

Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

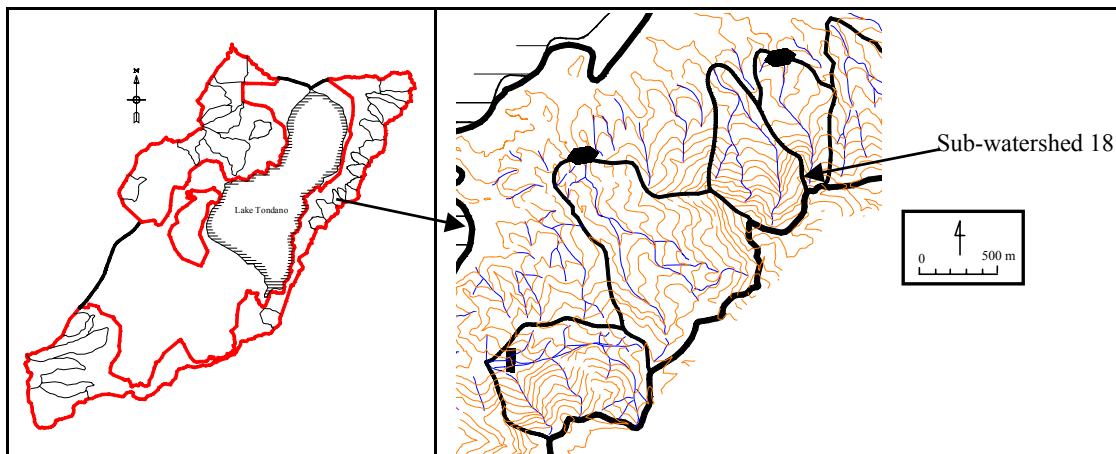
Sub-watershed - 18

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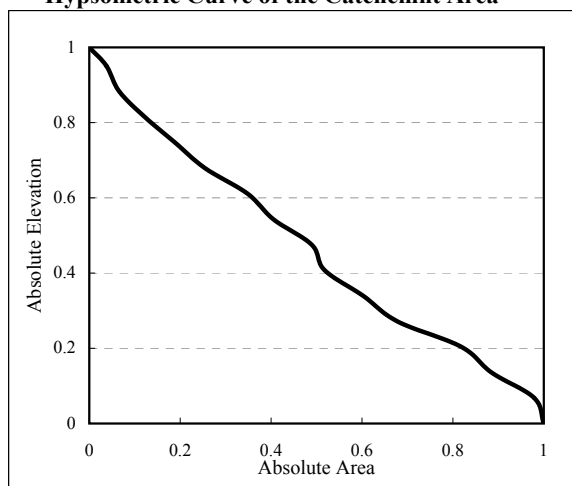
1) Catchment Area

Area	43	ha	Highest Point	1,068	m
Average Slope	48	%	Lowest Point	700	m
			Elevation Difference	368	m

Plan



Hypsometric Curve of the Catchment Area



Land Use of Catchment Area

Natural/Semi-natural Forest	18	%
Secondary Forest	0	%
Planted Forest	0	%
Estate	73	%
Mixture of Estate and Dry-farming Land	0	%
Dry Farming Land	9	%
Pasture Land	0	%
Paddy Field	0	%
Swamp	0	%
Water Body	0	%
Settlement & Othres	0	%

Source:
1:50,000 Land Use Map prepared by JICA Study Team
for Master Plan.

**The Study on Critical Land and Protection Forest
Rehabilitation at Tondano Watershed
in the Republic of Indonesia**

Japan International Cooperation Agency

Figure HAT2.19

Characteristics of Sub-watershed 18 (1/2)

Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

Sub-watershed - 18

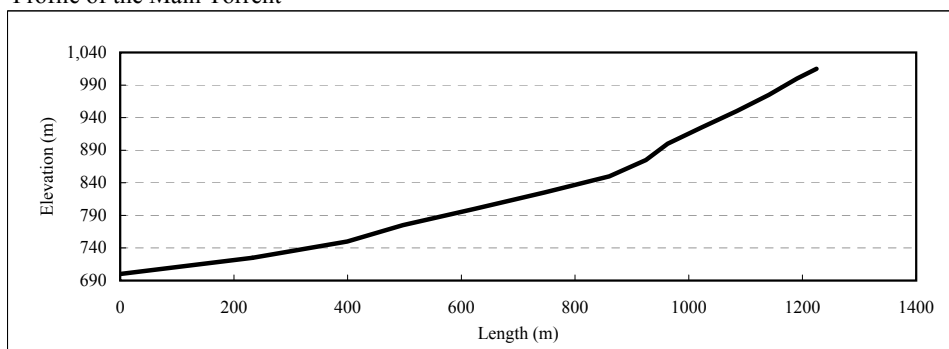
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2) Main Torrent

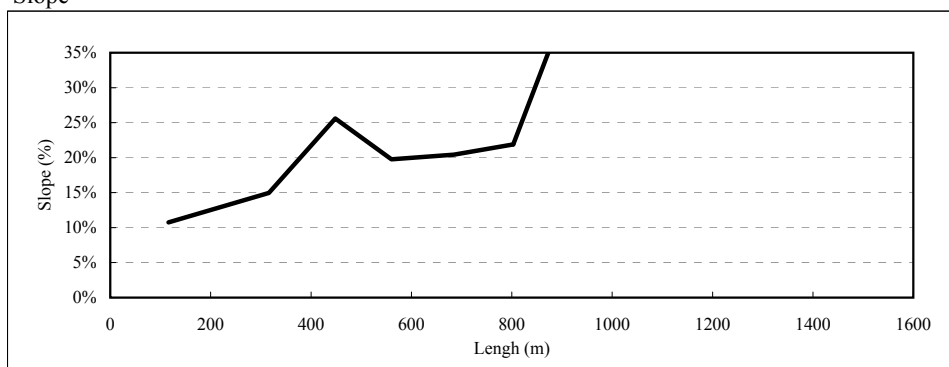
Mean Torrent Bed Gradient

50.8 %

Profile of the Main Torrent



Slope



Torrent Condition

Survey Point

TD-21

Bed Width

0.7 m

Bank Height

1.0 m

Bank Slope

70 -

Gravel Condition

Min

10 cm

Max

40 cm

Average

20 cm

Uniformity

No

Coverage Ratio

30 %

Amount of Deposition

0 -

Land Use of Surrounding Area

Arable Upland/Estate

Water Depth at the Time of Measurement

- m

Water Color

-

Remarks

See Figure HAT2.32 for the survey point.

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Figure HAT2.19

Characteristics of Sub-watershed 18 (2/2)

Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

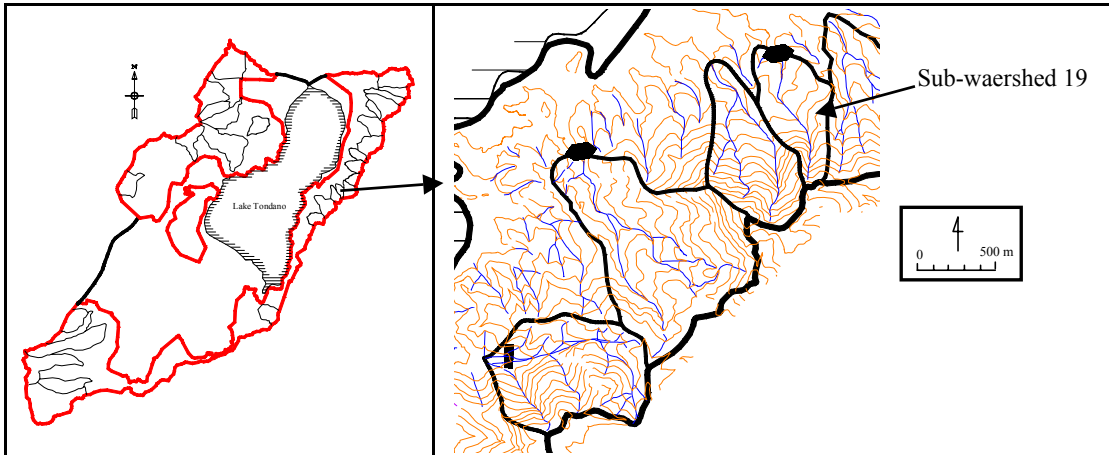
Sub-watershed - 19

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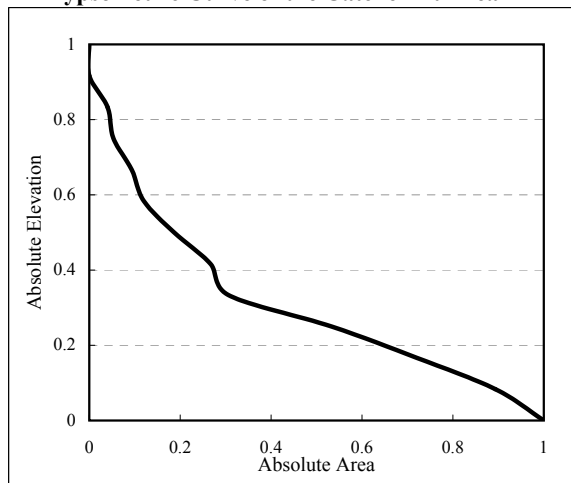
1) Catchment Area

Area	30	ha	Highest Point	1,000	m
Average Slope	33	%	Lowest Point	700	m
			Elevation Difference	300	m

Plan



Hypsometric Curve of the Catchment Area



Land Use of Catchment Area

Natural/Semi-natural Forest	0	%
Secondary Forest	0	%
Planted Forest	0	%
Estate	100	%
Mixture of Estate and Dry-farming Land	0	%
Dry Farming Land	0	%
Pasture Land	0	%
Paddy Field	0	%
Swamp	0	%
Water Body	0	%
Settlement & Othres	0	%

Source:
1:50,000 Land Use Map prepared by JICA Study Team
for Master Plan.

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Figure HAT2.20

Characteristics of Sub-watershed 19 (1/2)

Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

Sub-watershed - 19

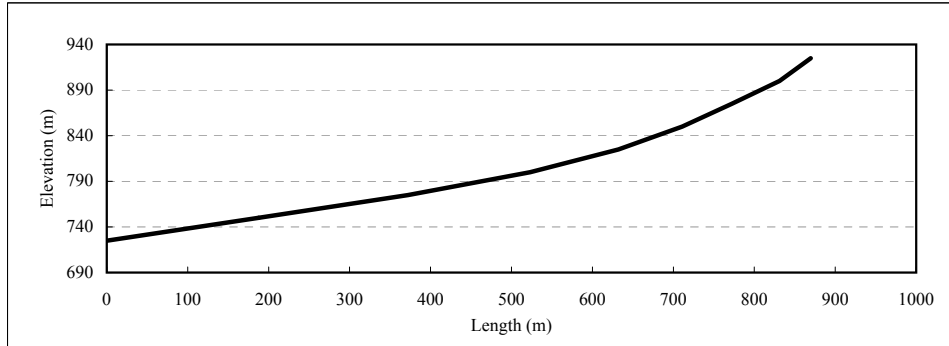
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2) Main Torrent

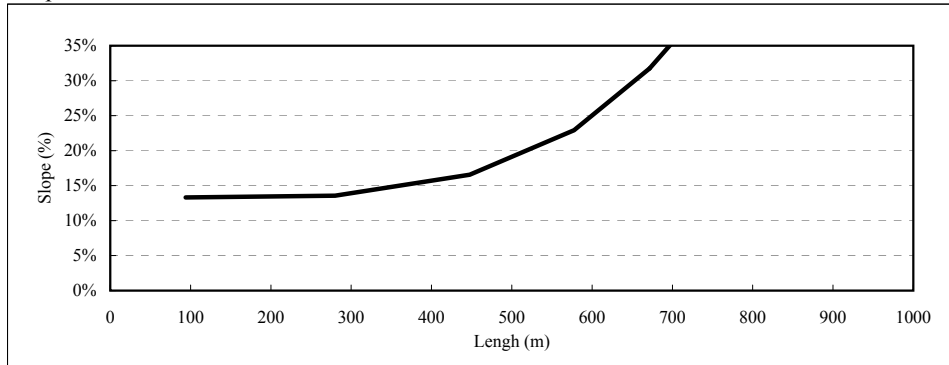
Mean Torrent Bed Gradient

40.5 %

Profile of the Main Torrent



Slope



Torrent Condition

Survey Point

TD-22

Bed Width

1.0 m

Bank Height

2.0 m

Bank Slope

60°

Gravel Condition

Min

10 cm

Max

60 cm

Average

20 cm

Uniformity

No

Coverage Ratio

90 %

Amount of Deposition

0 -

Land Use of Surrounding Area

Forest/Estate

Water Depth at the Time of Measurement

0.15 m

Water Color

Transparent and colorless

Remarks

See Figure HAT2.32 for the survey point.

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Figure HAT2.20

Characteristics of Sub-watershed 19 (2/2)