

B4. PRELIMINARY STRUCTURAL DESIGN AND COST ESTIMATE

B4.1 Preliminary Structural Design

The proposed flood mitigation master plan includes the following structures.

- 1) Control gated weir for Tapodu River (Tapodu gate)
- 2) Diversion weir for Tamalate Floodway (Tamalate Weir)
- 3) Drainage sluices across the dike
- 4) Bridges crossing the improved channels

These structures are designed preliminarily.

(1) Tapodu Gate for Tapodu River

The proposed structure is a concrete structure with dimensions of 36 m in length and 28 m in width having a compound section providing dike on both sides. General design drawing is shown in Figure B4.1.1. Following considerations were given to the design of Tapodu gate:

- 1) Freeboard: When the gate is fully open, the bottom of the gate leaf will be at least 1.0 m above the design high water level
- 2) Gate opening: Two (2) gate openings will be provided in case that a gate could not be lifted by some accident such as mechanical trouble.
- 3) Height of gate: Height of the gate will be determined based on the design high water level of the channel considering the required freeboard.
- 4) Bed consolidation works: Length of aprons constructed with concrete slab will be more than 3.0 m for intake and 5.0 m for outlet work. The apron will be extended more than 10.0 m for intake and 15.0 m for outlet work with gabion or equivalent.

(2) Diversion Weir of Tamalate Floodway

Major function of this weir is to consolidate riverbed at the inlet of floodway controlling diversion water. The weir has no gate and designed with concrete slab and concrete blocks on riverbed and with wet-rubble masonry on both sides of bank slopes. The size of weir is 50 m in length and 26 m in width. General design drawing is shown in

Figure B4.1.2.

(3) Drainage Sluices

Drainage sluices are provided to drain the excess water across the dike and also to prevent the intrusion of floodwater from the river. Following considerations were given to the design of these drainage sluices:

- 1) Conduit type sluice: The box culvert type will be applied to sluiceway conduit design. Standard designs will be adopted to the box culvert type
- 2) Gate type sluice: Manually operated slide gate will be applied because the slide gate has higher reliability of operation performance. General design drawing is shown in Figure B4.1.3.

(4) Bridge Structures

New bridges to be constructed for the project are 30 bridges. Following considerations were given to the design of these bridges:

- 1) Bridge type: Bridge types will be decided taking into consideration the site conditions for construction works and economic advantage, etc.
- 2) Bridge length and width: Length of each bridge depends on the river width between dikes at bridge site. Width of carriageway is designed at 4 m and 7 m without the sidewalk in accordance with the standard of Bina Marga.
- 3) Abutment: Abutment of the bridge is designed, so that front face of the abutment does not thrust into the river flow below the design high water level.

B4.2 Estimation of Project Cost

(1) Sub-Projects and Works for FM-MP

Sub-projects of FM-MP: The FM-MP is composed of following sub-projects:

Bolango-Bone River System

- 1) Bone River Improvement
- 2) Tamalate River Improvement with Floodway
- 3) Bolango River Improvement

Lake Limboto System

- 4) Biyonga River Improvement
- 5) Meluopo River Improvement
- 6) Marisa River Improvement
- 7) Alo-Pohu River Improvement
- 8) Riutenga River Improvement
- 9) Lake Limboto Management

Major Work Items: The following are the major works included in these sub-projects. The project and work costs will be estimated for these work items.

Earth works

- 1) Excavation work
- 2) Embankment work
- 3) Sediment trap work
- 4) Sodding work

Structural work

- 5) Structural concrete work
- 6) Wet rubble masonry work
- 7) Drainage sluice work : DS type-1 (1m x 1m)
: DS type-2 (3m x 3m)
- 8) Metal work
- 9) Bridge work : Br. type-1 (w = 4m)
: Br. type-2 (w = 7m)

(2) Basis of Cost Estimate

Project cost for the proposed master plan was estimated on the basis of the following conditions.

- 1) **Price Level:** The project cost and other related unit costs are expressed under the economic conditions prevailing in November 2001.
- 2) **Exchange Rate of Currencies:** Exchange rate of currencies are assumed as follows:
US\$1.00 = Rp.9,600 = ¥124 (¥1 = Rp.77.4)

- 3) **Constitution of Project Cost:** Project cost is composed of direct cost, land acquisition and compensation cost, administration cost, engineering service cost, and physical contingency. Project cost is estimated based on the following procedures and assumptions:

- (1) Direct cost: Unit cost basis
- (2) Land acquisition and compensation cost: Unit cost basis
- (3) Administration cost: 5% of (1) + (2)
- (4) Engineering service cost: 15% of (1)
- (5) Sub-total = (1) + (2) + (3) + (4)
- (6) Physical contingency = 10% of (5)
- (7) Price contingency: Annual escalation rate of 5% was assumed considering the rate of 0% for foreign currency portion and 10% for local currency portion

(3) Unit Work Costs

The work cost is estimated based on the quantity of works multiplied by standard unit work cost. The unit work costs were assumed based on the cost data of similar works executed in Sulawesi. The standard work costs applied to the Master Plan are listed below.

(Work)	(Unit)	(Cost: Rp.)
1) Excavation work	m ³	15,000
2) Embankment work	m ³	28,000
3) Sediment trap work	m	265,000
4) Sodding work	m ²	20,000
5) Concrete work	m ³	550,000
6) Wet masonry work	m ³	220,000
7) Drainage sluice work		
Type-1 (1m x 1m)	pcs	45,000,000
Type-2 (3m x 3m)	pcs	350,000,000
8) Metal work	m ²	130,000,000
9) Bridge work		
Type-1 (w = 4m)	m	17,000,000
Type-2 (w = 7m)	m	35,000,000

As to the land acquisition and compensation cost, following unit prices were assumed based on the information in Gorontalo.

- 1) Farmland : Rp. 3,000/ m²
- 2) Urban area : Rp. 20,000/ m²

(4) Project Costs

Cost of sub-projects were estimated as shown in Table B4.2.1 for summary and Table B4.2.2 for its breakdown. The results are summarized below.

(Sub-projects)	(Rp. Million)
1) Bone River Improvement	: 75,042
2) Tamalate River Improvement with Floodway	: 189,477
3) Bolango River Improvement	: 44,532
4) Biyonga River Improvement	: 30,203
5) Meluopo River Improvement	: 15,286
6) Marisa River Improvement	: 23,683
7) Alo-Pohu River Improvement	: 109,032
8) Rintenga River Improvement	: 23,865
9) Lake Limboto Management	: 43,905
TOTAL	555,025

The total project cost for the FM-MP amounts to Rp.555,025 million (US\$57.814 million or ¥7,169.1 million equivalent) at November-2001 fixed price, of which breakdown is as follows:

(Cost items)	(Cost: Rp. million)
1) Direct cost	: 361,974
2) Land acquisition and compensation cost	: 66,853
3) Administration cost	: 21,442
4) Engineering service cost	: 54,297
5) Physical contingency	: 50,459
TOTAL	555,025

Table B4.2.1 SUMMARY OF PROJECT COST FOR FM-MP

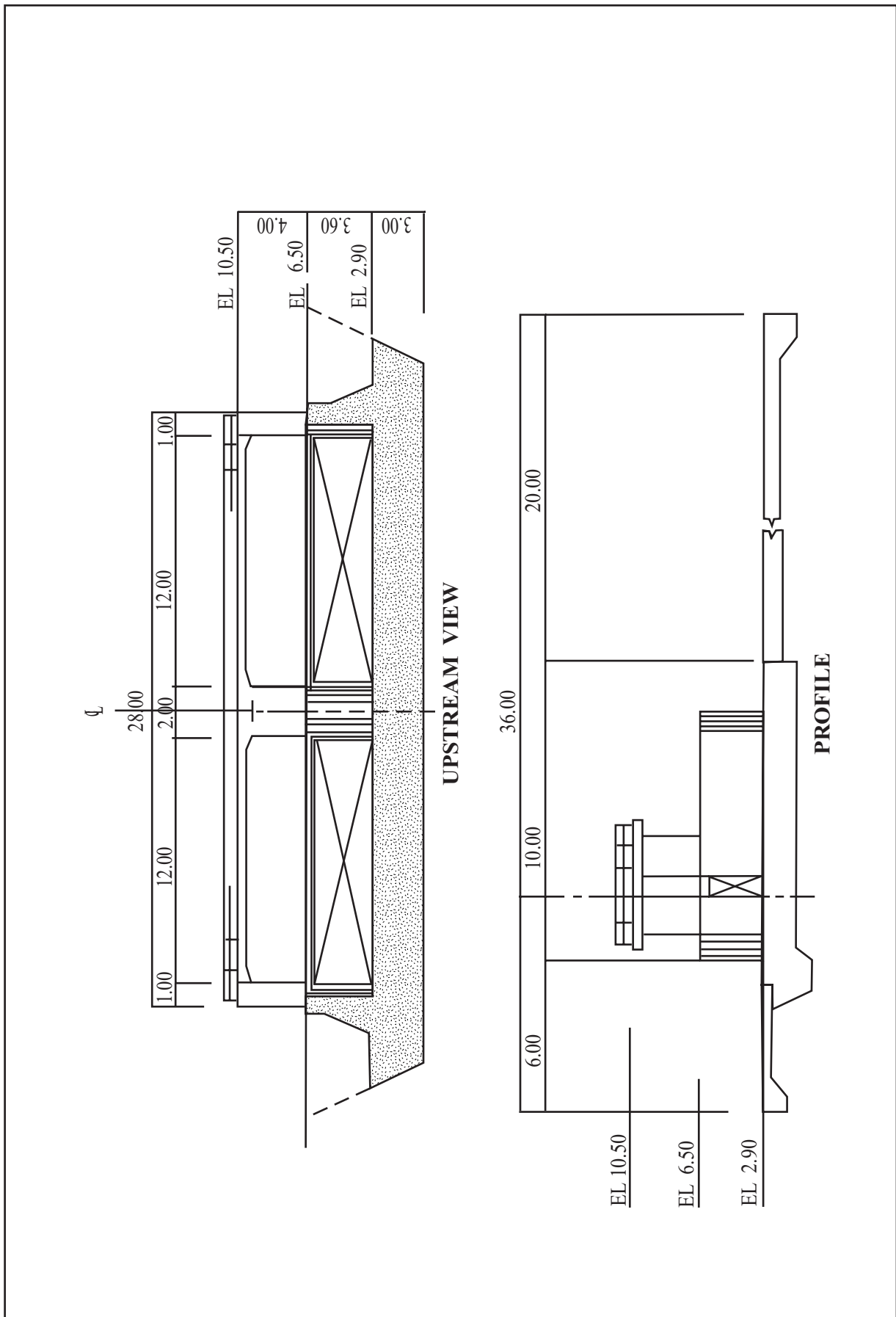
No	Work Item	Unit	Unit Price (Rp.)	FM-MP for LBB Basin (Grand Total)	
				Q'ty	Amount (Rp.million)
1	Direct Cost			0	361,974
	11. Earth Works				
	111. Excavation work	m ³	15,000	4,303,000	64,545
	112. Embankment work	m ³	28,000	2,085,000	58,380
	113. Sediment trap work	m	265,000	4,000	1,060
	114. Sodding work	m ²	20,000	86,000	1,720
	12. Structural Work				
	121. Concrete work	m ³	550,000	8,000	4,400
	122. Wet masonry work	m ³	220,000	611,000	134,420
	123. Drainage sluice work				
	- DS type-1 (1m x 1m)	pcs	45,000,000	33	1,485
	- DS type-2 (3m x 3m)	pcs	350,000,000	1	350
	124. Metal Works	m ²	130,000,000	86	11,180
	125. Bridge work				
	- Br. type-1 (w = 4.0 m)	m	17,000,000	1,670	28,390
	- Br. type-2 (w = 7.0 m)	m	35,000,000	1,300	45,500
	13. Miscellaneous work	l.s.		0	10,544
2	Land Acquisition			0	66,853
	21. Residential Land	m ²	20,000	2,219,000	44,380
	22. Agricultural Land	m ²	3,000	7,491,000	22,473
3	Indirect Costs				126,198
	31. Administration Cost	l.s.	-		21,442
	32. Eng. Services Cost	l.s.	-		54,297
	33. Physical Contingency	l.s.	-		50,459
GRAND TOTAL					
			(Rp.million)		555,025
			(US\$ million eq.)		57.814
			(Yen million eq.)		7,169.1

Table B4.2.2 PROJECT COSTS OF SUB-PROJECTS FOR FM-MP (2/4)

No	Work Item	Unit	Unit Price (Rp.)	Lower Bolongo River Improvement		Middle Bolongo River Improvement		Bolongo River Improvement (Total)		Biyonga River Improvement		Realignment of Biyonga R. w/ E. Sediment Trap		Biyonga River Improvement (Total)	
				Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)
1	Direct Cost														
	I1. Earth Works														
	I11. Excavation work	m ³	15,000	763,000	54,870	0	107,661	0	107,661	10,849	0	10,058	0	20,907	
	I12. Embankment work	m ³	28,000	188,000	11,955	1,560,000	23,400	660,000	1,848	51,000	510	34,000	85,000	1,275	
	I13. Sediment trap work	m	265,000	0	11,536	600,000	16,800	0	0	66,000	1,232	44,000	110,000	3,080	
	I14. Sodding work	m ²	20,000	0	0	0	0	0	0	0	583	2,200	2,200	583	
	I2. Structural Work														
	I21. Concrete work	m ³	550,000	0	0	0	0	0	0	0	0	0	0	0	
	I22. Wet masonry work	m ³	220,000	88,200	19,404	20,196	39,600	180,000	7,920	36,000	5,280	24,000	60,000	13,200	
	I23. Drainage sluice work														
	- DS type-1 (1m x 1m)	pcs	45,000,000	2	90	135	5	225	0	0	0	0	0	0	
	- DS type-2 (3m x 3m)	pcs	350,000,000	1	350	0	350	1	350	0	0	0	0	0	
	I24. Metal Works	m ²	130,000,000	0	0	0	0	0	0	0	0	0	0	0	
	I25. Bridge work														
	- Br. type-1 (w = 4.0 m)	m	17,000,000	0	0	0	0	0	0	0	0	30	30	510	
	- Br. type-2 (w = 7.0 m)	m	35,000,000	420	14,700	9,450	24,150	690	24,150	0	1,050	30	30	1,050	
	I3. Miscellaneous work	Ls.		1,538	1,598	0	3,136	0	3,136	316	293	0	0	609	
2	Land Acquisition														
	21. Residential Land	m ²	20,000	940,000	18,800	18,820	37,620	1,881,000	1,560	78,000	0	0	78,000	1,560	
	22. Agricultural Land	m ²	3,000	0	3,387	1,129,000	3,387	1,129,000	414	138,000	282	94,000	232,000	696	
3	Indirect Costs														
	31. Administration Cost	Ls.	-	3,580	21,001	0	40,809	0	40,809	3,777	3,263	0	0	7,040	
	32. Eng. Services Cost	Ls.	-	7,919	8,231	0	16,150	0	16,150	1,627	1,509	0	0	3,136	
	33. Physical Contingency	Ls.	-	8,309	8,916	0	17,225	0	17,225	1,509	1,237	0	0	2,746	
GRAND TOTAL															
					(Rp.million)		189,477		189,477		16,600			30,203	
					(US\$ million eq.)		19,737		19,737		1,729			3,146	
					(Yen million eq.)		2,447.4		2,447.4		214.4			390.1	

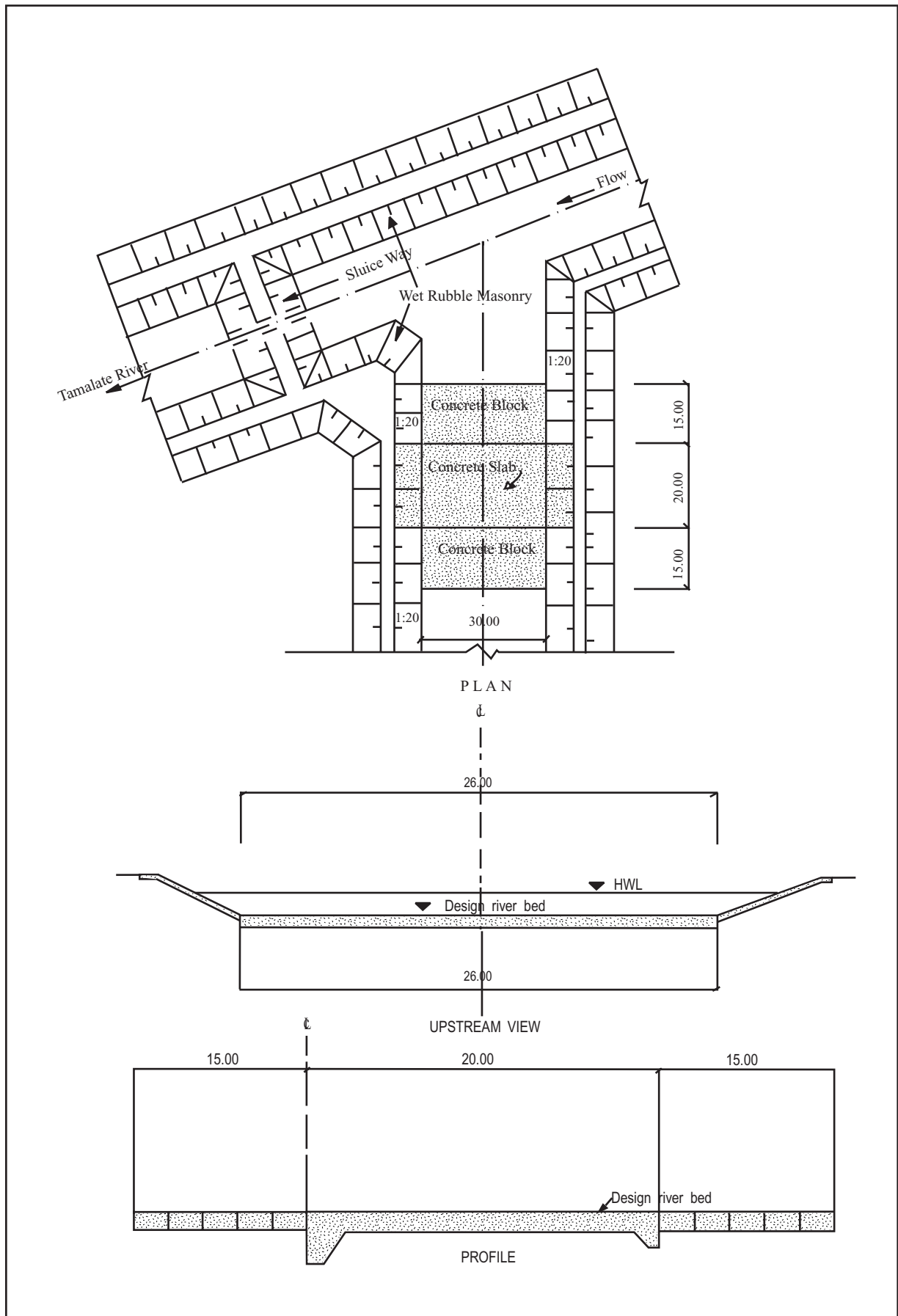
Table B4.2.2 PROJECT COSTS OF SUB-PROJECTS FOR FM-MP (4/4)

No	Work Item	Unit	Unit Price (Rp.)	Tapodu R. Improvement with Tapodu Gate		East Lake Dike		West Lake Dike		Lake Limboto Management (Total)	
				Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)	Q'ty	Amount (Rp.million)
1	Direct Cost			17,086			9,507		6,458		33,051
	11. Earth Works										
	111. Excavation work	m ³	15,000	0		90,000	1,350	60,000	900	150,000	2,250
	112. Embankment work	m ³	28,000	21,000	588	250,000	7,000	170,000	4,760	441,000	12,348
	113. Sediment trap work	m	265,000	0			0		0	0	0
	114. Sodding work	m ²	20,000	0		26,000	520	17,000	340	43,000	860
	12. Structural Work			0			0		0	0	0
	121. Concrete work	m ³	550,000	3,000	1,650		0		0	3,000	1,650
	122. Wet masonry work	m ³	220,000	9,000	1,980		0		0	9,000	1,980
	123. Drainage sluice work										
	- DS type-1 (1m x 1m)	pcs	45,000,000	0		8	360	6	270	14	630
	- DS type-2 (3m x 3m)	pcs	350,000,000	0			0		0	0	0
	124. Metal Works	m ²	130,000,000	86	11,180		0		0	86	11,180
	125. Bridge work										
	- Br. type-1 (w = 4.0 m)	m	17,000,000	70	1,190		0		0	70	1,190
	- Br. type-2 (w = 7.0 m)	m	35,000,000	0			0		0	0	0
	13. Miscellaneous work	l.s.		498			277		188	0	963
2	Land Acquisition			240			0		0		240
	21. Residential Land	m ²	20,000	0			0	0	0	0	0
	22. Agricultural Land	m ²	3,000	80,000	240		0	0	0	80,000	240
3	Indirect Costs			5,505			3,042		2,067		10,614
	31. Administration Cost	l.s.	-	866			475		323		1,664
	32. Eng. Services Cost	l.s.	-	2,563			1,426		969		4,958
	33. Physical Contingency	l.s.	-	2,076			1,141		775		3,992
	GRAND TOTAL			22,831			12,549		8,525		43,905
			(Rp.million)								
			(US\$ million eq.)	2,378			1,307		0,888		4,573
			(Yen million eq.)	294.9			162.1		110.1		567.1



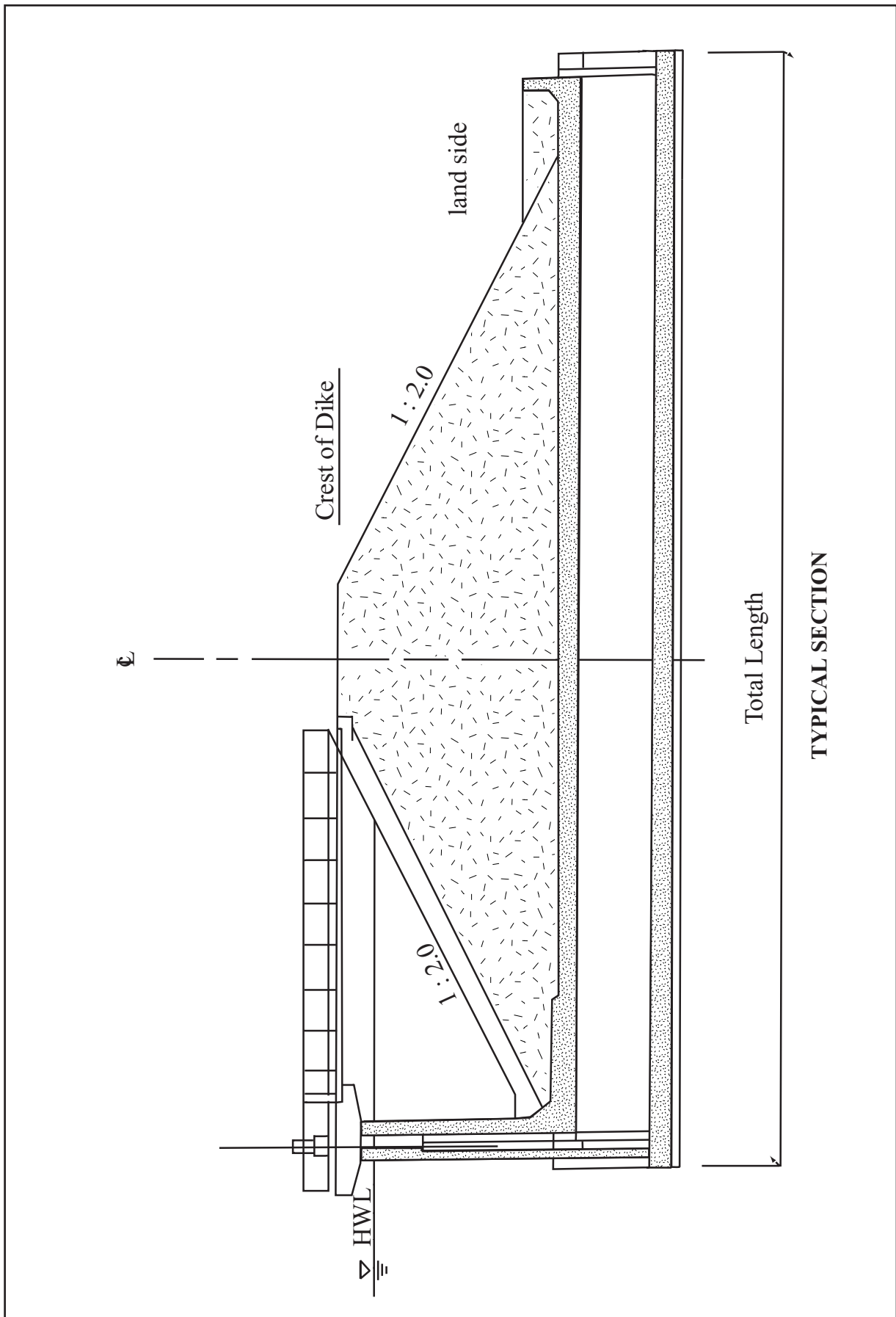
*The Study on Flood Control
and Water Management
in Limboto-Bolango-Bone Basin
in the Republic of Indonesia*
Japan International Cooperation Agency

Figure B4.1.1
TAPODU GATE



*The Study on Flood Control
and Water Management
in Limboto-Bolango-Bone Basin
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Japan International Cooperation Agency

Figure B4.1.2
TAMALATE WEIR



*The Study on Flood Control
and Water Management
in Limboto-Bolango-Bone Basin
in the Republic of Indonesia*
Japan International Cooperation Agency

Figure B4.1.3
DRAINAGE SLUICE

B5. IMPLEMENTATION OF MASTER PLAN

B5.1 Stage Construction

Strategy: The Flood Mitigation Master Plan (FM-MP) is proposed to support the socio-economic conditions at the target year of 2019. The project works must be carried out effectively in orderly manner toward the target year. It is also important to realize the flood mitigation effects as early as possible in the course of implementation corresponding to the progress of work. In order to activate the flood mitigation activities in the basin, the FM-MP is proposed to be implemented stage-wise as follows (Figure B5.1.1):

- 1) Preparatory stage : Until end of 2004
- 2) Intensive implementation stage : From beginning of 2005 to end of 2009
- 3) Sustainable implementation stage : From beginning of 2010 to end of 2019

Sub-projects: The project works of the FM-MP can be divided into following self-standing sub-projects:

Bolango-Bone River System

- 1) Bone River Improvement: Lower and middle Bone river improvement
- 2) Tamalate River improvement: Tamalate floodway and lower Tamalate river improvement
- 3) Bolango River improvement: Lower and middle Bolango river improvement

Lake Limboto System

- 4) Biyonga River improvement including realignment of lower Biyonga river with east sediment trap work
- 5) Meluopo River improvement
- 6) Marisa River improvement
- 7) Alo-Pohu River improvement including realignment of lower Alo-Pohu river with west sediment trap work
- 8) Rintenga River improvement
- 9) Tapodu River improvement with Tapodu gate
- 10) Dikes of Lake Limboto: East and west lake dikes

(1) Preparatory Stage

During this stage until the end of the 7th National Five-Year Plan in 2004, various preparatory works and activities should be performed for the coming implementation of full-scale project. Main works and activities are presented below. Some activities below are to be continued in the remaining stages.

Feasibility Study: Feasibility study needs to be conducted covering the following:

- 1) River Survey: To obtain topographic maps along the river with smaller contour intervals, longitudinal river profiles and cross sections.
- 2) Restudy of Master Plan: Based on the river survey result.
- 3) Feasibility Study: The study will cover discrete environmental studies as well in order to obtain approval for project implementation from MOPE.

Fund Arrangement: The project cost estimated in the feasibility study is allocated among the stakeholders such as central/local governments and communities, taking into consideration the nature of work and the capability of funding.

Definite Plan/Detail Design: A definite plan of the flood mitigation works will be drawn up after getting consent of the central/local government agencies and communities concerned. A detailed design will be prepared of the project facilities.

Preservation of Lands: One of the crucial issues of the works in urban area like Gorontalo is the land acquisition. Therefore, it is essential to preserve the lands for flood mitigation facilities. This should start immediately after the preparation of definite flood mitigation plan.

Research and Investigation: Throughout the implementation period of the FM-MP, research and investigation activities should also be conducted in parallel, for development of engineering tools to support the project. The following may be included among these activities, but not limited to:

- 1) Sediment Runoff: Study and analysis on sediment yield and transport are necessary especially in relation to the Lake Limboto.
- 2) Development of Erosion Control Works: For developing erosion control works effective and practical to the basin, various types of erosion control works

should be introduced and tested. The work should include measures against sheet erosion and riverbank erosion. The works should be monitored for their sediment control effects and evaluated taking the materials available and cost-performance into consideration.

- 3) **Research on Application of Bioengineering Technology:** In order to introduce bioengineering technology as a component of flood mitigation, research works and accumulation of experience are necessary, in particular, on the selection of plant species, type and function of works applicable, raising techniques, and possibility of income generation for the community.

Coordination with Relevant Agencies and Communities: Implementation of flood mitigation requires coordination with various agencies and organization, among others:

- 1) **For Structural Measures:** Coordination to allocate works and required cost among the relevant agencies and organizations;
- 2) **For Watershed Management:** Coordination mainly with the Department of Forest and Plantation to promote Land Rehabilitation and Soil Conservation (LRSC) project
- 3) **For Flood Plain Management:** Coordination and promotion for Community Mobilization to establish organizational basis for the flood mitigation activities in the communities. Training and workshop of the government officers in charge of flood plain management will be necessary as well as the community leaders

(2) Intensive Implementation Stage

Intensive Implementation: During the period of the 8th National Five-Year Plan from 2005 to 2009, actual construction works at site and activities for watershed management and flood plain management will be implemented intensively. The projects to be implemented in this stage must be the basic facilities and activities for flood mitigation and the priority ones expected to yield higher outcome. Through the intensive implementation, it is expected the flood mitigation activities in the basin will be stimulated and related personnel and administration will be trained and adjusted toward effective implementation of the project.

Projects to be Selected for Intensive Implementation: The projects for the intensive implementation should be selected considering the following matters:

- 1) Urgency of implementation
- 2) Important facilities and areas to be protected
- 3) Site in more critical conditions
- 4) Magnitude of favorable social impacts
- 5) Engineering sequence of implementation

Non-structural Measures: In parallel with the structural measures, watershed management and flood plain management will be implemented as follows:

- 1) Watershed management by encouraging activities such as construction of erosion control facilities, afforestation and land use control, and publicity activities in the watershed areas in coordination with the Department of Forest and Plantation.
- 2) Flood plain management by encouraging and promoting Local Coping Measures and Community-based Sustainable Measures to be taken by the community people in the flood plain areas.

(3) Sustainable Implementation Stage

During the period of the Ninth and Tenth National Five-Year Plans from 2010 to 2019, the remaining sub-projects will be carried out in sustainable manner in parallel with the watershed management and flood plain management activities.

Structural Measures: After completion of the sub-projects selected for the intensive implementation, remaining sub-projects of the FM-MP are to be implemented in this stage. With completion of the sub-projects, basic flood mitigation facilities of the LBB basin will be improved based on 20-year probable flood.

Non-structural Measures: In parallel with the structural measures, watershed management and flood plain management will be continued to in coordination with the Department of Forest and Plantation, and by encouraging and promoting community people.

B5.2 Organizational and Institutional Arrangements

(1) Water Resources Management Authority

Administrative Authorities: According to the Act No. 22 of 1999 pertaining Local Government Administration, the authorities of Kabupaten/Kota covers all administrative issues except for the policies of foreign affairs, defence and security, judicature, money and finance, religion, etc. A diagram of shearing authorities and responsibilities is shown in Figure B5.2.1.

Authority Shearing: The shearing of authorities and responsibilities among central and local governments with respect to water resources management are as follows:

- 1) The central government has the authorities and responsibilities to conduct water resources management, covering policy of national planning and the control macro national development, efficiency in water resources use, strategic and high technology, conservation and national standardization;
- 2) The authorities of provincial government cover those inter-Kabupaten/Kota administrative issues. As to public work/water resources the authorities of provincial government cover:
 - Determination of water resources standard in inter-Kabupaten/Kota;
 - Support for cooperation among Kabupaten/Kota;
 - Support for resources management;
 - Permission for changing and demolishing water structures for the use of inter-Kabupaten/Kota
- 3) Beside the above, provincial government can implement the authority which Kabupaten is not able to implement.

Decentralization and De-concentration of Authority: The decentralization means the transferring authorities owned by the central government to the local governments, while the de-concentration system is an implementation procedure of the authorities of the central government to be implemented by the local government.

The authorities of Province in De-concentration and those to be done for Kabupaten are shown in Table B5.2.1.

(2) Institution for Flood Mitigation in LBB Basin

Relevant Agencies: There are three government institutions which carry out flood mitigation in the LBB Basin. They are:

- 1) Dinas of Public Works/Settlement and Regional Infrastructure (Dinas PU Kimpraswil) of Gorontalo Province;
- 2) Dinas of Public Works (Dinas PU) of Gorontalo City; and
- 3) Dinas of Public Works and Regional Infrastructure (Dinas PU dan Praswil) of Kabupaten Gorontalo.

Dinas PU/Kimpraswil of Gorontalo Province: Plan and design for flood mitigation are to be prepared by Technical Planning Section, while implementation is conducted by river section and operation and maintenance are carry out by Operation and Maintenance Section. The Technical Implementation Unit (TIU or UPTD) and Group of Functional Jobs are not yet established.

Dinas PU of Kota Gorontalo: Dinas PU of Kota Gorontalo is in charge of management of water resources mattes in Kota Gorontalo. The Dinas PU is an administrative implementation element of the public works sector having obligation for implementation part of the autonomous authority under the decentralization framework of the city.

Dinas PU dan Praswil of Kabupaten Gorontalo: The flood mitigation activities in the Kabupaten Gorontalo are carried out by Dinas PU dan Praswil of Kabupaten Gorontalo.

Organization for Coordination: According to the Public Work Minister's Decree No. 67/PRT/1993, it is necessary to establish Provincial Water Resources Management Committee (Panitia Tata Pengaturan Air Propinsi – PTPA) and River Basin Water Resources Management Committee (Panitia Pelaksana Tata Pengaturan Air – PPTPA) for coordination. PTPA has jobs to assist Governor in coordination for water and water resources management. PPTPA has jobs to respond the development demand and assist PTPA in the river basin concern. The roles of PTPA and PPTPA are very important for the all activities of water resources management. For instance, mechanism of arrangement in planning and implementing flood control is shown in Figure B5.2.2. In the province of Gorontalo PTPA and PPTPA are not yet established, but will be soon established since provincial governor's decree on this matter has

already been issued. These will be finally incorporated in the Balai PSDA for integrated water resources management. An organization forum was established in Kabupaten Gorontalo for water resources management, by the name Panitia Pelaksana Tata Pengaturan Air (PPTPA) Wilayah Sungai Kabupaten Gorontalo and the Secretariat of PPTPA River Basin in Kabupaten Gorontalo was decided by Bupati's Decree No. 527/2001 dated 8 May 2001.

(3) Organization and Institution for Implementation of FM-MP

Job Shearing in Flood Mitigation: Schematic location of the LBB basin is shown in Figure B5.2.3 in relation with Kabupaten Gorontalo, Kota Gorontalo and Kabupaten Boalemo. The LBB basin extends crossing the border of Kabupaten Gorontalo and Kota Gorontalo in the Province of Gorontalo. In this case Province of Gorontalo has authority to manage the LBB-Basin in cooperation with Kabupaten and Kota of Gorontalo, according to the Government Regulation No. 25/2000 concerning Authority of Government and Province. The job and authority of central government, province and kabupaten/kota for flood mitigation are shown in Table B5.2.2 in comparison with those before and after implementation of decentralization. As shown in the Table, under the decentralization system, the flood mitigation authorities will be transferred to the Kabupaten and Kota in principle. However, province will implement the authorities as ever until Kabupaten / Kota will have capability for implementation. Province will also implement de-concentrated authority from the Central Government. Central Government will budget and control some important construction and rehabilitation projects which are not capable of Province.

Implementation under Deconcentration: Implementation of the FM-MP may be executed through "Deconcentration system". The deconcentration is an implementation system to transfer the authorities of central government to Governor as a representative according to the law (Gov. Reg. No. 39/2001, Article 2 and Article 3). In carrying out of the authority deconcentrated, a special unit tentatively called as "Flood Mitigation Project in LBB Basin" will be organized in the province from autonomous authority on responsibility and budgeting. The Flood Mitigation Project (the Project) in LBB Basin will be responsible to Directorate General of Water Resources (DGWR) and operational activities, under guidance of the DGWR, to Dinas PU/Kimpraswil of Gorontalo Province through Sub-Dinas of Water Resources Management.

Organizational Arrangement: Organizational arrangements for the implementation of the Project are proposed as shown in Figure B5.2.4. The organization is composed of mainly three elements, i.e., managerial, staffing and implementation. The unit for the Flood Mitigation Project will be organized mainly with the staff of the Gorontalo Province, Kabupaten and Kota. It is essential to promote capacity building of these relevant agencies in collaboration.

Obligation and Authority: The Project Manager has obligation and authority for managing, regulating and coordinating the implementation of all project works giving direction and guidance, supervising works and controlling the staff and Implementation Element during the project implementation. The Project Manager will be responsible to Director General of Water Resources Development and operation to the chief of Dinas PU/Kimpraswil of Gorontalo Province through Sub-Dinas of Water Resources Development.

Table B5.2.1 AUTHORITIES OF PROVINCE UNDER DECONCENTRATION

No.	Authority	Form of Authority		
		Formulation	Implementation	Evaluation
1	Deconcentrated Authorities	-	✓	✓
1.1	National Planning & Dev. Control	-	✓	✓
1.2	Financial Balance	-	✓	✓
1.3	State Administration System & Economic Inst.	-	✓	✓
1.4	Human Resources Building & Efficiency	-	✓	✓
1.5	Eff. Natural Resources Strategic & High Technology	-	✓	✓
1.6	Conservation	-	✓	✓
1.7	Standardization	-	✓	✓
2	Authority done by Province for Kabupaten/Kota	✓	✓	✓
2.1	Public Works	✓	✓	✓
2.2	Healthy	✓	✓	✓
2.3	Education & Culture	✓	✓	✓
2.4	Agriculture	✓	✓	✓
2.5	Communication	✓	✓	✓
2.6	Trade and Industry	✓	✓	✓
2.7	Capital investment	✓	✓	✓
2.8	Environment	✓	✓	✓
2.9	Land Affairs	✓	✓	✓
2.10	Cooperation	✓	✓	✓
2.11	Human Power	✓	✓	✓

Source: Profile of Province Gorontalo from Law No. 22/1999 and Gov. Regulation No. 25/2000.

**Table B5.2.2 JOB SHARING IN FLOOD MITIGATION AUTHORITY
(RIVER BASIN LOCATED INTER-KABUPATEN/KOTA)**

No.	Related Institution	Initiative			Planning			Actuating			Budgeting			Control		
		Before Decent.	Now	Under Decent.	Before Decent.	Now	Under Decent.	Before Decent.	Now	Under Decent.	Before Decent.	Now	Under Decent.	Before Decent.	Now	Under Decent.
1	MASTER PLAN															
	- Central	-	-	-	-	√ ^②	-	√	√ ^①	√	-	√ ^③	√ ^③	√ ^③	-	-
	- Province - Kabupaten/Kota	√ -	√ √	√ √	√ √	√ -	√ -	- -	√ -	√ -	√ -	√ -	√ -	- -	- -	√ -
2	CONSTRUCTION															
	- Central	-	-	-	-	-	-	-	√ ^②	-	√ ^②	√ ^③	√ ^③	√ ^③	√ ^③	√ ^③
	- Province - Kabupaten/Kota	√ -	√ √	√ √	√ √	√ -	√ ^④ √ ^④	√ √	√ -	√ -	√ ^④ √ ^④	√ ^① √	√ ^① √	√ -	√ √	√ √
3	REHABILITATION															
	- Central	-	-	-	-	-	-	-	-	-	-	√ ^②	√ ^②	√ ^③	√ ^③	√ ^③
	- Province - Kabupaten/Kota	√ -	√ √	√ √	√ √	√ -	√ √	√ √	√ -	√ ^① √	√ √	√ ^① √	√ -	√ √	√ √	√ √
4	OPERATION															
	- Central	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Province - Kabupaten/Kota	√ -	√ √	√ √	√ √	√ -	√ √	√ √	√ -	√ √	√ √	√ √	√ -	√ √	√ √	√ √
5	MAINTENANCE															
	- Central	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Province - Kabupaten/Kota	√ -	√ √	√ √	√ √	√ -	√ √	√ √	√ -	√ √	√ √	√ √	√ -	√ √	√ √	√ √

Note :

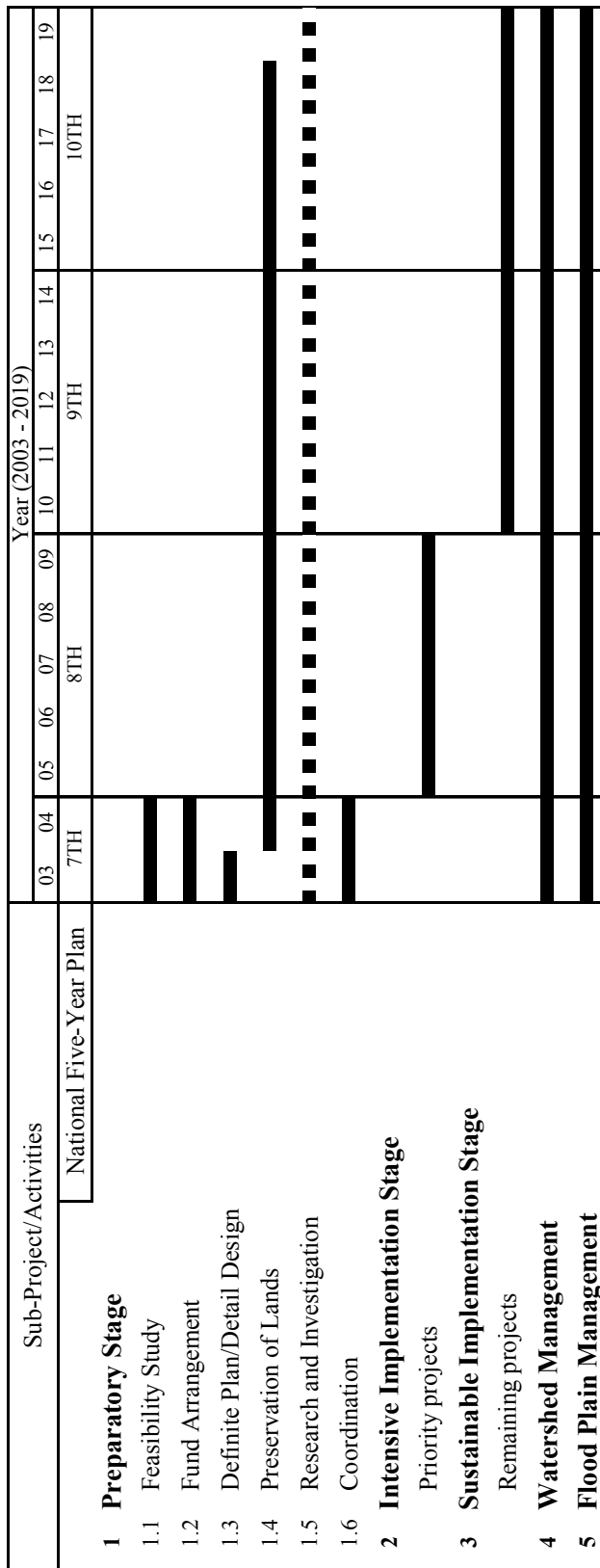
① In condition if Kabupaten is not capable yet.

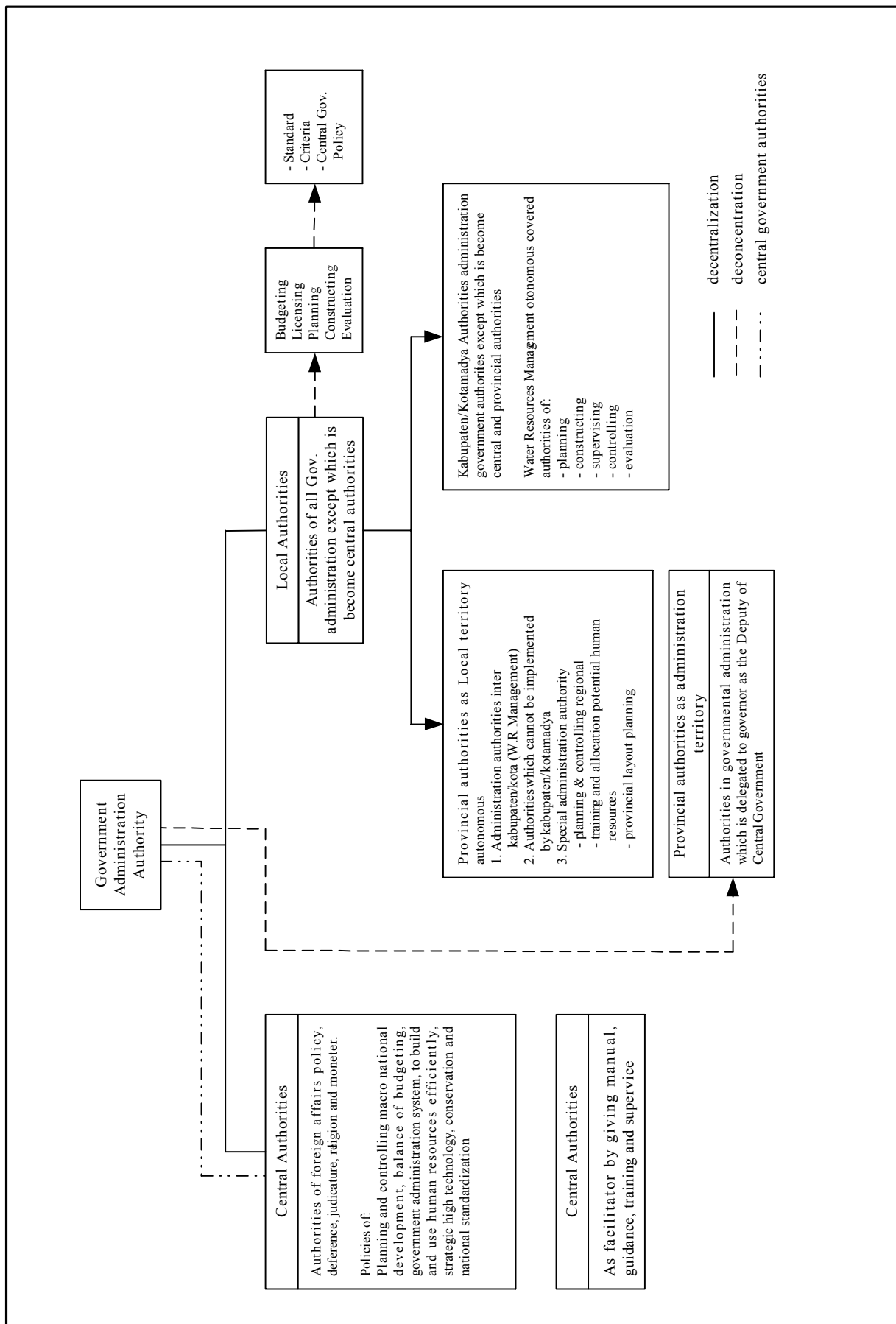
② In condition if Province is not capable yet.

③ In condition budgeting by Central

④ Small Scale Structure

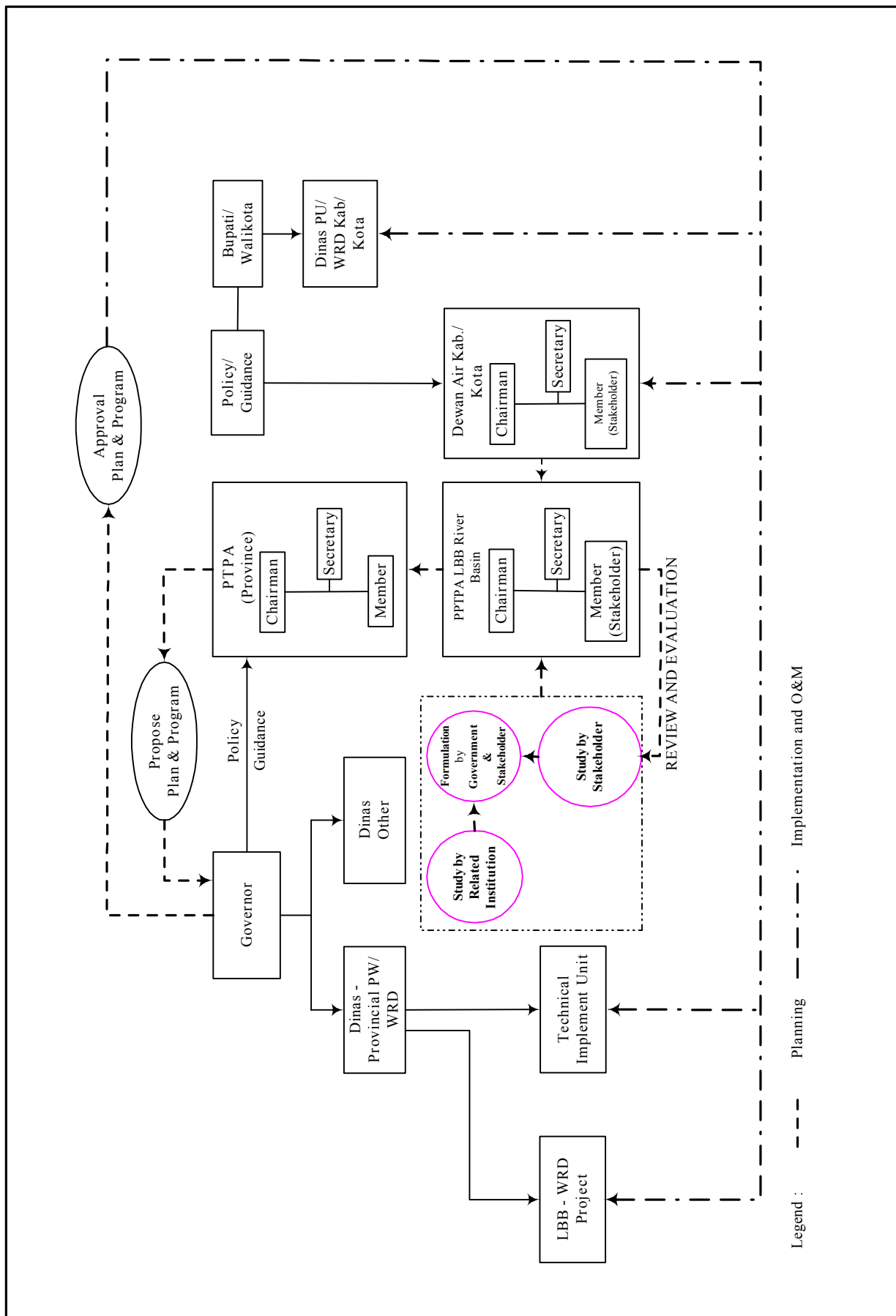
Decent. : Decentralization





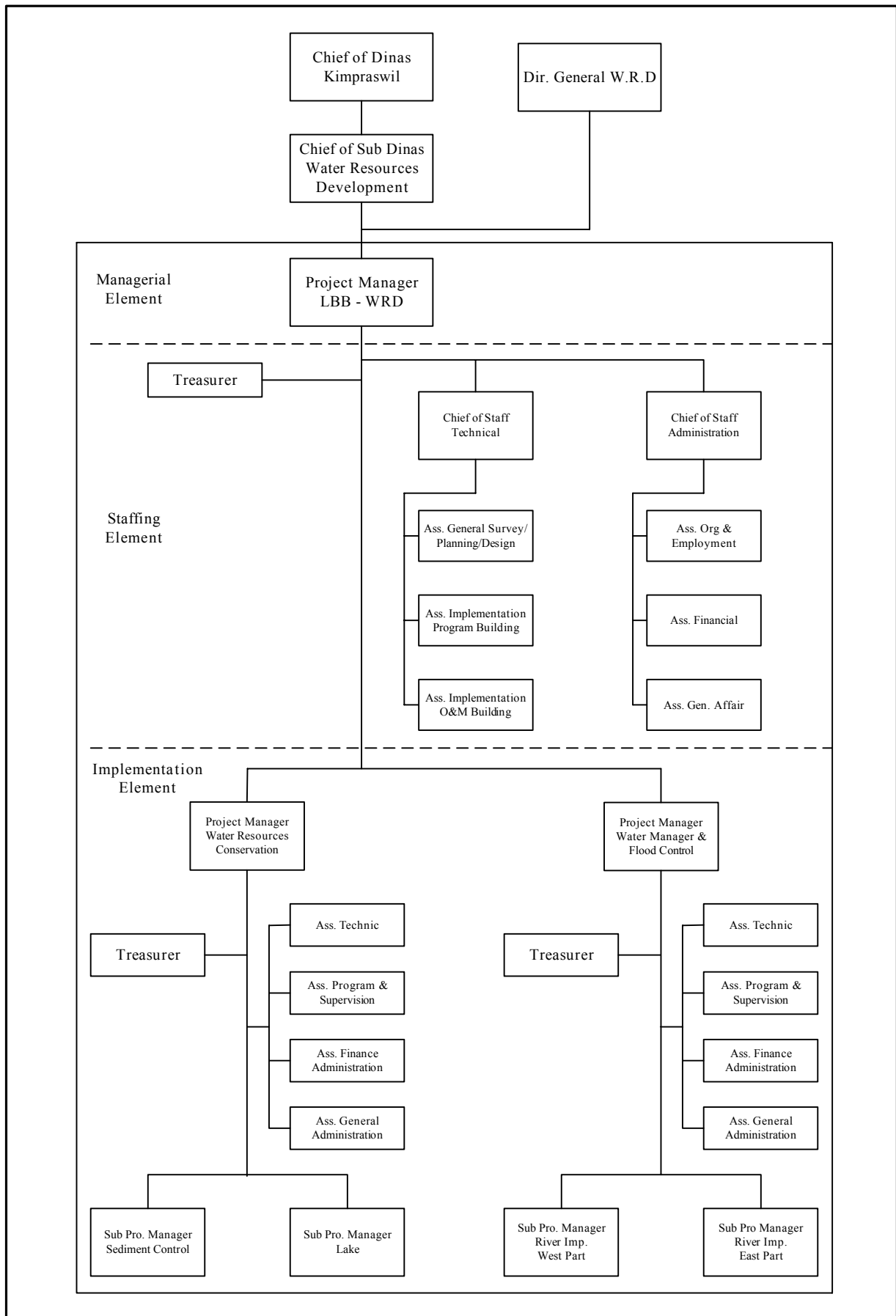
The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia
 Japan International Cooperation Agency

Figure B5.2.1
WATER RESOURCES MANAGEMENT UNDER DECENTRALIZATION



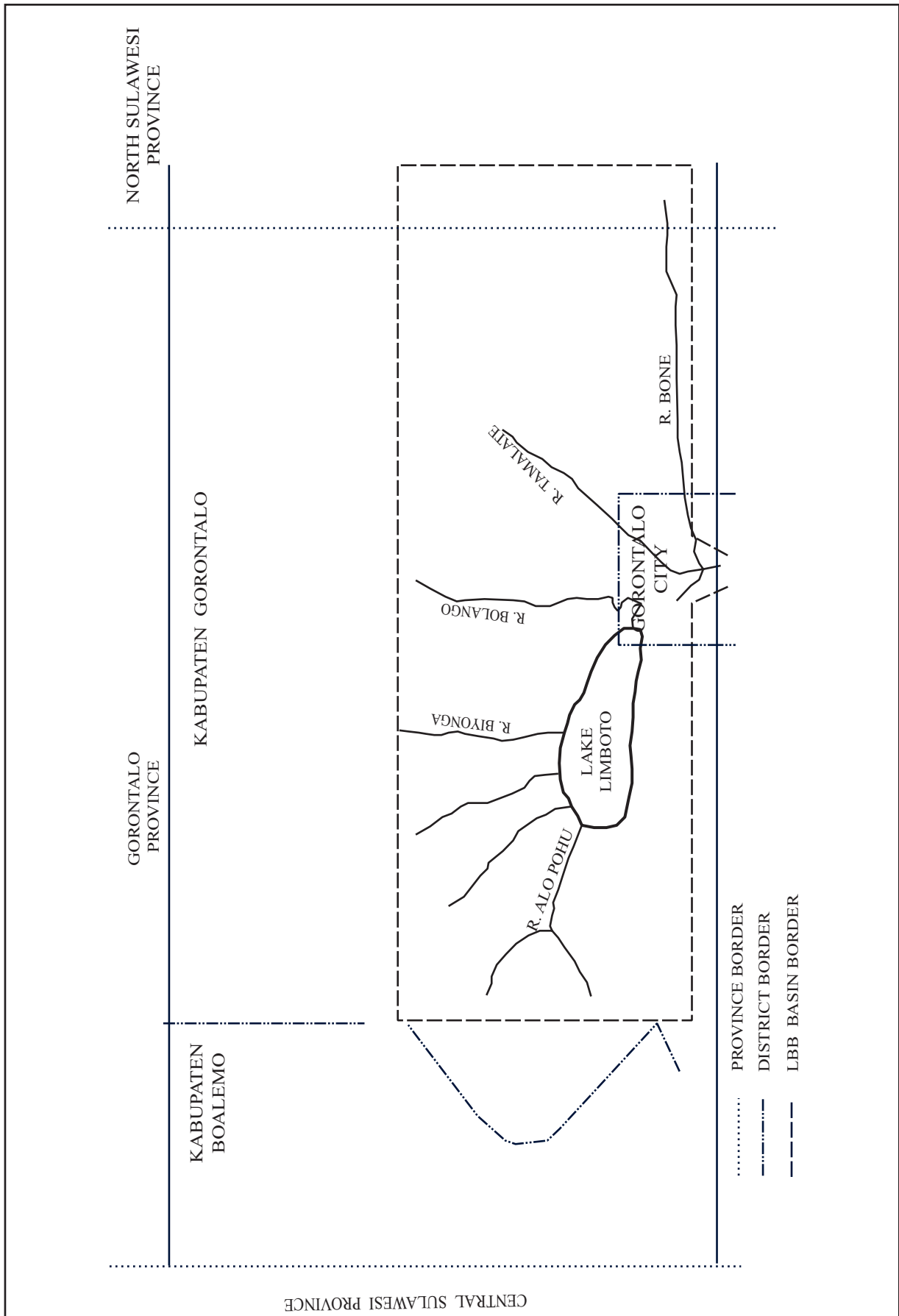
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Figure B5.2.2
MECHANISM OF ARRANGEMENT IN PLANNING AND IMPLEMENTATION



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Figure B5.2.4
PROPOSED ORGANIZATION FOR IMPLEMENTATION OF FM-MP



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and Water Management
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in the Republic of Indonesia*

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Figure B5.2.3
SCHEMATIC LOCATION OF LBB BASIN