

## Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

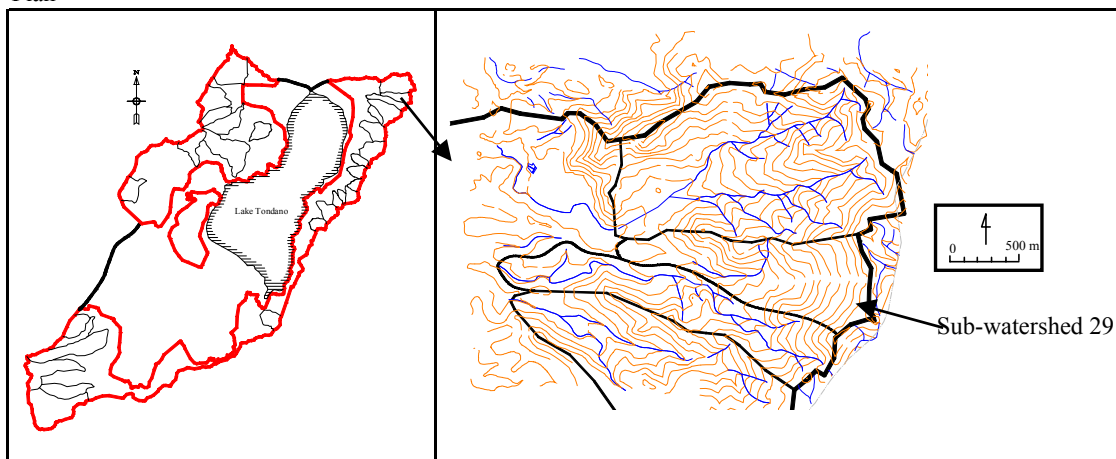
Sub-watershed - 29

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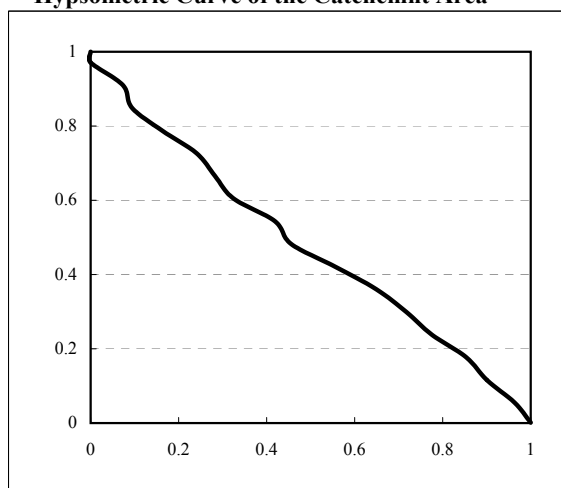
### 1) Catchment Area

Area	76	ha	Highest Point	1,137	m
Average Slope	38	%	Lowest Point	728	m
			Elevation Difference	409	m

Plan



**Hypsometric Curve of the Catchment Area**



### Land Use of Catchment Area

Natural/Semi-natural Forest	37	%
Secondary Forest	0	%
Planted Forest	0	%
Estate	63	%
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.

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

Japan International Cooperation Agency

**Figure HAT2.30**

**Characteristics of Sub-watershed 29 (1/2)**

## Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

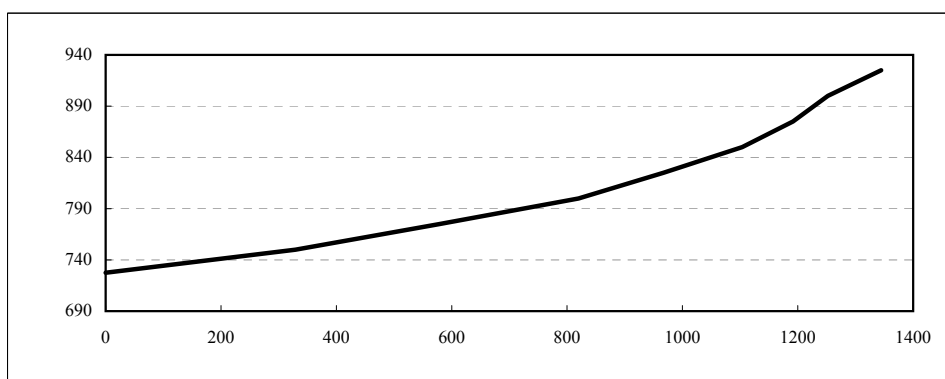
Sub-watershed - 29

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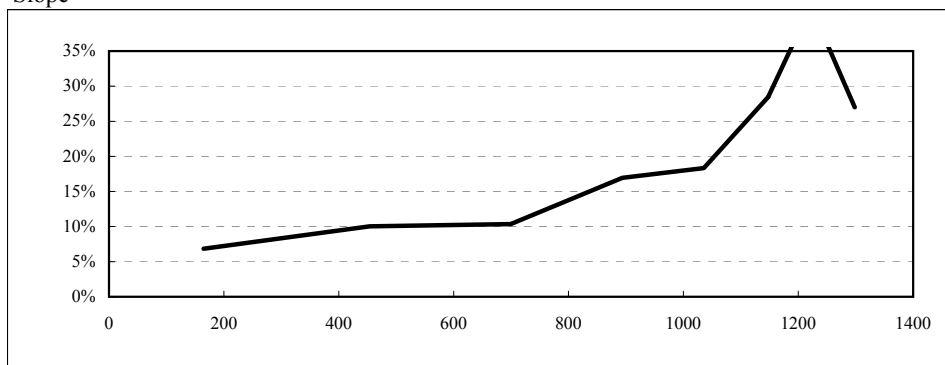
### 2) Main Torrent

Mean Torrent Bed Gradient

20.4 %



Slope



### Torrent Condition

Survey Point

TD-31

Bed Width

2.0 m

Bank Height

1.0 m

Bank Slope

60 °

Gravel Condition

Min

10 cm

Max

50 cm

Average

30 cm

Uniformity

No

Coverage Ratio

70 %

Amount of Deposition

0 -

Land Use of Surrounding Area

Arable Upland/Grassland

Water Depth at the Time of Measurement

0.1 m

Water Color

Transparent and colorless

Remarks

See Figure HAT2.32 for the survey point.

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**Figure HAT2.30**

**Characteristics of Sub-watershed 29 (2/2)**

## Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

Sub-watershed - 30

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### 1) Catchment Area

Area

198

 ha

Highest Point

1,160

 m

Average Slope

38

 %

Lowest Point

715

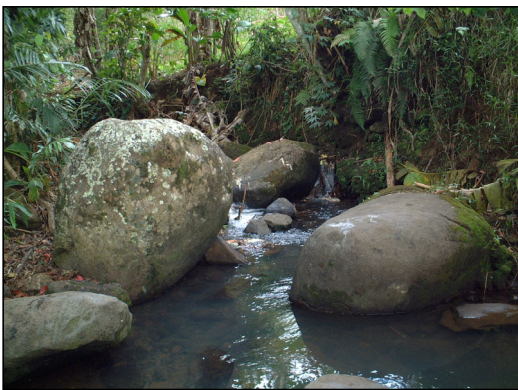
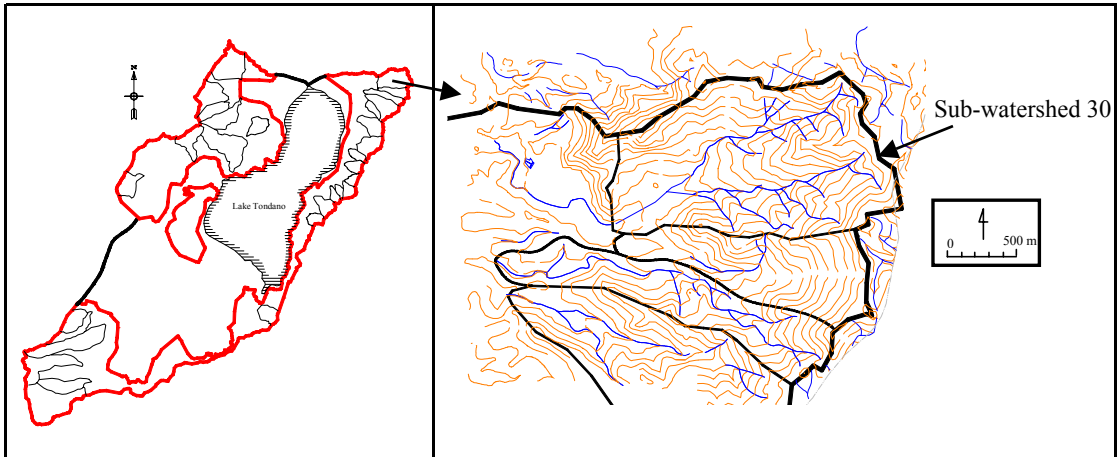
 m

Elevation Difference

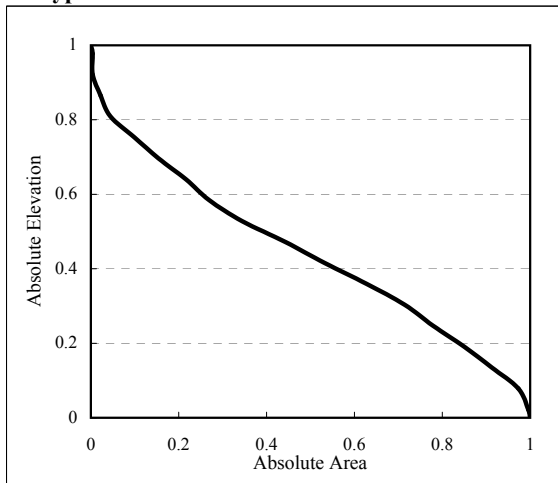
445

 m

Plan



### Hypsometric Curve of the Catchment Area



### Land Use of Catchment Area

Natural/Semi-natural Forest	4 %
Secondary Forest	0 %
Planted Forest	0 %
Estate	94 %
Mixture of Estate and Dry-farming Land	2 %
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 HAT2.31**

**Characteristics of Sub-watershed 30 (1/2)**

## Characteristics of Sub-watershed in the Intensive Area

Sub-watershed No.

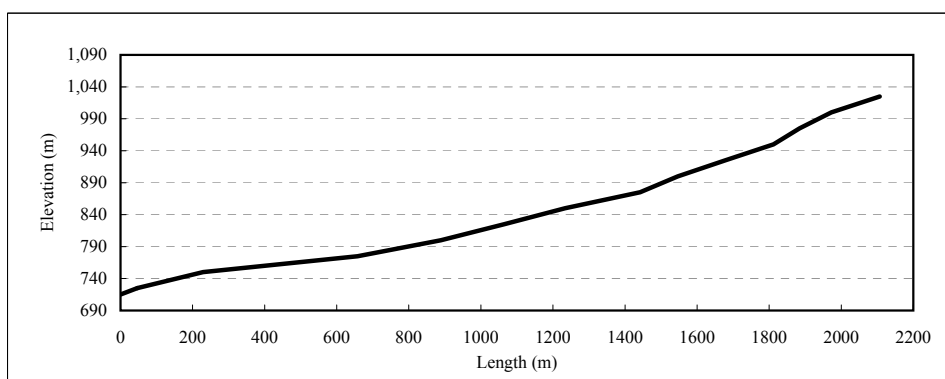
Sub-watershed - 30

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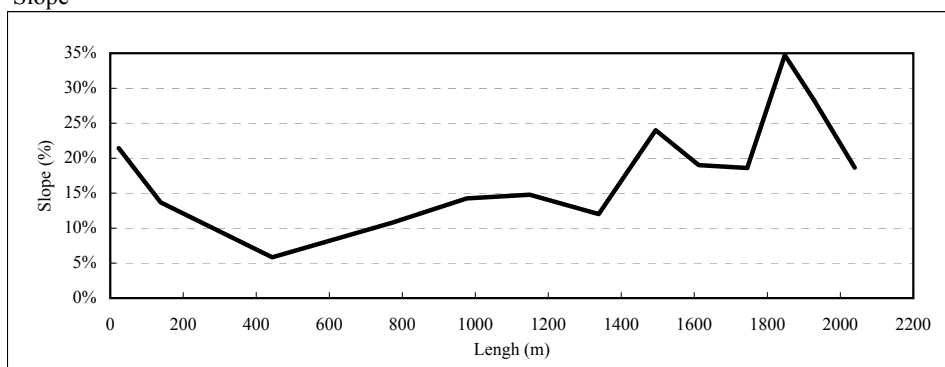
### 2) Main Torrent

Mean Torrent Bed Gradient

34.8 %



Slope



### Torrent Condition

Survey Point

TD-32

TD-33

Bed Width

2.0 m

3.0 m

Bank Height

2.5 m

1.0 m

Bank Slope

70 -

60 -

Gravel Condition

Max

5 cm

10 cm

Min

150 cm

100 cm

Average

30 cm

40 cm

Uniformity

No

No

Coverage Ratio

90 %

70 %

Amount of Deposition

0 -

0 -

Land Use of Surrounding Area

Arable Upland/Grassland

Forest

Water Depth at the Time of Measurement

0.2 m

0.2 m

Water Color

Transparent and somewhat yellow-brown

Transparent and somewhat gray

Remarks

See Figure HAT2.32 for the survey point.

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Figure HAT2.31

Characteristics of Sub-watershed 30 (2/2)

