Inventory Survey of Major Road Cut Slope Failures in the Intensive Area

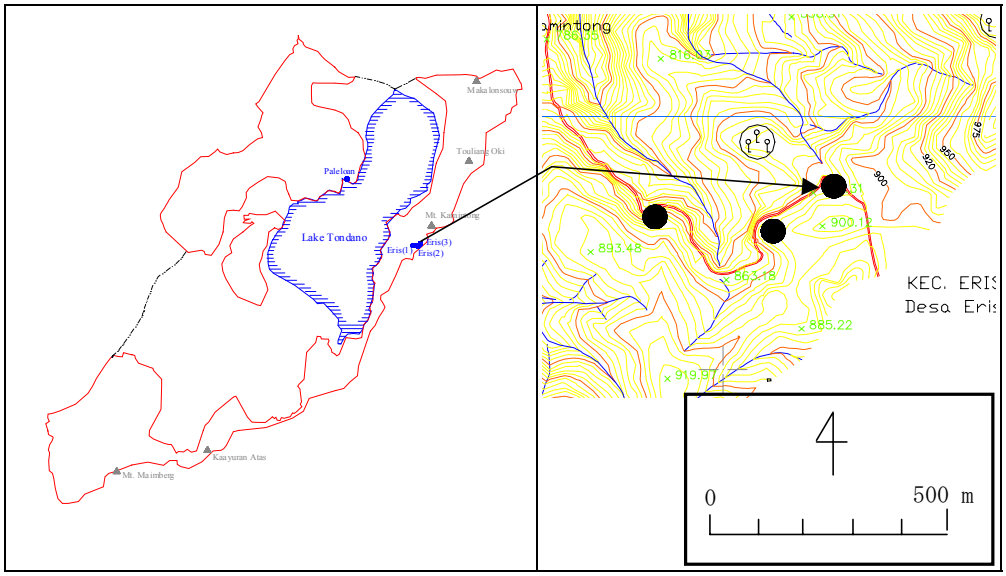
Name of Road Cut Slope Failure: Eris-3

Survey Date: 16-Nov-00

1)Location

Coordinate	01°12'55" N 124°55'31" E
Name of the Place	Eris-3, Sub-district Eris

Plan



2)Slope Failure Condition

Height	4.0	m
Length	15.0	m
Area	0.006	ha
Mean Depth	0.5	m
Estimated Volume	30	m^3
Estimated Original Slope	70	°
Present Land Use	Forest	
Applied Zone	Bm1 Zone	
Possibility of slope failure expansion	Middle	
Possibility of natural rehabilitation	Low	

View

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

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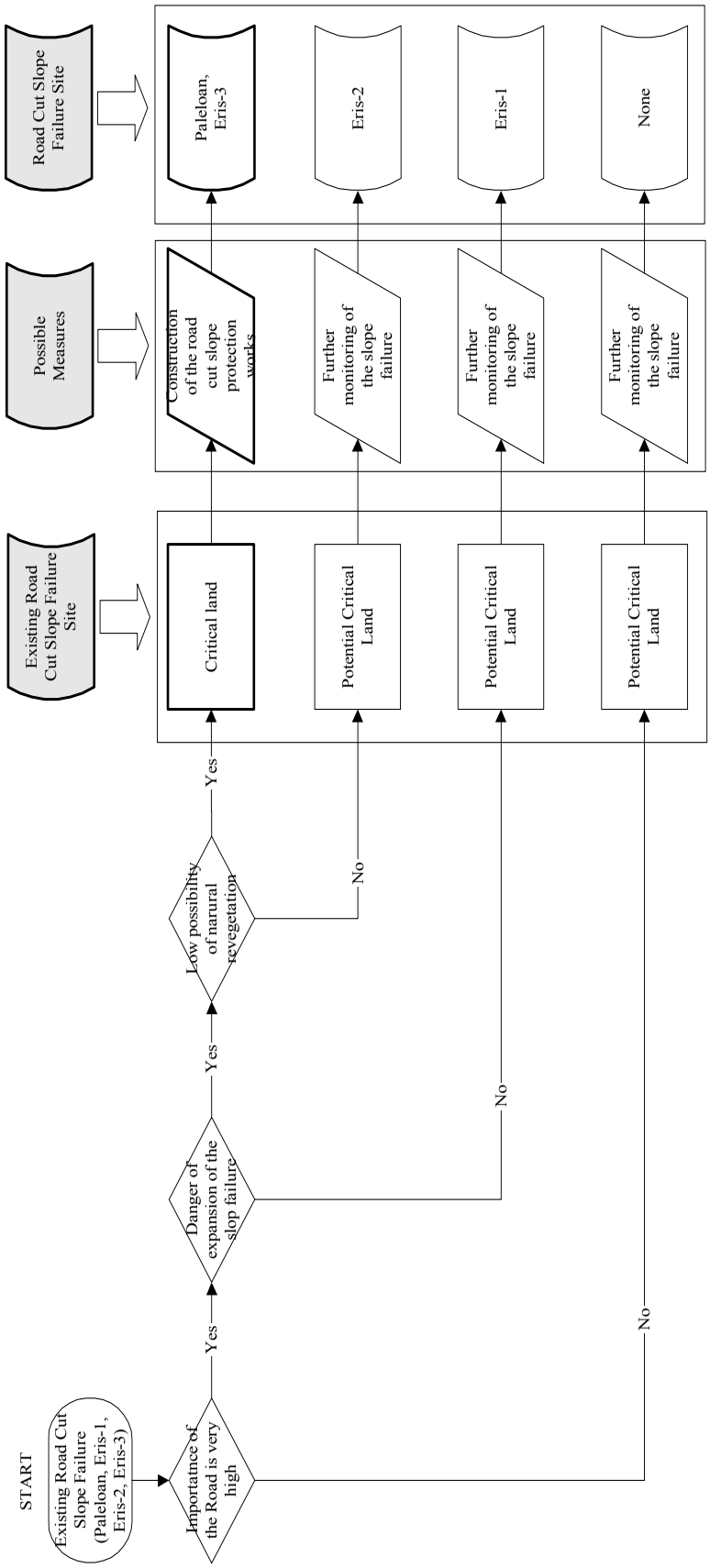
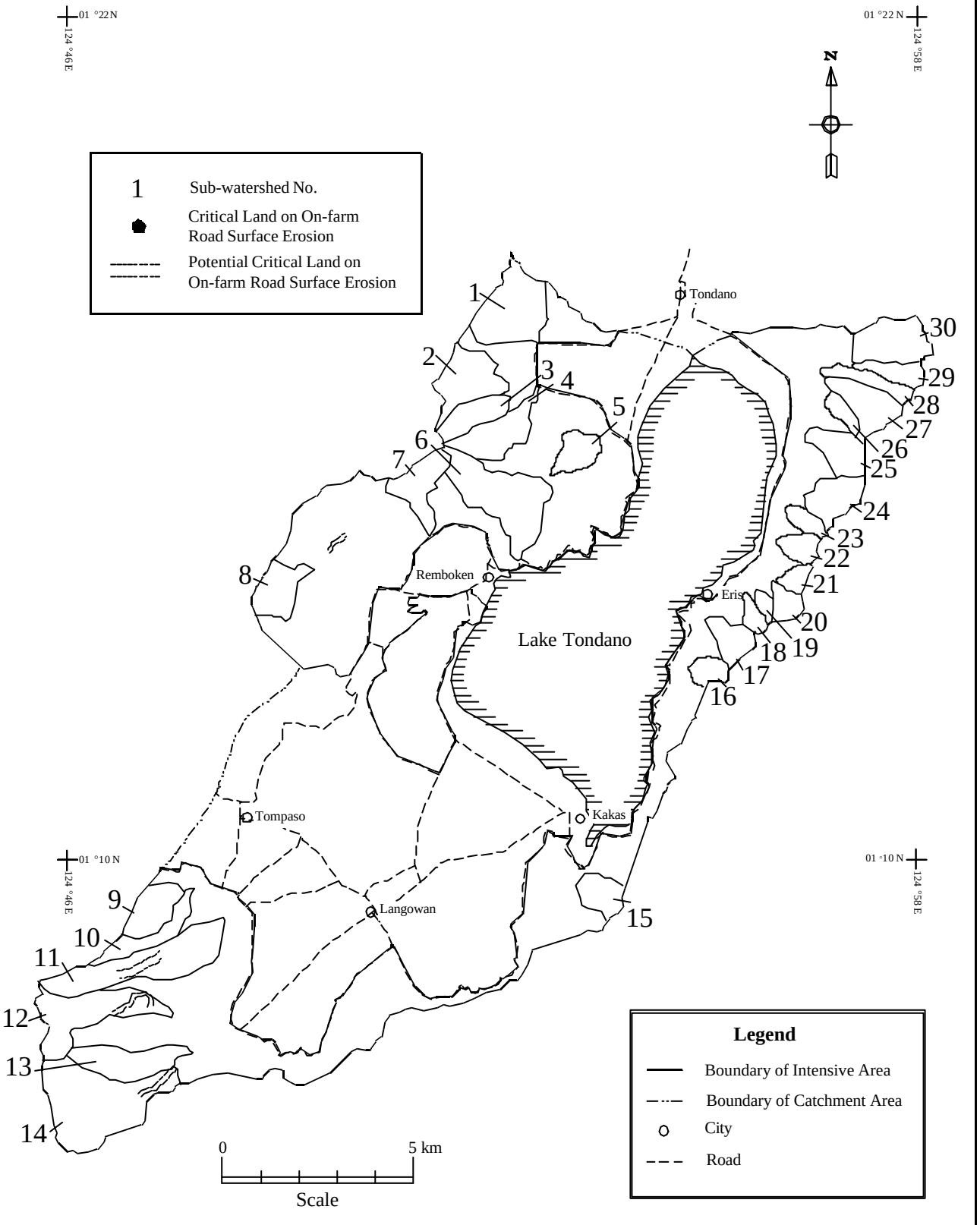
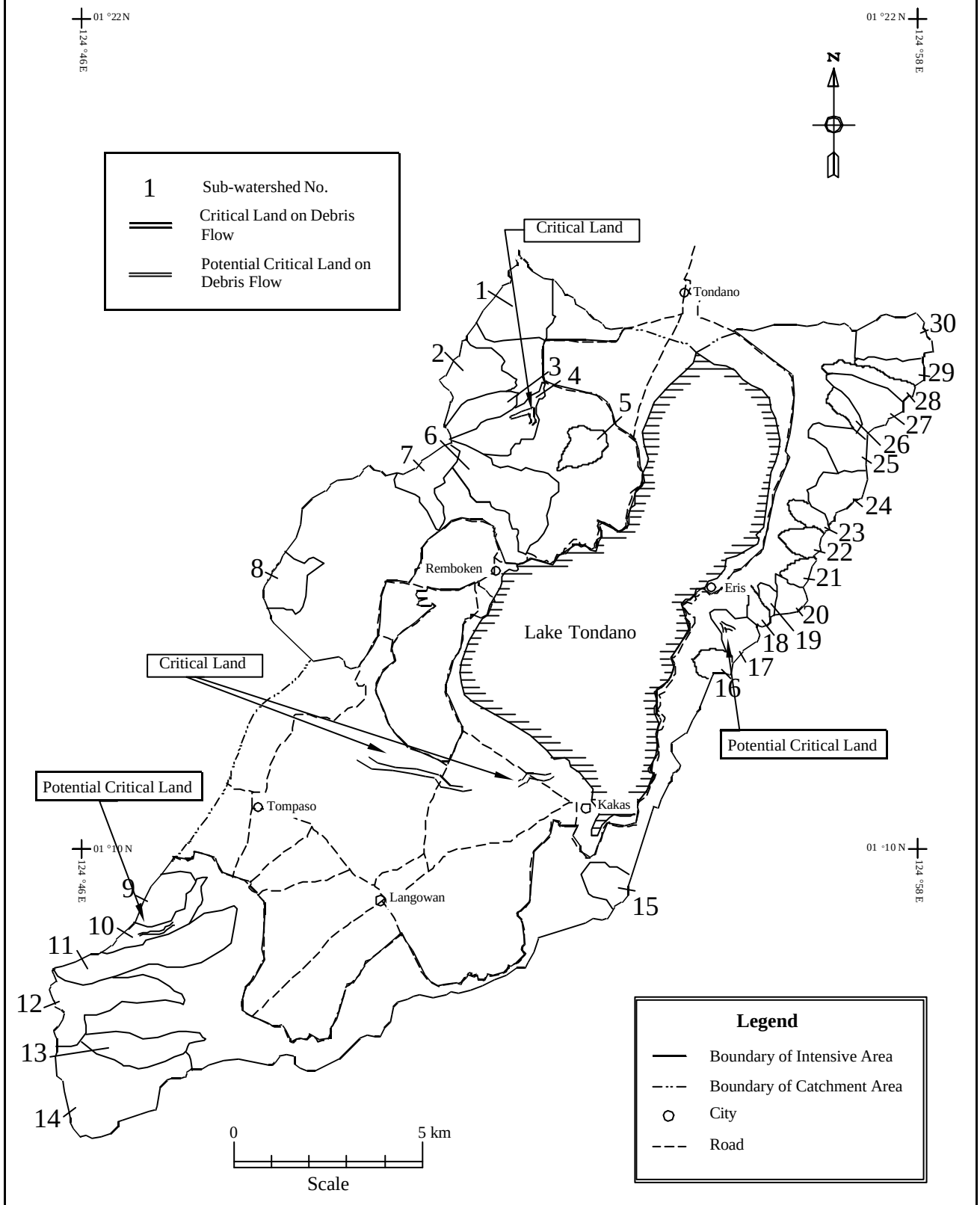
Figure H.3.20
Condition of Slope Failure along the Road (Eris-3)



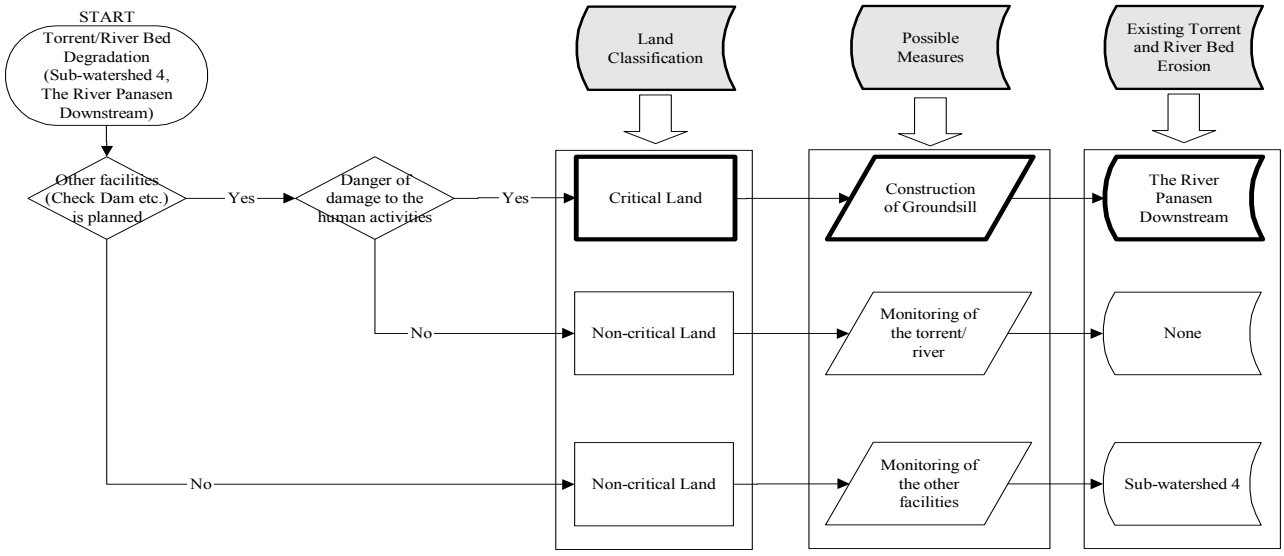
The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.21**
Japan International Cooperation Agency	**Identification of Critical Land regarding Slope Failure along the Road**



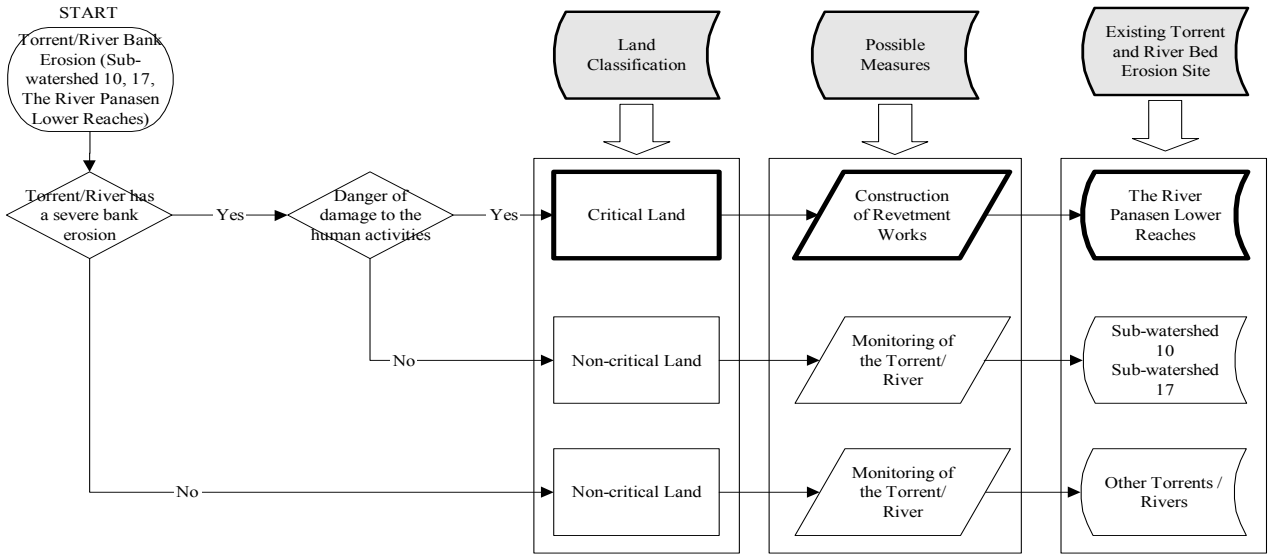
The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.22 Critical Land and Potential Critical Land regarding On-farm Road Surface Erosion**
Japan International Cooperation Agency	



The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.23**
Japan International Cooperation Agency	**Critical Land and Potential Critical Land regarding Torrent and River Erosion**

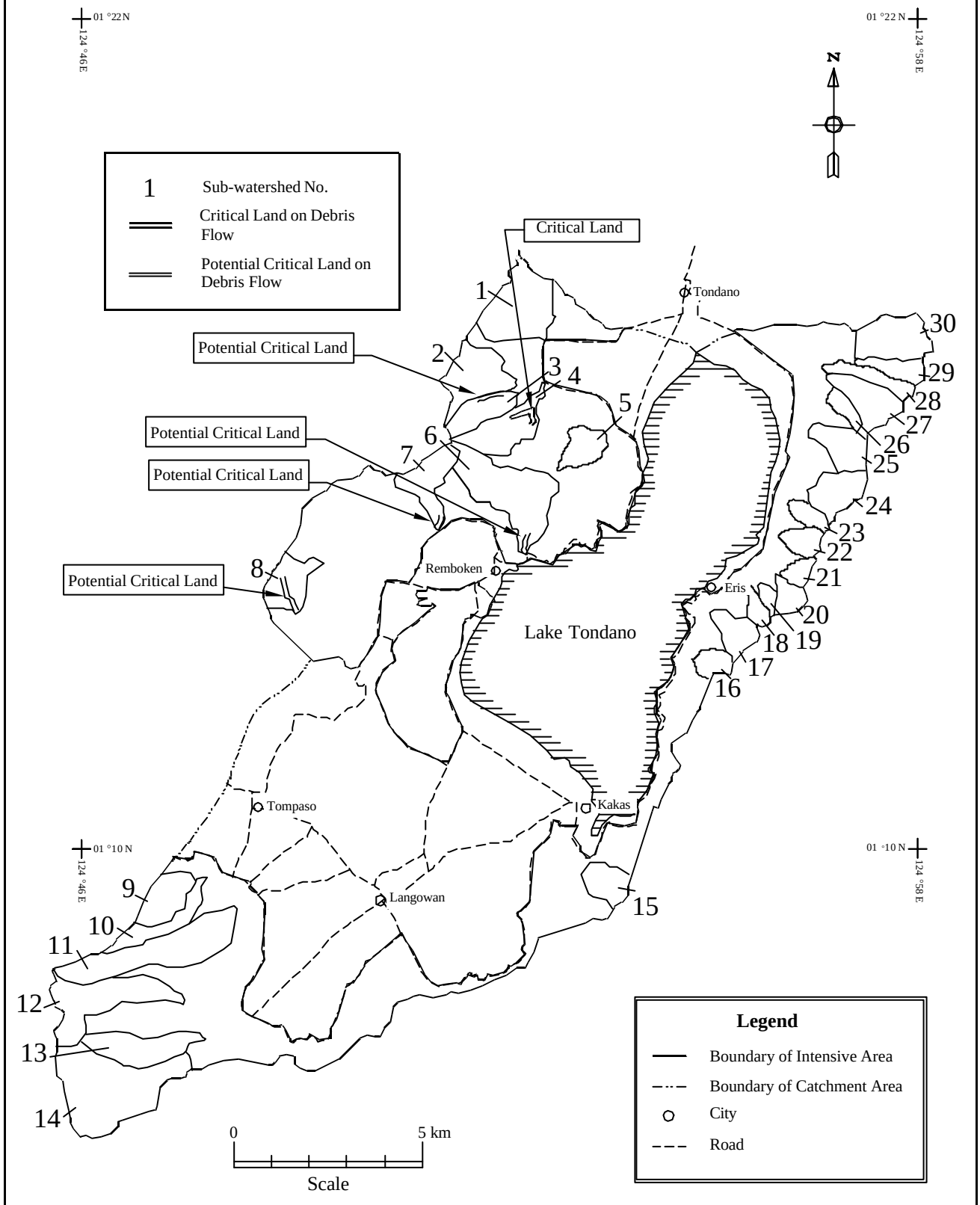


Identification of Critical Land on Torrent and River Bed Erosion

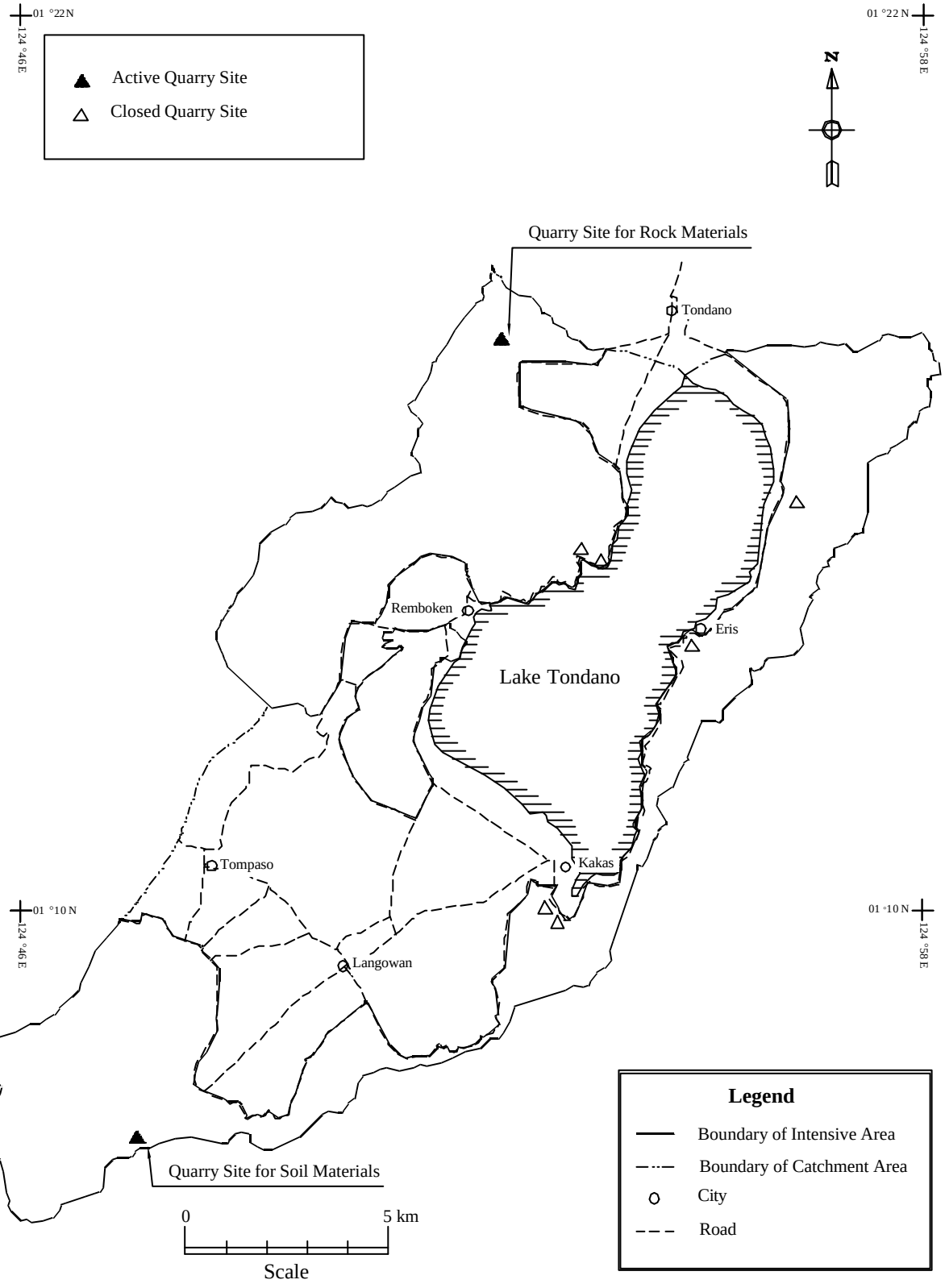


Identification of Critical Land on Torrent and River Bank Erosion

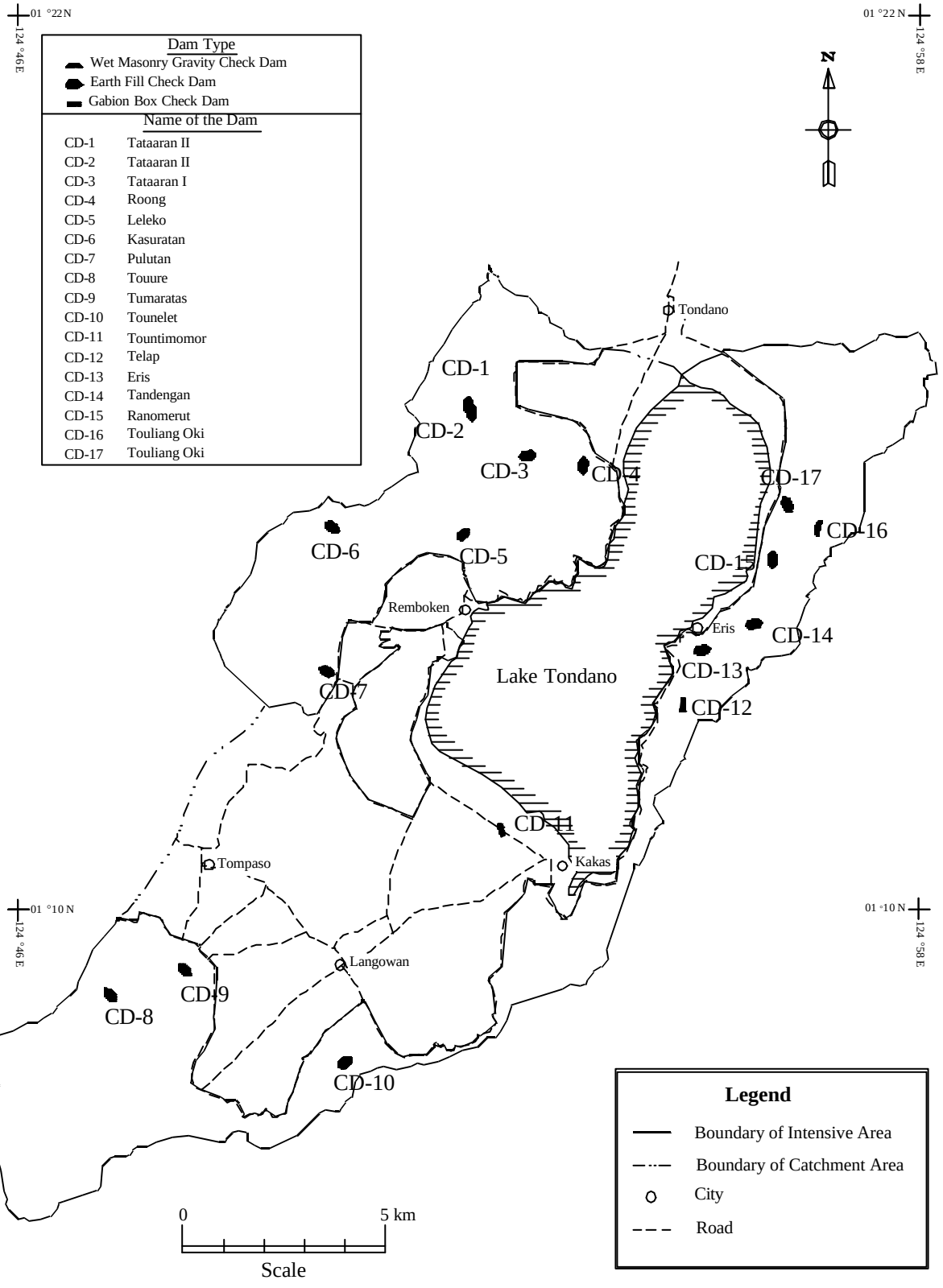
The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.24** **Identification of Critical Land on Torrent and River Erosion**
Japan International Cooperation Agency	



The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.25**
Japan International Cooperation Agency	**Critical Land and Potential Critical Land regarding Debris Flow**



The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.26**
Japan International Cooperation Agency	**Location of Quarry Site**



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

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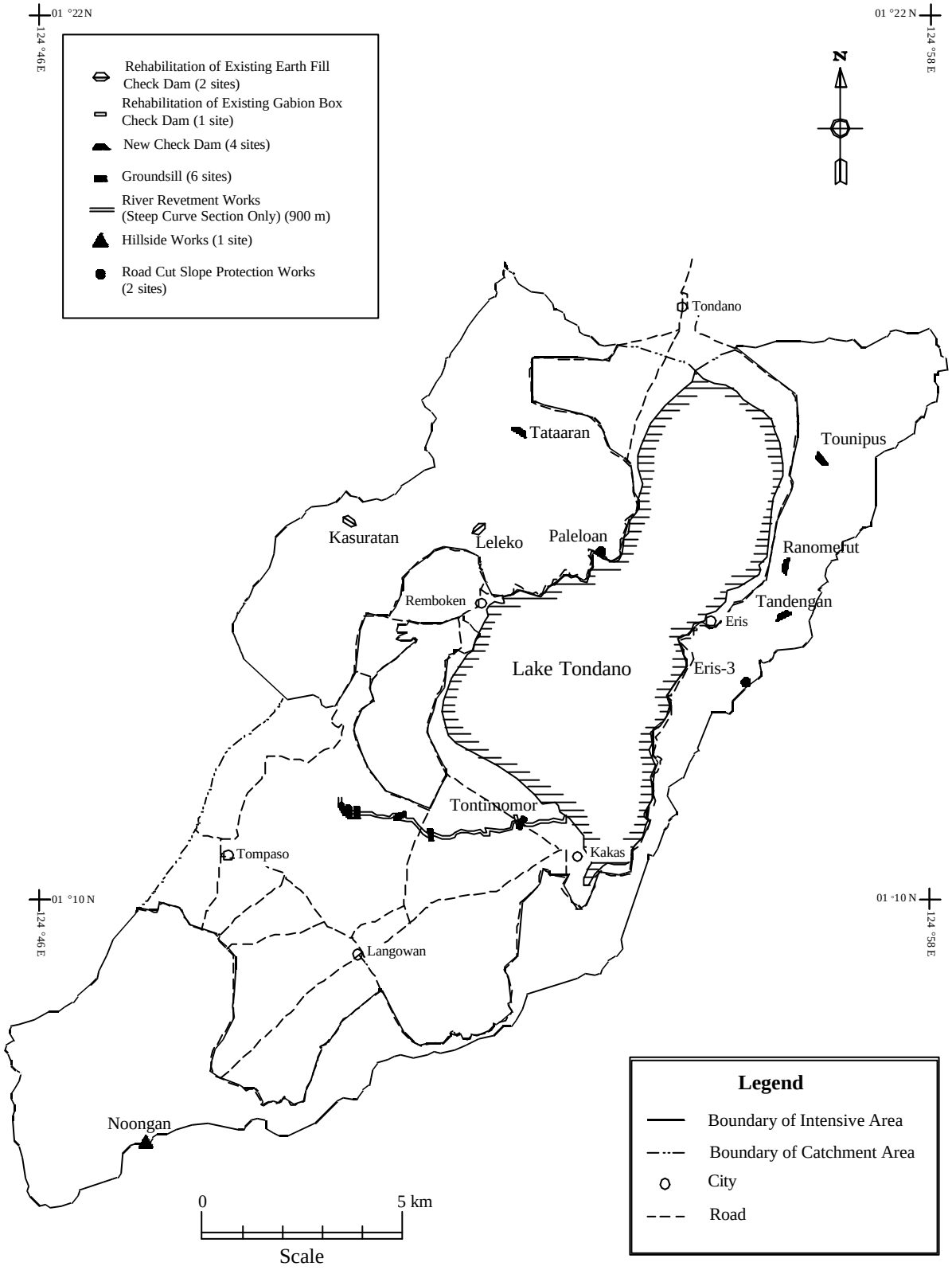
Figure H.3.27

Location of Existing Check Dam



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

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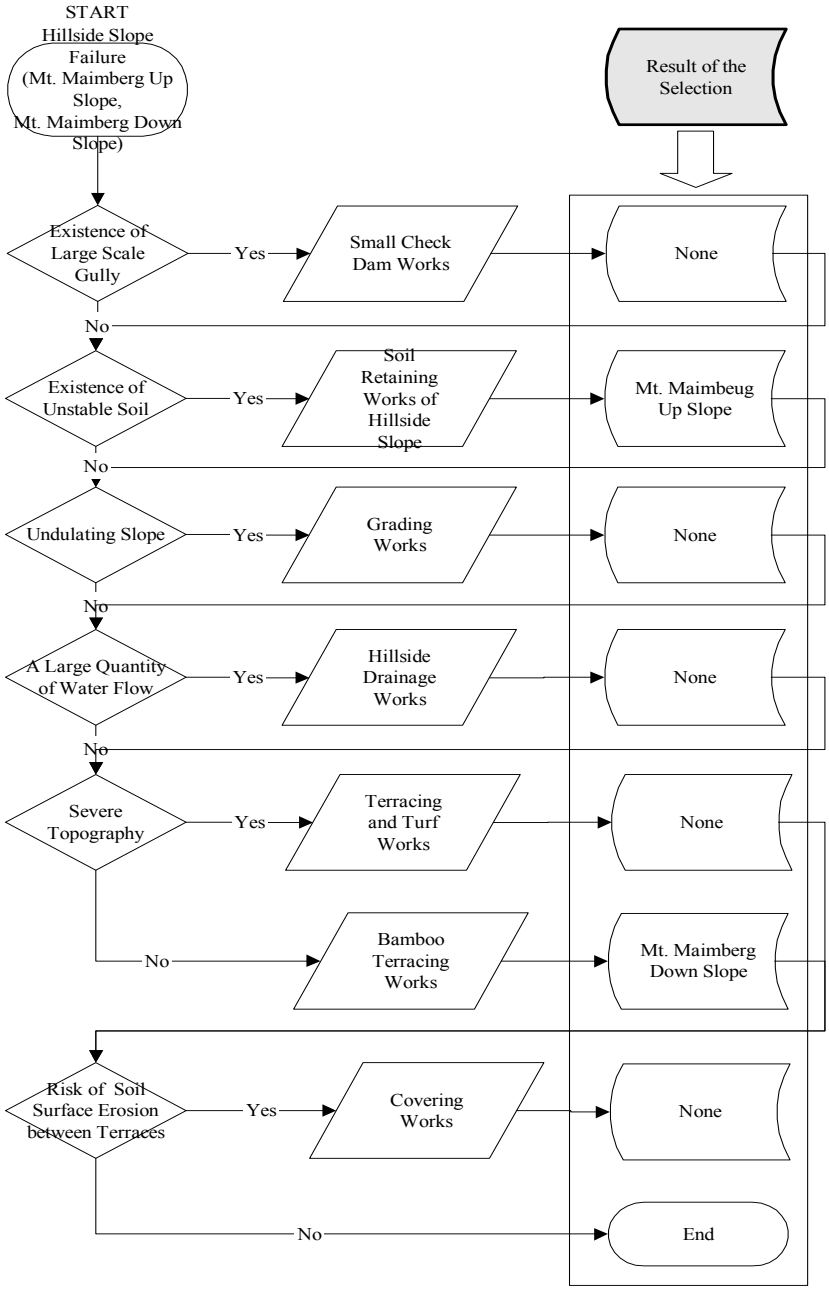
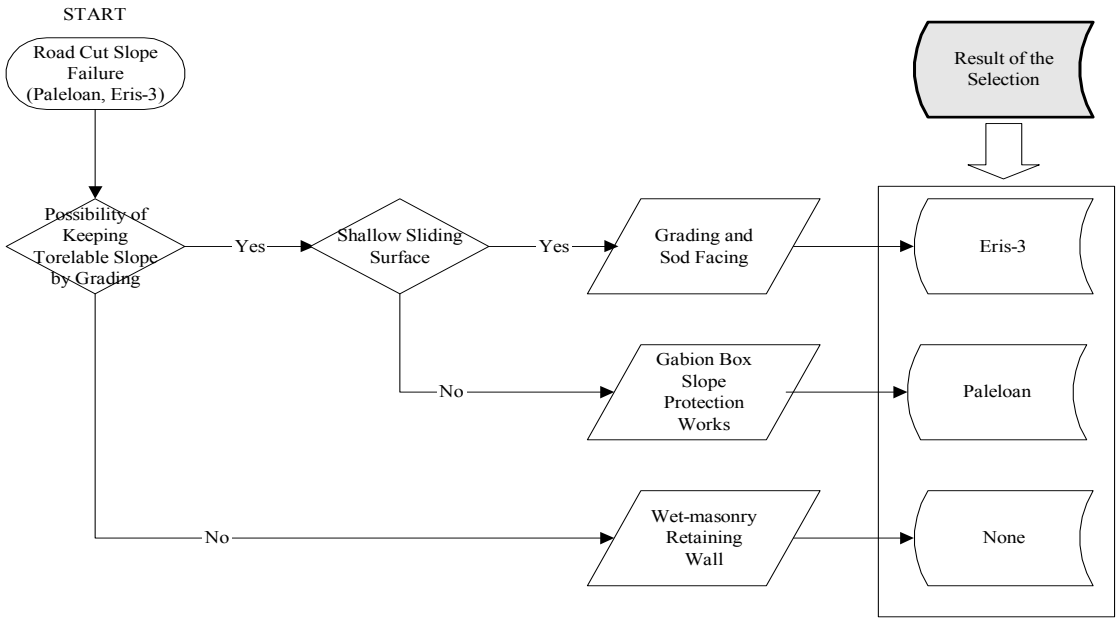
Figure H.3.28

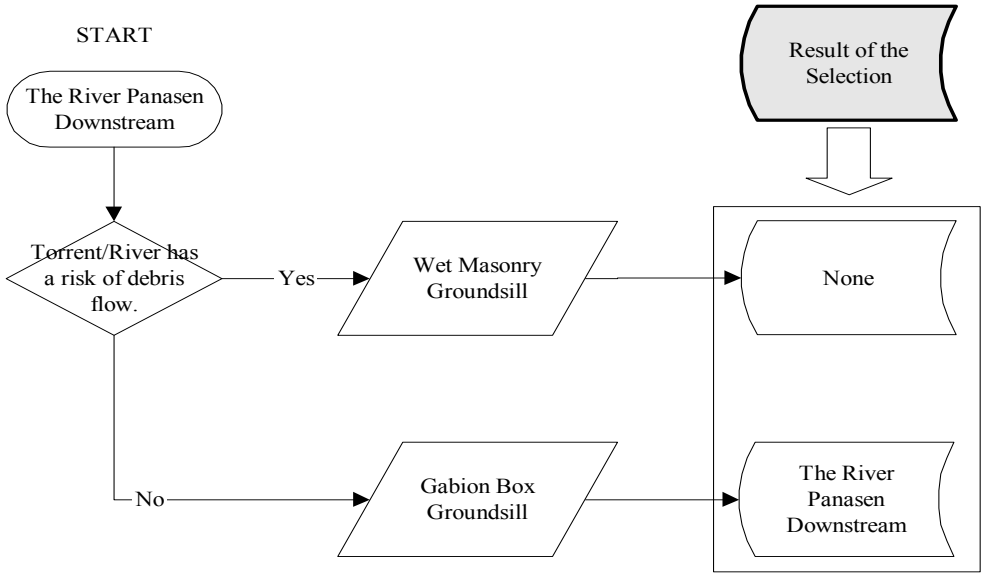
Proposed Sites of Erosion Control Facilities



The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.29**
Japan International Cooperation Agency	**Type Selection of Slope Protection Works for Hillside**

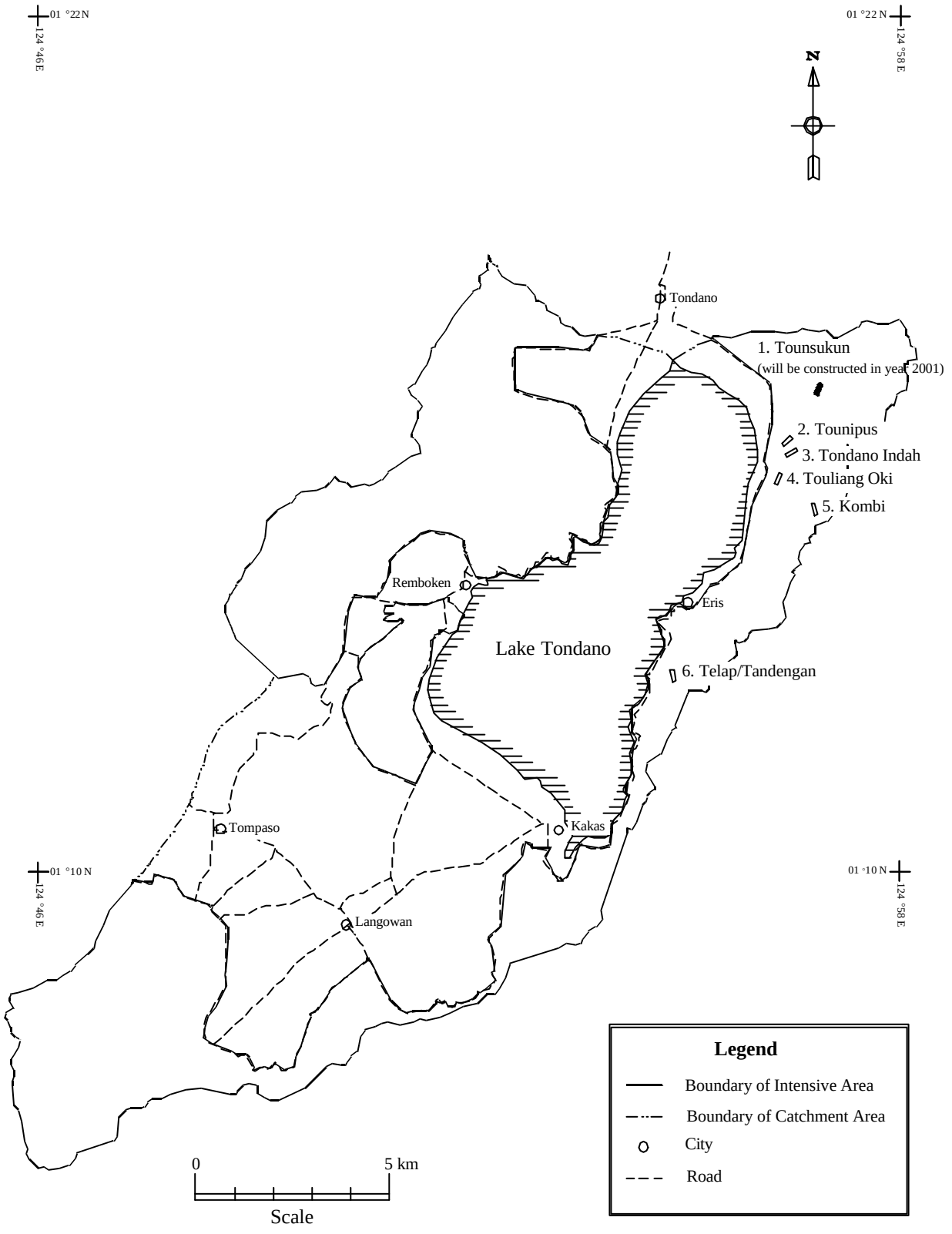


Type Selection of Slope Protection Works for Road



Type Selection of River Bed Protection Works

The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.30 Type Selection of Slope Protection Works for Road and River Bed Protection Works**
Japan International Cooperation Agency	



The Study on Critical Land and Protection Forest Rehabilitation at Tondano Watershed in the Republic of Indonesia	**Figure H.3.31**
Japan International Cooperation Agency	**Location of Projected Check Dam by Regional Irrigation Service Office**

Figure H.3.32
Site Selection of the Check Dam for Sediment Control

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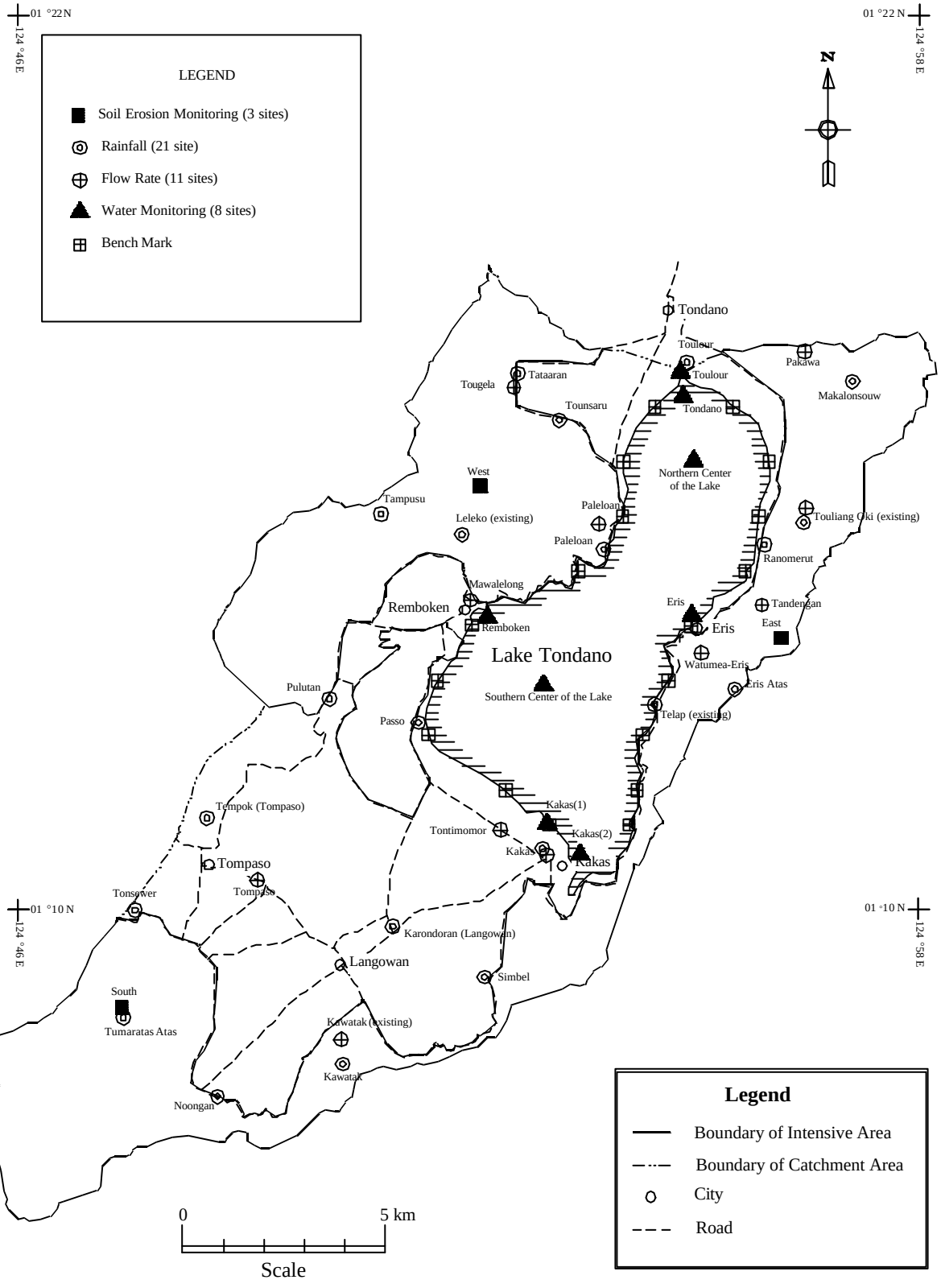

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Figure H.3.33

Proposed Monitoring System

Components	Work Volume	1st Year												2nd Year											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1 Detailed Design																									
Survey, Design, Tendering and Contract	L.S.																								
2 Constuction Works																									
2.1 Check Dam	4 sites																								
2.2 River Bed Protection Works	6 sites																								
2.3 River Bank Protection Works	900 m																								
2.4 Slope Protection Works for the Hillside	1 site																								
2.5 Slope Protection Works for Road	2 sites																								

Implementaion Schedule of Erosion Control Facility Development

Components	Work Volume	Year									
		1	2	3	4	5	6	7	8	9	10
1 Constuction Works of Monitoring Stations											
1.1 Erosion and Sedimentation	3 sites										
1.2 Water Balance Monitoring	35 sites										
2 Purchase of Monitoring Appratus	-										
3 Monitoring of Erosion and Sedimentation	3 Sites										
3.1 Monitoring of Erosion	Weekly										
3.2 Monitoring of Sediment Delivery Ratio	Weekly										
3.3 Monitoring of Sedimentation	Once in five years										
4 Monitoring of Water Quality	38 Sites										
4.1 Monitoring of Water Quality	4times/year										
4.2 Sediment Sampling & Analysis	Once in five years										
5 Monitoring of Water Balance	35 Sites										

Implementaion Schedule of Monitoring System Development

Figure H.3.34
Implementation Schedule of Erosion Control Facility Development and Monitoring System Development