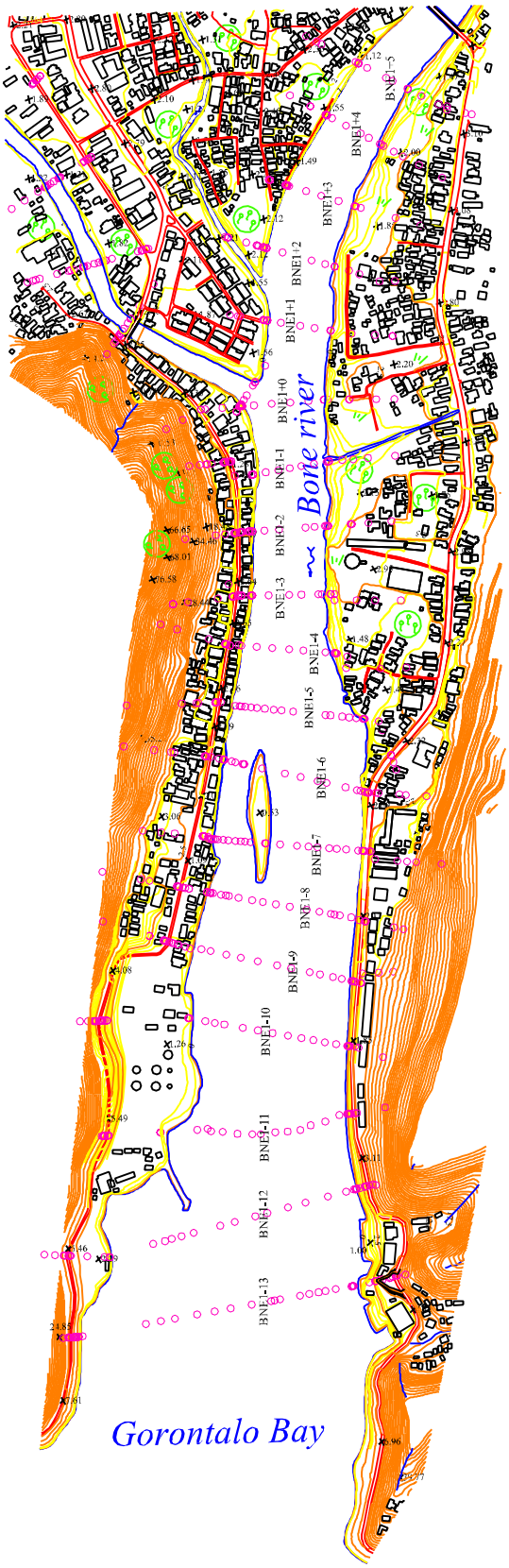
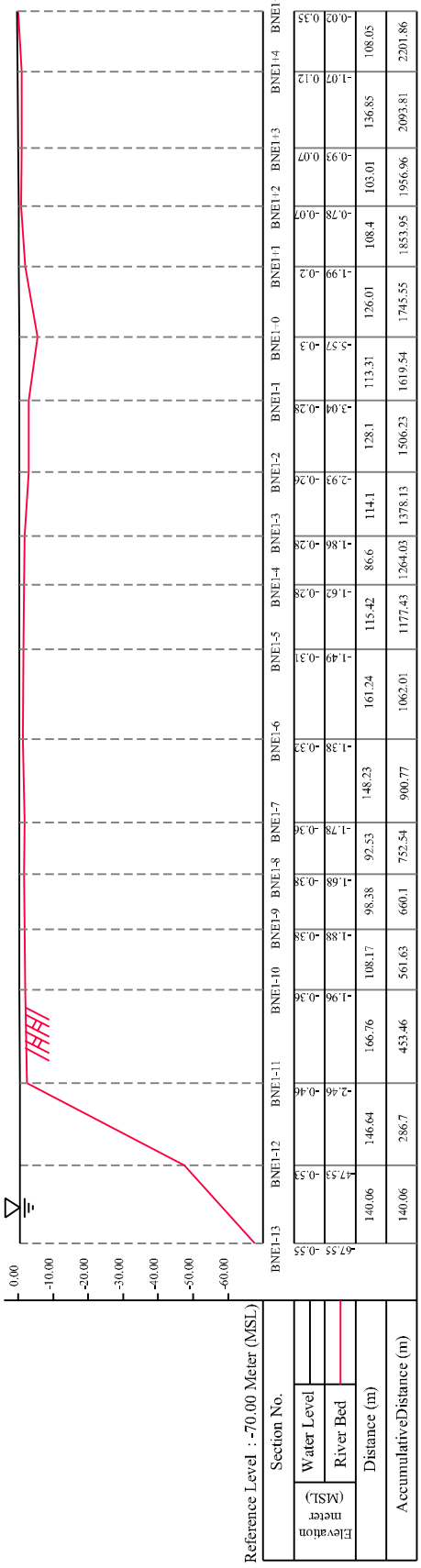




Section No.		BNE1-13	BNE1-12	BNE1-11	BNE1-10	BNE1-9	BNE1-8	BNE1-7	BNE1-6	BNE1-5	BNE1-4	BNE1-3	BNE1-2	BNE1-1	BNE1-0	BNE1+1	BNE1+2	BNE1+3	BNE1+4	BNE1+5
Elevation meter (MSL)	Water Level	-0.55	-0.53	-0.46	-0.36	-0.38	-0.38	-0.36	-0.33	-0.31	-0.28	-0.28	-0.26	-0.28	-0.3	-0.2	-0.07	0.07	0.12	0.35
	River Bed	-67.55	-47.53	-2.46	-1.96	-1.88	-1.68	-1.78	-1.38	-1.49	-1.62	-1.86	-2.93	-3.04	-5.57	-1.99	-0.78	-0.93	-1.07	-0.02
Distance (m)			140.06	146.64	166.76	108.17	98.38	92.53	148.23	161.24	115.42	86.6	114.1	128.1	113.31	126.01	108.4	103.01	136.85	108.05
AccumulativeDistance (m)			140.06	286.7	453.46	561.63	660.1	752.54	900.77	1062.01	1177.43	1264.03	1378.13	1506.23	1619.54	1745.55	1853.95	1956.96	2093.81	2201.86

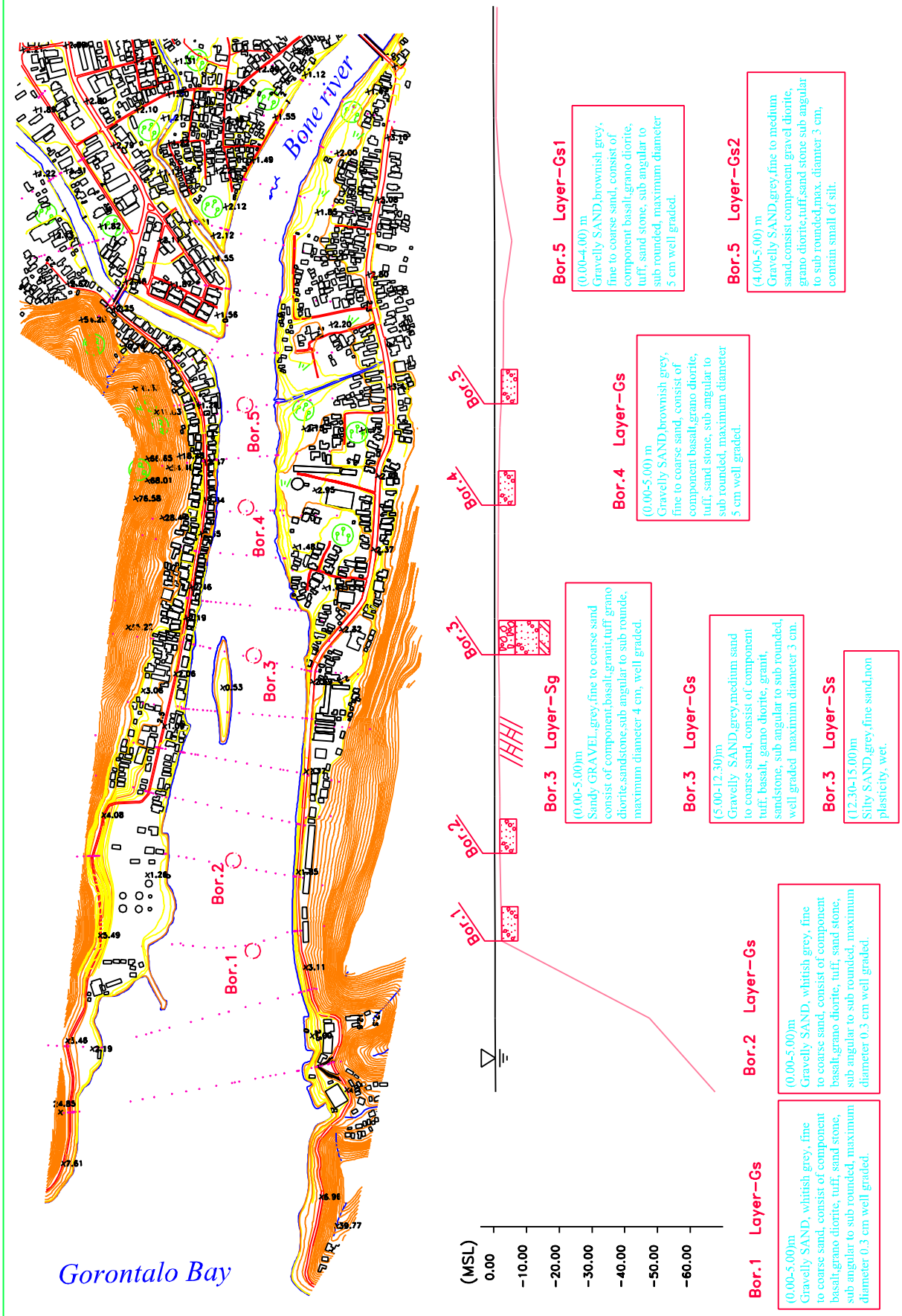
Reference Level : -70.00 Meter (MSL)

The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

Figure C2.3.4

LONGITUDINAL PROFILE OF ESTUARY OF BONE RIVER

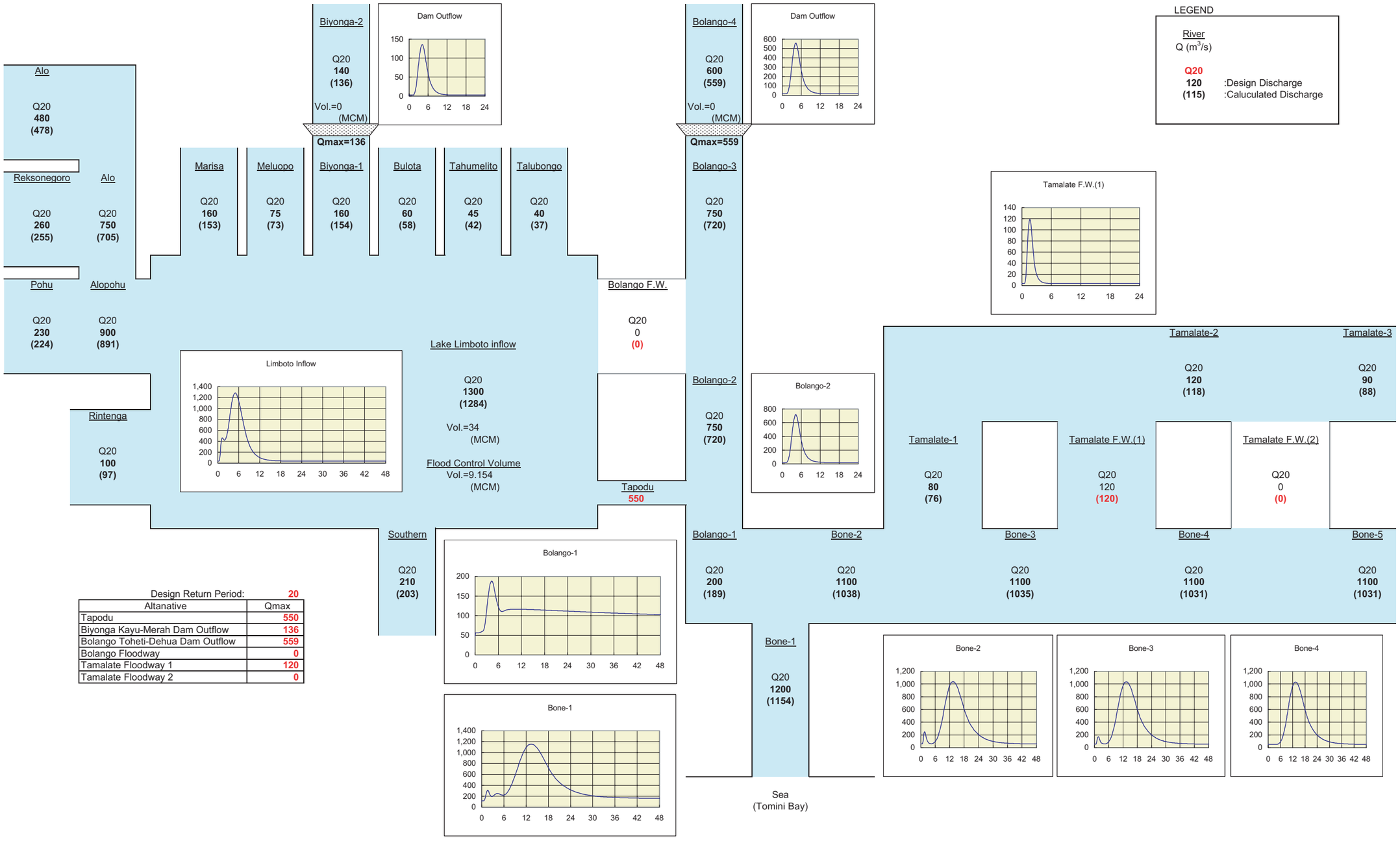


The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

Figure C2.3.5

GEOLOGICAL PROFILE OF ESTUARY OF BONE RIVER



Design Return Period: 20

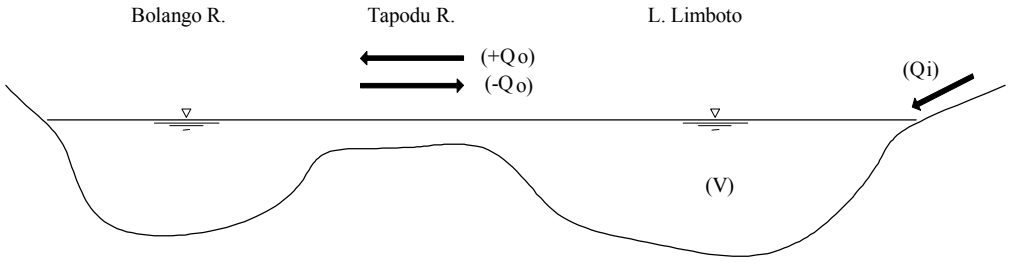
Altanative	Qmax
Tapodu	550
Biyonga Kayu-Merah Dam Outflow	136
Bolango Toheti-Dehua Dam Outflow	559
Bolango Floodway	0
Tamalate Floodway 1	120
Tamalate Floodway 2	0

The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

Figure C2.4.1

REVISED DESIGN DISCHARGE DISTRIBUTION



(1) Fundamental Equation

$$dV = Q_i - Q_o$$

where,

V = Volume of lake water
t = Time
Q_i = Inflow to lake
Q_o = Outflow from lake

(2) Differential Equation

$$(V_{t+1} - V_t)/dt = (Q_{i,t} + Q_{i,t+1})/2 - (Q_{o,t} + Q_{o,t+1})/2$$

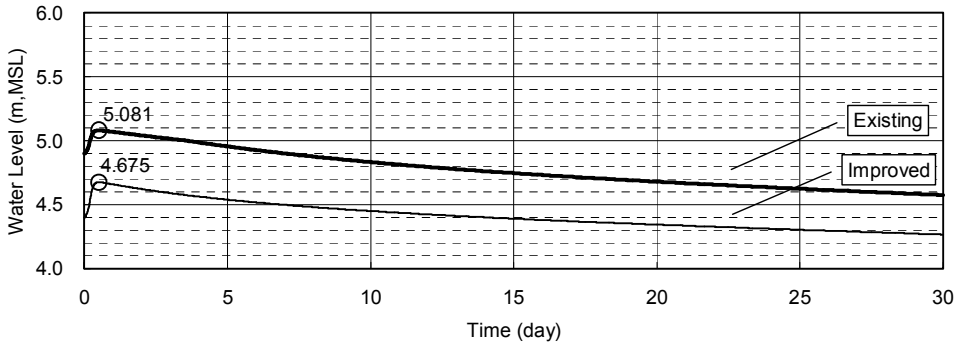
where,

V_{t+1} = Volume of lake water at time t+1
V_t = Volume of lake water at time t
$Q_{i,t}$ = Inflow discharge at time t
$Q_{i,t+1}$ = Inflow discharge at time t+1
$Q_{o,t}$ = Outflow discharge at time t
$Q_{o,t+1}$ = Outflow discharge at time t+1
dt = Time increment between t and t+1

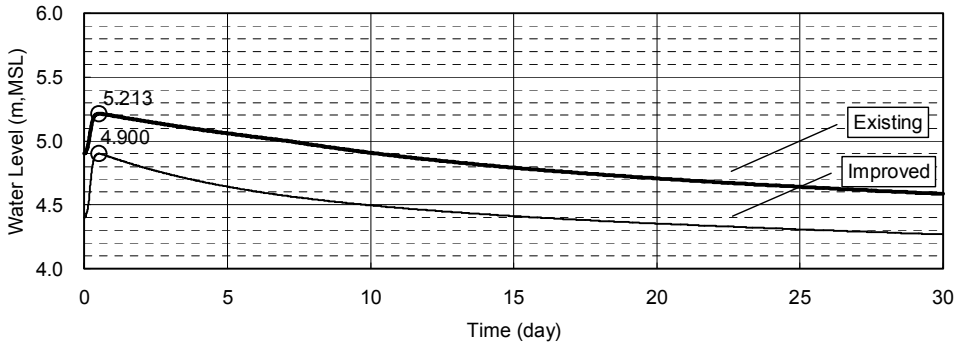
H-AV of Lake Limboto

H(m,msl)	Existing		Design	
	$A(km^2)$	$V(m^3)$	$A(m^2)$	$V(m^3)$
2.0	11.50	6,732,500	11.50	6,732,500
3.0	21.00	22,877,500	21.00	22,877,500
4.0	27.81	47,445,000	25.11	46,770,000
5.0	50.28	86,490,000	39.36	80,355,000
5.5	53.78	113,377,500	39.36	100,035,000
6.0	57.27	140,265,000		

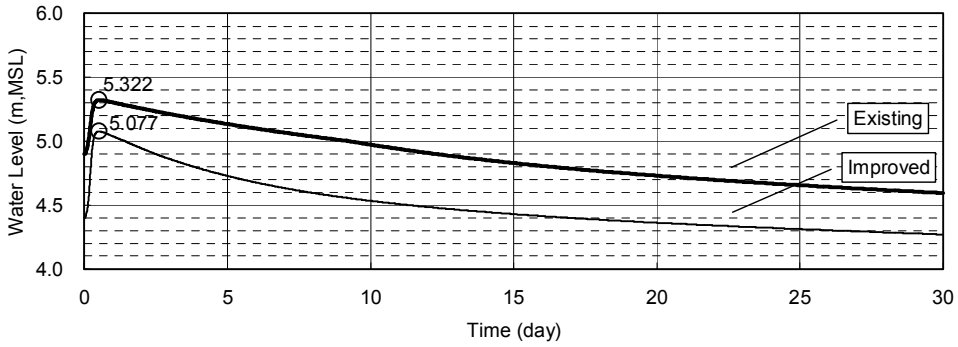
2-YEAR FLOOD



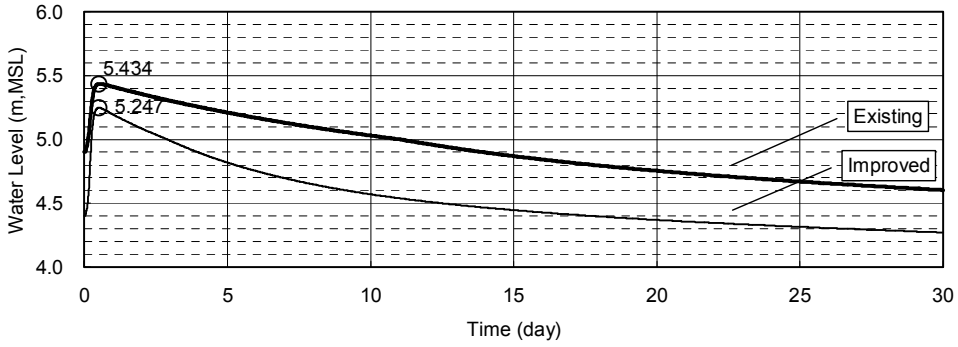
5-YEAR FLOOD



10-YEAR FLOOD



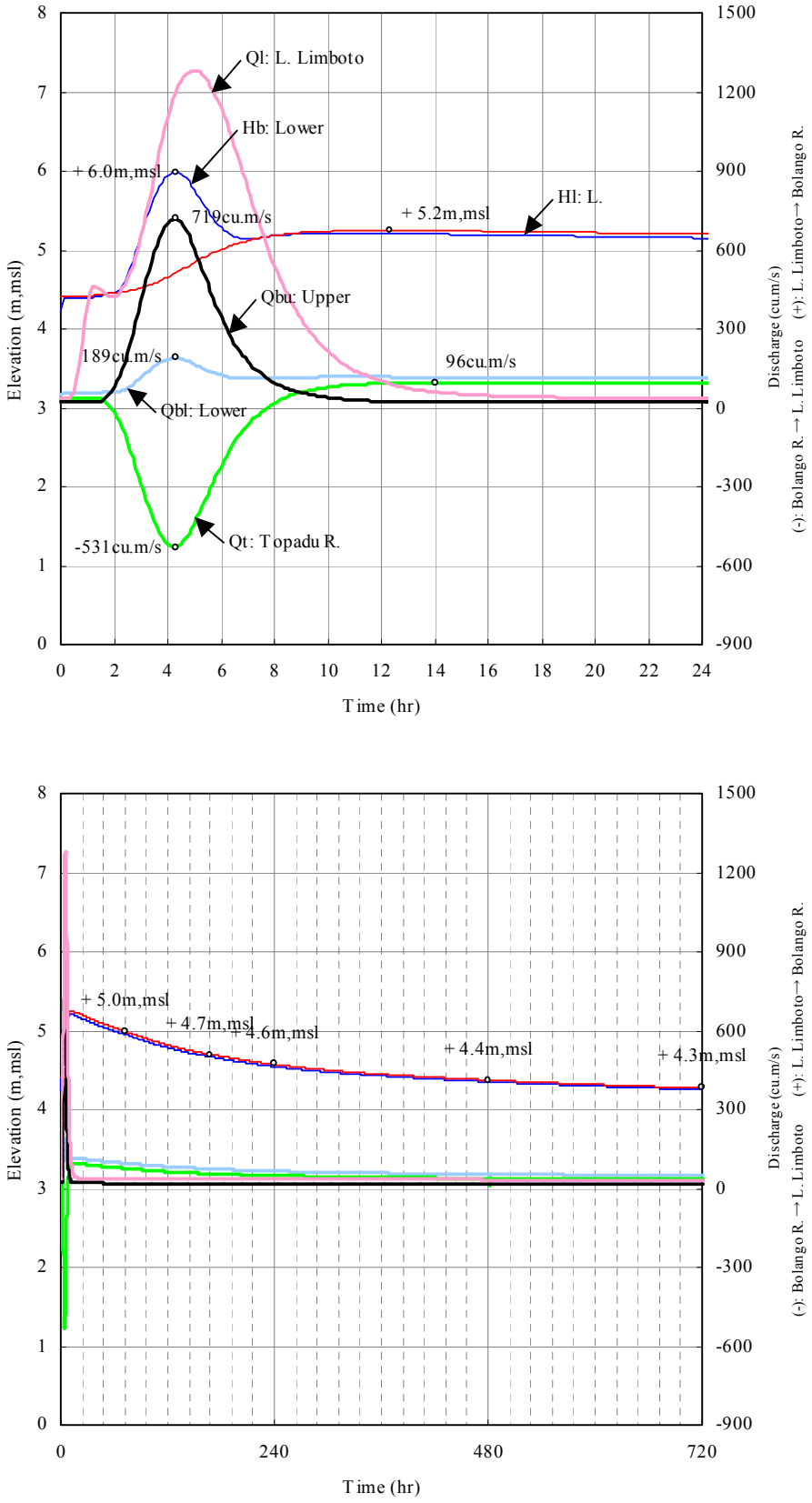
20-YEAR FLOOD



The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

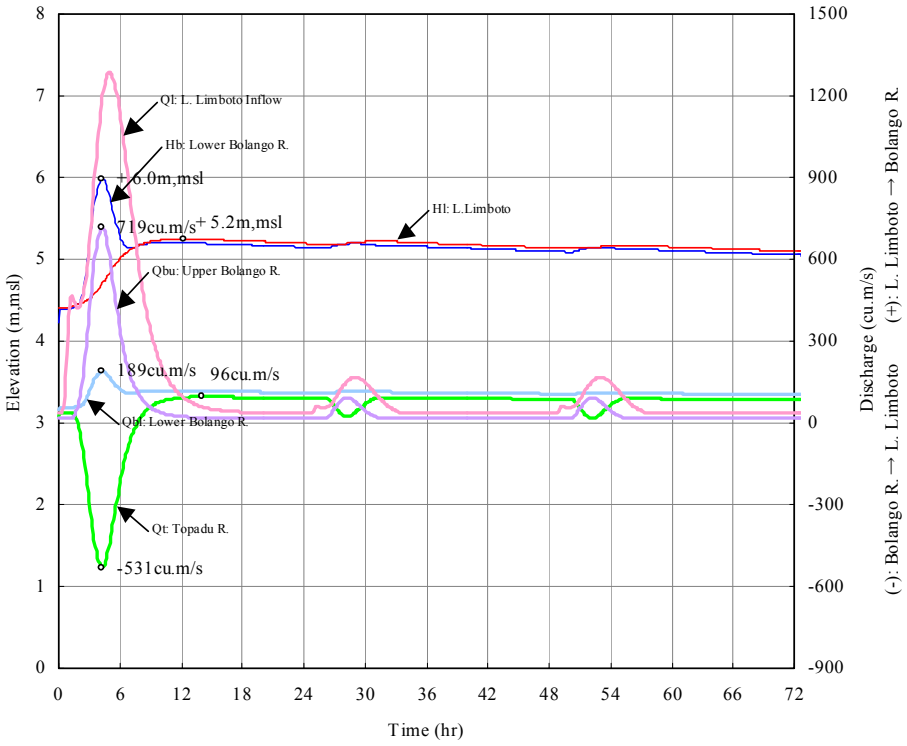
Figure C2.4.3
LAKE WATER LEVEL CALCULATED BY FLOOD STORAGE MODEL

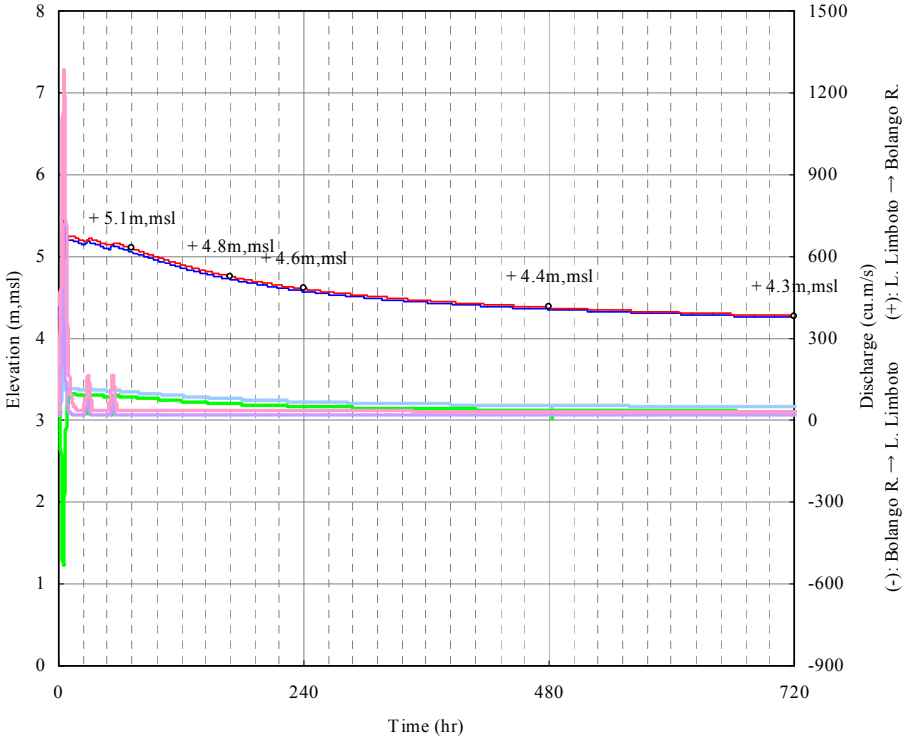


The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

Figure C2.4.4
RESULT OF FLOOD WATER STORAGE CALCULATION : 20-YEAR FLOOD

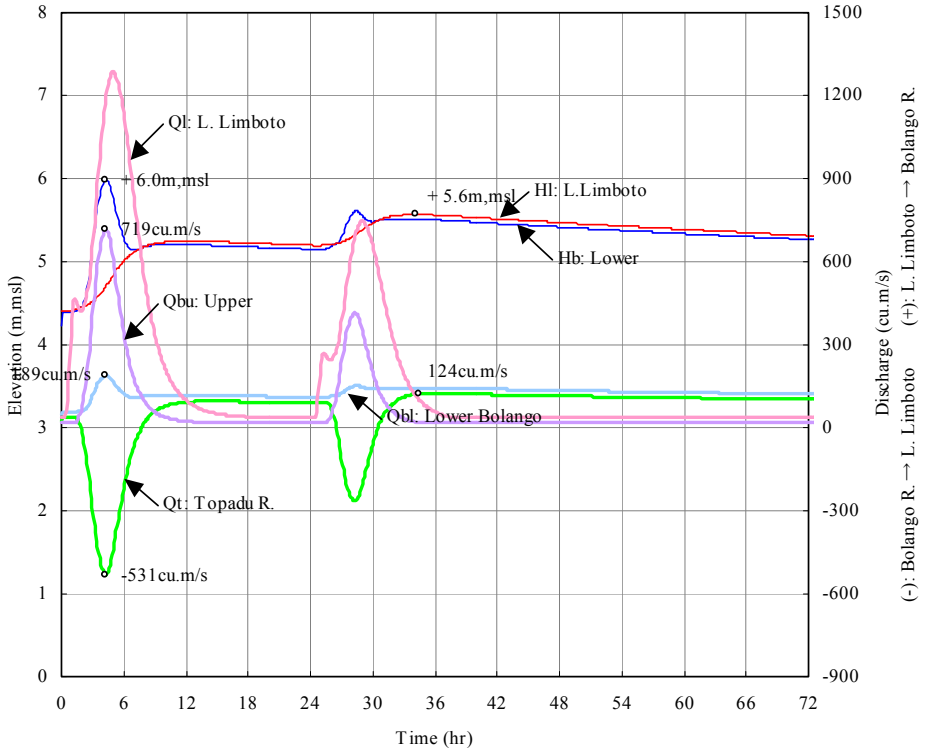


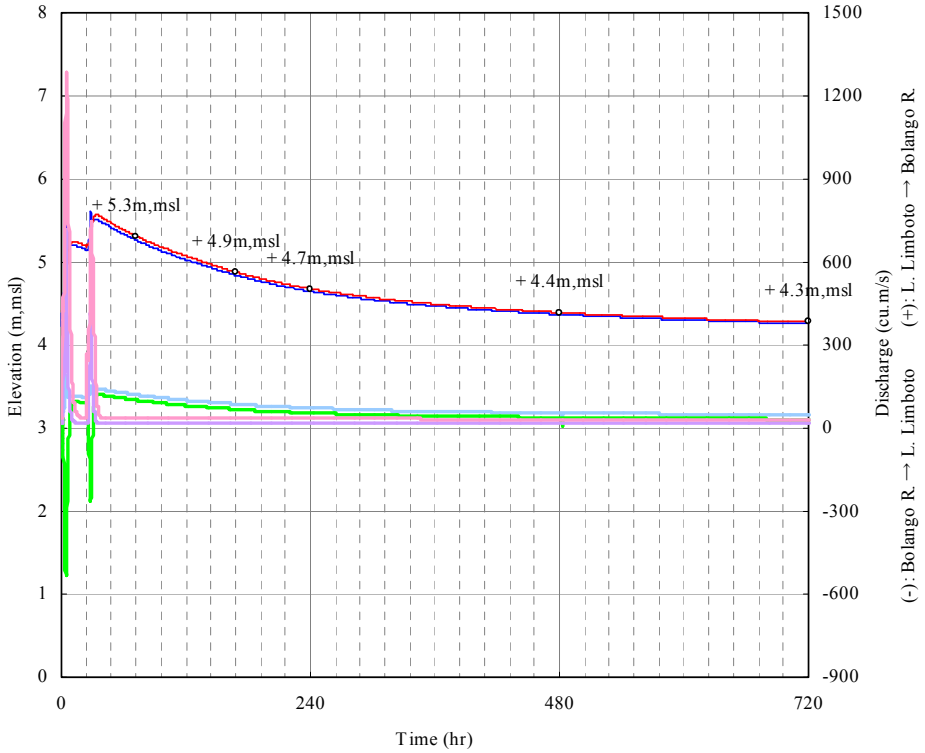


The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

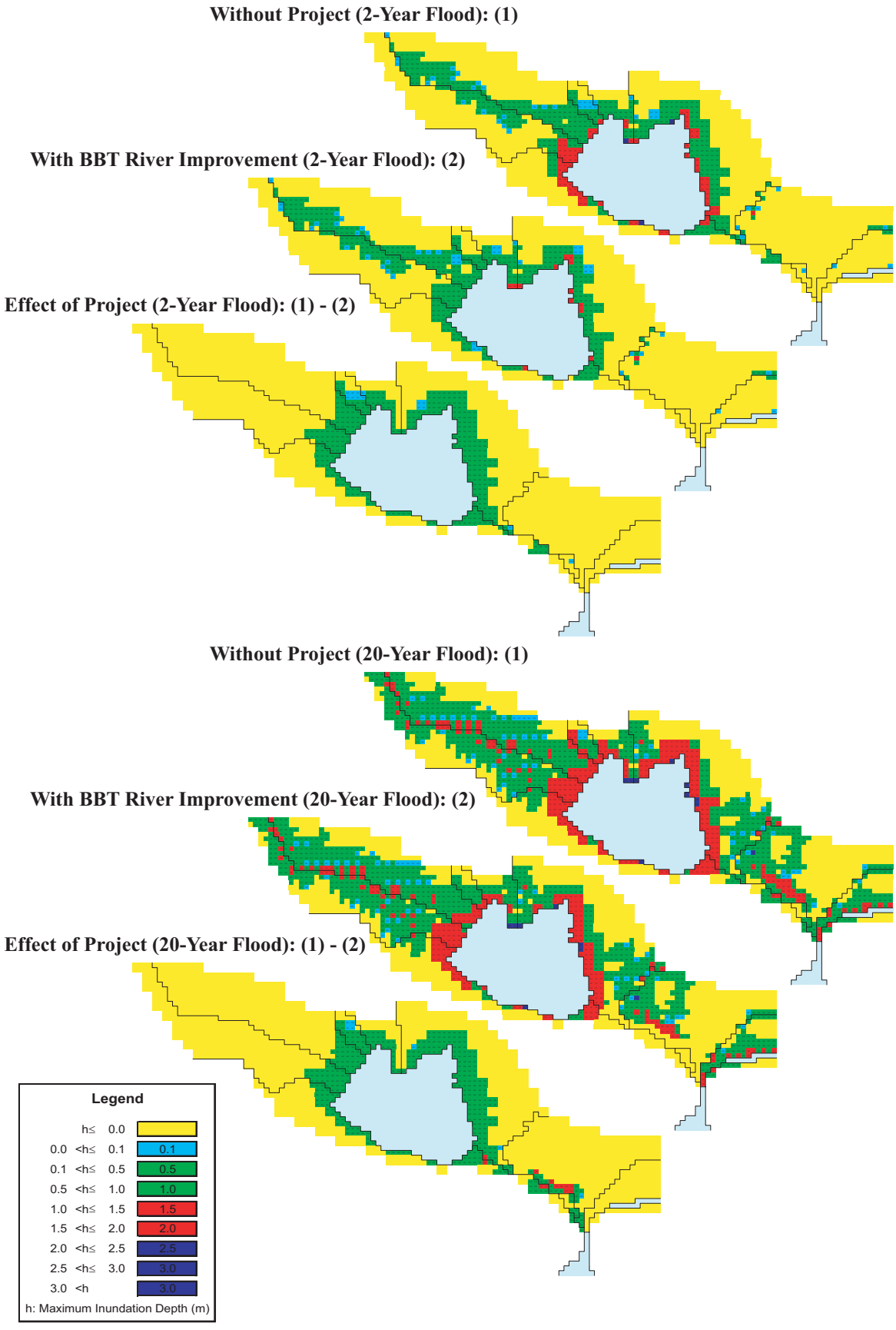
Japan International Cooperation Agency

Figure C2.4.5
RESULT OF FLOOD WATER STORAGE CALCULATION :
3-DAY CONSECUTIVE FLOOD





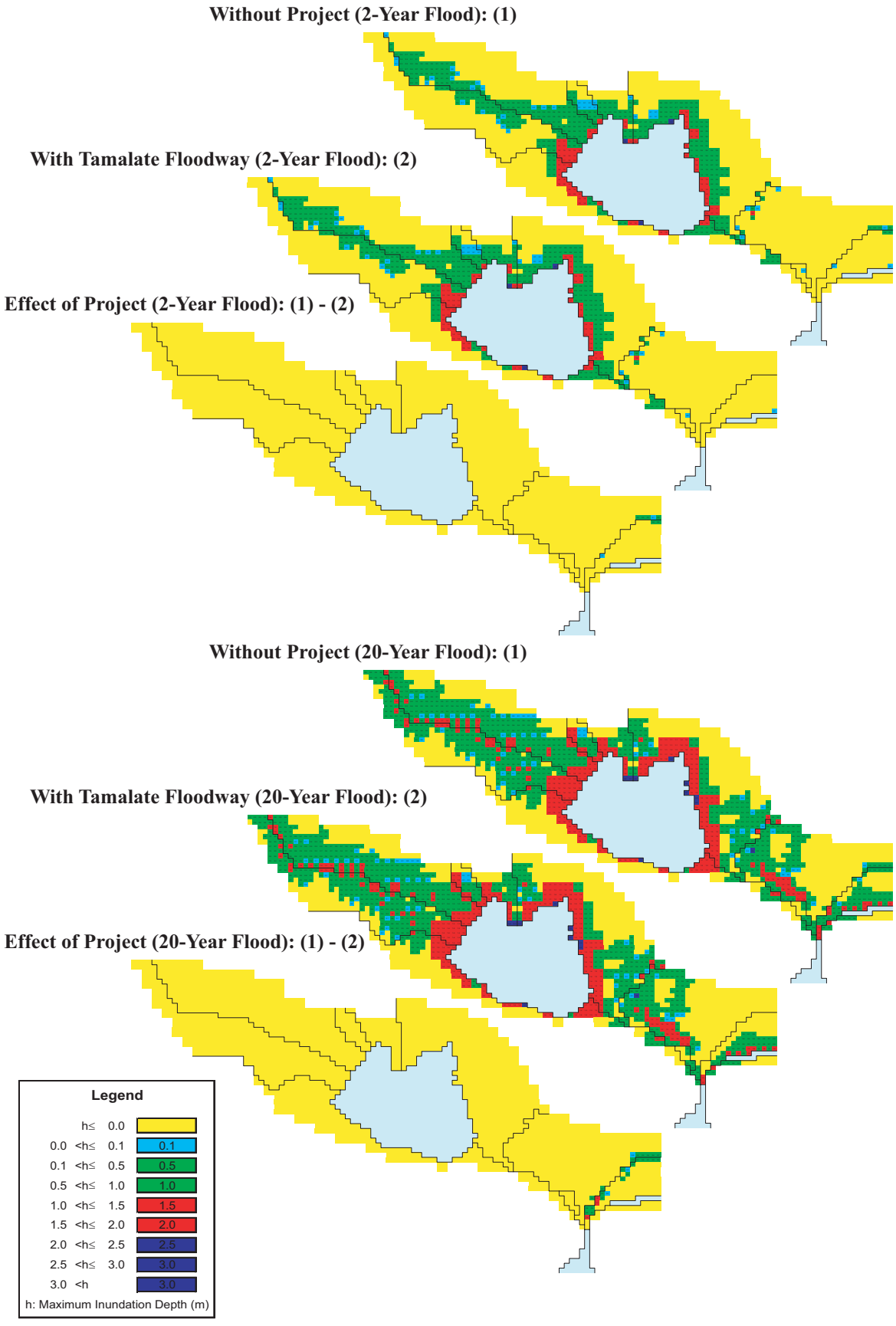
The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia *Japan International Cooperation Agency*	**Figure C2.4.6** **RESULT OF FLOOD WATER STORAGE CALCULATION :** **2-DAY CONSECUTIVE FLOOD**



The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

Figure C2.5.1
RESULT OF FLOOD FLOW ANALYSIS (1/2: BBT RIVER IMPROVEMENT)



The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia

Japan International Cooperation Agency

Figure C2.5.1
RESULT OF FLOOD FLOW ANALYSIS (2/2: TAMALATE FLOODWAY)