc.)	Obscure evidence	8	12							
ormation of the adjacent slope ck fall, collapse, cracks, bulge, and other	More than one clear evidences Obscure evidence	5	5							
	Total	(A)								
	Cause G1: Talus slope G2: Collapsed slope, Clear knick line G3: Terrace scarp, Overhung slope Catachment slope, debris flow deposit Erodable soil (Mainly arenaceous soil) Silty sand, silty clay, clay Cobble, pebble Jointed rock, rocks that are weak against erosion and weathering.  Dip slope (bedding, weak plane) Soft soil coverline baserock, Hard rock overlies weak rock, Others  Surface soil, boulder, rock  Spring water  Vegetation  Height (H), gradient (i)  Immation of the survey slope all soil and rock falls, gully erosion, scouring, ession, bulge, fallen tree, cracks, etc.)  Immation of the adjacent slope	Cause G1 : Talus slope G2 : Collapsed slope, Clear knick line G3 : Terrace scarp, Overhung slope Catachment slope, debris flow deposit  Erodable soil (Mainly arenaceous soil) Silty sand, silty clay, clay Cobble , pebble  Jointed rock, rocks that are weak against erosion and weathering.  Dip slope (bedding, weak plane)  Soft soil coverline baserock, Hard rock overlies weak rock, Others  Surface soil, boulder, rock  Sightly unstable Stabel  Natural water spring Water seepage scar Nil  No-vegitation, Grassland Complex (grass, structure) Structure  H>30m H<30, i > 30° i < 30°, H<15m H>50m J5 <h<30m and="" bulge,="" clear="" collapse,="" cracks,="" evidence="" evidence<="" evidences="" h<15m="" mation)="" more="" no="" one="" other="" shall,="" td="" than=""><td>Cause G1: Talus slope G2: Collapsed slope, Clear knick line G3: Terrace scarp, Overhung slope Catachment slope, debris flow deposit Cobble , pebble Cobble , pebble Conspicuous Sility sand, silty clay, clay Cobble , pebble Conspicuous Conspicuous</td><td>  Cause   Classification   Point   score    </td><td>Cause  Classification  Complex (Complex (Com</td><td>Classification Point score G1: Talus slope G2: Collapsed slope G2: Collapsed slope G2: Collapsed slope G2: and G3: and G3:</td><td>Cause Classification Point score G1: Tatus slope G2: Collapsed slope, G3: Tareas scarp, Overfung slope G3: Tareas scarp, Overfung slope G3: Tareas scarp, Overfung slope Catachment slope, debris flow No G2 and G3 G2 or G3 G3 (2) Conspicuous Sity sand, slip' clay, clay Cobble, pubble Sity sand, slip' clay, clay Cobble, pubble Sighty consequences None G10 G10 Conspicuous S10 Conspicuous S10 None G10 Conspicuous None G10 Conspicuous S10 None G10 Conspicuous S10 None G10 Conspicuous None G10 Conspicuous None G</td><td>Cause Classification Point score   Classification   Point score   Classification   Point score   Classification   Point score   Classification   Classification</td><td>Clases Clases Claseification Point socre  G2 : Collaged slope, G3 : Traina group G3 : Traina G3 : Traina group G3 : Traina G3 : Traina group G3 : Traina group G3 : Traina group G3 : Traina group G3 : Traina G3 : Trai</td><td>Classes Classification Point score  G2: Collegand slope, G3: Transa scarp, Overhung slope G4: Tr</td></h<30m>	Cause G1: Talus slope G2: Collapsed slope, Clear knick line G3: Terrace scarp, Overhung slope Catachment slope, debris flow deposit Cobble , pebble Cobble , pebble Conspicuous Sility sand, silty clay, clay Cobble , pebble Conspicuous	Cause   Classification   Point   score	Cause  Classification  Complex (Complex (Com	Classification Point score G1: Talus slope G2: Collapsed slope G2: Collapsed slope G2: Collapsed slope G2: and G3:	Cause Classification Point score G1: Tatus slope G2: Collapsed slope, G3: Tareas scarp, Overfung slope G3: Tareas scarp, Overfung slope G3: Tareas scarp, Overfung slope Catachment slope, debris flow No G2 and G3 G2 or G3 G3 (2) Conspicuous Sity sand, slip' clay, clay Cobble, pubble Sity sand, slip' clay, clay Cobble, pubble Sighty consequences None G10 G10 Conspicuous S10 Conspicuous S10 None G10 Conspicuous None G10 Conspicuous S10 None G10 Conspicuous S10 None G10 Conspicuous None G10 Conspicuous None G	Cause Classification Point score   Classification   Point score   Classification   Point score   Classification   Point score   Classification   Classification	Clases Clases Claseification Point socre  G2 : Collaged slope, G3 : Traina group G3 : Traina G3 : Traina group G3 : Traina G3 : Traina group G3 : Traina group G3 : Traina group G3 : Traina group G3 : Traina G3 : Trai	Classes Classification Point score  G2: Collegand slope, G3: Transa scarp, Overhung slope G4: Tr

Site No. 23 Inventory Sheet C Date July 9, 2019



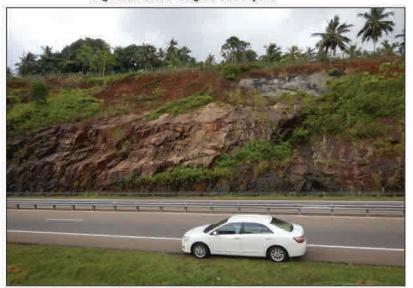
P1 Rock slope failure or rockfall occurring slopne major joints, likewise, indicating further rockalls along the joint surfaces



P2 About φ40am of rock block falling down by rockfall



P3 High road cut slope of fresh rocks, showing potential wegde rock failure along two sets of joints



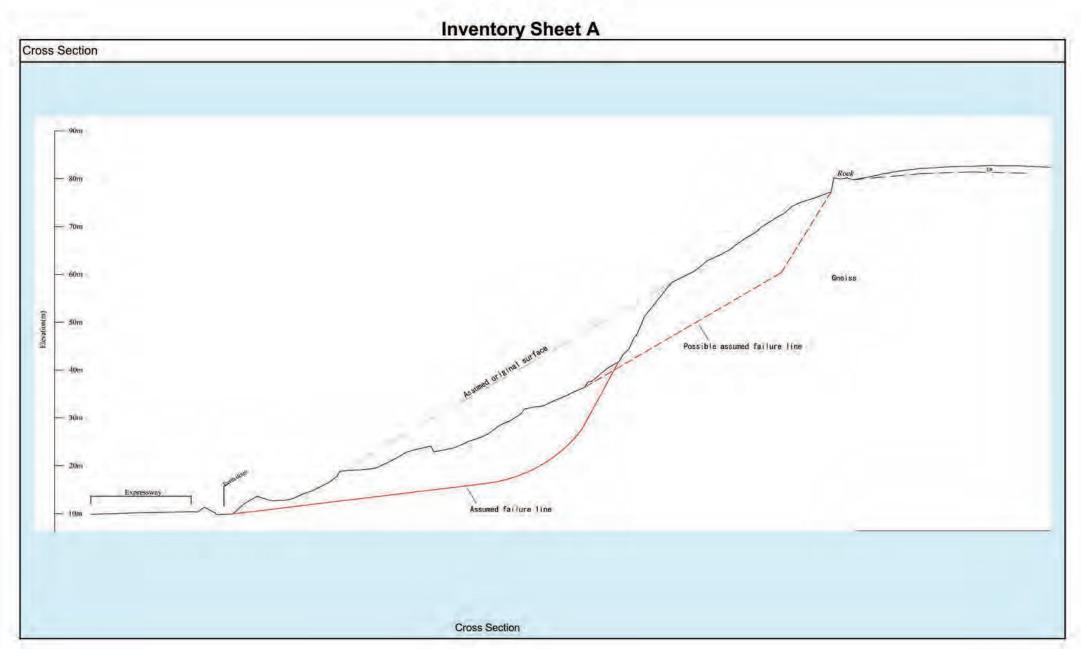
P4 Road cut slope of strongly and slightly weathered rocks, showing shallow slope failure on the strongly weathered rocks locally protected with mortar spraying method

Site No. 23 Inventory Sheet C Date July 9, 2019



P5 Similar to that in P4, showning major joints dipping out of the cut slope in the slightly weathered rocks, further indicating a hight potential for rockfalls

				Inve	ntory Sh	eet A					
District	Galle	Management offic	e Nuwara				oad Name		Kottawa - Godag	ama Section	
Site No.	25		Disaster Type	Slope Fa	ilure Loca	ation Star	101.3km	End 1	01.7km latitude 6°02'40.	9"N longitude	80°18'48.1"E
Main body	Both	Traffic control	Hourly	mm	Traffic volume	Week day	/12h	holiday	Bus route	Deto	our
ppo map/Sketch			*		1	77				.91	7.
			P5	Slope ar		P3					
											A CONTRACTOR OF THE CONTRACTOR
	0 10 20	49 80 40	100 m	F	Plan A4-68						



Site No. 25

[Cause] (Ai) Cause Classification Point score G1: Talus slope G1 3 Topography with factor of G2: Collapsed slope, Ü Not G1 Clear knick line 5 3 G2 and G3 G3: Terrace scarp, Overhung slope 2 G2 or G3 Catachment slope, debris flow (5) 0 No G2 and G3 Erodable soil (Mainly arenaceous soil) Conspicuous 8 Silty sand, silty clay, clay Slightly consequenous Cobble , pebble (8) 0 12 Conspicuous Jointed rock. 6 6 rocks that are weak against erosion and Slight conspicuous (6) weathering. None 0 Conspicuous Dip slope (bedding, weak plane) Ö None Conspicuous 6 Soft soil coverline baserock, 4 Hard rock overlies weak rock, Slightly conspicuous (4) None Unstable 12 12 Surface soil, boulder, rock Slightly unstable (12) Stabel 0 Natural water spring 8 8 Spring water Water seepage scar (8) 0 5 No-vegitation, Grassland 3 3 Complex (grass, structure) Vegetation (3) Structure 18 H>30m 15 H<30, i > 30° i < 30°, 15<H<30m 10 5 1<30°, H<15m 17 Height (H), gradient (i) H>50m 18 16 30<H<50m 12 15<H<30m 10 (17) H<15m Deformation of the survey slope More than one clear evidences 12 12 (small soil and rock falls, gully erosion, Obscure evidence scouring, depression, bulge, fallen tree, cracks (12) 0 No evidence More than one clear evidences Deformation of the adjacent slope Rock fall, collapse, cracks, bulge, and other Obscure evidence 3 deformation) (3) No evidence

Total score

74

Slope Failure Rock Fall

Checked by Yang Pucai

Organization JICA Survey Team

[Countermeasure] (B) = (A) + $\alpha$  or (A) ×0 Well effective against the potential slope failure and rock fall. ×0 -20 Effective but not completely against the potential rock fall and slope failure. Not completely protected from the potential slope failure and rock fall. -10±0 No countermeasure was constructed, or the existing countermeasure cannot be expected effective. (B) sum total 74 [History] (C) Disaster history point check The disaster has caused a traffic disturbance or closure after the 100 recent implementation of countermeasures. No traffic disturbance has occurred but there is a record of 70 comparatively serious rock falls and slope failures that reached to the There is a record of rock falls and slope failures on a small scale that 40 that did not reach to the road. (D) = MAX (B,C) No disaster records 0 Score from cause 74 (C) c) 40 Score from history 40 Among (B)&(C), large (D)=MAX(B,C) 74

[Description]

Slopes are relatively gentle and consist of moderately to highly weathered rocks. Talus deposits and sediments of debris are distributed both sides of the road. A failure of around 40m in width is observed at 139km point. The site is in the tea plantation area.

A4-70

Site No. 25 Inventory Sheet C Date July 17, 2017



P1 Whole view of the slope failure, the collapsed materials were partially removed and partially flatted on the toe of cut slopes



P2 Road cut slope of the strongly weathered rocks next to the slope failure



P3 The installed gabion retaining wall near the slope failure



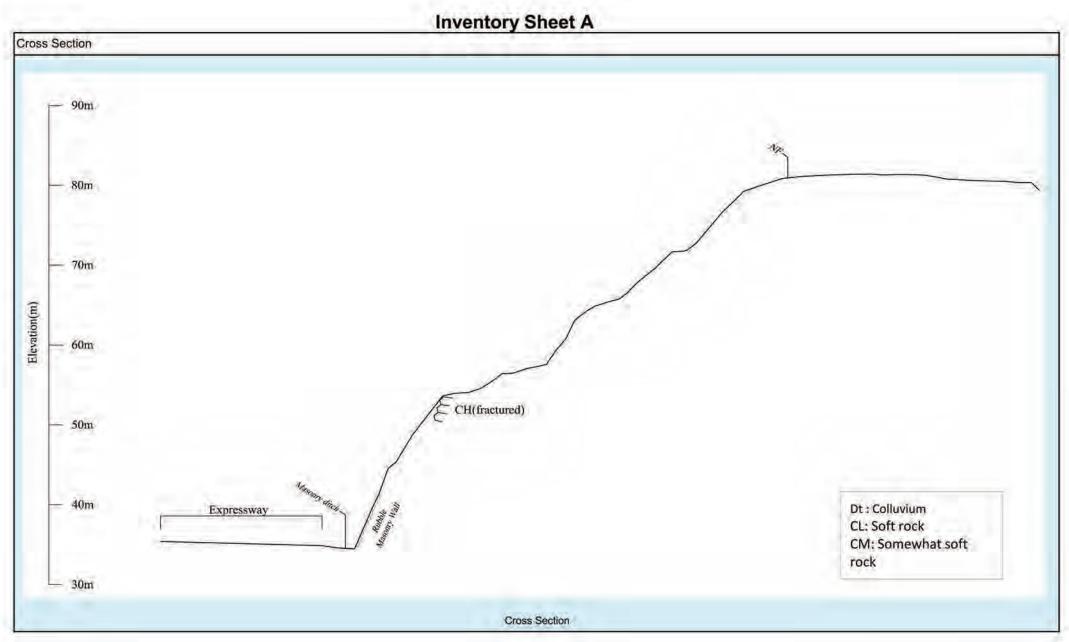
P4 Main scarp of the slope failure, showing the strongly weathered rocks

Site No. 25	Inventory Sheet C	Date	July 17, 2017
-------------	-------------------	------	---------------



P5 Whole view of the slope failure looking upslope from the road

				Inven	tory Sh	neet A								
District	Galle	Management office	Nuwara	Eliya	Road No	E-001	Roa	ad Name		Ko	tawa - Go	dagama \$	Section	
Site No.	25 -	ad2 Dis	aster Type	Rock fall	Loc	cation S	tart	108.6km	End	108.7km latitu	le 6°01	57.6"N	longitude	80°22'30.7"E
Main body	Mountain side	Traffic control	Hourly	mm T	raffic volun	ne Week d	ay	/12h	holiday		Bus route		Det	our
opo map/Sketc	h	Y												
		PA	P1 P2	General La	Plan 1		0. 25	ad2						
	C 18 20	.40 AQ .605	100. Im		Pla	73								



Si	te N	lo. 25 - ac	12			Inventory Sheet B	Check	ked b	У			Yang Pu	caí	
au	se]	(Ai)			- 5	(Slope Failure • Rock Fall)	Organi	izatio	n		JIC	CA Surve	Team	į.
ter	n	Cause	Classification	Point	score									
pography with	factor of	G1 : Talus slope G2 : Collapsed slope, Clear knick line G3 : Terrace scarp, Overhung slope Catachment slope, debris flow	G1 Not G1 G2 and G3 G2 oe G3	3 3 2	2	[Countermeasure] (B) = (A) +a or (A) ×0								
	4	deposit  Erodable soil (Mainly arenaceous soil)	No G2 and G3 Conspicuous	0	(6)	Well effective against the potential slope failure and rock fall.							×O	
Soil	prope	Silty sand, silty clay, clay Cobble , pebble	Slightly consequenous  None	4	(8)	Effective but not completely against the potential rock fall and slo	e failure	i.					-20	
Rock	character	Jointed rock, rocks that are weak against erosion and	Conspicuous Slight conspicuous	12 6	6	Not completely protected from the potential slope failure and rock	fall.						-10	13
	ਰ	weathering.  Dip slope (bedding, weak plane)	None Conspicuous None	80	(12)	No countermeasure was constructed, or the existing countermea	ure cann	not be	ехре	ected	effective.		±0	
Geological	Structure	Soft soil coverline baserock, Hard rock overlies weak rock, Others	Conspicuous Slightly conspicuous None	6	8 (14)	[History] (C) Disaster history	Į,	oint I	check	1		Tota		38
		Surface soil, boulder, rock	Unstable Slightly unstable Stabel	12 6 0	6 (12)	The disaster has caused a traffic disturbance or closure after the implementation of countermeasures.  No traffic disturbance has occurred but there is a record of	ecent 1	100	CHECK					
		Spring water	Natural water spring Water seepage scar Nil	8 4	4 (8)	comparatively serious rock falls and slope failures that reached to road.  There is a record of rock falls and slope failures on a small scale that did not reach to the road.	bal	70 40	1		(D) =0	MV /B C		
	ī	Vegetation	No-vegitation, Grassland Complex (grass, structure)	3	3	No disaster records		0		L	I Comment	MAX (B,C	(B	38
			H>30m H<30, i > 30° i < 30°, 15 <h<30m 15<h<30m<="" 30°,="" <="" i="" td=""><td>1 18 15 10 5</td><td>12</td><td>[Description]</td><td>[(c</td><td>2)</td><td>40</td><td></td><td>1.02/</td><td>from histor (B)&amp;(C), I</td><td></td><td>40 )=MAX 40</td></h<30m>	1 18 15 10 5	12	[Description]	[(c	2)	40		1.02/	from histor (B)&(C), I		40 )=MAX 40
3		Height (H), gradient (i)	H>50m 30 <h<50m 15<h<30m H&lt;15m</h<30m </h<50m 	18 16 12 10	(18)	The road seems to be stable and relatively high slope consists mainly of fresh to relatively fresh seepage water are seen along the cliff.								
(st	mall	nation of the survey slope soil and rock falls, gully erosion, scouring, ssion, bulge, fallen tree, cracks, etc.)	More than one clear evidence Obscure evidence No evidence		8 (18)									
(R	ock	nation of the adjacent slope fall, collapse, cracks, bulge, and other nation)	More than one clear evidence Obscure evidence No evidence	s 5 3	3 (5)									
			Total	(A)	8									

Site No. 25 - ad2 Inventory Sheet C Date July 9, 2019



P1 Road cut slope of the highly fractured rocks, showning major joints dipping into the cut slope, Stone pitching was installed to prevent rock slope faillure in the fractured rocks



P2 Unstable huge rock blocks and boulders predimante on the top surface of the rock slope



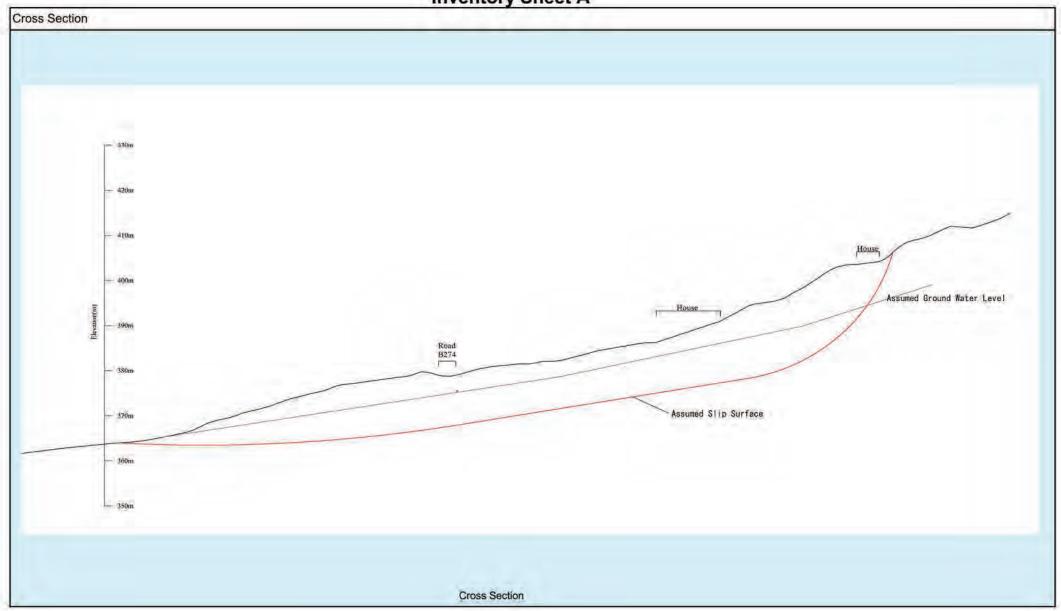
P3 Same as that in P2



P4 Road cut slope of the strongly weathered rocks, surface drainage was installed on the cut slope

				Inve	ntory S	Sheet A								
District	Matale	Management office	Ma	atale	Road No			ad Name			Matale-II	lukkumbura-Lag	gala road	
Site No.	26	D	isaster Type	Landsli	de L	ocation	Start	11/2	End	11/4	latitude	7°31'18.8"N	longitude	80°40'52.9"E
Main body	Both	raffic control	Hourly	mm	Traffic vol	ume Week	lay	1631/12h	holiday		Bu	s route	Deto	ur
opo map/Sketch			17	.5 (7)		2)	12				N.	AT.		
		# BM-04 557566 770 M 489317, 34 M 357,670 7 40,087 7 40,087 7		Road (8-274	Plan A	10 CE 10 THE TOTAL OF THE TOTAL			Hotea					





Landslide

deformation

Subsidence,

Upheaval and cracks on road surface, Deformation of countermeasure works

Site No.		26		li	nventory	Sheet	В		Checked by	Yang Pucai	
		*			(Land	slide)			Organization	JICA Survey Te	am
actor] (A)						(C	)=MAX(A,B)		1		
Item		Check Point		check	score	90	ore evaluated from	causo		(A)	60
Landslide	A scarp, hilly top	Clear Fairly clear	30	30			- A		(B)	357-1	
Topography	is observed.	out intoo, suigo on tivo cum	Unclear	7	(30)	Sc	ore evaluated from	history		1,07	100
		Fault, shered zone	1	(18)	(00)		and provided thems	- End		(C)=MA	X(A,
		Volcanic alteration zone	18		Am	nong (B)&(C), large	e one.		777	100	
Geological	Geological	Dip slope		14	18	_			1		
	structure	Opposite dip slope		7	I Parana	[Co	ountermeasure] (D	) = (c) + a c	or (c) x 0		4
		Intrusive structure, Cap rock	structure	3				Catego	ry	point (a)	che
		Others		0	(18)	No	countermeasure			±0	
conditions		Mesozoic/palaeozonic forma	tions	(7)			oamoude a	No effe	ect	±0	
	Geological meterial	Tertiary formation (sedimend	lary rocks)	~	7	341	ectiveness of untermeasure	Slight	effect	-30	1
		Quarternary formation (muds					untermeasure	High e	High effect		
		Others (Volcamic rock, Igned	0	(7)				Total	(D)	70	
	Spring Water	Present			5				Total		70
	Spring water	Absent	0	(5)			-				
		Total			60	100					
		Total			00		escription]				
									by landslide, are obs		
listory] (B)									idence and tilted wal tion works have beer		
Item	Check Point			check	score		berved in the area.	TOTADIMA	don works have been	r carried out by	110,1
Landslide history	Record (d	ocumental or patrimony)	Present Absent	0	100 (100)						
	Scarp in slope,		Clear	100							
Landslide	Bulge and depression,		E-Markaman	-36	100						

(100)

100

75

0

(B)

Fairly clear

Unclear

Total

Date

Site No. 26

P1 The subsidence of the road surface and the deformation of masonry retaining wall within the landslide



P2 The deformation situation of the road that pass along the middle part of landslide



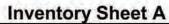
P3 Cracks occurring on the retaining wall within the landslide

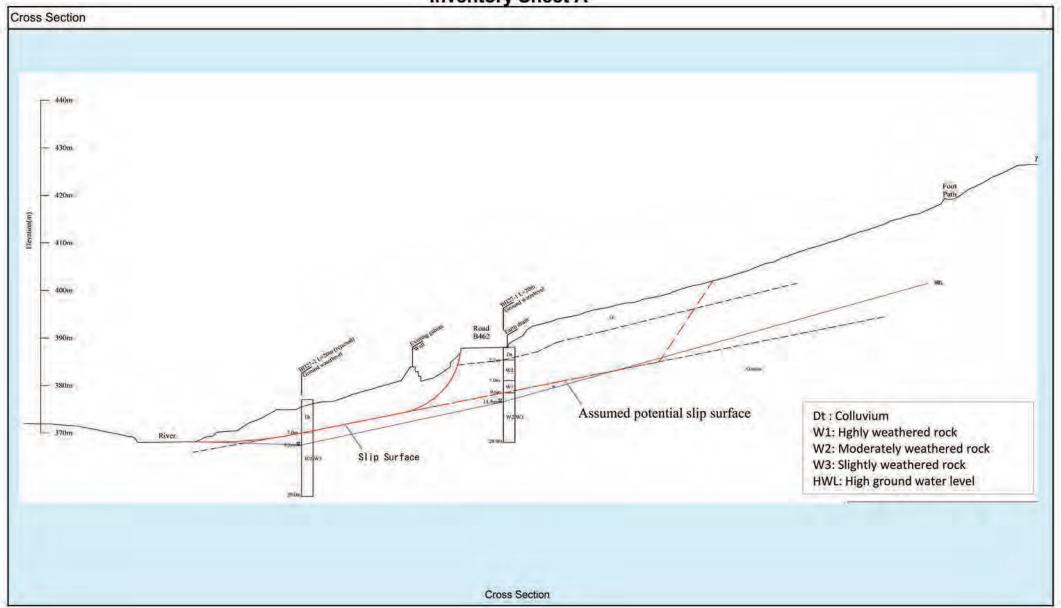


P4 The slope condition of the planned drainage well location

**Inventory Sheet A** 

				inventor	y Sheet A							
District	Matale	Management	office Mata	le Road	No B-463	Road Name			Watt	egama - Matale	road	
Site No.		27	Disaster Type	Landslide	Location	Start 6+030	End	6+100	latitude	7°23'34.9"N	longitude	80°39'37.4"E
Main body	Both	Traffic control	Hourly	mm Traffic	volume Week	day 5600/12h	holida	у	Bus	s route	Deto	our
Topo map/Sketch		- N: 21	17 .5		D)		- 1/2		Α	411	,	-81
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				18/4/1 18/11	117/2011	1/1/2	- V	111	1			
					K-111111	11/1	1/1	11				
			.//(0		111 186		N.	XIII )				
		ali.	1999	W. Sally	1/1/2	MAN,	P4	11111				
		- Miller	(11111		A I Day	BH27-1	X	117 /	11111			
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		1 1	111711/	11/	P2	11 / 1/16	2))),	1871	12/1			
		1	7172111,	ØBH27				1/5	1/	1/7/		
		93	7-1116		XCV	MISCH!		M.	1 /	17-72		
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				and the same	10) 1	11/17	1	11/1	( a )			
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					1. 1	111111						
					Plan 81							





Site No.		27		-	nventory		Checked by	Yang Pucai		
					(Lands	ide)	Organization JI	CA Survey Te	am	
actor] (A)						(C)=MAX(A,B)				
Item		Check Point		check	score	Score evaluated from	cause	(A)	35	
Landslide Topography	disorder of cont	oography or gentle slope, our lines, bulge on river bank	Clear Fairly clear	30	30		re evaluated from history			
Topograpin	is observed.		Unclear	7	(30)	Score evaluated from	Thistory		100	
		Fault, shered zone		18		Among (B)&(C), large	one	(C)=M/	AX(A,E	
		Volcanic alteration zone	18	2.	Among (b)a(c), large	une.		100		
	Geological	Dip slope	14	0						
	structure	Opposite dip slope	7		[Countermeasure] (D)	= (c) + α or (c) x 0				
		Intrusive structure, Cap rock	3			Category				
Geological conditions		Others		(0)	(18)	No countermeasure	±0			
		Mesozoic/palaeozonic forma	tions	7	100		No effect	±0	1	
	Geological	Tertiary formation (sedimend	ary rocks)	7	0	Effectiveness of countermeasure	Slight effect	-30		
	meterial	Quarternary formation (muds	tone, etc)	<u></u>		Countermeasure	High effect	x0		
		Others (Volcamic rock, Igneous rock)			(7)	-	4.63	(D)	400	
	and all applicati	Present	(5)	5		Total		100		
	Spring Water	Absent	8	(5)						
		Total		35		[Description]				
listory] (B)						Slopes of relatively ge	ently gradient are observed both s be caused by heavy rainfall are s			
Item		Check Point		check	score					
recorri	Check Point			400	100000000000000000000000000000000000000					
Landslide	Depart /d	an market as a state and	Present	(100)	100					
	Record (d	ocumental or patrimony)	Present Absent	0	(100)					
Landslide	Scarp in slope,		the second second second second	$\sim$						
Landslide history	Scarp in slope, Bulge and depre Subsidence,	ession,	Absent	0						
Landslide history	Scarp in slope, Bulge and depre Subsidence, Upheaval and c		Absent Clear	100	(100)					

Date

27 Site No.

P1 Cracks occurring due to landslide movement on the road shoulder



P2 Whole view of the lower landslide looking downslope from the road



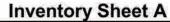
P3 Main scarp on the valley side of the road with max height of about 7m

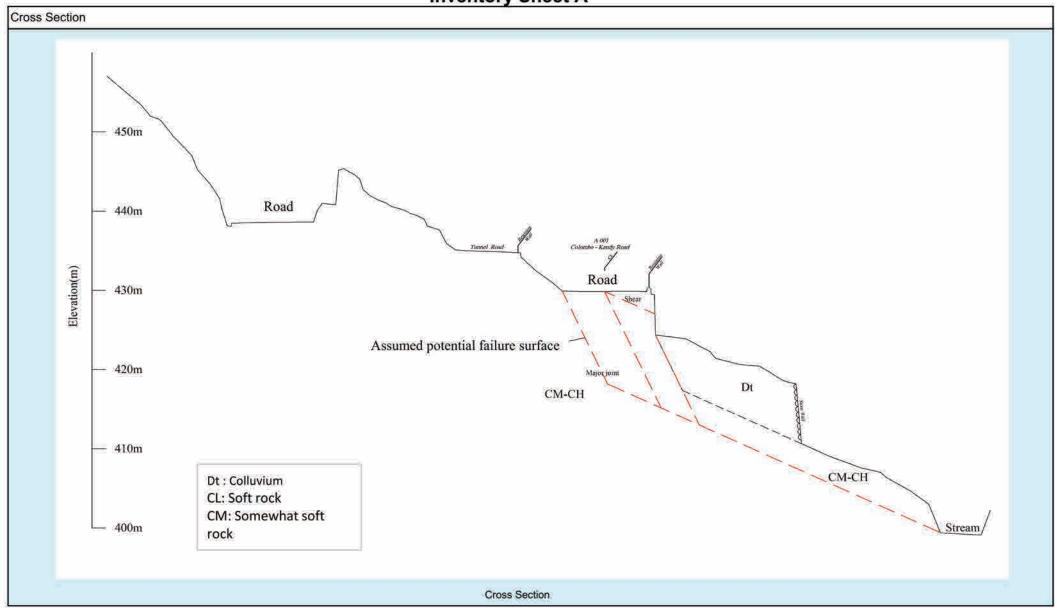


P4 Stepped landform on the upper slope of the road, showing a potential scarp

**Inventory Sheet A** 

					Inve	ntory	Shee	et A								
District	10.11.0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1				Kegalla Road No A-001 Road Name					Colombo - Kandy road						
Site No.		31	Disaste	er Type	Slope Fa	ilure	Locati	on Sta	rt 99/8	End	99km	latitude	7°15'07.8"N	longitude	80°30'32.9"E	
Main body	Vally side	Traffic control		Hourly	mm	Traffic v	olume	Week day	23594/12h	holiday	E	Bus	s route	Deto	our	
opo map/Sketch		30		r	323		-91	,		16)			42.	740	. 91	
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						XB	11/1/2	Sall -			(6)					
		P4		1	1.5		11/58					III.				
				38/7/	A TO	[[[]]]	1/1/1/1/					///.				
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		XXXX	370		MIN S	7711	33()\5		166	1)	5	/				
		57	1///	MORA	(B) /20	1000	(2)()	)/ 5 Y	5/16		86/	17				
		1/2/1/			15X/4/4		$\sim \sim 1$	11 6	1 1182		11/1	/1				
	2 )/(	(630)				(A)))(H)	1	9	XXXXX	3/	UM					
	175)	Ma a illie	B) // (1)	P2 ///	Z21 // 11/	(1218S) [	<	2/2	27 J J J J J J J J J J J J J J J J J J J		18/12	(				
		oxe De X			77/11	(1) (Ex	1	5		1/1	377)	)				
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		111111111111111111111111111111111111111	K K C	774	((/)//))	H1\\S	))//[~	738	111	1/	1 (((	1				
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	(12) ( <i>71)</i> i		The state of the s	B)))))){	1671	(1)(E)	(11/1	11/1			$\sqrt{s}$	S.				
	1122318		A ME	9064000	((5) 1/	(2))	1/1/1	125 (6	1865		M					
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		- / - / - V//	11/11/2	- 11117	211111111	11111	A4-85		1 11							





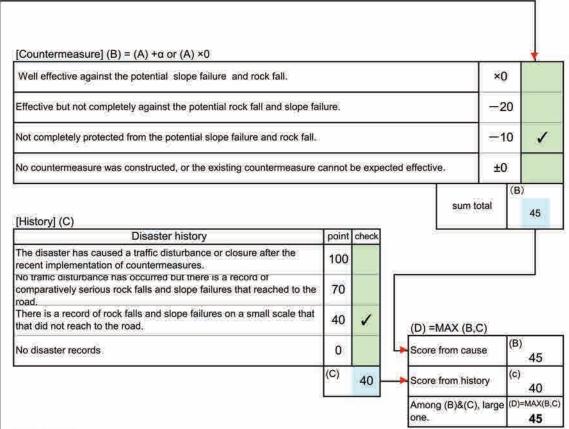
Site No. 31

[Cause] (Ai)

_	ausej tem	Cause	T	Classification	Point	score
	- 442	G1 : Talus slope	G1	)	3	
Topography	Topography with factor of	G2 : Collapsed slope, Clear knick line	0.0000	I G1	(0)	5
ogi	fac	G3 : Terrace scarp, Overhung slope		and G3	3	8
o o	To H	Catachment slope, debris flow		or G3	(2)	7727
	100	deposit	No	G2 and G3	0	(6)
	Soil	Erodable soil (Mainly arenaceous soil)		nspicuous	(8)	8
	Soil	Silty sand, silty clay, clay Cobble , pebble		ghtly consequenous	4	
Suc		Cobble , peoble	No	16.52	0	(8)
ditio	Rock character	Jointed rock,		nspicuous	(12)	
200	Rock	rocks that are weak against erosion and weathering.		ght conspicuous	б	
Sal	5	weathering.	No	TO COLUMN TO THE TOTAL COL	0	(12)
Geological conditions	F# V/23	Dip slope (bedding, weak plane)		nspicuous	8	
96	gica	and the control of th	No		(0)	4
ن	Geological Structure	Soft soil coverline baserock,		nspicuous	6	
	S ts	Hard rock overlies weak rock, Others		ghtly conspicuous	(4)	
		Others	No		0	(14)
		ALTERNA MARK WAS MANUAL TO A	******	stable	(12)	12
		Surface soil, boulder, rock		ghtly unstable	6	
lion			-	ibel	0	(12)
go	L. Million AND Provided Company (MAY value of			tural water spring	8	4
Surface codition		Spring water		iter seepage scar	(4)	1.002
ırta			Nil	A DESCRIPTION OF THE PARTY OF T	U	(8)
Š			L	-vegitation, Grassland	5	3
		Vegetation	******	mplex (grass, structure)	3	11.5%
			Str	ucture	1	(5)
			П	H>30m	18	
			soil	H<30, i > 30°	15	
2			S	i < 30°, 15 <h<30m< td=""><td>10</td><td></td></h<30m<>	10	
mel		Height (H), gradient (i)	Ц	i <30°, H<15m	5	15
Geometry		5/5/ <b>9</b> /21/03/0 <b>/9</b> /5/5/5/5/7/		H>50m	18	
٠,			rock	30 <h<50m< td=""><td>16</td><td></td></h<50m<>	16	
			2	15 <h<30m< td=""><td>12</td><td>-</td></h<30m<>	12	-
	n-I-		Ш	H<15m	10	(18)
		mation of the survey slope I soil and rock falls, gully erosion,	Mo	re than one clear evidences	The second second	8
IO		ing, depression, bulge, fallen tree, cracks,		scure evidence	(8)	-8
mai	etc.)		No	evidence	0	(18)
Deformation		mation of the adjacent slope		re than one clear evidences		0
ă	12023 5500	fall, collapse, cracks, bulge, and other		scure evidence	3	_^
	deform	nation)	No	evidence	(0)	(5)
				EST. 21 117	(A)	
				Total score	5	5

## Inventory Sheet B

Checked by	Yang Pucal	
Organization	JICA Survey Team	



## [Description]

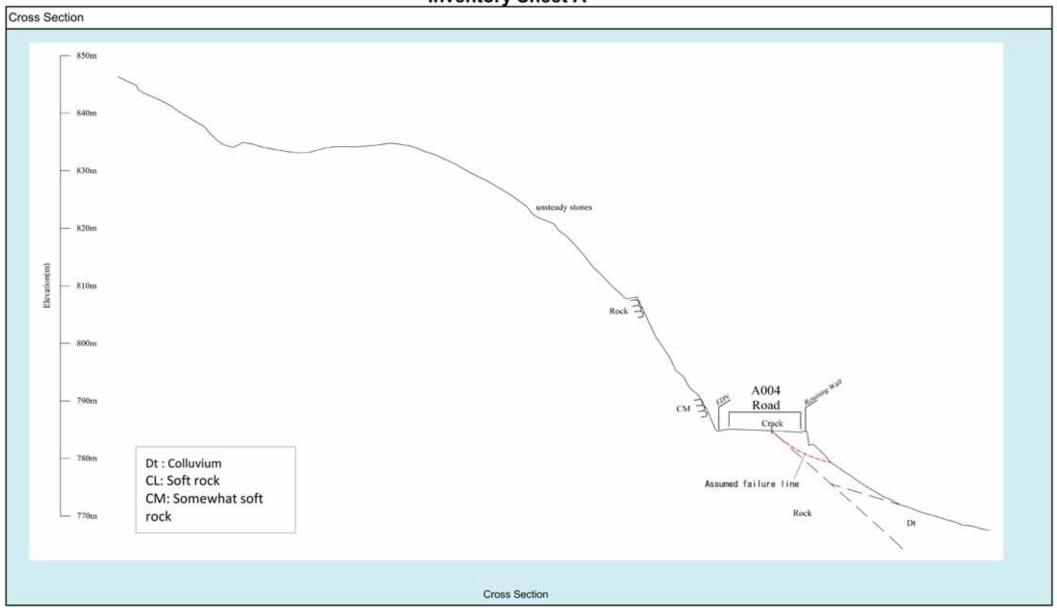
Slopes of this site is close to the valley of the river and Colombo-Kandy road of A01change the route after crossing the valley around the site. Surface flow might concentrate to this valley on the basis of interpretation of airial photos and topographic maps, therefore both surface and groundwater flow appear to cause many sorts of failures in this site.. Scurs of failures are confirmed at places in and around this site.

A4-87

**Inventory Sheet C** Site No. 31 Date P1 Deformation situation of the road surface on the valley side of the road P2 Deformed concrete wall due presumably to movement on the valley side of the road P3 Open cracks observed below the road P4 Foliation joints dipping adversely out of the slope.

				Inve	ntory S	Sheet A									
District	Badulla	Management office	ce Bandar		Road No			d Name		Colon	bo-Ratna	apura-We	ellawaya	a-Batticaloa	road
Site No.	33		Disaster Type	Rock fa	all L	ocation	Start	171/5	End	172/2	latitude	6°45'47	7.1"N	longitude	80°50'46.1"I
Main body	Both T	raffic control	Hourly	mm	Traffic vol	ume Week	day 9	057/12h	holiday		Bu	is route		Deto	ur
po map/Sketc	n	5.		· · · · · · · · · · · · · · · · · · ·	9.	-B)	10		4			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		,	
	0 10 20	40 80	P1 P2	Orosa Santani I	Pla	4-89									

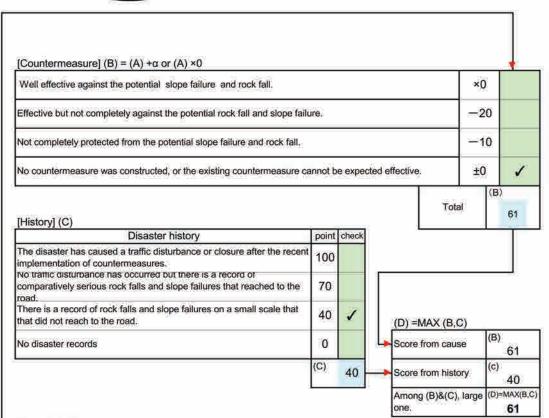
## **Inventory Sheet A**



-	ause] Item	)	Cause	Т	Cla	ssification	Point	score	
opograpny	Topography with factor of	G2 : C	alus slope collapsed slope, clear knick line	G1 Not	G1 and G3		0 3	5	
odo	Topogra fact		errace scarp, Overhung slope Catachment slope, debris flow	G2	or G3 G2 and G	3	(2)	(6)	
	Soil	Eroda	ble soil (Mainly arenaceous soil) and, silty clay, clay	Cor	spicuous		8	8	
S	ord Ord	Cobbl	e , pebble	Nor	ie	iahturinaariamuumaana	0	(8)	
Geological conditions	Rock character	2000	d rock, that are weak against erosion and		spicuous ht conspi		(12)	12	
g	0	3 - 2 - 100	XXXXX	1790207	spicuous		0	(12)	
golo	@ <u>77</u>	Dip slo	ope (bedding, weak plane)	Nor	*************		(0)	1	
ě	ogic	Soft o	oil coverline baserock.	38.52	spicuous	6	4		
	Geological Structure	PARALL VICES	ock overlies weak rock,	*******	htly cons	(4)			
	0 -	Others		Nor	***********		0	(14	
		-		Uns	table		12	6	
		S	urface soil, boulder, rock	Slig	htly unsta	able	(6)	6	
Surface codition				Stal	bel		0	(12	
				Nat	ural wate	r spring	8	4	
Ö			Spring water	Wa	ter seepa	ge scar	(4)	- 500	
ırtac				Nil			0	(8)	
ัด			00 0			, Grassland	5	3	
			Vegetation	*******	nplex (gr	(3)	751		
				Stru	icture	1	(5)		
				- 1		H>30m <30, i > 30°	18		
				soil	***********		-		
ity				10	************	0°, 15 <h<30m< td=""><td>10</td><td colspan="2">15</td></h<30m<>	10	15	
Seometry			Height (H), gradient (i)	H	1<.	30°, H<15m H>50m	18	13	
Ge						30 <h<50m< td=""><td>16</td><td></td></h<50m<>	16		
				ð.	************	15 <h<30m< td=""><td>12</td><td></td></h<30m<>	12		
						H<15m	(10)	(18	
-	Defa	mation	of the gringer alone	Mor	e than or	ne clear evidences	12		
tion	(small	soil ar	of the survey slope nd rock falls, gully erosion, scouring oulge, fallen tree, cracks, etc.)	Obs	cure evid	lence	(8)	8	
ma	10.10		TO PROPERTY OF THE PROPERTY OF	100000	evidence	ne clear evidences	0	(18	
Deformation	(Rock	fall, co	of the adjacent slope illapse, cracks, bulge, and other	Obs	cure evi	5	0		
Ц	deform	nation)		No	evidence		(0)	(5)	
						Total	(A)	1	



Checked by	Yang Pucai
Organization	JICA Survey Team



## [Description]

Slopes of this site consisting of relatively to moderately weathered rocks with relatively thin overburden of debris are observed both sides of the road. Small size of scurs are observed at limited places. Houses of thirteen (13) were damaged due to slope disasters in 1989 next to this site.

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Site No.

Date

June 25, 2019

P1 The cut slope situation of the target section



P2 Cracks and deformation situation of the road surface



P3 Cracks occurring on the block wall on the valley side of the road



P4 Numerious boulders distributed on the upper slope of the road cut slope (diameter 60cm)