Supplement of TRIGRS input parameters

Table S1 The parameters used in TRIGRS

Geologic Time	Name (abbr.)	γ_s (kN/m^3)	C (kPa)	ϕ (°)	K (10^{-6} m/s)	D (10^{-6} m^2/s)	Description (Ref: Central Geological Survey in Taiwan)
Holocene	Alluvium (a)	19.5	10.5	34	29	8800	Gravel, sand, and mud
	Terrace Deposits (t)	23	6.5	30	0.7	220	Gravel, sand and clay
Pleistocene	Lateritic Terrace Deposits (lt)	18.6	35	30	0.8	800	Red earth, lateritic gravel, sand, intercalated with sand and silt lentils
Miocene	Mushan Formation (Ms)	27.5	16.8-28.8	32.0-36.0	10	2000	Alternations of sandstone and shale, intercalated with coal seams
	Nanchuang Formation (Nc)	27.5	23.5	34.5	10	2000	Alternations of sandstone and shale, intercalated with coal seams
	Nankang Formation (Nk)	27.5	29	36	10	2000	Sandstone, siltstone, and shale
	Piling Shale (Pi)	24.8	19.9-27.4	32.0-35.0	10	2000	Shale with intercalated sandstone
	Shihti Formation (St)	27.5	24.1-30.1	32.0-34.0	10	2000	Alternations of sandstone and shale, intercalated with coal seams
	Tapu Formation (Tp)	27.5	20.9	34	10	2000	Alternations of muddy sandstone, white sandstone and shale
	Taliao Formation (Tl)	27.5	16.3-27.3	32.0-36.0	10	2000	Shale and sandstone
Oligocene-Miocene	Wenshui Formation (Ws)	24.8	16.4-28.9	32.0-36.0	10	2000	Sandstone and shale interbeds
Oligocene	Kangkou Formation (Kk)	25.3	20.6-33.1	26.0-31.5	20	4000	Argillite or slate intercalated with thin to thick-bedded siltstone
	Shuichangliu Formation (Om)	27.5	21.0-33.5	29.0-33.0	10	2000	Argillite, slate
	Tatungshan Formation (Tt)	27.5	19.1-33.0	28.0-34.0	10	2000	Argillite intercalated with thin to thick-bedded siltstone and fine-grained sandstone
	Tsuku Formation (Tu)	25.3	18.0-30.0	27.0-30.0	10	1000	Alternations of siltstone and argillite
Eocene	Chungling Formation (Cl)	25	24.8-32.8	29	20	4000	Argillite or slate, with thin bedded metasandstone
	Hsitsun Formation (Ht)	25	22.2-32.6	30.5-33.5	10	2000	Thin alternations of argillite and metasandstone
	Szeleng Sandstone (Em)	23.5	18.1-32.0	28.0-32.0	10	2000	Thick-bedded party pebbly quartzitic sandstone, arkosic sandstone and thin alternations, with argillite and thin coal seams on the upper part

Supplement of relationship of slope and landslide depth

Table S2 Relationship of slope and landslide depth (Chen et al., 2010)

Slope (degree)	Shimen watershed northern Taiwan (m)	Dajia watershed middle Taiwan (m)	Landslides triggered by Typhoon Aere in Shimen watershed northern Taiwan (m)	Average (m)	Classified Levels in Figure 8 (m)
<20	1.41	3.04	0.32	1.59	1.5
20~30	3.13	4.19	2.82	3.38	3.5
30~40	3.51	5.33	4.27	4.37	4.5
40~50	2.17	3.49	1.98	2.55	2.5
>50	1.82	1.33	0.20	1.12	1.0

Chen S.C., Wu C.H., Wang Y.P. (2010) The Discussion of the Characteristic of Landslides Caused by Rainfall or Earthquake. Journal of Chinese Soil and Water Conservation, 41(2): 94-112. (in Chinese)

Supplement of debris flow coverage area

Table S3 Debris flow coverage area for different use

Land Use Type	Scenario 1 (Square kilometer)	Scenario 2 (Square kilometer)
Transportation Loss	0.22	0.25
Household Loss	0.09	0.10
Publid Building Loss	0.03	0.03
Forest Loss	44.35	54.52
Hydraulic Facility Loss	1.70	1.89
Industry and Commerce Loss	0.07	0.07
Agriculture Loss	0.45	0.57