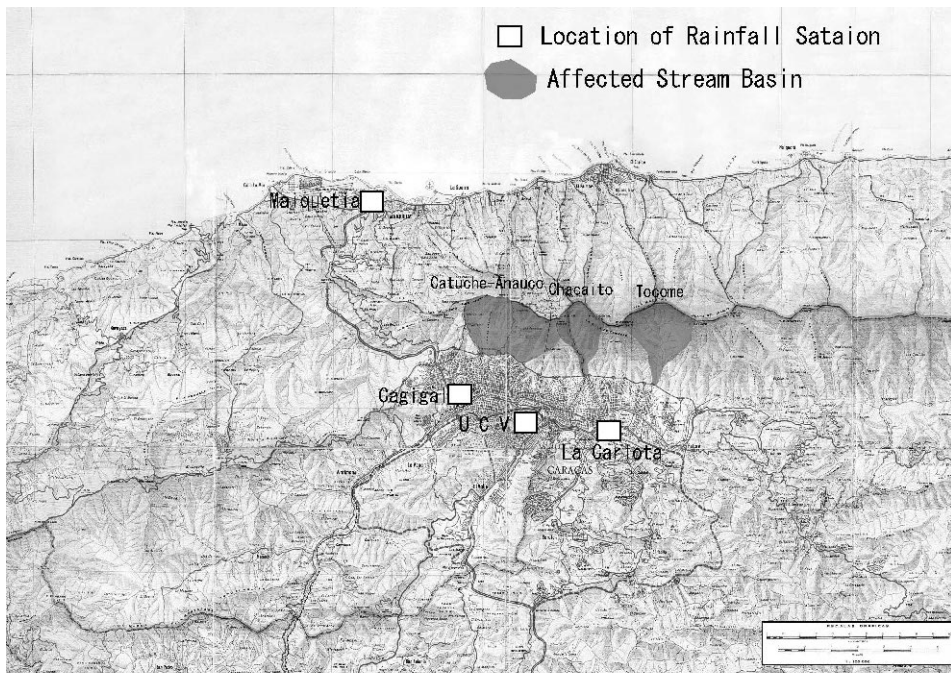


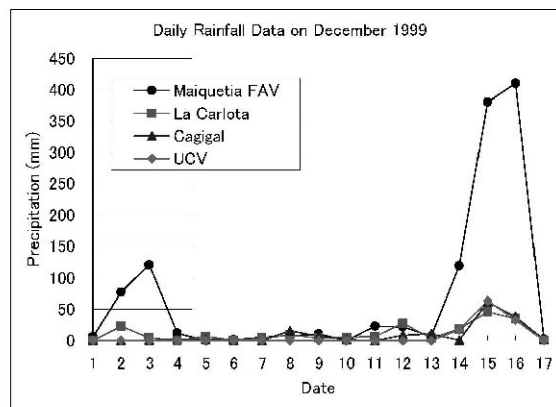
**Figure 4.1.1.12 Isohyets During Feb.15-17, 1951**



Rainfall Stations which operated at the event of December 1999

(mm)

date	Maiquetia FAV	La Carlota	Cagigal	UCV
1	6.0	0.0	0.3	-
2	77.3	23.2	0.0	-
3	121.2	4.7	0.9	-
4	11.8	0.0	2.8	-
5	0.0	6.7	1.8	-
6	1.1	0.6	0.6	-
7	5.0	3.8	0.0	-
8	8.1	9.0	16.0	-
9	10.4	3.9	7.3	-
10	0.0	5.0	1.9	-
11	23.2	6.8	0.3	-
12	21.8	28.1	8.6	-
13	7.1	4.0	10.8	-
14	120.0	18.6	0.6	17.5
15	380.7	46.2	61.5	63.7
16	410.4	34.9	38.6	32.8
17	2.9	0.6	1.5	-
sum	1207.0	196.1	153.5	114.0



Daily Rainfall Amount at the event of December 1999

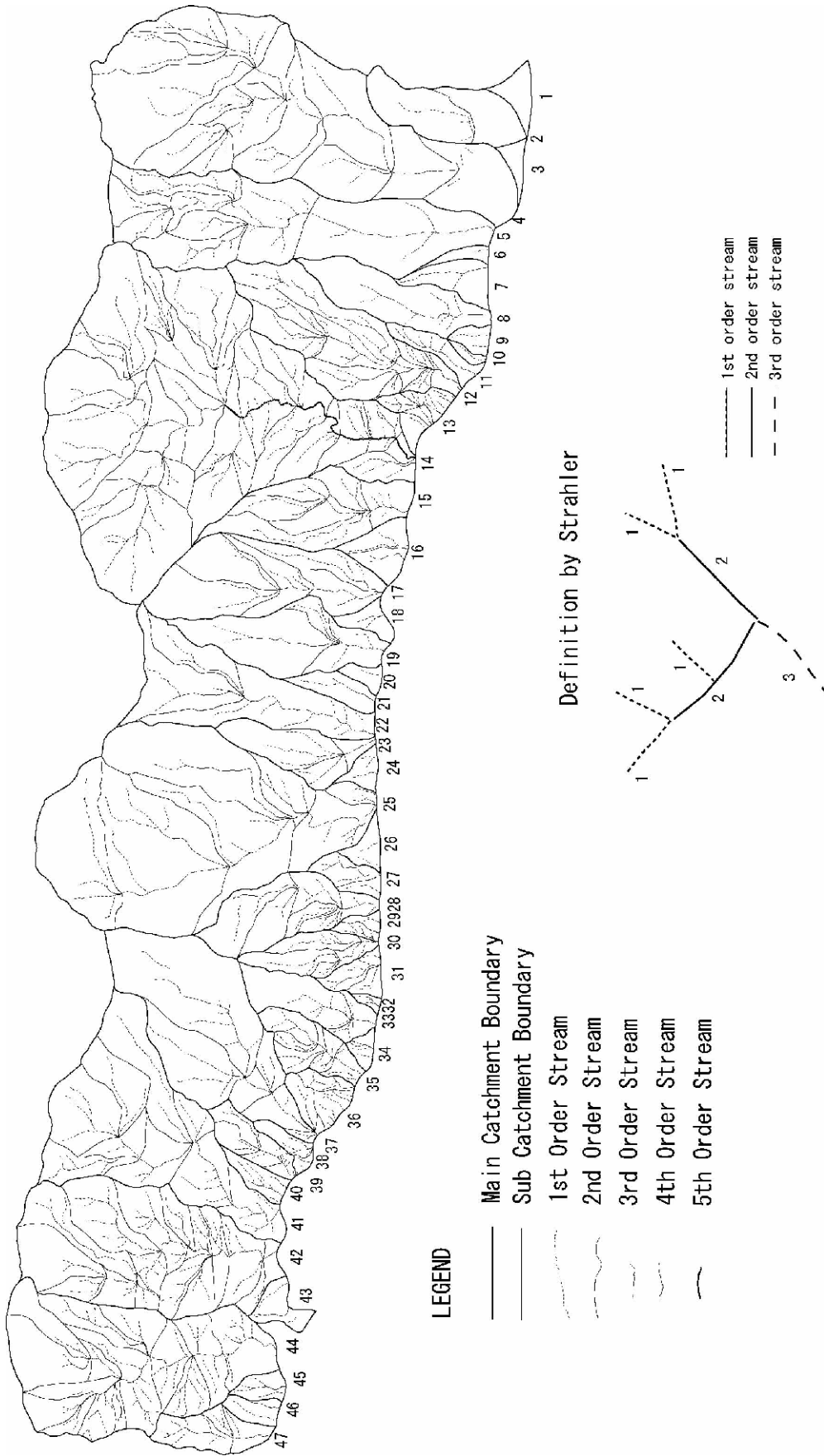
Maiquetia	Cagigal	UCV	La Carlota
1560 years	4 years	5 years	1 year

Return Period of the Daily Rainfall in December 1999

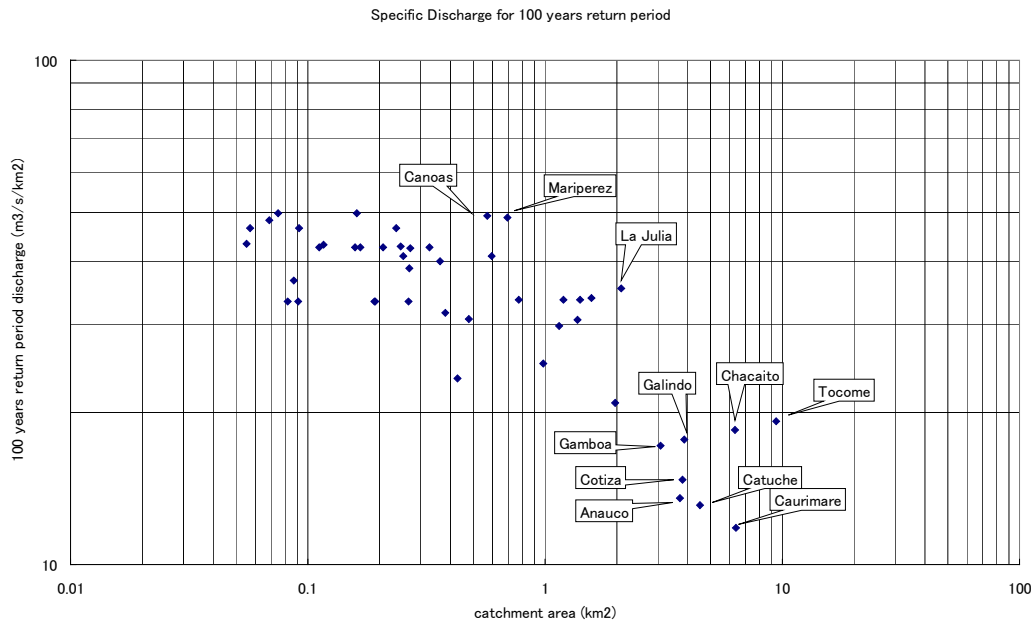
**Figure 4.1.1.13(1/2) Rainfall during the Event of December 1999 in and around Caracas Valley**











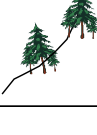

**Figure 4.1.1.13(2/2) Rainfall during the Event of December 1999 in and around Caracas Valley (source: USGS)**



**Figure 4.1.1.14 Sub-catchment and Stream Order in the Mountain Streams**



**Figure 4.1.1.15 Specific Discharge for 100 years return period**

Type	Slope Condition	Legend	Symbol	Description
1		Active Collapse		an active collapse with exposure of soil /rock, no vegetation covers
2		New Collapse covered with Grass		an active collapse covered with bush or grass, collapse occurred in recent years
3		New Collapse under Trees		an active collapse covered with sparse trees, a collapse might occur under trees in recent years
5		Old Collapse without tree		an old collapse covered with bush or grass
4		Old Collapse covered with trees		an old collapse covered with trees

**Figure 4.1.1.16 Types of Slope Collapse in the Mountain Stream Catchment**



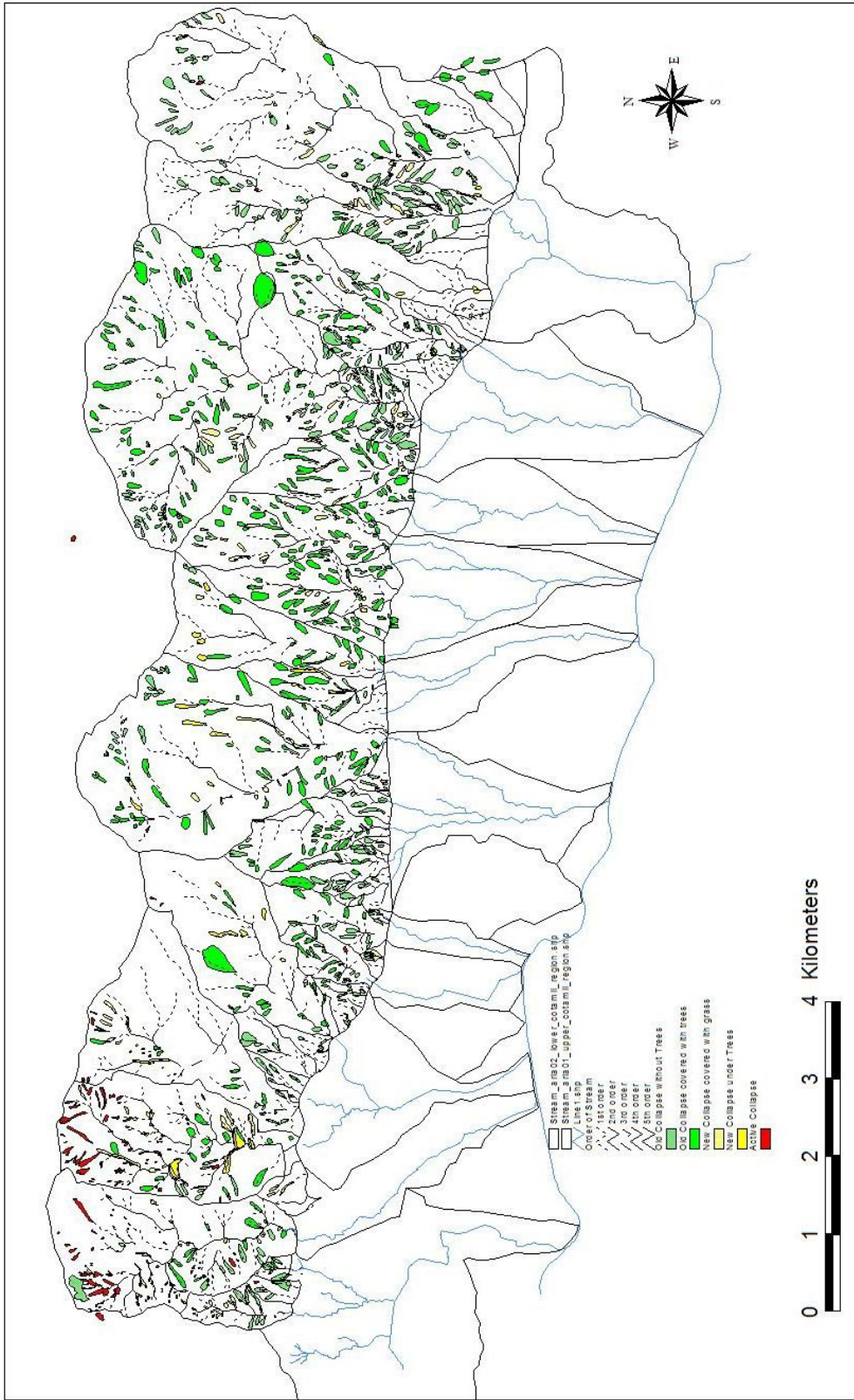


Figure 4.1.1.17 Potential Slope Failure

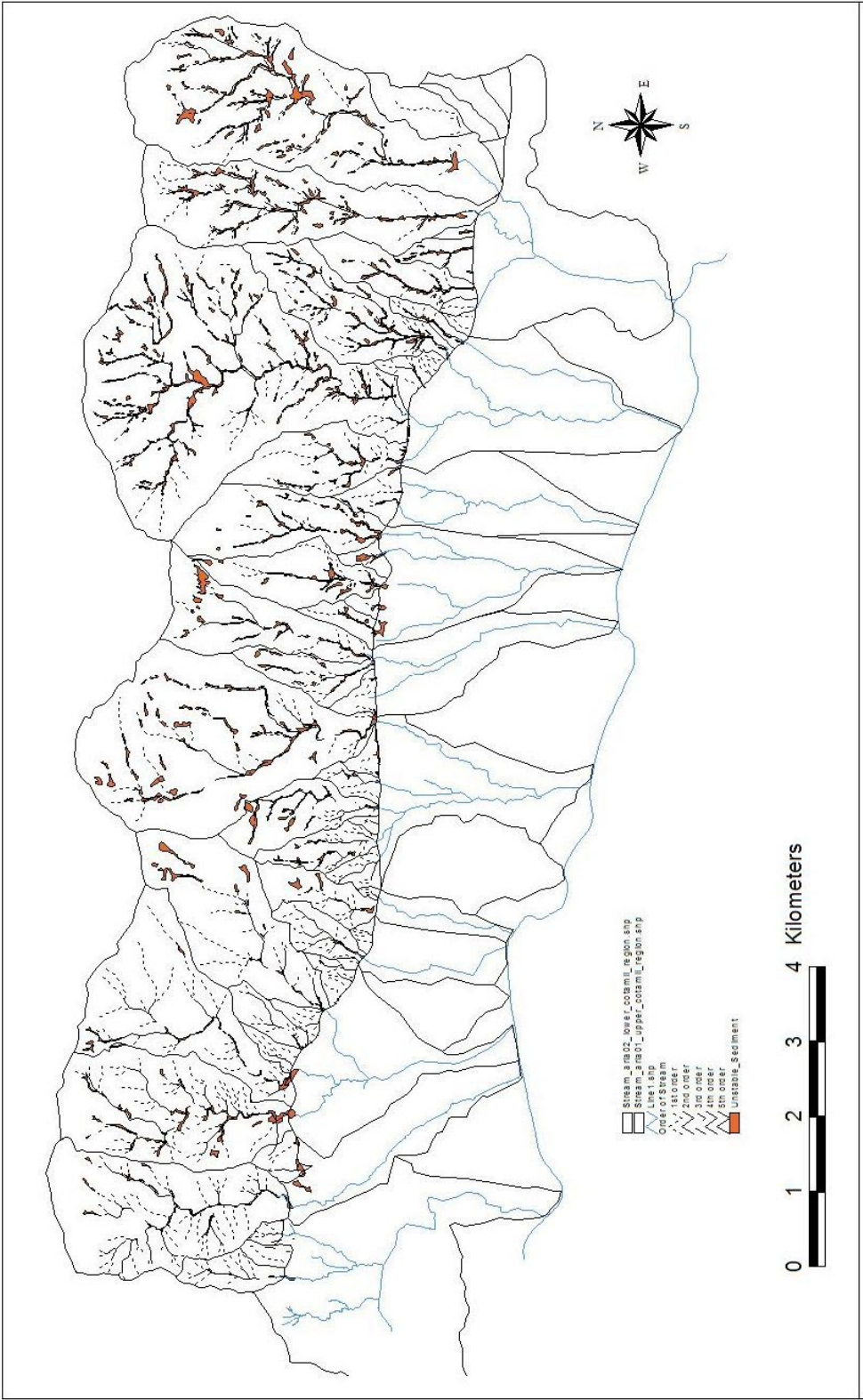


Figure 4.1.1.18 Unstable Sediment on Stream Bed

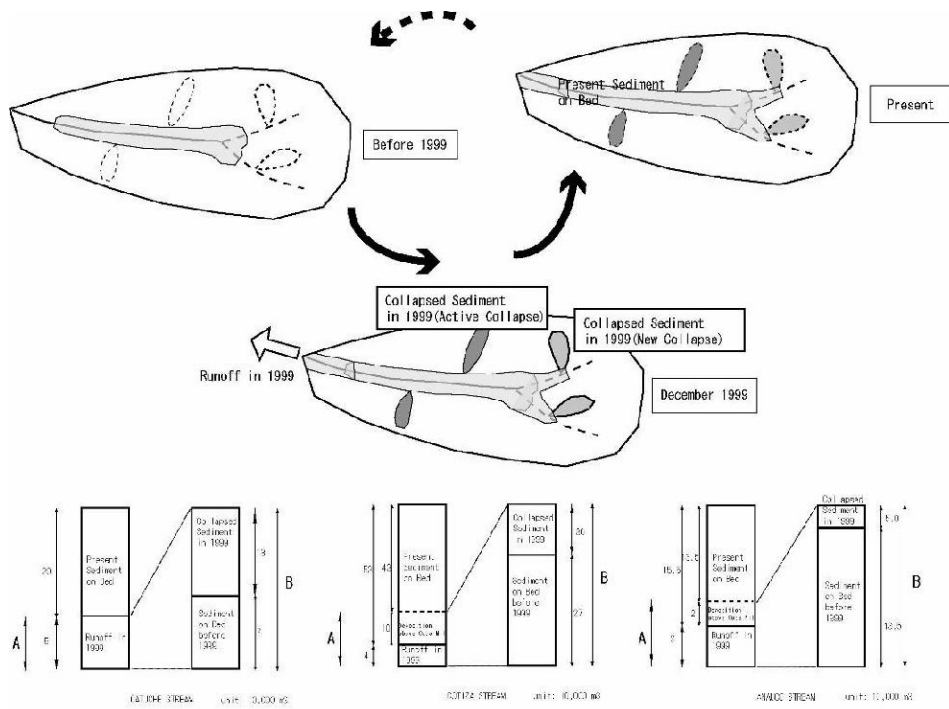


Figure 4.1.1.19 Sediment Movement before and after December 1999 Flood

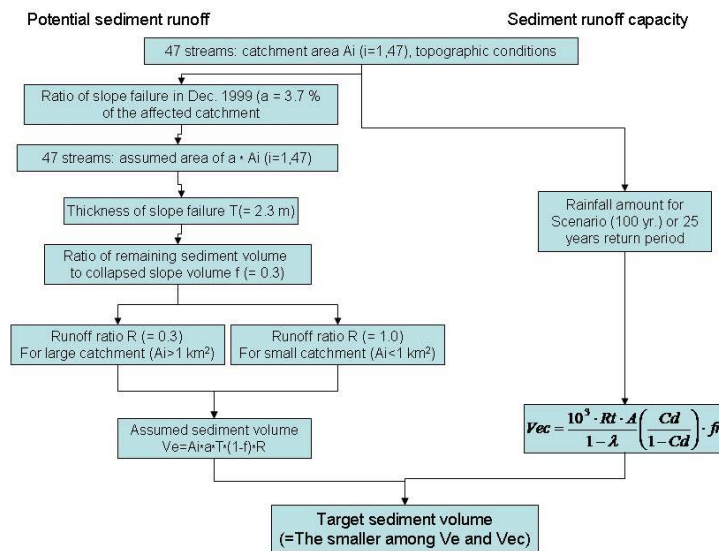


Figure 4.1.1.20 Evaluation Flow for Target Sediment Volume



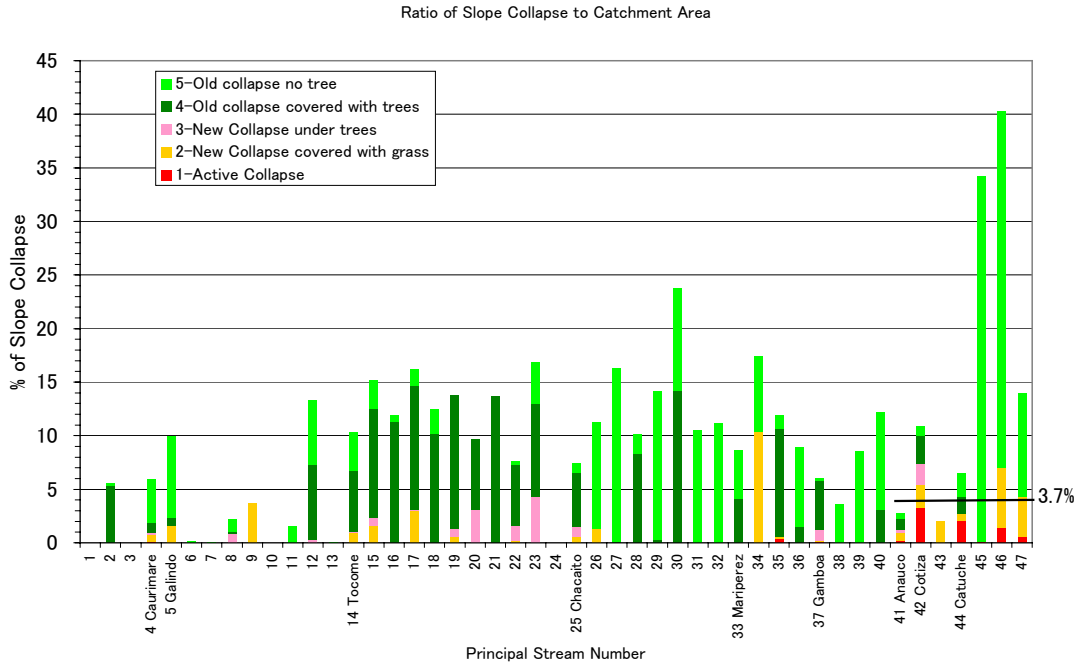


Figure 4.1.1.21 Ratio of Slope Collapse to Catchment Area

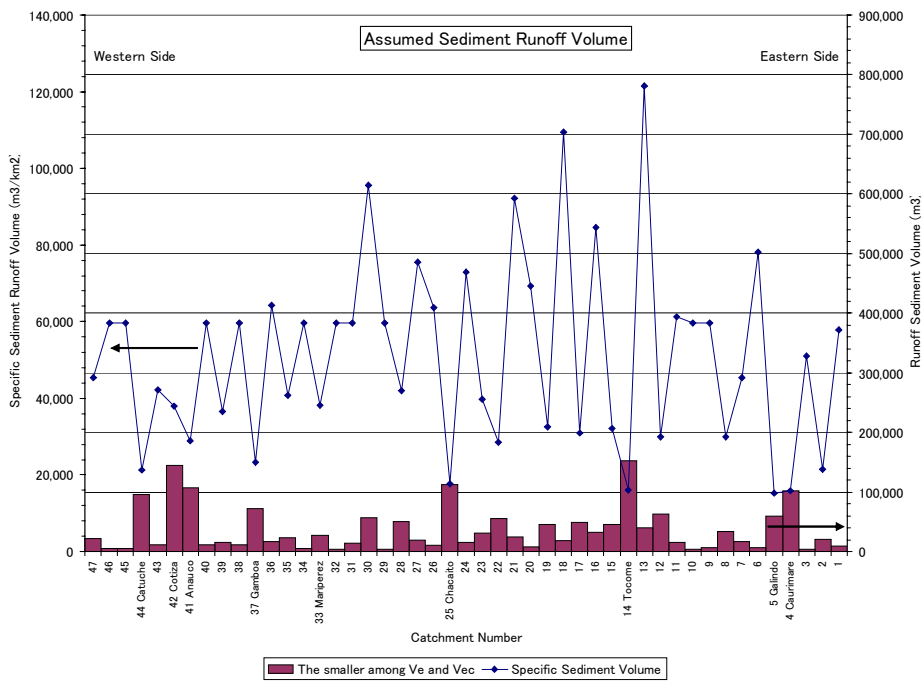
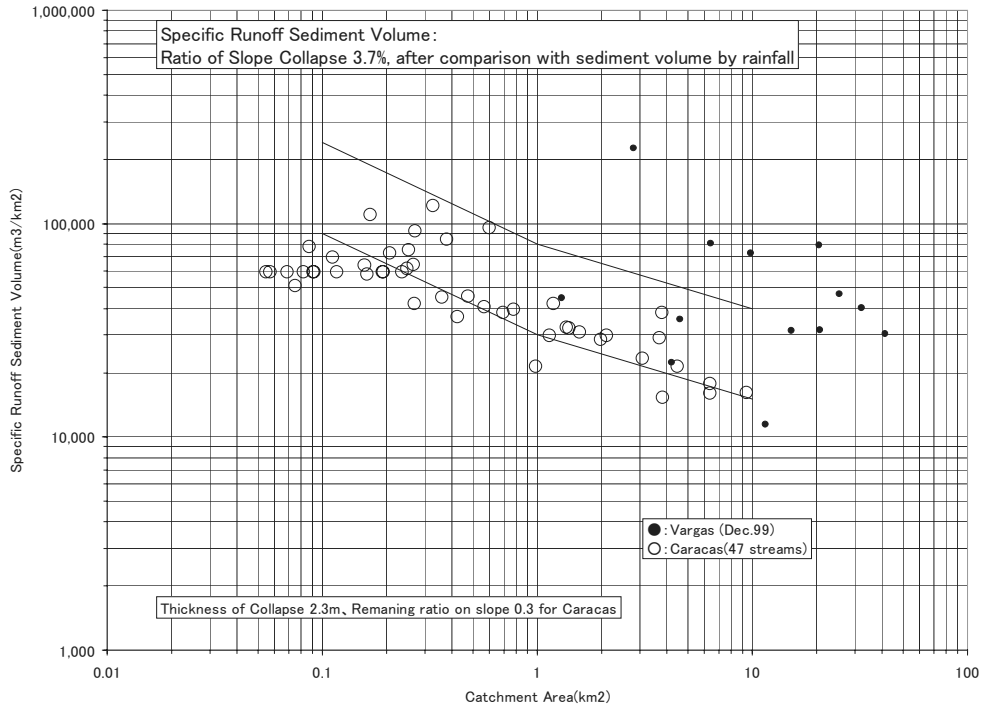
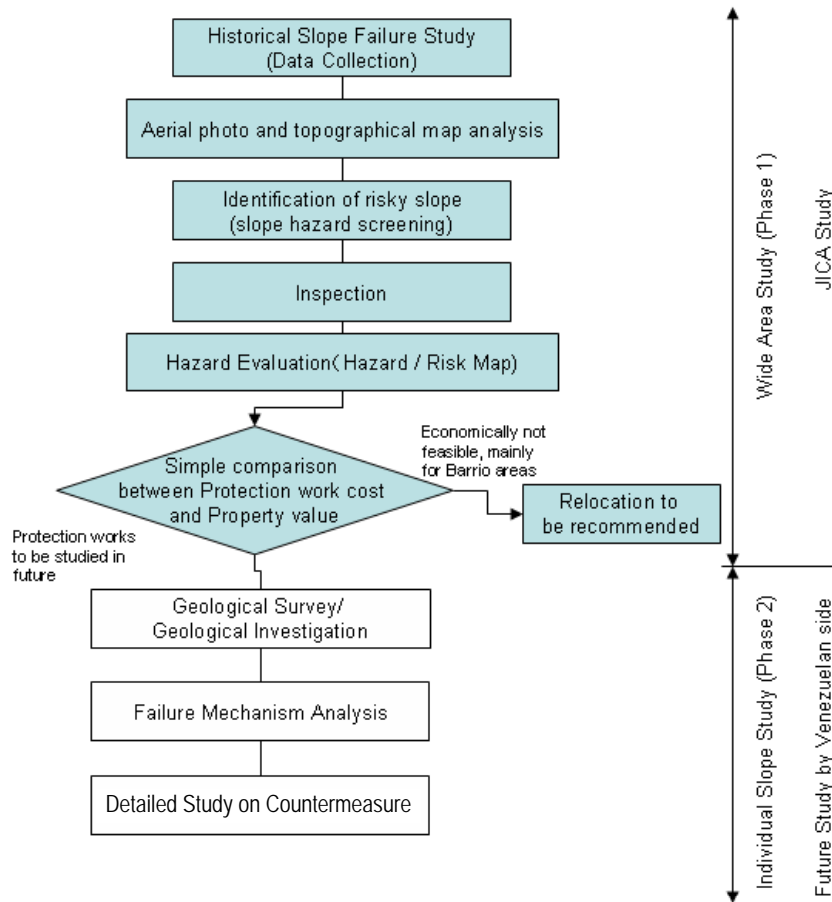


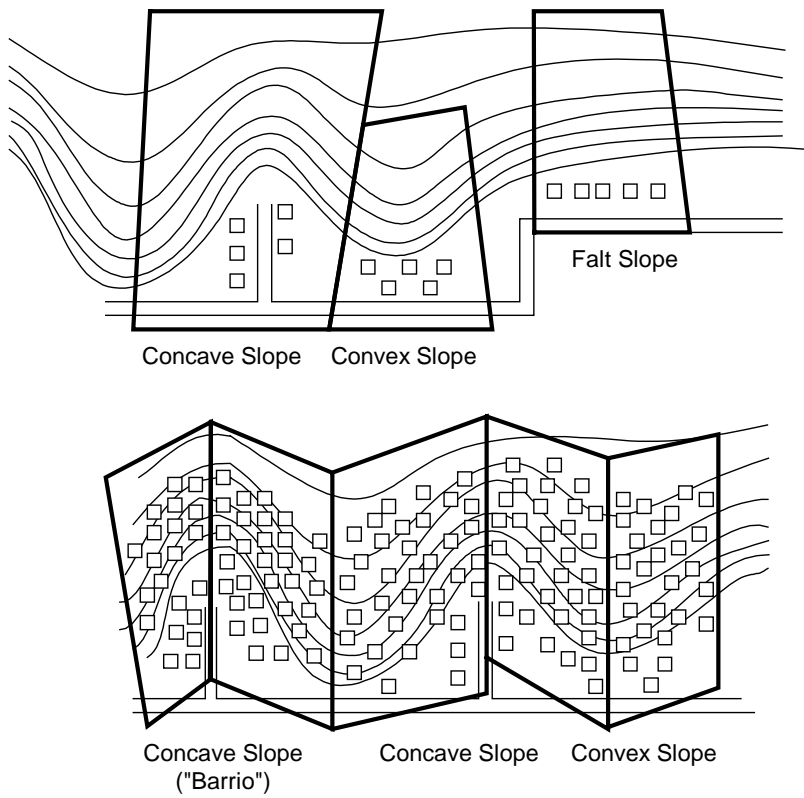
Figure 4.1.1.22 Estimated Sediment Runoff Volume for Scenario Flood



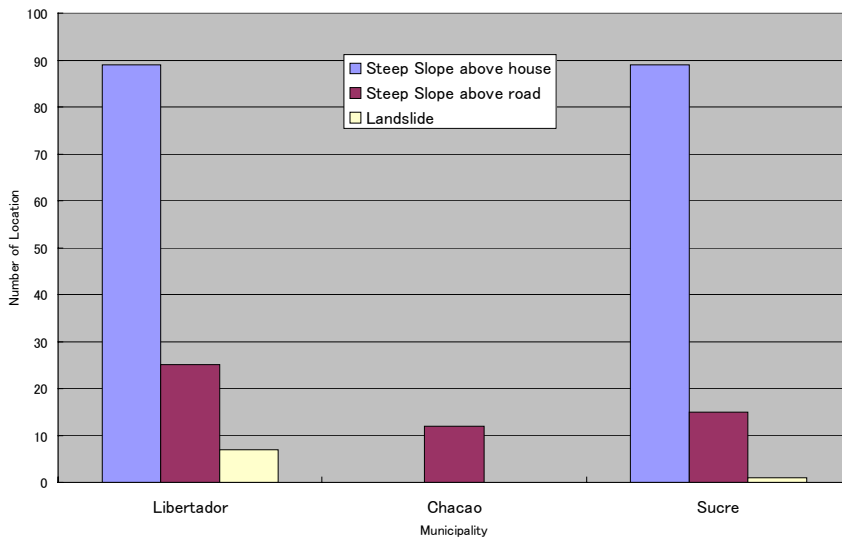
**Figure 4.1.1.23 Specific Sediment Runoff Volume**



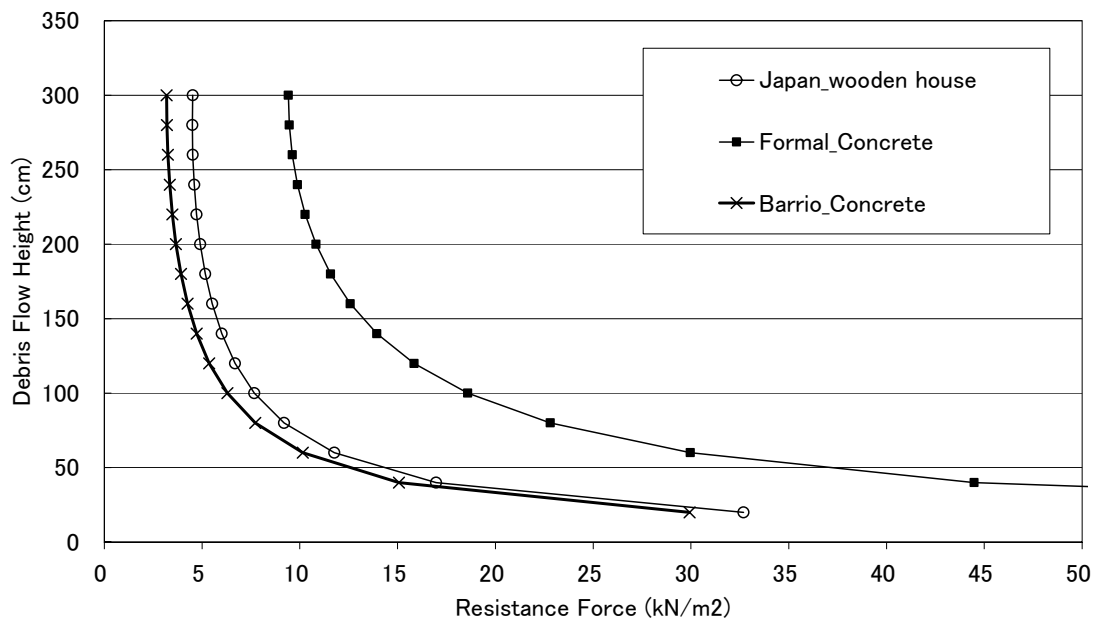
**Figure 4.1.1.24 Work Diagram for Step Slope Study**



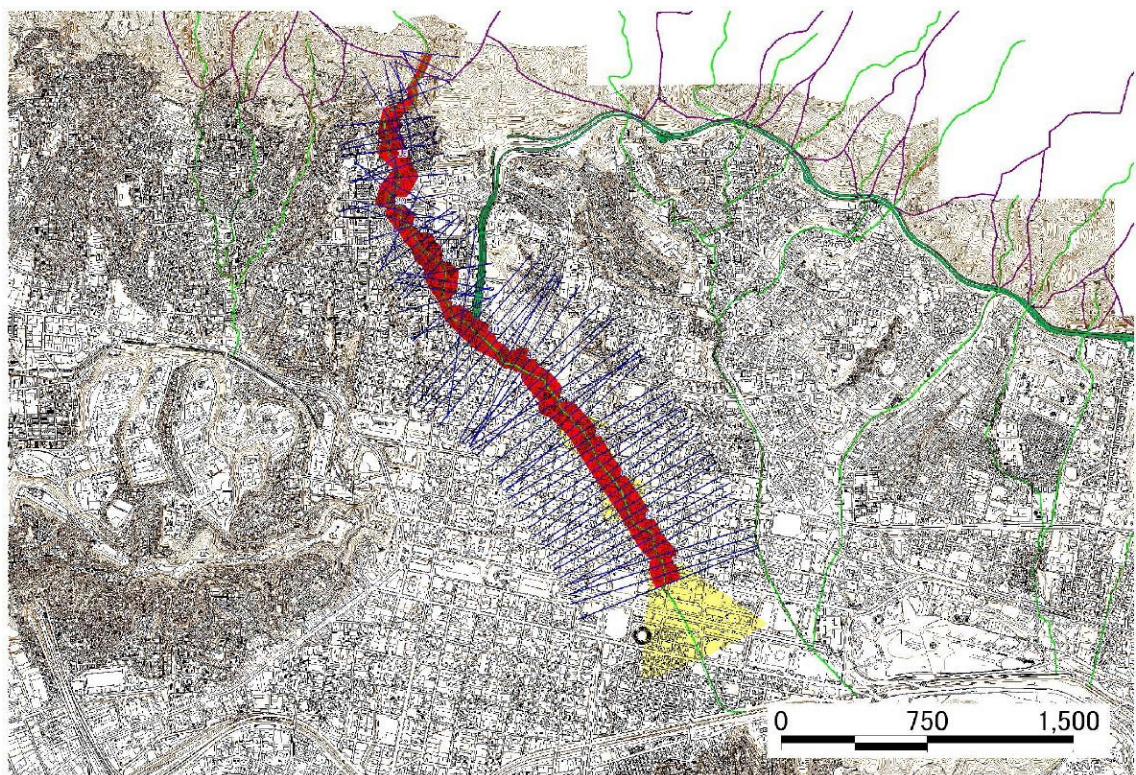
**Figure 4.1.1.25 Criteria for Identification of Unit Slope**



**Figure 4.1.1.26 Number of Unstable Steep Slope and Landslide**

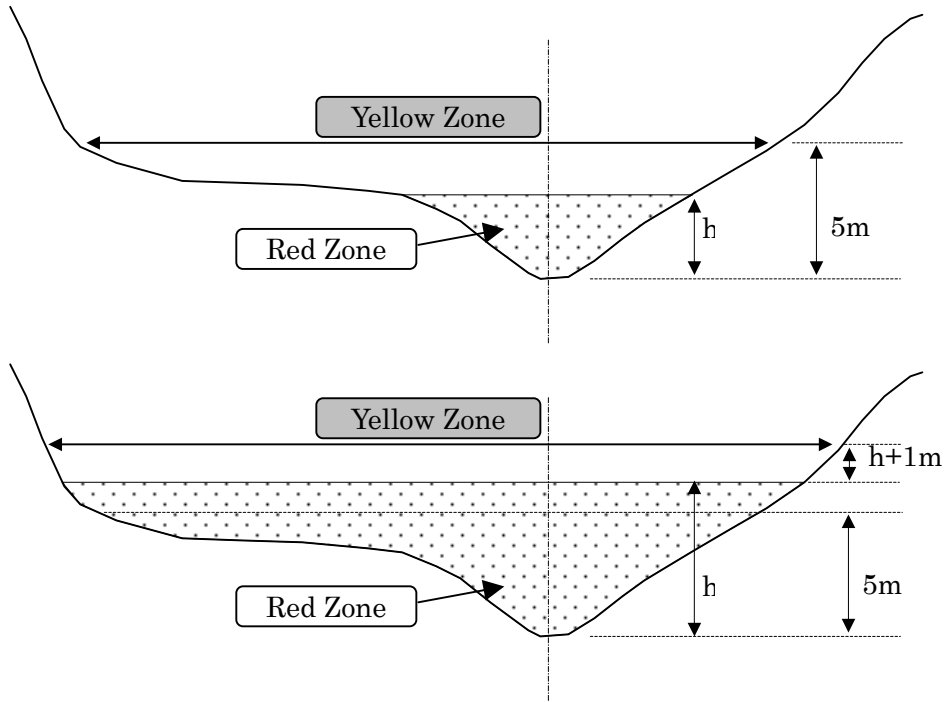


**Figure 4.1.1.27 Resistance Force for Each Type of Building in Caracas**

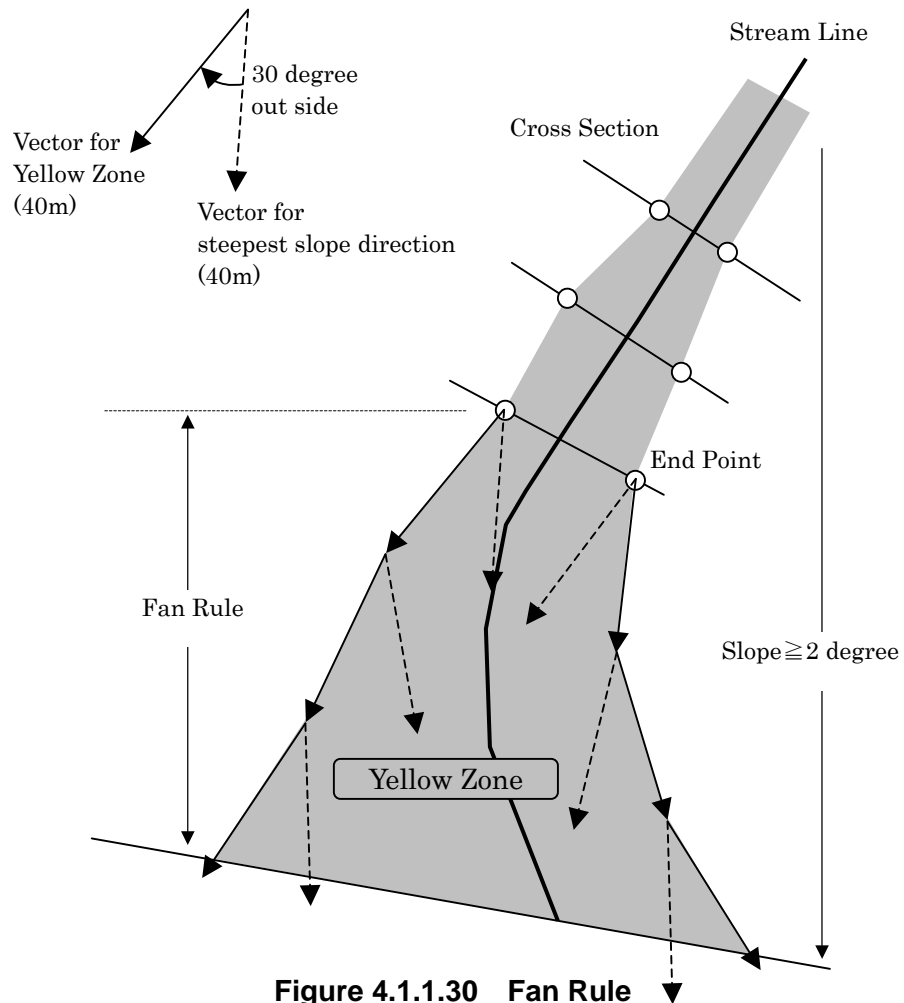


**Figure 4.1.1.28 Example of Cross Sections for Method 1 (Catuche)**





**Figure 4.1.1.29 Definition of Yellow Zone**



**Figure 4.1.1.30 Fan Rule**

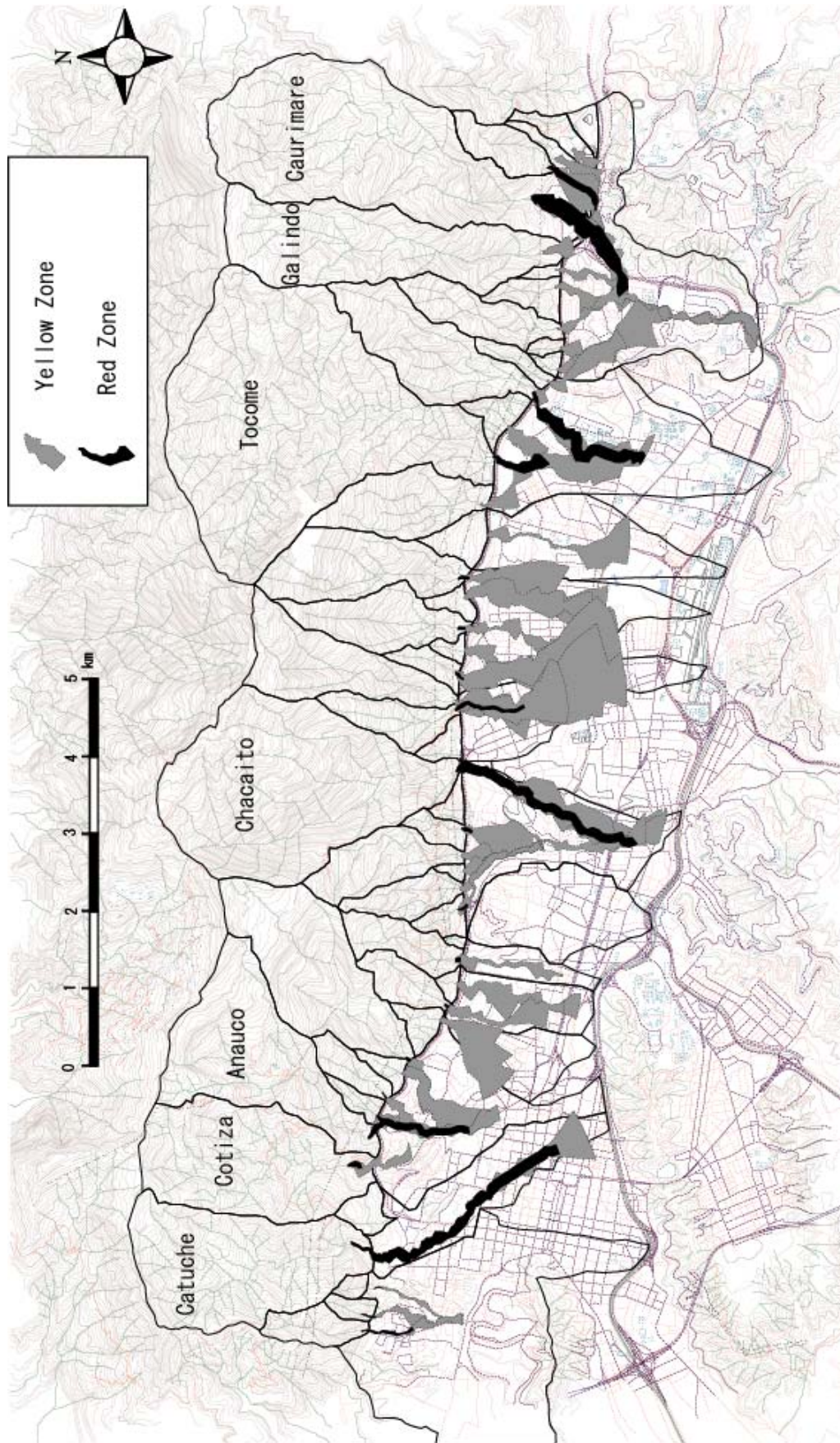


Figure 4.1.1.31 Debris Flow Hazard Map by Method-1

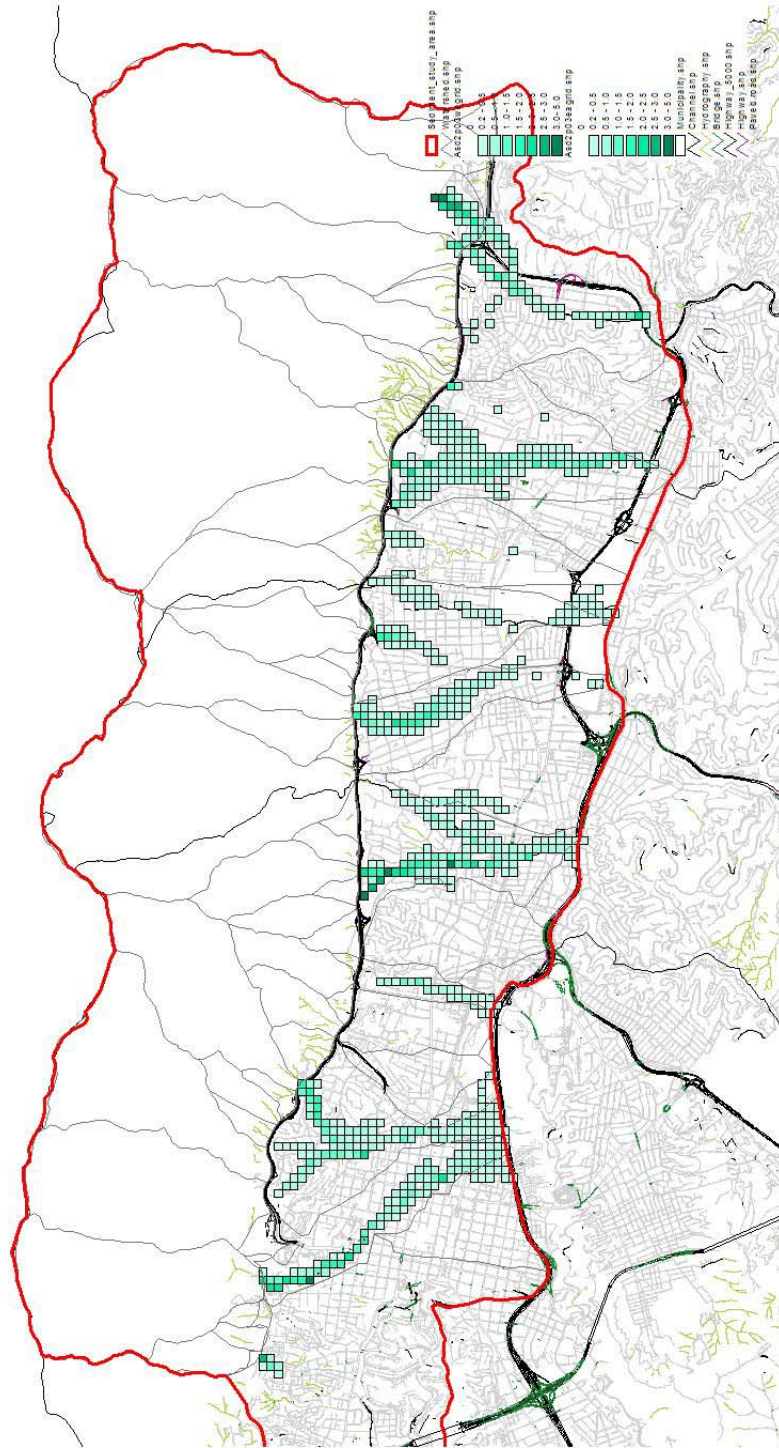
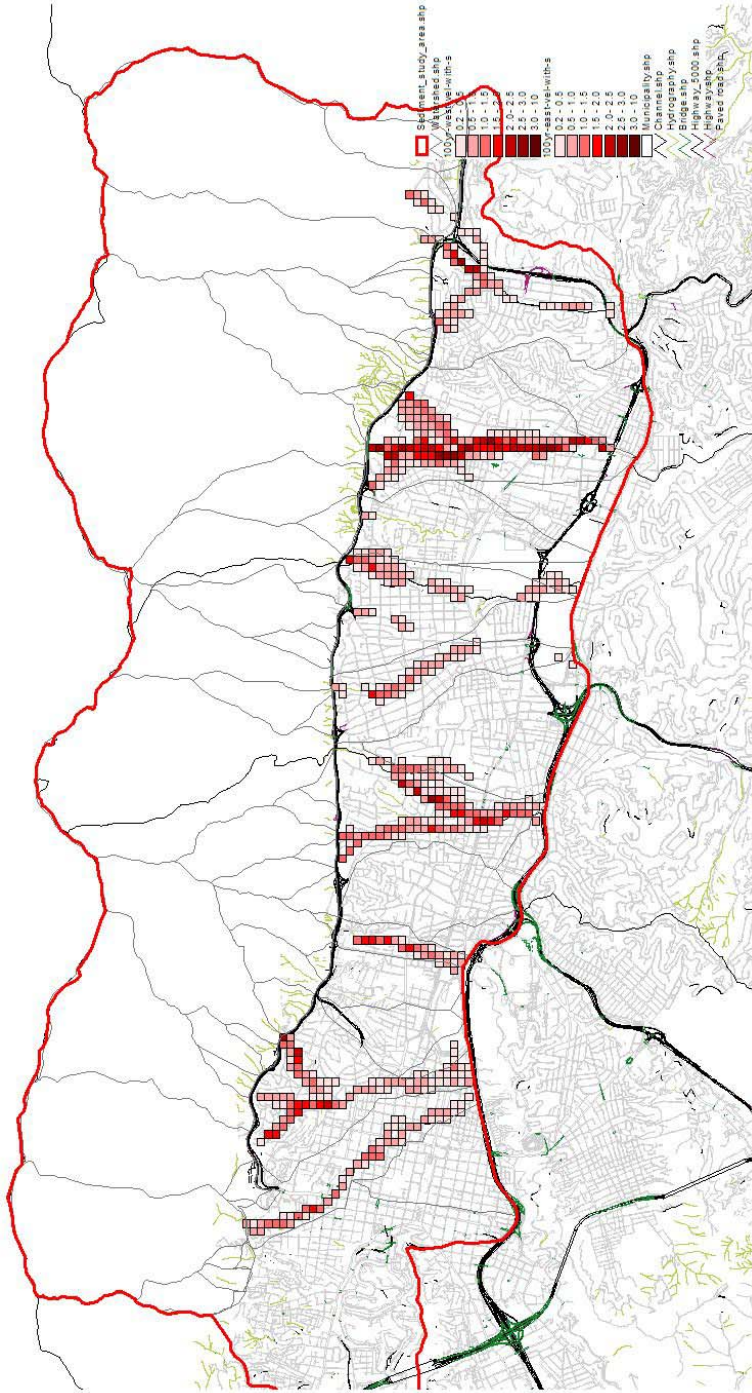


Figure 4.1.1.32 Depth for 100 Years Return Period under Existing Conditions





**Figure 4.1.1.33 Velocity for 100 Years Return Period under Existing Conditions**



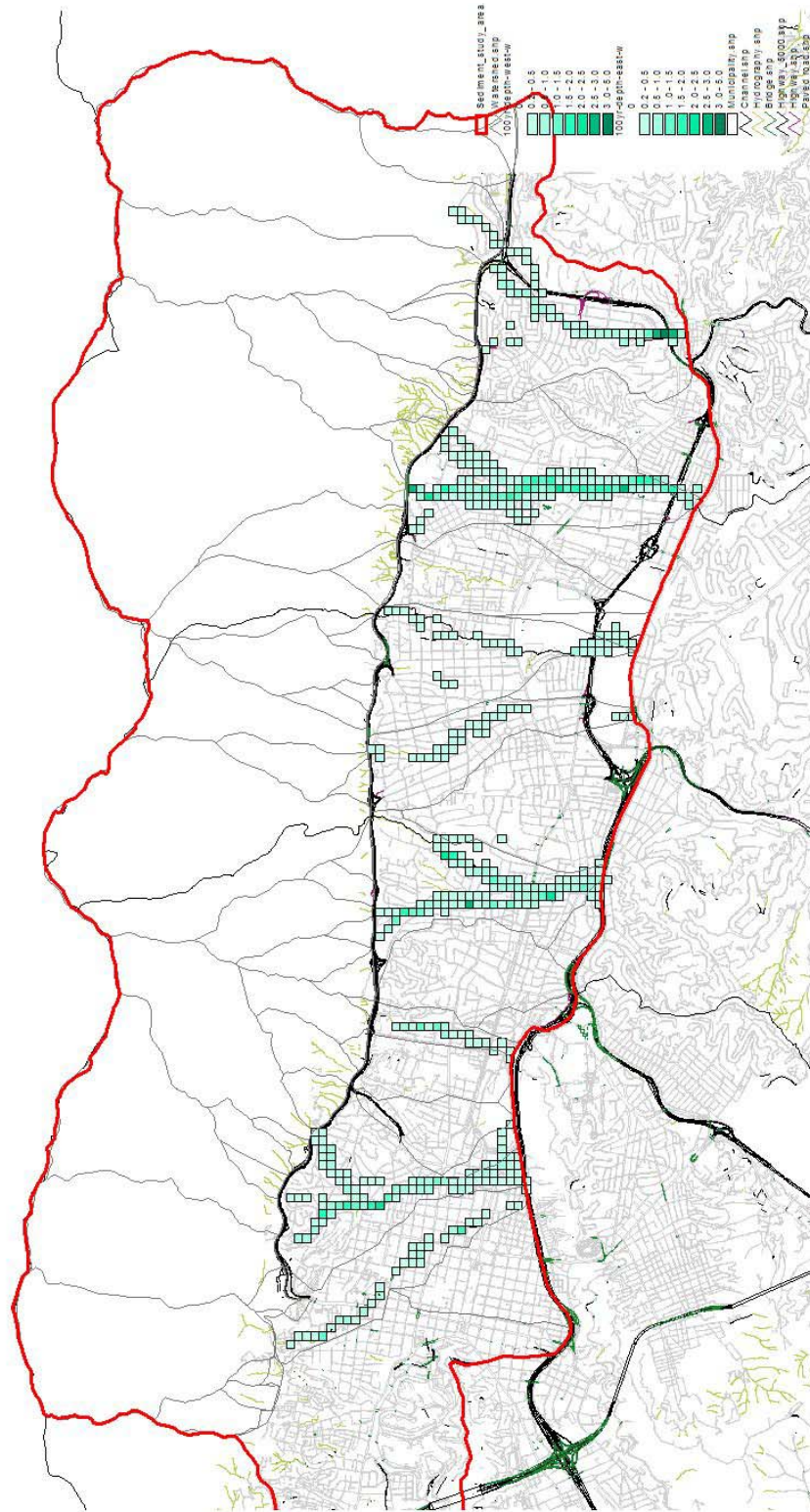
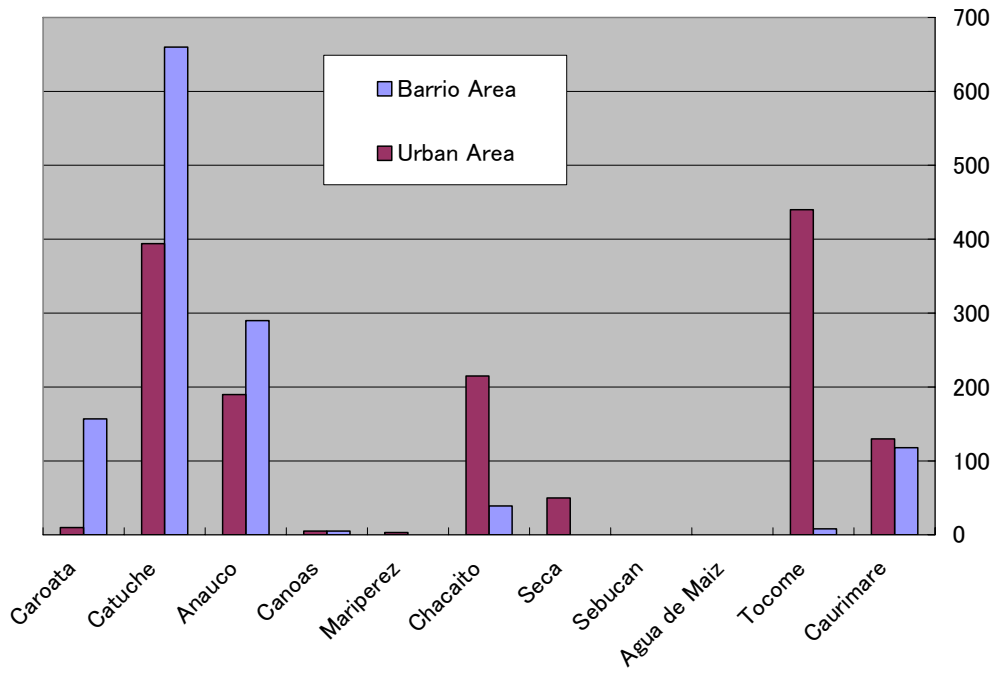


Figure 4.1.1.34 Depth for 100 years return period under with-Sabo Dam conditions



**Figure 4.1.1.35 Number of House in Red Zone**

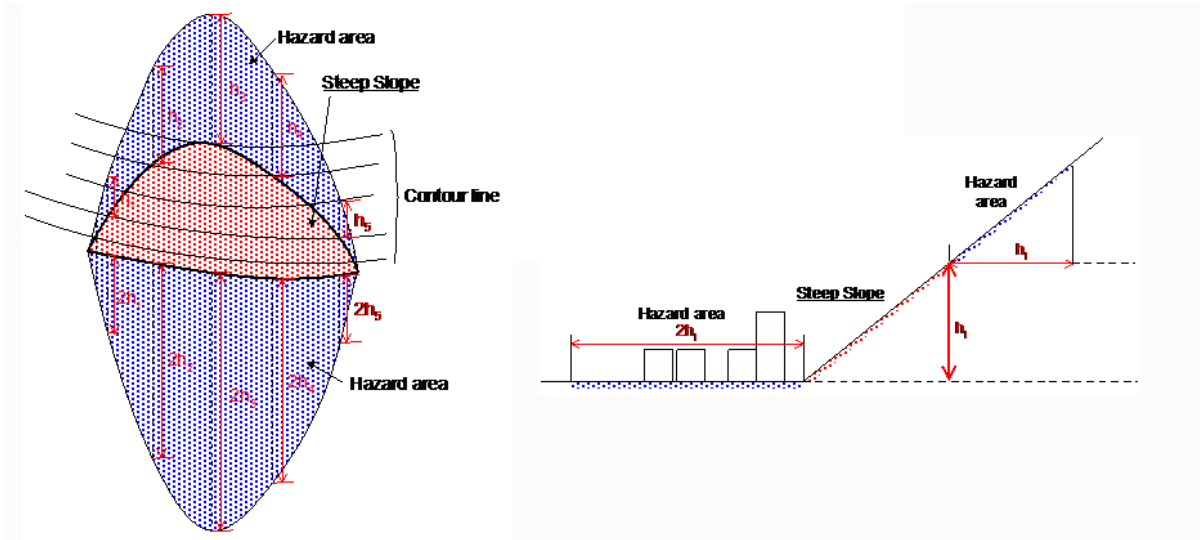


Figure 4.2.1.1 Concept of Affected Area (Risk) by Step Slope Failure

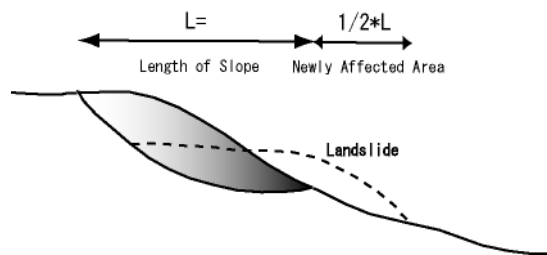
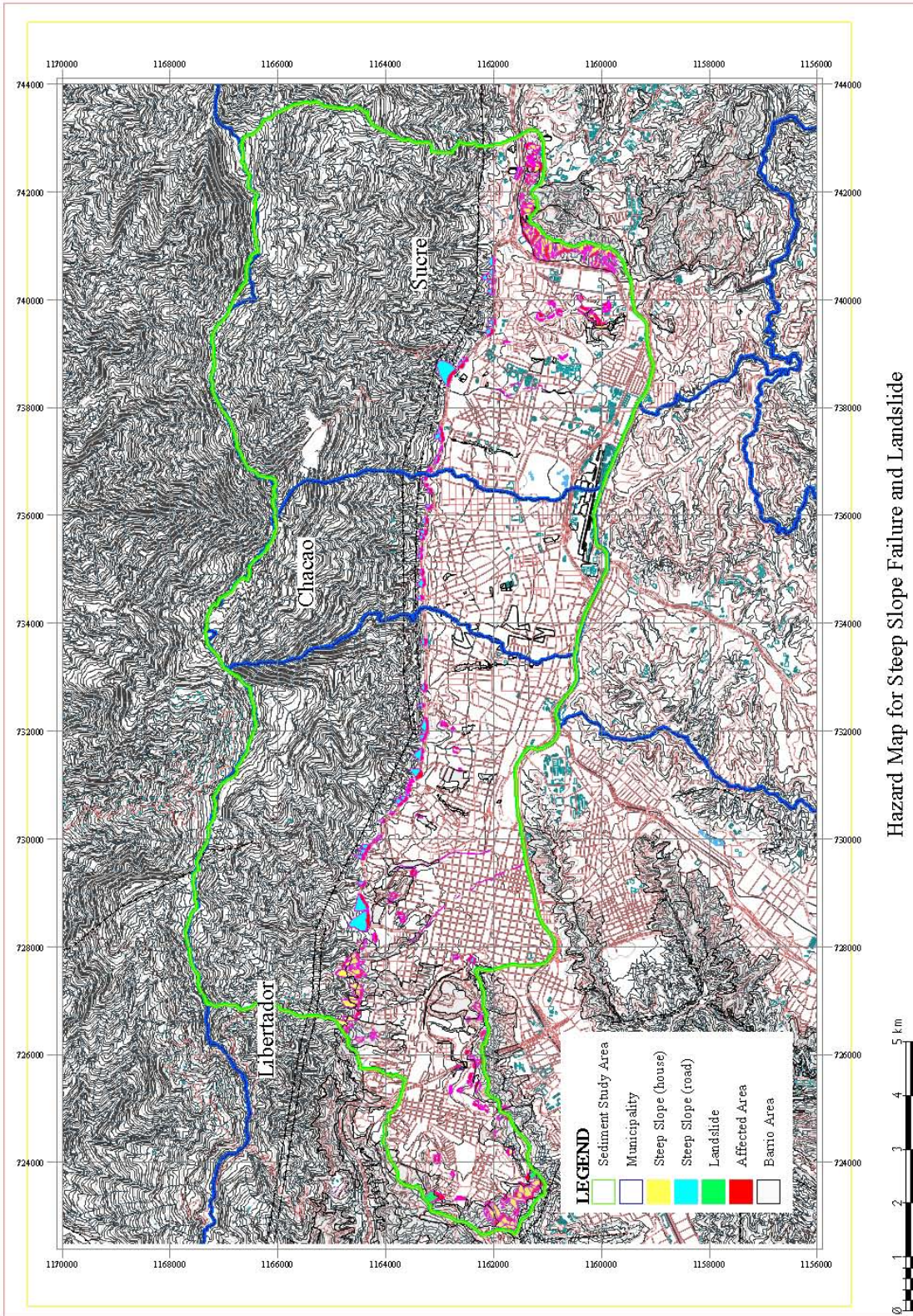


Figure 4.2.1.2 Concept of Affected Area (Risk) by Landslide





**Figure 4.2.1.3(1/4) Hazard Map for Landslide and Steep Slope Failure (Whole Area)**



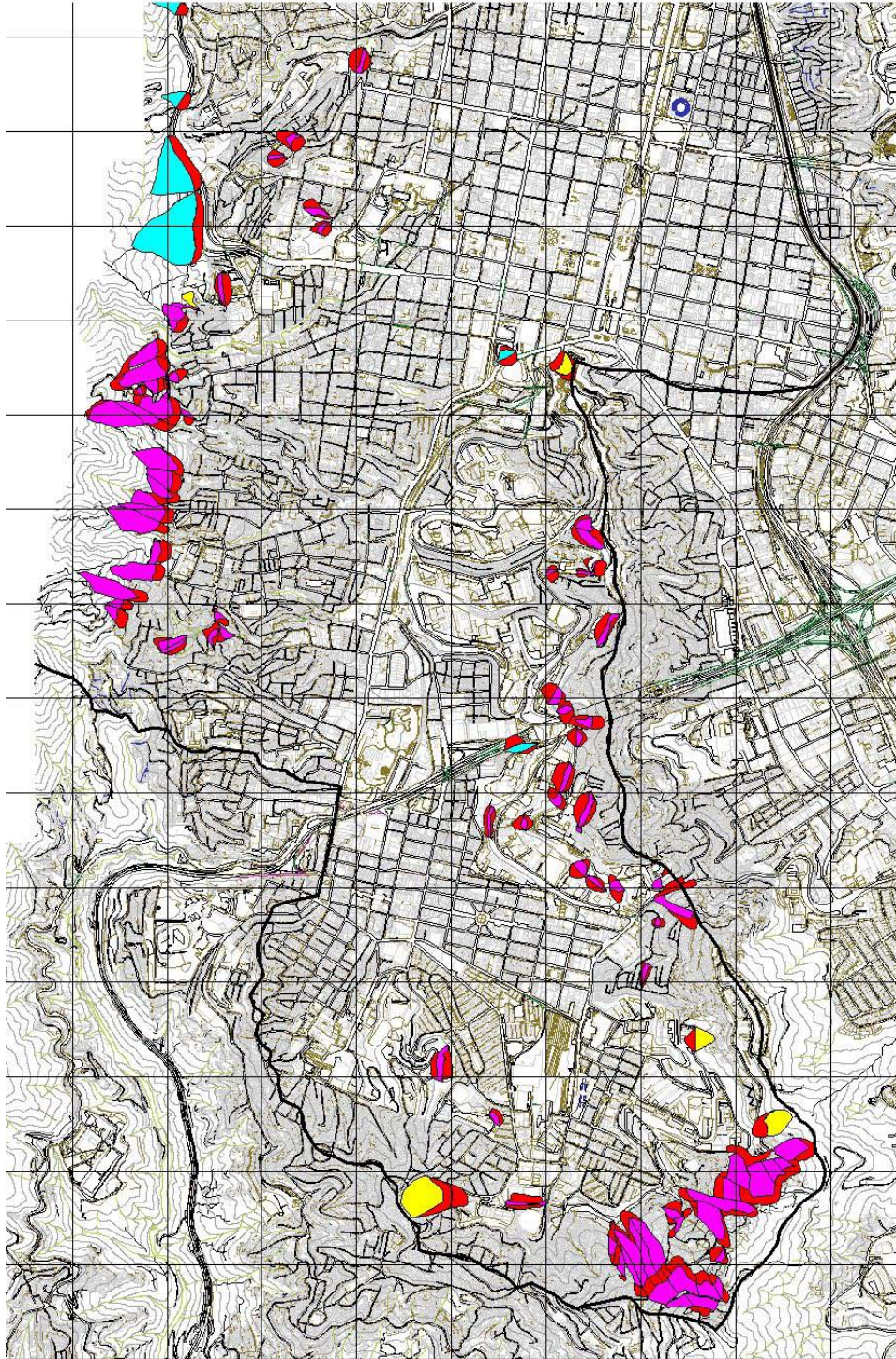


Figure 4.2.1.3(2/4) Hazard Map for Landslide and Steep Slope Failure (Western Part)





Figure 4.2.1.3(3/4) Hazard Map for Landslide and Steep Slope Failure (Central Part)

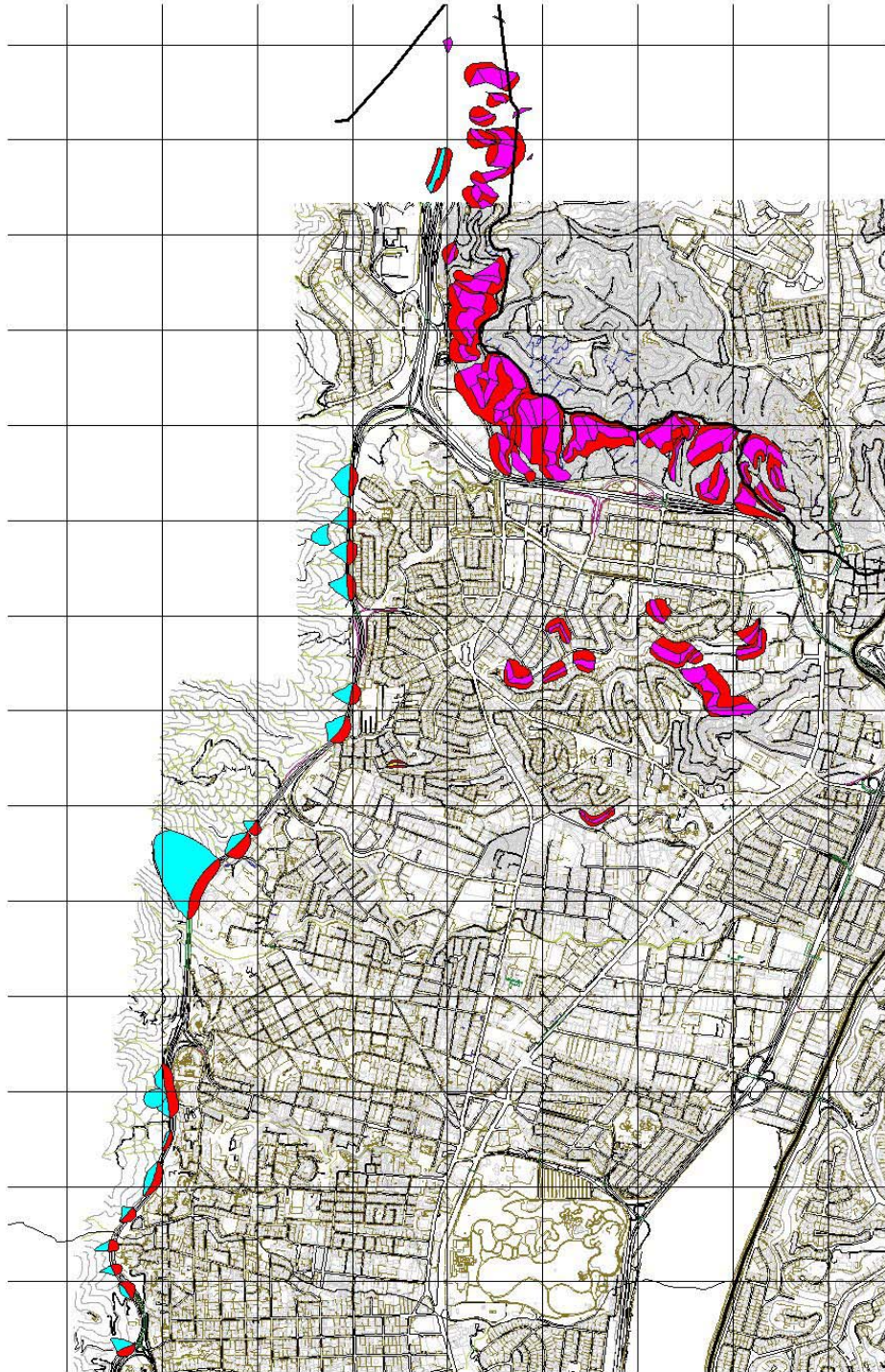


Figure 4.2.1.3(4/4) Hazard Map for Landslide and Steep Slope Failure (Eastern Part)



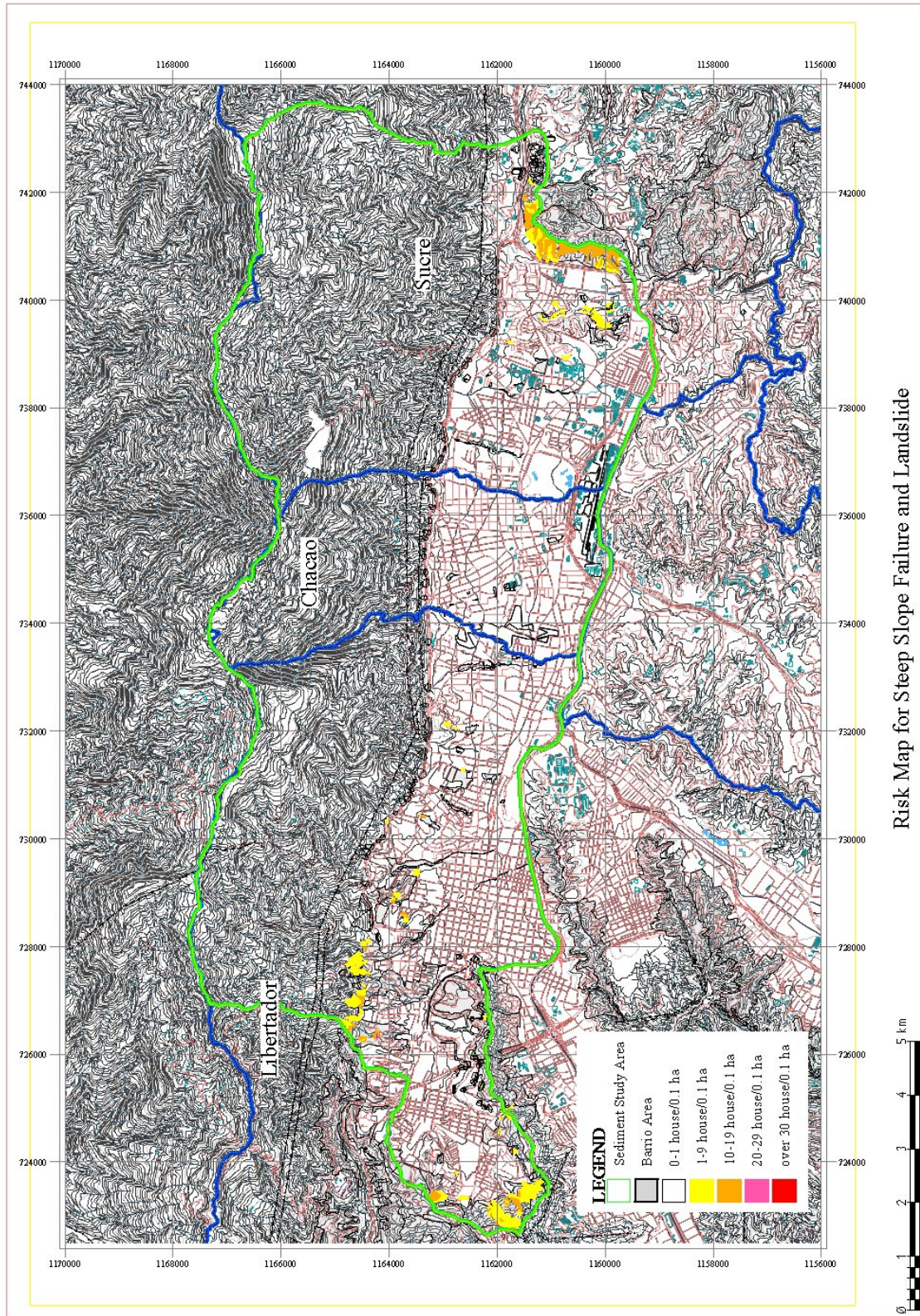


Figure 4.2.1.4 Risk Map for Landslide and Steep Slope Failure (Whole Area)