

CHAPTER 2 CREEK CONDITIONS

2.1 Methodology

From August to November, 2006 the Study Team conducted aerial photo interpretation (the photos of 1998 and 2004) and field survey for outcrops and sedimentation in the Study Area, hiring of local geologists. The purpose of the aerial photo interpretation is basically to identify the slope failures in the past. The purpose of the field investigation for outcrops and sedimentation is to identify the thickness of failure and to estimate the sediment deposition volume in creeks.

Figure S3-2-1, Figure S3-2-2, Figure S3-2-3 and Figure S3-2-4 show the location map of the surveyed points for outcrops and sedimentation. Table 4-4-2 shows the summary results of each point. For outcrop, the thickness of soil weathering is estimated. For sedimentation in creek, the deposition depth (m), stream width (m), maximum boulder size (m), maximum matrix diameter (m), and water depth (m) are shown.

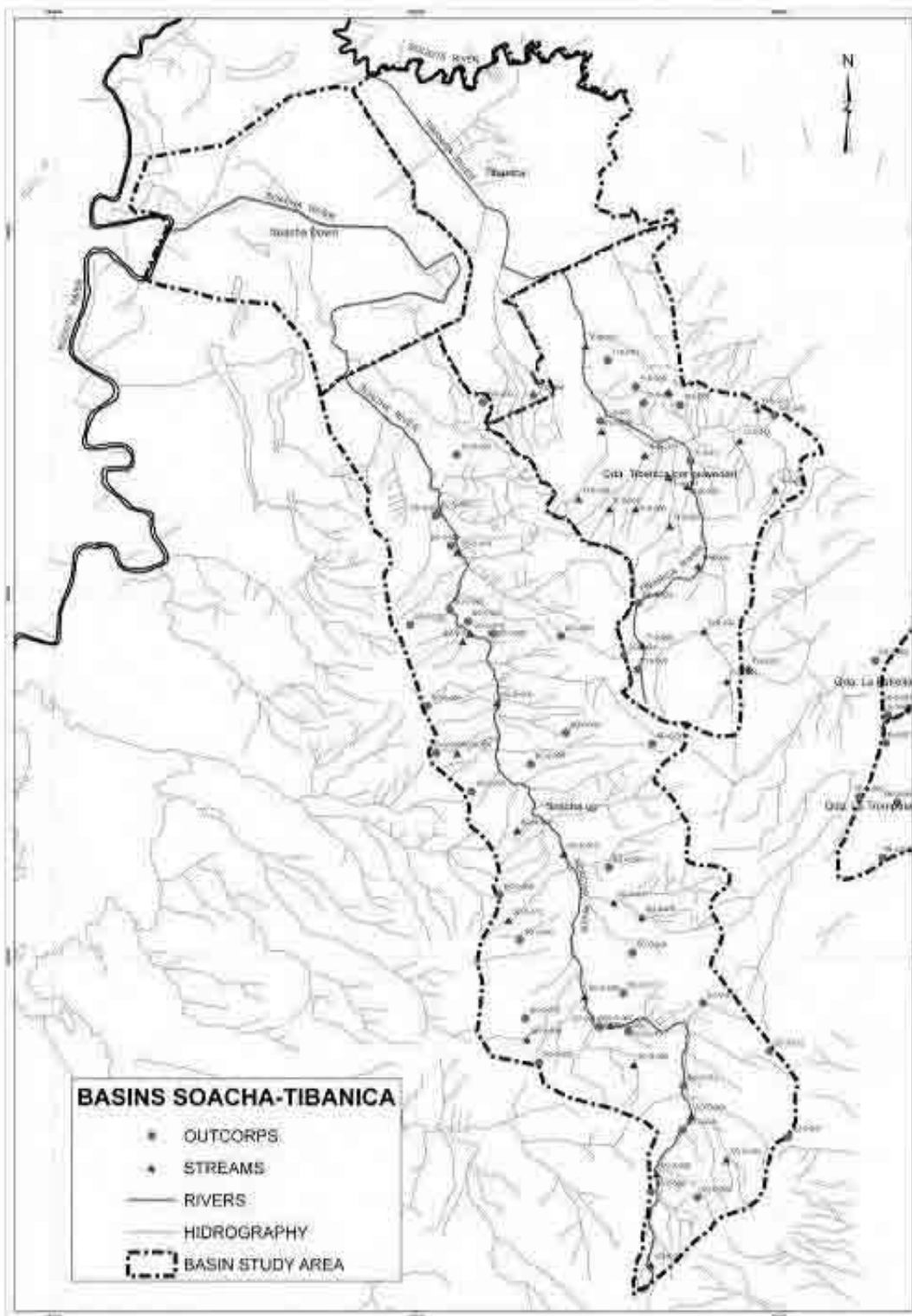


Figure S3-2-1 Location of Surveyed Outcrops and Deposit (Soacha River and Tibanica River)

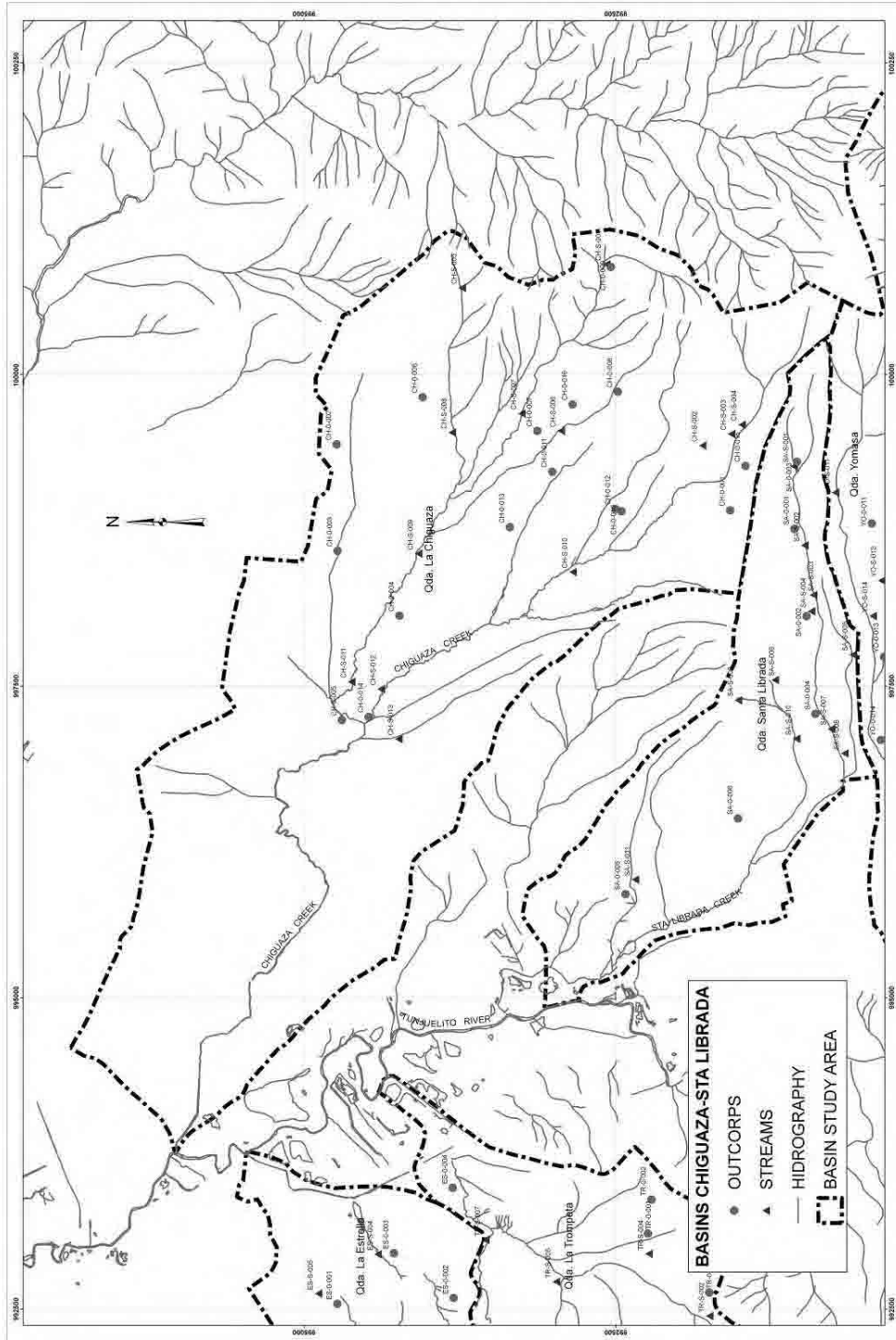


Figure S3-2-2 Location of Surveyed Outcrops and Deposit (Chiguaza and Santa Librada creeks)

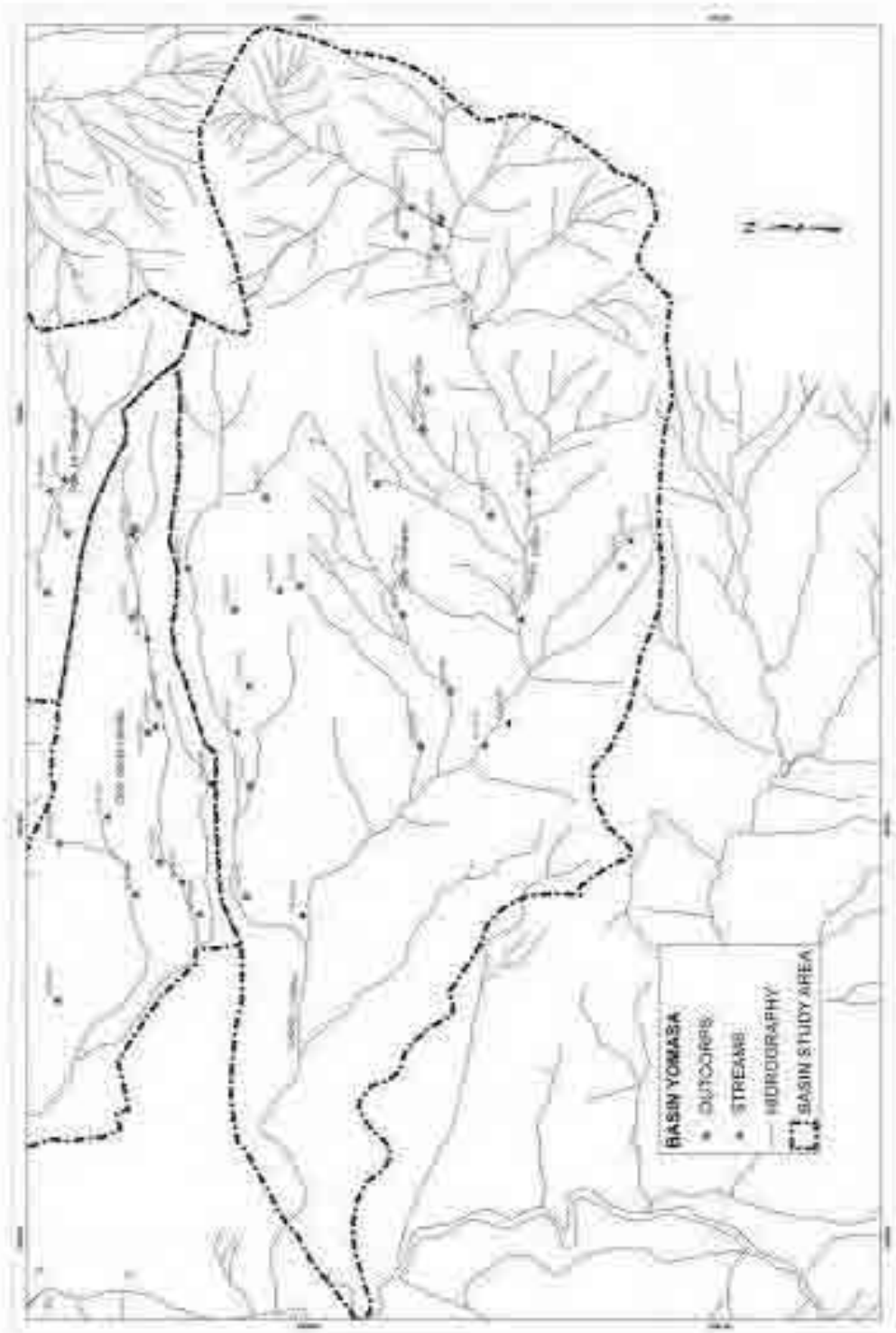


Figure S3-2-3 Location of Surveyed Outcrops and Deposit (Yomasa creek)

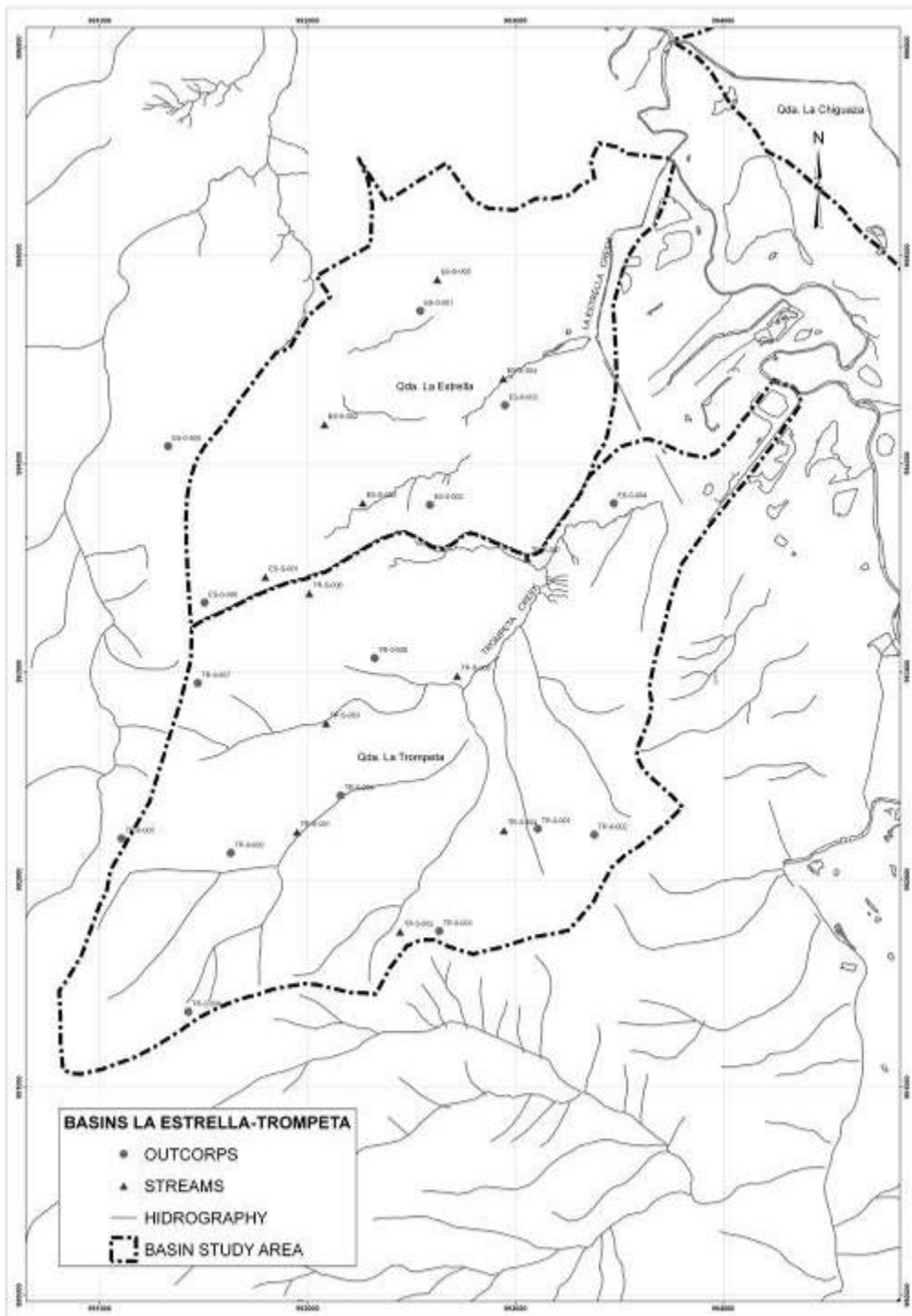


Figure S3-2-4 Location of Surveyed Outcrops and Deposit (La Estrella and Trompeta creeks)

Table S3-2-1 Thickness of Soil Weathering (1/2)

SHEET No	COORDINATES		LOCATION NAME	DATE	thickness
	NORTH	EAST			soil weathering (m)
SO-O-001	994153	987865		2006/10/10	3.9
SO-O-002	994414	986984	Ladrillera Las Tapias	2006/10/10	0.9
SO-O-003	994458	986050	Vereda Quiba Baja	2006/10/10	1
SO-O-004	993085	987060	Vereda Fusunga	2006/10/10	0.6
SO-O-005	992654	986576	Vereda Fusunga	2006/10/10	0
SO-O-006	990855	986145	Vereda Fusunga	2006/10/10	1.4
SO-O-007	990230	986426	Vereda Fusunga	2006/10/10	0.6
SO-O-008	986687	988872	San Jorge Farm	2006/10/9	0
SO-O-009	986763	988231	San Jorge Farm	2006/10/9	0
SO-O-010	987613	988668	San Jorge Farm	2006/10/9	0.4
SO-O-011	987520	990121	La Bella Suiza	2006/10/9	0.5
SO-O-012	988702	989869		2006/10/9	0.2
SO-O-013	989364	988948		2006/10/9	0.2
SO-O-014	988224	988683	Vereda Quiva	2006/10/9	0.2
SO-O-015	988973	987920	Next to Soacha River	2006/10/9	0.3
SO-O-016	989034	987528	Next to Soacha River	2006/10/9	0
SO-O-017	989498	987850	San Jorge	2006/10/9	0.1
SO-O-018	990054	987974	San Jorge Farm	2006/10/9	0.7
SO-O-019	989150	986500	Vereda Hungría	2006/10/10	0
SO-O-020	988546	986687	Vereda Hungría	2006/10/10	2.7
SO-O-021	991234	987650	Arenera La Esperanza	2006/10/10	0.9
SO-O-022	992932	988255	Near Ojo de Agua	2006/10/10	0.3
SO-O-023	994874	988060	Vereda Quiba Baja	2006/10/10	1.7
SO-O-024	996075	985260	Vereda Panamá	2006/10/11	8
SO-O-025	995665	985471	Fusunga	2006/10/11	5.4
SO-O-026	994785	985460	Alfagres	2006/10/11	0.5
SO-O-027	994620	985710	Alfagres	2006/10/11	0.5
SO-O-028	997712	985898	Vereda Panamá	2006/10/11	4
SO-O-029	992275	985760	Near El Recodo Farm	2006/10/11	0.2
SO-O-030	992808	985270	Vereda Fusunga	2006/10/11	1.3
SO-O-031	993458	985150		2006/10/11	0
SO-O-032	994576	984913		2006/10/11	1.5
CH-O-001	991584	998910	Near Carretera Oriente San Bernardo	2006/10/3	1.7
CH-O-002	994739	999440	Near San José	2006/10/4	0
CH-O-003	994732	998586	Bella Vista	2006/10/4	> 1.1
CH-O-004	994235	998065	Diana Turbay	2006/10/4	0.3
CH-O-005	994698	997228	Diana Turbay	2006/10/4	0
CH-O-006	994050	999818	Near Puente Colorado	2006/10/4	2.2
CH-O-007	993130	999549	Near Chiquaza River	2006/10/4	0.9
CH-O-008	992485	999863	Near Chiquaza River	2006/10/4	0.3
CH-O-009	992540	1000864	Near Chiquaza	2006/10/4	0.3
CH-O-010	992455	998904	Near San Rafael	2006/10/4	0
CH-O-011	993010	999220		2006/10/4	1
CH-O-012	992500	998921	Near San Rafael	2006/10/4	0
CH-O-013	993350	998775		2006/10/4	1
CH-O-014	994482	997254	Diana Turbay	2006/10/5	0.1
CH-O-015	991461	999266	Near San Bernardo School	2006/10/5	1.1
CH-O-016	992848	999760	Near Chiquaza River	2006/10/5	1.9

Table S3-2-2 Thickness of Soil Weathering (2/2)

SHEET No	COORDINATES		LOCATION NAME	DATE	thickness
	NORTH	EAST			soil weathering (m)
ES-O-001	994734	992543	San Pablo, La Florida	2006/10/6	0.7
ES-O-002	993801	992590	Barrios Unidos	2006/10/5	0.5
ES-O-003	994280	992950	Lucero Bajo	2006/10/5	0.5
ES-O-004	993808	993474	Mochuelo Bajo	2006/10/5	0.2
ES-O-005	994083	991330	Villa del Progreso	2006/10/6	0.8
ES-O-006	993331	991505	Cordillera Sector	2006/10/6	0
TR-O-001	992243	993108	Mochuelo Bajo	2006/10/5	1
TR-O-002	992215	993380	Mochuelo Bajo	2006/10/5	0.5
TR-O-003	991751	992634	Mochuelo Bajo	2006/10/5	0.7
TR-O-004	992403	992160	El Mochuelo	2006/10/6	0.6
TR-O-005	992197	991105	Near Cuchilla Tierra Colorado	2006/10/6	0
TR-O-006	991363	991427		2006/10/6	0.4
TR-O-007	992944	991472	El Recuerdo Sur	2006/10/6	0.5
TR-O-008	993064	992323	Near Limonar	2006/10/6	0.2
TR-O-009	992127	991631	El Mochuelo	2006/10/11	0.4
SA-O-001	991069	998761	La Flora	2006/10/3	0.6
SA-O-002	990971	998062	Juan Rey	2006/10/3	0.2
SA-O-003	991048	999300	Santa Librada	2006/10/3	0.2
SA-O-004	990900	997278	Santa Librada	2006/10/3	0
SA-O-005	992423	995832	La Fiscala	2006/10/5	0
SA-O-006	991521	996438	Ladrillera Santa Librada	2006/10/5	1
TI-O-001	993956	989572	Near El Guabal	2006/10/10	0
TI-O-002	993963	988050	Near El Encanto	2006/10/10	0.6
TI-O-003	997640	985915	Near El Bosque	2006/10/11	1.6
TI-O-004	997736	986610	Near Los Nogales	2006/10/11	1.5
TI-O-005	997384	987536	Near Terreros Lagoon	2006/10/11	1
TI-O-006	997628	988128	Near Terreros Lagoon	2006/10/11	1
TI-O-007	997601	988637	Near Terreros Lagoon	2006/10/11	0.3
TI-O-008	997462	989940	Near Jerusalem	2006/10/11	1.2
TI-O-009	997855	988027	Near Terreros Lagoon	2006/10/11	1.3
TI-O-010	998218	987640	Julio Rincón	2006/10/11	1.2
TI-O-011	996832	988777	Ciudadela Sucre - Bellavista	2006/10/11	0.9
YO-O-001	988096	999068	Los Soches	2006/10/2	0.2
YO-O-002	989135	998310	Near Yomasa River	2006/10/2	0.2
YO-O-003	989317	997980	Yomasa River	2006/10/5	0.5
YO-O-004	988890	999380		2006/10/2	>4.8
YO-O-005	990050	998950	Near Carretera Oriente	2006/10/2	0.2
YO-O-006	989275	1000135		2006/10/2	0
YO-O-007	989217	1001000	Yomasa - Acueducto Property	2006/10/2	0
YO-O-008	989193	1001184	Acueducto Property	2006/10/2	0
YO-O-009	989414	1001079	Acueducto Property	2006/10/2	0.7
YO-O-010	989305	999900	Acueducto Property Rood	2006/10/2	0.9
YO-O-011	990448	998806	Vereda Tihuaque	2006/10/3	0.4
YO-O-012	990257	999486	Yomasa	2006/10/3	0.1
YO-O-013	990349	997735	Vereda Tihuaque	2006/10/3	0.2
YO-O-014	990375	997068	Ladrilleras Yomasa	2006/10/3	0.1

Table S3-2-3 Property of Deposit Material (1/2)

SHEET No	COORDINATES		LOCATION NAME	DATE	Stream bed	Stream width	Boulder	Matrix	water depth
	NORTH	EAST			deposit (m)	(m)	max. dia.(m)	max.dia. (m)	(m)
SO-S-001	985758	988256	ICA San Jorge	2006/10/9	0.5	1.5	0	1	0
SO-S-002	987009	988335	San Jorge Farm	2006/10/9	1	2.5	1	0	0
SO-S-003	987205	989296	San Jorge Farm	2006/10/9	2.5	2	0	0	0
SO-S-004	987810	988817	San Jorge Farm	2006/10/9	2	2	0.7	0.2	0
SO-S-005	988512	988020	San Jorge Farm	2006/10/9	1.2	2.5	1.5	0.2	0
SO-S-006	989055	987700	San Jorge Farm	2006/10/9	3	10	7	0.3	0
SO-S-007	989040	987538	Soacha River	2006/10/9	2	5	3	0.4	0
SO-S-008	988861	986547	Vereda Hungria	2006/10/10	0.5	22	0	0	0
SO-S-009	989452	987344	San Jorge ICA	2006/1/9	1	2	1.5	0	0
SO-S-010	990543	988130	San Jorge Farm	2006/10/9	1.5	4	0	0	0
SO-S-011	990746	987747	ICA San Jorge	2006/10/9	0	3	0	0	0
SO-S-012	990505	986291	Vereda Hungria	2006/10/10	1	1.5	0	0	0
SO-S-013	991414	987055	San Jorge Sector	2006/10/10	1	4	0	0	0
SO-S-014	991742	986414	San Jorge Sector	2006/10/10	0	5	0	0	0
SO-S-015	992805	985587	Fusunga Sector	2006/10/10	0.5	10	0	0	0
SO-S-016	993496	986136	Fusunga Sector	2006/10/10	0.5	0.8	0	0	0
SO-S-017	994347	985662	Afluent Soacha River	2006/10/10	0.5	5	10	0	0
SO-S-018	985760	994450	Fusunga Sector	2006/10/10	1	2	0	0	0
SO-S-019	995575	985582	Fusunga	2006/10/10	3	3	15	0.5	0
SO-S-020	996128	985306	Vereda Panamá Sector	2006/10/10	3	5	0	0	0
TI-S-001	993798	989306	Fusunga Sector	2006/10/10	0.5	8	0	0	0
TI-S-002	994487	988992	Tibanica	2006/10/11	1.5	6	0	0	0
TI-S-003	994297	988139	Tibanica	2006/10/10	0.5	7	0	0	0
TI-S-004	995381	988911	Tibanica	2006/10/11	4	1	0	0	0
TI-S-005	995937	988518	Tibanica - Ciudadela	2006/10/11	2	15	0	0	0
TI-S-006	996172	988044	Ciudadela	2006/10/11	0.5	10	0	0	0
TI-S-007	996170	987684	Ciudadela	2006/10/11	2	5	0	0	0
TI-S-008	996310	987263	Ciudadela	2006/10/11	2	5	0	0	0
TI-S-009	996441	989972	Altos de Potosí	2006/10/11	0.5	0	0	0	0
TI-S-010	996480	988759	Tibanica	2006/10/11	0	3	3	0	0
TI-S-011	996609	988503	Ciudadela Sucre - Bellavista	2006/10/11	1.5	2	2	0	0
TI-S-012	996909	988172	Terrerros Lagoon	2006/10/11	1.5	1	0	0.3	0
TI-S-013	997113	989485	Tibanica	2006/10/11	1.5	4	0	0	0
TI-S-014	997543	989727	Terrerros Lagoon	2006/10/11	0.5	2	0	0	0
TI-S-015	997786	988501	Terrerros Lagoon	2006/10/11	0.5	1.5	0	0	0
TI-S-016	997239	987574	Terrerros Lagoon	2006/10/11	2	80	5	0	0
TI-S-017	998413	987358	District Julio Rincón	2006/10/11	8	50	0	0	0
TR-S-001	992227	991974	Mochuelo Way	2006/10/6	0.5	3	0	0	0
TR-S-002	991784	992471	Mochuelo Bajo Sector	2006/10/6	0.5	7	0	0	0
TR-S-003	992750	992115	Lucero Alto Sector	2006/10/6	1	3	0	0	0
TR-S-004	992235	992970	Mochuelo Sector	2006/10/6	2	2.5	0	0	0
TR-S-005	992978	992796	Mochuelo Sector	2006/10/6	1	5	0	0	0
TR-S-006	993375	992034	Lucero Alto	2006/10/6	0	3	0	0	0
TR-S-007	993544	993083	Mochuelo Bajo Sector	2006/10/6	1.5	3	0.8	0	0
ES-S-001	993454	991822	Lucero Alto	2006/10/6	0	8.3	1	0	0
ES-S-002	994187	992107	Lucero Alto Sector	2006/10/6	2	3	0	0.05	0
ES-S-003	993809	992291	Estrella	2006/10/6	0	2	0	0	0

Table S3-2-4 Property of Deposit Material (2/2)

SHEET No	COORDINATES		LOCATION NAME	DATE	Stream bed	Stream width	Boulder	Matrix	water depth
	NORTH	EAST			deposit (m)	(m)	max. dia.(m)	max.dia. (m)	(m)
ES-S-004	994407	992967	Lucero Bajo Sector	2006/10/6	1	5.4	0	0	0
ES-S-005	994884	992650	La Florida and San Luis Sector	2006/10/6	0	1.5	0	0	0
YO-S-001	989379	1001266	Yomasa - High Sector	2006/10/2	1	2	0.8	0.7	0
YO-S-002	989205	1001173	Yomasa - High Sector	2006/10/2	1	1.5	0	0.18	0
YO-S-003	989000	1000550	Puente Verde Sector	2006/10/2	1	2	2	0	0
YO-S-004	988666	999542	Cerveceria Colombo-Alemana	2006/10/3	2	10	5	1.2	0
YO-S-005	989588	999588	Tiguaque Sector	2006/10/3	1	1	0.15	0	0
YO-S-006	988047	999249	Los Soches Sector	2006/10/3	1	1	0	0	0
YO-S-007	988710	998771	Yomasa River	2006/10/2	2	10	10	0.5	0
YO-S-008	989432	998800	Yomasa	2006/10/3	0.5	2	0	0	0
YO-S-009	988791	998143	Yomasa River	2006/10/2	0.8	8	5	0	0
YO-S-010	988935	998008	Yomasa River	2006/10/2	2	8	2	0	0
YO-S-011	990739	999079	Yomasa	2006/10/3	2	10	0.5	0	0
YO-S-012	990180	998948	Yomasa	2006/10/3	1	5	0	0	0
YO-S-013	990368	998372	Yomasa	2006/10/3					
YO-S-014	990483	998088	Yomasa	2006/10/3	2	1.5	0	0	0.3
YO-S-015	990042	996977	Yomasa- Villavicencio Av.	2006/10/4	0.5	3	2	0.7	0
SA-S-001	991072	999289	Santa Librada	2006/10/3	2	18	0	0	0
SA-S-002	990985	998654	La Esperanza and La Flora sectors	2006/10/3	1	5	0	0.3	0
SA-S-003	990916	998256	La Esperanza and La Flora sectors	2006/10/3	1	4	2	0	0
SA-S-004	990932	998125	Santa Librada	2006/10/3	0.3	10	0	0.5	0
SA-S-005	990597	997777	Santa Librada	2006/10/4	1	15	0	0	0
SA-S-006	991223	997574	Santa Librada	2006/10/4	0.5	5	0	0	0
SA-S-007	990771	997181	Santa Librada River	2006/10/4	0.7	3	5	0.08	0
SA-S-008	990665	996985	Santa Librada	2006/10/4	1	2	0	0.3	0
SA-S-009	991518	997412	Ladrilleras Sector	2006/10/4	1.2	6	0	0	0
SA-S-010	991051	997102	Santa Librada	2006/10/4	0	5	3	0	0
SA-S-011	992343	995973	La Fiscala Sector	2006/10/4	0	5	0	0	0
CH-S-001	992575	1000909	Chiguaza Sector	2006/10/5	1	3	0.5	0	0
CH-S-002	991804	999455	Chiguaza	2006/10/5	0	30	0	0	0
CH-S-003	991573	999549	Bernardo Sanchez School	2006/10/5	2	4.6	0.25	0.02	0
CH-S-004	991488	999623	Bernardo Sanchez School	2006/10/5	0.8	2	1.2	0.1	0
CH-S-005	993733	1000722	El Zuque Mines	2006/10/5	0	2	1.2	0	0
CH-S-006	992938	999573	Chiguaza	2006/10/5	1.5	2	1	0	0
CH-S-007	993255	999712	Chiguaza	2006/10/5	1.5	3	1.5	0.1	0
CH-S-008	993812	999560	Puente Colorado Sector	2006/10/5	1.2	3	1.2	0.15	0
CH-S-009	994082	998588	Chiguaza River	2006/10/5	1	3	1.2	0.15	0
CH-S-010	992844	998440	La Belleza Sector	2006/10/5	1	1	0.5	0	0
CH-S-011	994619	997560	Diana Turbay Sector	2006/10/4	1.2	5	3	0.08	0
CH-S-012	994382	997502	Diana Turbay Sector	2006/10/4	1.5	3	1	0.1	0
CH-S-013	994240	997100	El Rincon del Valle and Ayacucho Sector	2006/10/4	1	4	0	0	0

2.2 River / Creek Condition

2.2.1 Soacha River

The river bed conditions of the Soacha river are shown in the sketch point ; SO-S-001, SO-S-002, SO-S-004, SO-S-006, SO-S-007, SO-S-009, SO-S-013, SO-S-016, SO-S-018, SO-S-019 and SO-S-020. The common features of these sketches are glacial deposit on river bed and high vegetation such as tree on the slope of the river bank.

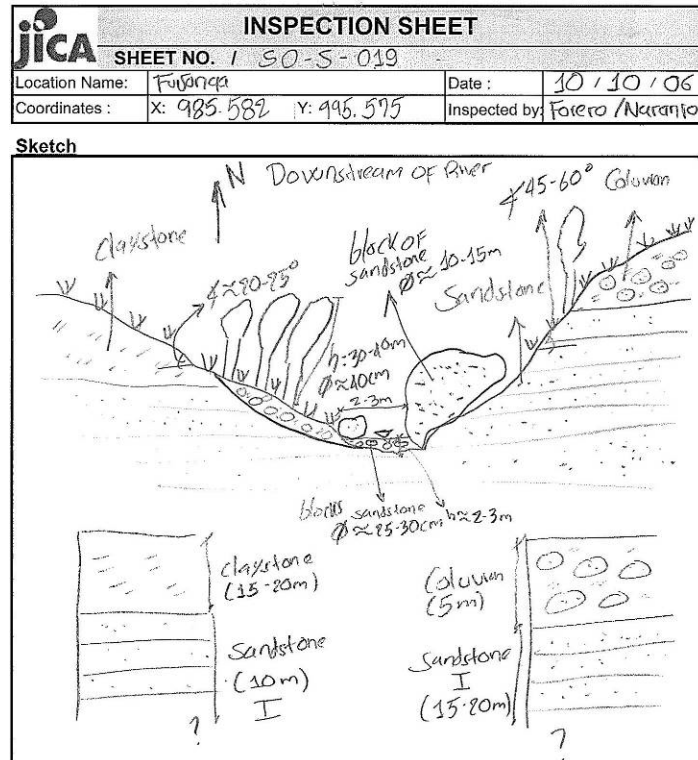


Figure S3-2-5 Sketch of River Section of Soacha River (SO-S-009)

2.2.2 Tibanica River

In the Tibanica River, boulder deposit is not found on the river bed. Figure S3-2-6 and Figure 3-2-7 show the typical cross sections of the upstream and downstream of the Terreros Dam site, respectively. In the upstream of the dam, the river channel is that eroded fluvial glacial deposit. The bed material is composed of fine sediment. In the downstream of the dam, the sediment generation is quite limited obviously by the dam.

As a whole, the unstable sediment deposit on the river bed is few in the Tibanica river.

jica		INSPECTION SHEET	
SHEET NO. 1		TI-S-004	
Location Name:	Tibanica	Date:	11 / 10 / 06
Coordinates:	X: 988.911 Y: 995.381	Inspected by:	Naranjo / Forero

Sketch

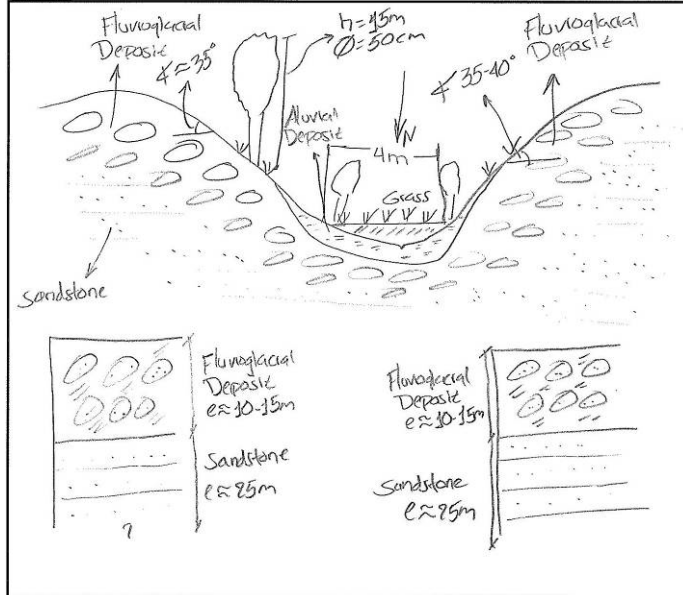


Figure S3-2-6 Sketch of River Section of Tibanica River (TI-S-004)

jica		INSPECTION SHEET	
SHEET NO. 1		TI-S-017	
Location Name:	District Julo Rincon	Date:	11 / 10 / 06
Coordinates:	X: 987.358 Y: 998.413	Inspected by:	Naranjo / Forero

Sketch

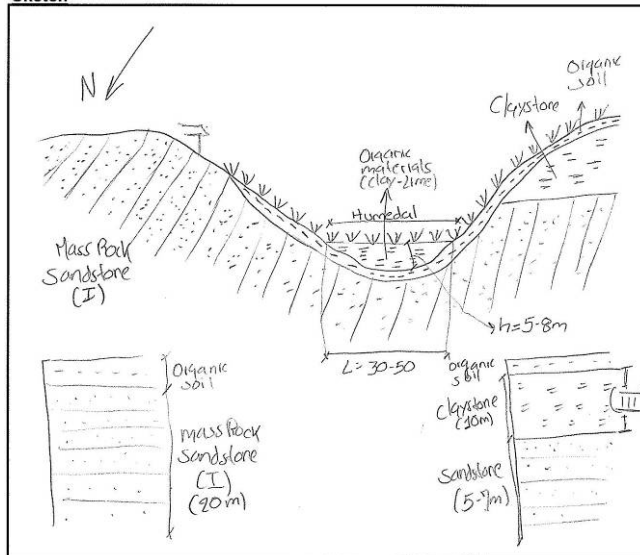


Figure S3-2-7 Sketch of River Section of Tibanica River (TI-S-017)

2.2.3 Chiguaza Creek

In Chiguaza creek, Los Puentes has a bed slope of 3 degree, which means debris flow from transporting to stopping reach. In fact, round boulder on the riverbed and round boulder layer in the bank can be seen.



Photo S3-2-1 Chiguaza Creek (confluence point of Qda. Nutria)

Figure S3-2-8 is the cross section of the Chiguaza creek just upstream of Los Puentes. The alluvial deposit layer has been eroded and on the eroded creek bed there are fine sediment and boulders. These fine sediment and boulders can be regarded as transported materials by flood water. It is understood that the alluvial deposit layer was developed in geological time scale, and the present creek course was created by the degradation process by water. Different from alluvial fan area suffered from frequent sediment runoff in tropical countries, the Chiguaza creek generally does not have sediment deposition layers on the creek bank which means debris flow (the creek filled by transported sediment and the flow width beyond the creek with) is not significant flood phenomenon. The boulders themselves can be transported by flood from upstream and remain on the mild slope reach (for example, Los Puentes).

Figure S3-2-9 is the cross section of the Chiguaza creek near La Gloria. This has similar feature with CH-S-011.

Figure S3-2-10 is the cross section of the Chiguaza creek just upstream of Carrera Oriente. This section is called Zuque creek. In this creek the deposited sediment went downstream at the flood of May 1994. The present condition shows less sediment deposit on the creek bed and the bank slopes are covered by tall trees and vegetation. It is assumed that since the last large scale flood (May 1994), significant floods have not occurred in this creek.

Figure S3-2-11 is the most upstream cross section of the Zuque creek. It is not clear that boulders on the creek bed are rock falls or those transported from upstream, however, it can be regarded that sediment generation potential is low.

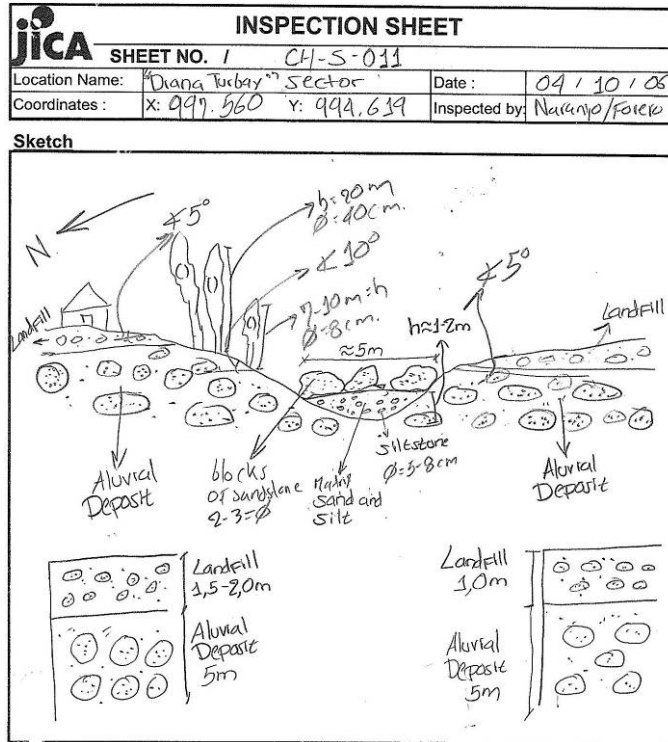


Figure S3-2-8 Sketch of Cross Section of Chiguaza Creek (CH-S-011)

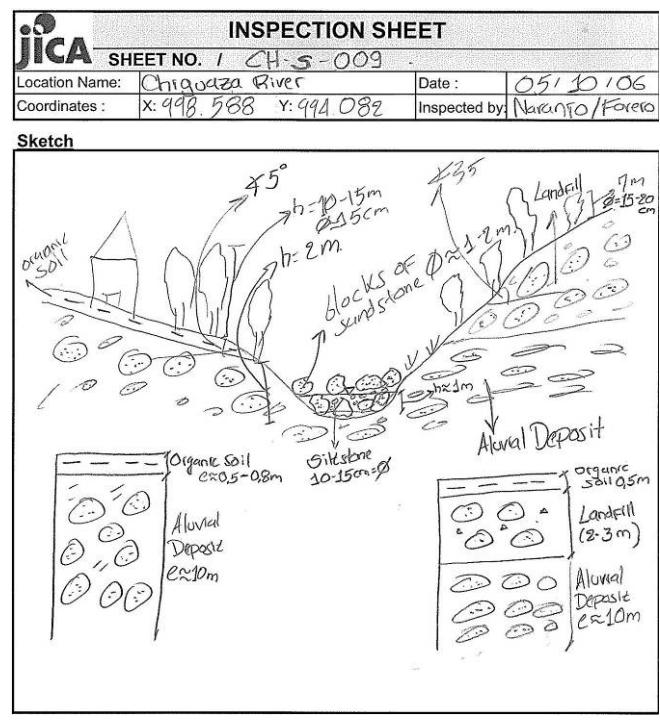


Figure S3-2-9 Sketch of Cross Section of Chiguaza Creek (CH-S-009)

jica		INSPECTION SHEET	
SHEET NO. 1 CH-S-008			
Location Name:	"Puente Colorado" Sector	Date:	05/30/06
Coordinates:	X: 999.560 Y: 993.812	Inspected by:	Naranjo/Foreiro

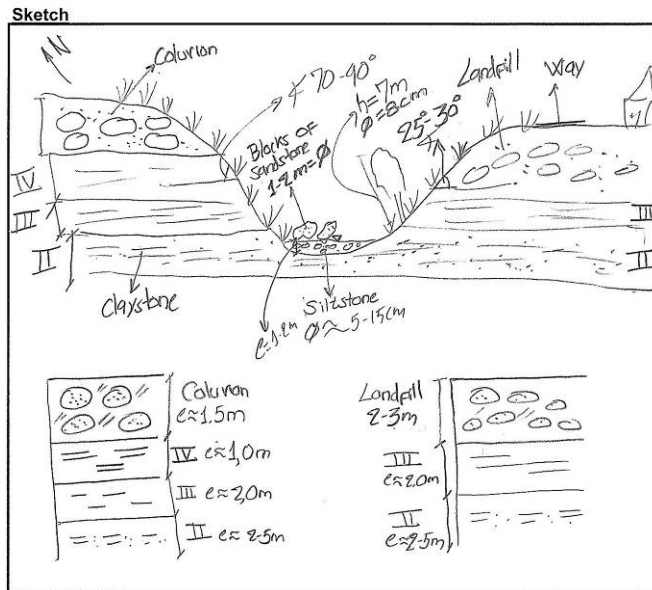


Figure S3-2-10 Sketch of Cross Section of Chiguaza Creek (CH-S-008)

jica		INSPECTION SHEET	
SHEET NO. 1 CH-S-005			
Location Name:	"El Zague" Mines	Date:	05/30/06
Coordinates:	X: 1.000.792 Y: 993.733	Inspected by:	Naranjo/Foreiro

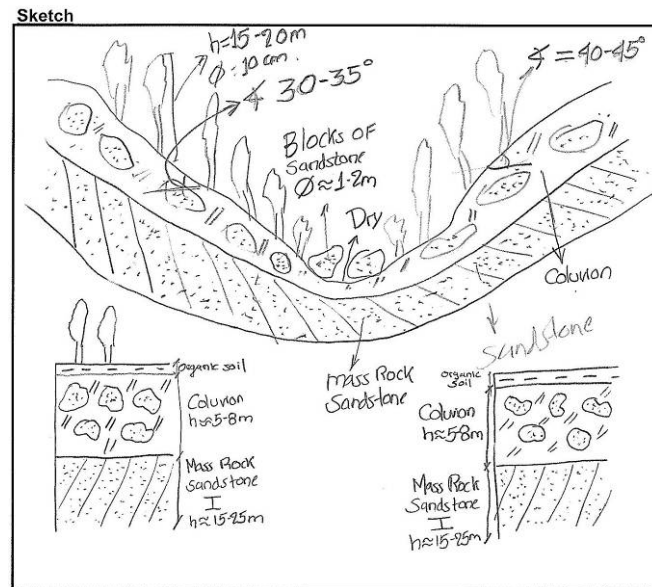


Figure S3-2-11 Sketch of Cross Section of Chiguaza Creek (CH-S-005)

Figure S3-2-12, Figure S3-2-13 and Figure S3-2-14 are the cross sections of Silverio Sur creek and Seca creek and Verejones creek, respectively. One of the common features of these creeks is dense vegetation on the creek banks.

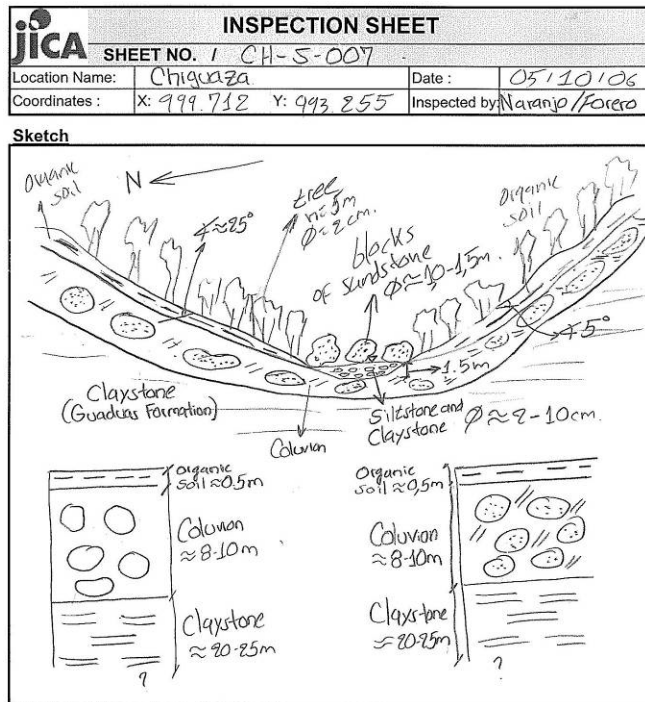


Figure S3-2-12 Sketch of Cross Section of Silverio Sur Creek (CH-S-007)

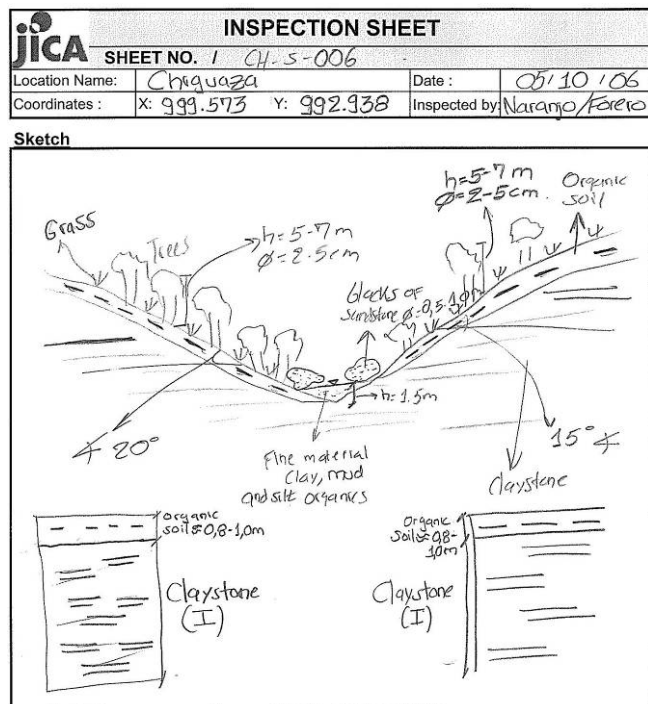


Figure S3-2-13 Sketch of Cross Section of Seca Creek (CH-S-006)

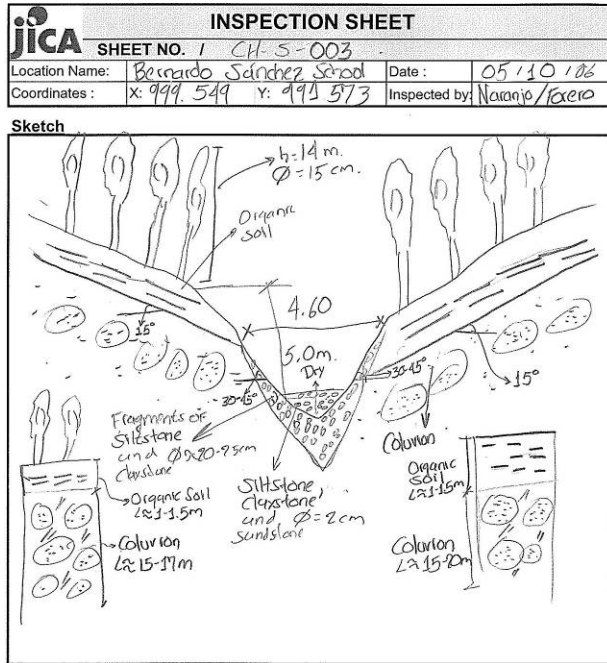


Figure S3-2-14 Sketch of Cross Section of Verejones Creek (CH-S-003)

2.2.4 Santa Librada

As shown in Chapter 1, in the Santa Librada creek there is little new slope failure according to the aerial photo interpretation. Figure S3-2-15 shows the cross section of middle reach of the Santa Librada creek. The both banks are covered by vegetation. On the creek bed there are few sediment deposit. It can be regarded that comparatively said the creek has not experienced large scale flood recently.

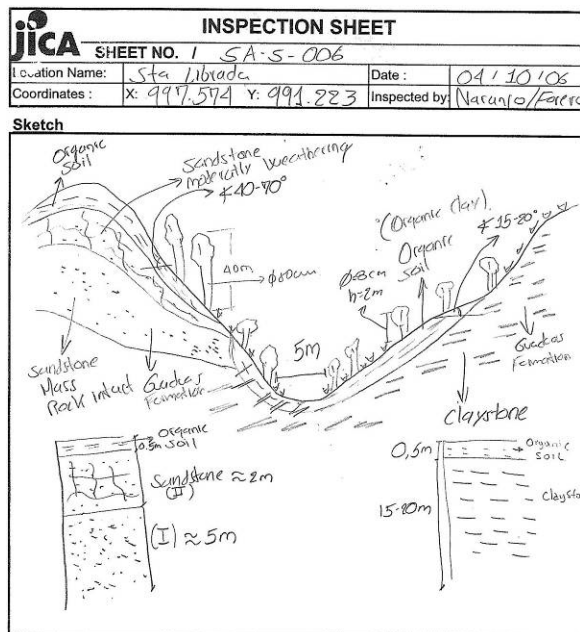


Figure S3-2-15 Sketch of Cross Section of Santa Librada Creek (SA-S-006)

2.2.5 Yomasa Creek

In Yomasa creek, Aleman is located on the mild slope reach having lower than 3 degree. In this reach the debris flow deposits. The bed materials are composed of large boulder and smaller ones such as cobbles. Figure S3-2-16 is the longitudinal profile of the Yomasa creek in which the creek condition survey points are indicated. One of the important features of the Yomasa creek is that it has a mild slope reach in the upstream area. YO-S-003 which is located on the downstream end of the mild slope reach is shown in Figure S3-2-17. Because of its mild slope, the deposit on the creek is few although the upper area has a lot of new slope failures. The surrounding area is said to have security problems so that the detailed site investigation was very difficult.



Photo S3-2-2 Yomasa Creek (near Carrera Oriente)

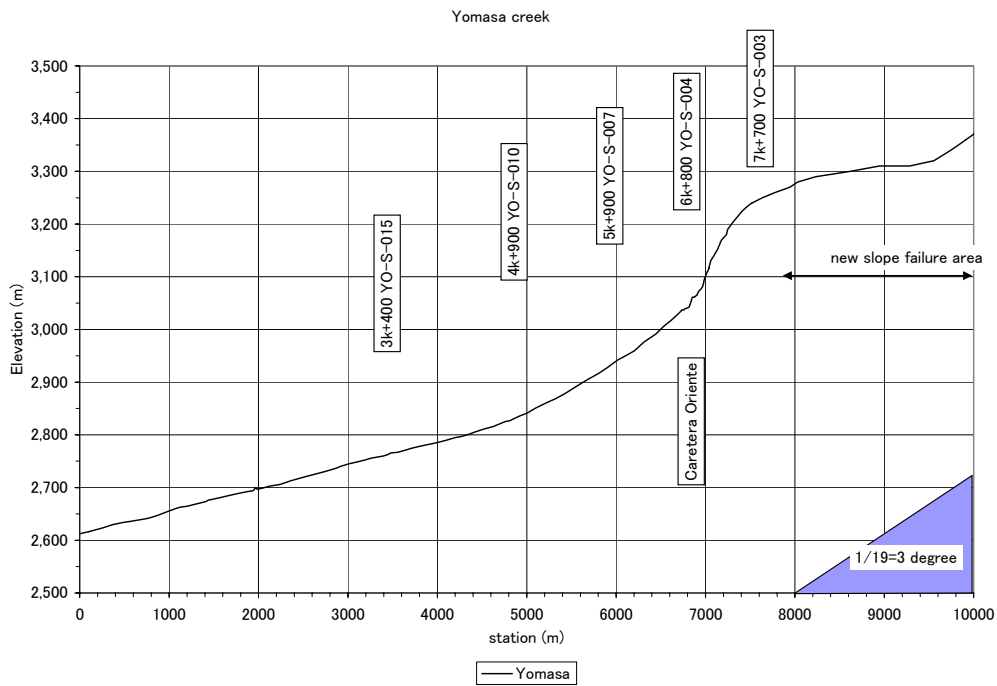


Figure S3-2-16 Longitudinal Profile and Location of Creek Condition Survey of Yomasa creek

jica INSPECTION SHEET			
SHEET NO. 1 YO-S-003			
Location Name:	Puente Verde sector	Date:	08/30/06
Coordinates:	X: 100.550 Y: 989.000	Inspected by:	Nakano/Foreiro

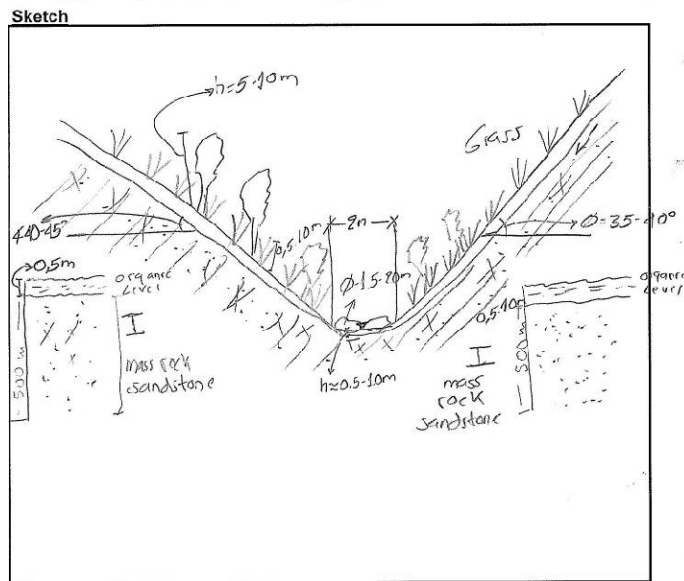


Figure S3-2-17 Sketch of Cross Section of Yomasa Creek (YO-S-003)

The next downstream point is YO-S-004 (6K+800), located upstream side of Carrera Oriente. The cross section is shown in Figure S3-2-18. In this cross section, the sediment deposition nearly 4 meter thickness can be recognized together with drift wood. Since it is located on the strep slope reach (refer to Figure S3-2-16). This kind of sediment deposition can be regarded as unstable deposition which could cause debris flow.

jica INSPECTION SHEET			
SHEET NO. 1 YO-S-004			
Location Name:	Cerveza Colombo-Alexandre	Date:	03/10/06
Coordinates:	X: 999.542 Y: 988.666	Inspected by:	Ikemoto-Tanaka

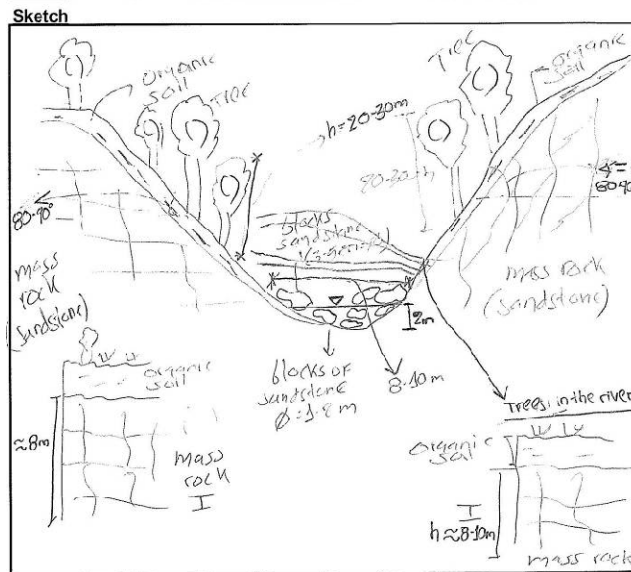


Figure S3-2-18 Sketch of Cross Section of Yomasa Creek (YO-S-004)

Figure S3-2-19 and Figure S3-2-20 are the cross sections downstream of Carrera Oriente. YO-S-010 is located just on the creek bed slope changing point as shown in Figure S3-2-16. This kind of point is generally said to be sediment deposition area. The alluvial deposit has been eroded and on the eroded creek bed further sediment deposition can be recognized including boulders.

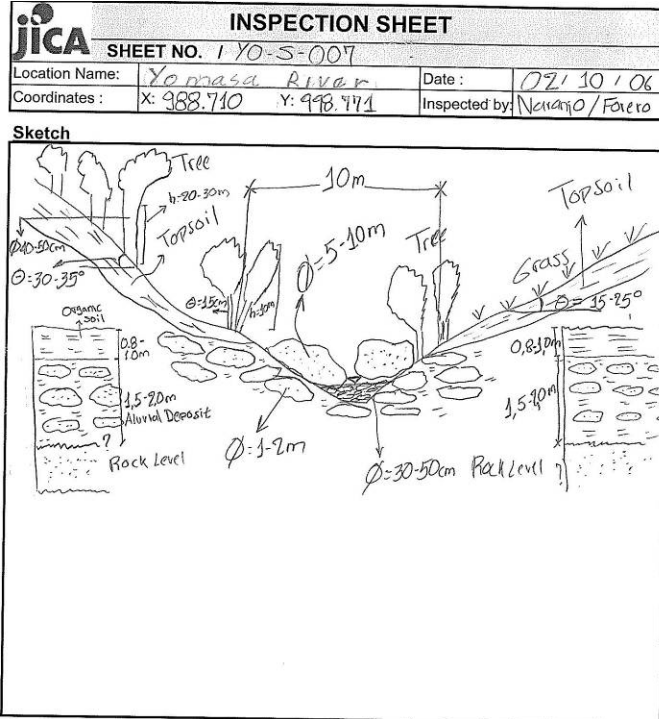


Figure S3-2-19 Sketch of Cross Section of Yomasa Creek (YO-S-007)

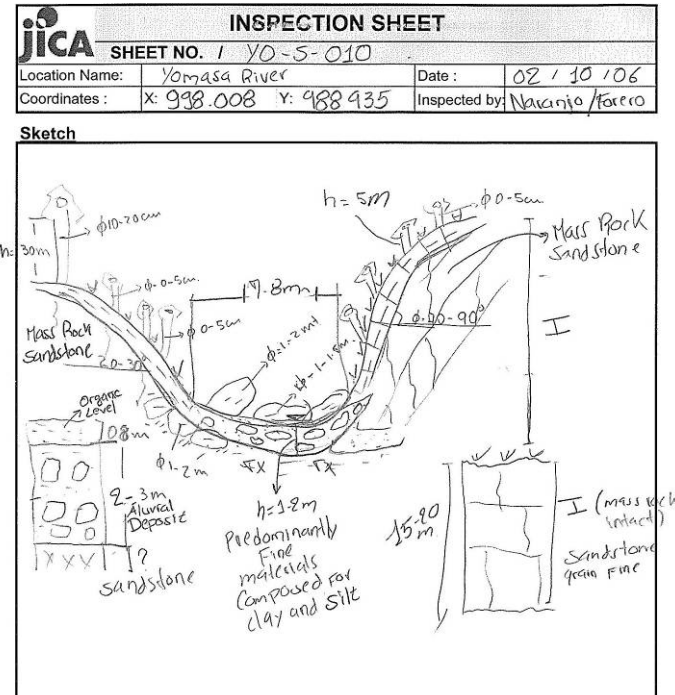


Figure S3-2-20 Sketch of Cross Section of Yomasa Creek (YO-S-010)

Figure S3-2-21 is the most downstream point of the cross section of the Yomasa. The alluvial deposit has been eroded and on the eroded creek bed further sediment deposition can be recognized including boulders. On the bank slope, sediment deposit layers can be recognized on clay stone.

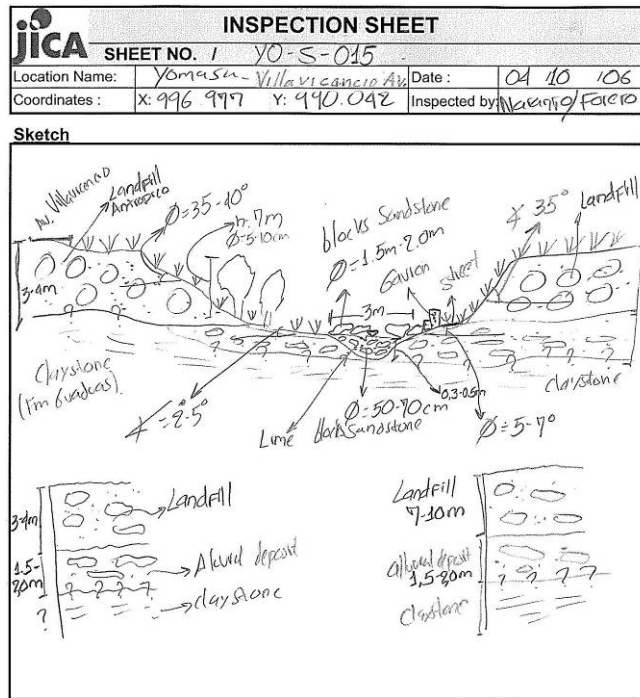


Figure S3-2-21 Sketch of Cross Section of Yomasa Creek (YO-S-015)

2.2.6 La Estrella Tromepta

Figure S3-2-22 and Figure S3-2-23 show the cross section of the Trompeta creek. TR-S-001 is that of upstream section and glacial deposit is dominant. TR-S-005 is the downstream side, in which the alluvial deposit is dominant. In the deposit on the creek there are little large boulders and is only fine sediment. According to the aerial photo interpretation, in the upper part of the Trompeta creek catchment, comparatively large new slope failures were recognized, however, it can be concluded that such new slope failure did not contribute to the large size sediment deposition on the creek.

Figure S3-2-24 is the cross section of La Estrella which is located at the downstream of new slope failure identified by the aerial photo interpretation. Sediment deposition is not recognized on the creek bed. It can be concluded that such new slope failure did not contribute to the large size sediment deposition on the creek.

jica INSPECTION SHEET			
SHEET NO. 1 TR-S-001			
Location Name:	Mochele Way	Date:	06/10/06
Coordinates:	X: 991.974 Y: 992.827	Inspected by:	Nakimjo Forcia

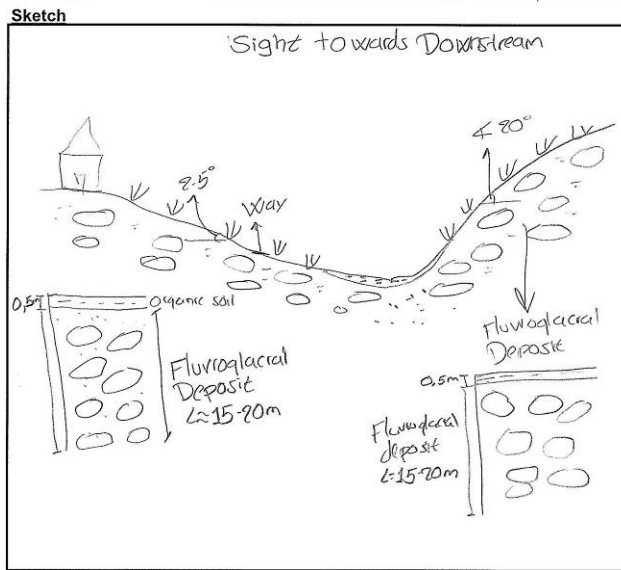


Figure S3-2-22 Sketch of Cross Section of Trompeta Creek (TR-S-001)

jica INSPECTION SHEET			
SHEET NO. 1 TR-S-005			
Location Name:	Mochele Sector	Date:	06/10/06
Coordinates:	X: 992.196 Y: 992.998	Inspected by:	Nakimjo Forcia

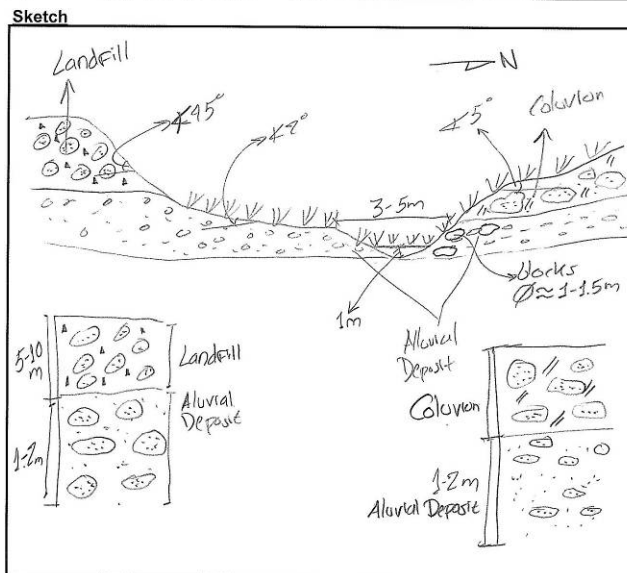


Figure S3-2-23 Sketch of Cross Section of Trompeta Creek (TR-S-005)

INSPECTION SHEET			
jica		SHEET NO. 1 ES-S-003	
Location Name:	Estrella	Date:	06/30/06
Coordinates:	X: 992291 Y: 993809	Inspected by:	Arango/Parro

Sketch

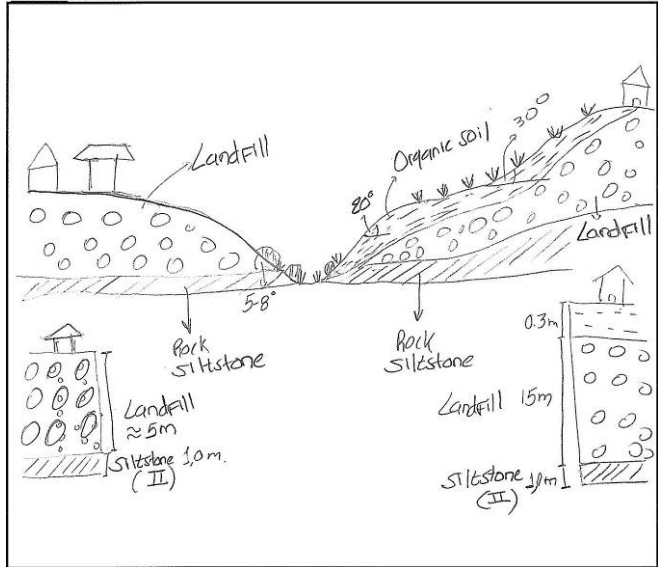


Figure S3-2-24 Sketch of Cross Section of La Estrella Creek (ES-S-003)

CHAPTER 3 OUTCROPS

Table S3-3-1 is the average weathering thickness of each creek. There is a clear tendency that Soacha and Tibanica have the thickness over 1.0 m while other creeks are around 0.5m. According to the creek conditions, in Soacha and Tibanica there is few boulders generation on the river bed, however in the site observations there are a lot of unstable rocks on the slopes. In Chiguaza and Yomasa, the average weathering thicknesses are 0.7 m and 0.6 m, respectively. In these creeks, there are no records of debris flow occurrence associated with slope failure at this moment. If such debris flow occurs in the future, this weathering thickness data is quite useful to analyze the sediment balance between slope failure volume and sediment runoff volume.

Table S3-3-1 Average Weathering Thickness of Each Creek

Creek	Soacha	Tibanica	Chiguaza	Santa Librada	Yomasa	Estrella	Tromepta
Average Weathering thickness (m)	1.2	1.0	0.7	0.3	0.6	0.5	0.5