

Table C8.4.9 DESCRIPTION OF IMPACTS ON SOCIAL ENVIRONMENTAL COMPONENTS (1/3)

<i>Environmental component to be affected</i>	<i>Phase *</i>	<i>Description of direct impact</i>	<i>Negative/ Positive</i>	<i>Spatial extent/ Area to be affected</i>	<i>Conditions of impacts to occur</i>	<i>Quantitative magnitude</i>	<i>Possible secondary impacts**</i>
1. Resettlement	PC	Change of residence and start of new life is necessary for the concerned residents as a result of land acquisition.	Negative	Along Tamalate Floodway site, downstream of Tapodu, Bolango, Biyonga and Alo-Pohu rivers	Not avoidable. The magnitude of impact depends on the magnitude and location of the projects	In total 130 houses and 69 ha of lands	Adjustment oneself to a new location
			Positive				
2. Livelihood	PC	Resettlement measures may force the concerned households to change occupation or lose asset such as rice field.	Negative	Along Tamalate Floodway construction site, downstream of Tapodu, Bolango, Biyonga and Alo-Pohu rivers	Insufficient compensation and no appropriate alternative lands provided	130 houses (estimated more than 500 persons), 69 ha	Impoverishment of the affected households
			Positive				
3. Local Population's Opposition	C	Recruitment of workers for the project implementation provides a job opportunity in the region which can be an alternative source of income for the relocated households	Positive	All the project sites. Area may go beyond boundaries of concerned village, though.	Local residents is recruited favorably to the people from outside.	230-400 worker recruitment (est. more than 900 persons influenced)	Influx of workers outside the local villages
			Negative				
3. Local Population's Opposition	M/O	Stable water level provides favorable environment for fish culture in the lake Limboto.	Positive	Lake Limboto surrounding area (19 fishery villages at kabupaten level)	Tapodu gate properly controlled and managed, with the promotion of fishery in the lake	With 4 m of water level, maximum potential of fish production can be 1,552 ton/year	Labor shift into fishery industry from other sectors
			Negative				
3. Local Population's Opposition	PC	Land acquisition would cause people's frustration or resistance to release of land and project implementation	Negative	Along Tamalate Floodway site, downstream of Tapodu, Bolango, Biyonga and Alo-Pohu rivers	Insufficient socialization of the projects, lack of dialogue between the residents and the government, inappropriate land acquisition measures	14 desa/kelurahan at project sites, and surrounding desa of the lake Limboto	In the most serious case, project commencement is hindered.
			Positive				
3. Local Population's Opposition	C	Construction work would produce noise and waste, and cause traffic jam, esp. around Pilolodaa market	Negative	All the sites of construction work	In the most serious case, project implementation is retarded or rejected.	14 desa/kelurahan at project sites, and Pilolodaa market	In the most serious case, project implementation is retarded or rejected.
			Positive				

Table C8.4.9 DESCRIPTION OF IMPACTS ON SOCIAL ENVIRONMENTAL COMPONENTS (2/3)

<i>Environmental component to be affected</i>	<i>Phase *</i>	<i>Description of direct impact</i>	<i>Negative/ Positive</i>	<i>Spatial extent/ Area to be affected</i>	<i>Conditions of impacts to occur</i>	<i>Quantitative magnitude</i>	<i>Possible secondary impacts**</i>
3. Local Population's Opposition (cont.)	M/O	Construction of facilities may cause community split	Negative	Along Tamalate Floodway and Tapodu river improvement sites	Insufficient socialization of the projects, lack of dialogue between the residents and the government, inappropriate land acquisition measures	Population of desa/kelurahan along Tamalate Floodway and Tapodu river	Not Clear
	PC	None	-	-	-	-	-
4. People's mobility	C	Transportation vehicle could cause crowded traffic and disturbance to activities at Pilolodaa market	Negative	At the Tapodu gate construction site, Kel. Pilolodaa and its neighborhood	Inappropriate schedule of utilization of existing roads	Affected people's number is not clear (Kel. Pilolodaa and its market users)	People's opposition to the project activities
	M/O	The construction of new bridges and access road along the dike together with heightening of some existing bridges could increase mobility of local population	Positive	Around the project sites where concerned bridges and roads are provided	The bridges and roads are properly used and maintained.	Not Clear. (population of Kota Barat/ Selatan/ Utara, Kec. Kabila/ Telaga, mainly)	Not Clear
5. Access to waters	PC	As the lands along concerned rivers are to be acquired, people's access to waters becomes limited. In other words, people's daily life activity (bathing, laundry, waste dumping, privy, etc.) and their visual accessibility to waters are disturbed.	Negative	Along Tamalate Floodway and Tapodu river improvement sites, in addition to some coastal area of lake Limboto	It is difficult to avoid, i.e. to change people's attitude in a short term Practice of waste-dumping is controlled.	130 households relocated + α. Not Clear (Residents along the treated rivers and Tamalate Floodway)	Intensive utilization of alternative water place. Domestic waste may be dumped somewhere else and the place will be polluted.
			Positive				
	C	Access to waters is limited by land occupation for construction works and daily life is disturbed.	Negative	All the project sites	Not avoidable.		
M/O	With constructed structures (dikes, gate, etc.), it becomes more difficult to access to river and lake waters.	Negative	Along Tamalate Floodway, Tapodu river improvement sites, in addition to some coastal area of lake Limboto.	Alternative path to waters/place are not provided in the design of structural interventions.			

Table C8.4.9 DESCRIPTION OF IMPACTS ON SOCIAL ENVIRONMENTAL COMPONENTS (3/3)

<i>Environmental component to be affected</i>	<i>Phase *</i>	<i>Description of direct impact</i>	<i>Negative/Positive</i>	<i>Spatial extent/Area to be affected</i>	<i>Conditions of impacts to occur</i>	<i>Quantitative magnitude</i>	<i>Possible secondary impacts**</i>
6. Public Health and sanitation	PC	Health facilities/personnel located in the project sites may need to move as a consequence of land acquisition and people's access to public health becomes difficult.	Negative	Along Tamalate Floodway and Bolango river improvement sites.	Existing health facilities and/or personnel need to be relocated	Not Clear.	Not Clear.
	C	None	-	-	-	-	-
	M/O	When the proposed projects are all properly implemented, Flood risks in the region will be mitigated.	Positive	All the flood prone areas in Kota and Kab. Gorontalo	All the completed facilities are properly used and maintained (no stagnant water within sluices).	Not Clear. (all the population of flood prone area)	Not Clear.
7. Waste	PC	People's habit of waste dumping into rivers may be disturbed.	Negative /Positive	Along all the project sites except for Sediment trap installation.	Access to acquired lands is strictly prohibited.	Not Clear. The volume of waste is not quantified yet.	Domestic waste may be dumped somewhere else and the place will be polluted.
	C	Various construction works will produce construction waste.	Negative	At all the project sites	Construction waste is not properly disposed	Not Clear.	Not Clear.
	M/O	People choose improved rivers as a new waste dumping spot.	Negative	Along all the project sites including Sediment trap installation.	Access to rivers and lake is not prohibited.	Not Clear.	Malfunction of Tapodu Gate and sluice gates.

* PC: Pre-construction phase, C: Construction phase, O/M: Operation and Maintenance phase.

** "Possible secondary impacts" are the impact which may occur as a result of direct impacts mentioned and need to be taken into consideration for project implementation.

**Table C8.4.10 RESULT OF IMPACT EVALUATION
ON SOCIAL ENVIRONMENTAL COMPONENTS**

<i>Conceivable impacts</i>	<i>Nature of impacts</i>	<i>Evaluation result</i>
(1) Negative impacts		
Change of residence	1. Affected population limited compared to past victims/damage 2. Affected area is limited to project sites. 3. Impact lasts forever and irreversible 4. Possible interaction with other components such as livelihood 5. Can be compensated	<u>Not Significant</u> , Proper land acquisition is the key
Loss of productive lands, change of occupation	1. Number of affected people seems limited 2. Affected area is limited to project sites' neighborhood 3. Intensity/duration seems possibly high 4. Impact is reversible (with compensation)	<u>Not Significant</u> , Proper land acquisition is the key
Local population's resistance	1. Community perception is positive as a whole 2. Affected area is limited to project sites 3. Impact may last only for a short time of period 4. Possible interrelation with land acquisition procedure 5. Impact is reversible	<u>Not Significant</u> , Proper land acquisition and socialization are the key
Disturbance of local traffic circulation	1. Affected population is large considering nature of existing local market 2. Affected area is limited (Pilolodaa market only) 3. Impact lasts only during construction stage 4. Other components not affected	<u>Not Significant</u> , need socialization to avoid secondary impact (opposition)
Limited access to river and lake waters	1. Affected population limited compared to past victims/damage 2. Affected area is limited to project sites 3. Impact lasts forever and irreversible 4. Possible interaction with other components like waste 5. Habitat change needs a fundamental change	<u>Not Significant</u>
Disturbance of waste dumping into rivers	1. Number of affected people seems limited 2. Affected area is limited to project sites 3. Impact may last beyond project implementation period 4. Possible interaction with public health 5. Impact is reversible with human intervention	<u>Not Significant</u> ,
(2) Positive impacts		
Job creation and better livelihood (enhanced potential of fish culture)	1. 230-400 jobs estimated, benefiting more than 900 persons 2. Benefiting area can be wide including outside Gorontalo 3. Impact lasts for one phase only, fish culture long-term impact 4. Possible interaction with other components like public health	<u>Significant</u> , both immediate and short-term impact and possibly long-term impact
Better people's mobility	1. Benefiting population is relatively large 2. Benefiting area can go beyond project sites 3. Impact lasts for a long time 4. Possible interaction with other components, livelihood 5. Impact is cumulative (bridges/roads are basic infrastructure)	<u>Significant</u>
Reduction of flood risks	1. Benefiting population is quite large 2. Benefiting area extends to all kecamatan around Lake 3. Impact lasts for a long time with proper O/M 4. Interaction with all the other components	<u>Significant</u>
Improvement of sanitary condition	1. Benefiting population is large, those of flood prone area 2. Affected area can extend to all flood prone areas 3. Impact lasts until the facilities collapse 4. Benefit is evident only when flooding	<u>Significant</u>
Limited access to rives and lake waters (less waste dumping)	1. Number of benefiting people seems limited 2. Benefiting area is limited to project sites 3. Impact may last beyond project implementation period 4. Possible interaction with public health 5. Impact could be assimilated by affected communities	<u>Not Significant</u>

Table C8.4.11 ENVIRONMENTAL MANAGEMENT PLAN ON NATURAL ENVIRONMENTAL COMPONENT

<i>Environmental component</i>	<i>Management objective</i>	<i>Management goal</i>	<i>Measure/Action for mitigation/enhancement</i>	<i>Evaluation criteria</i>
1. Geology (erosion and sedimentation)	Erosion of river banks.	Keeping river banks being non-eroded condition.	Regular inspection and maintenance of river bank and river channel.	Same as Management goal.
	Well water	Prevention of inconvenience on drinking water supply.	Supply of drinking water for affected households.	Ditto
2. Groundwater and land subsidence	Land subsidence	Assurance of remedial measure for damage caused by land subsidence	Detection of occurrence of land subsidence phenomenon.	Ditto
	Water level of rivers and flood risks	Flood control for floods up to 20 year recurrence period.	Appropriate gate control at Tapodu gate.	Ditto
3. Water regime	Water level in Lake Limboto	Keeping the planned water level more than 4.0 m.	Appropriate gate control at Tapodu gate.	Ditto
4. Terrestrial flora and fauna	Wild plants and animals	No impacts on protected species.	Transplantation of protected species, if any.	Ditto
	Aquatic weeds (Macrophytes)	Prevention of overgrowing.	Keeping lake water level at constantly high (higher than 4.0 m).	Ditto
5. Aquatic flora and fauna	Eels and other migratory fish, if any.	Keeping fishing output as current status. /Assurance of compensation for damaged fishermen.	Keeping discharge possible enough for eel's migration and water quality in good condition in drainage channels.	Current fishing output of eels.
	Other fish	Keeping fishing output more than current status.	Appropriate gate control at Tapodu gate.	Current fishing output./ Current aquaculture production.
6. Air Quality	Air pollution caused by emission gas	Preventing health damage of nearby residents.	Keeping construction machinery and transportation vehicles in good condition by means of regular tune-up.	Ambient air quality standards of NOx, SOx and CO, provided by Government Regulation No. 82, 2001.
	Dust	Keeping air dust in tolerable condition.	Keeping traffic rules and regulations./Keeping good driving manner.	Allowed dust concentration of 230 µg/m ³ , provided by Government Regulation No.41/1999.
7. Water Quality	Noise	Keeping ambient noise level in tolerable condition.	Consideration of transportation routes, e.g. construction of Temporary exclusive road.	Allowed noise level provided by Decree of Environmental Ministry No. 48, 1996.
	Turbidity and alkalinity in rivers and in Lake Limboto	Keeping turbidity in tolerable condition for daily water use.	Enclosure of construction site by sandbags for prevention of turbid water discharge.	Water quality standards provided by Government Regulation No. 82, 2001.
7. Water Quality	Alkalinity in rivers and in Lake Limboto	Keeping pH in tolerable condition for fish habitat.	Installation of on-site treatment pond of high alkali water.	Ditto
	Water quality of Lake Limboto	Keeping water quality in suitable for aquaculture.	Appropriate gate control at Tapodu gate./ Proper inspection and maintenance of sediment trap.	Ditto

Table C8.4.12 ENVIRONMENTAL MANAGEMENT PLAN ON SOCIAL ENVIRONMENTAL COMPONENTS

Environmental component	Management Element	Management goal	Measure/Action for/Mitigation/Enhancement	Evaluation criteria
1. Resettlement	Land Acquisition	To minimize negative impact by resettlement on the affected residents	Respect the existing regulations regarding land acquisition, in order to determine fair and proper compensation conditions to all the affected residents A combination of informal and formal approaches should be carefully designed and implemented.	(1) Keppress* No.55 /1993 and Peraturan Menteri Negara Agraria/ Kepala BPN No.1 /1994 (2) Keppress No.2 /1993 and Peraturan Menteri Negara Agraria/ Kepala BPN No.3 /1994.
	Land Acquisition	To minimize income loss caused by the project, of the affected residents To satisfy the people whose land is acquired by the project	Any loss of agricultural and fishery production should be taken into account to determine the amount and conditions of compensation, in direct consultation with the affected residents Provide alternative lands for continuing present activities	- Acceptance of compensation and conditions - The amount of compensation fairly determined by using NIOP**
2. Livelihood	Land Acquisition	To control tension among people concerned	Socialization to the affected people so as to avoid unrest	- Incident of people's unrest
	Recruitment of workers	To alleviate negative impact on income of the affected residents	Give priority of recruitment as worker in the project to the affected residents	- Recruitment of local affected residents
3. Local Population's	Fishery promotion	To encourage growth and development of economic activity surrounding Lake Limboto	In collaboration with Dinas Perikanan: Establish Limboto Lake Spatial Plan allotting area for fish culture Training on fish culture Encourage the establishment of fisherman group	- Development of fish culture in Lake Limboto - Contribution of fishery to regional economy
	Dissemination activity (socialization)	To avoid people's unrest and resistance to the project	Socialization of the projects toward the people affected by the Tاملate Floodway, Tapodu Gate and Sediment trap construction, in order to improve the population's perception (level of acceptance) on the mentioned projects	- People's perception on the project (ref: Agree=68%, Not agree=23.1% as of June 2002)
4. People's mobility	Land Acquisition	To ease people's frustration	The amount and conditions of compensation should be fairly determined according to the agreement with land/house owners	- Acceptance of affected people on amount and conditions of compensation concluded
5. Access to waters	Traffic conditions	To alleviate disturbance of people and vehicle's mobility and of usual function of market which is caused by project	Transportation schedule is to be carefully prepared taken into account the existing market at Pilodaa, especially its peak periods and days of the marketstage and surrounding traffic	- Incidence of traffic jam during construction
	Accessibility to river and lake waters	To minimize disturbance of daily activities such as washing and bathing	Design dikes with path or stairs Individual consultaion for those who suffer from difficult access to waters	- Constructed dikes - Case of individual consultation
6. Public health and Sanitation	Accessibility to health services	Not to worsen people's access to health services, because of eventual relocation of health facilities/ personnel	Careful choice of project site in order to maintain existing health service off not avoidable, individual consultaion for those who suffer from difficult access to health services	- Relocation of health facilities and personnel's residence - Case of individual consultation
	Practice of waste dumping	To keep improved river streams and constructed Floodway clean	Regular investigation and cleaning of the Floodway by either local people or public service	- Situation around constructed structures (Tاملate Floodway, Tapodu gate, dikes, etc.)
7. Waste	Construction waste	To avoid unorganized deposit of construction waste	Determine deposit places for each of construction sites and organize properly disposal of waste	- Situation of construction waste at project sites

* Keppress (Presidential Decree); ** NIOP: (Nilai Jual Objek Pajak: Sold Value of Tax Object)

Table C8.4.13 ENVIRONMENTAL MONITORING PLAN ON NATURAL ENVIRONMENTAL COMPONENT

<i>Environmental Component</i>	<i>Monitoring plan</i>					
	<i>Management objective</i>	<i>Phase</i>	<i>Monitoring Parameter</i>	<i>Monitoring Sites</i>	<i>Frequency/Period</i>	<i>Methodology</i>
1. Geology (erosion & sedimentation)	Erosion of river banks	O/M	Erosion point and magnitude.	Tapodu R., Bolango R., Bone R. and Tamalate R.	After major floods when necessary.	On-site visual observation
	Well water	C & O/M	Well water level	Along Tamalate floodway and Tapodu river, and Siendeng Cutoff channel.	Once a month during and after the construction of Tamalate floodway, excavation of Tapodu river and Siendeng Cutoff channel. / Period of monitoring is to depend on monitoring result of early stage.	Manual measurement of well water level of local residents.
2. Groundwater and land subsidence	Land subsidence	C & O/M	Ground elevation (Altitude)	Ditto	Ditto	Survey of ground level elevation
	Water level of rivers and flood risks	O/M	Overflow point and inundation area	LBB basin (Lower basin area)	After major flood when necessary.	On-site visual observation
	Water level in Lake Limboto	O/M	Water level	Lake Limboto and Tapodu gate	Daily for 5 years after completion of Tapodu gate.	Measurement on water gauge
4. Terrestrial flora and fauna	Wild plants and animals	C & O/M	Species designated as protected species.	Tamalate floodway and river widening sites.	Before vegetation clearance.	On-site visual observation
	Aquatic weeds (Macrophytes)	O/M	Submerged and emergent plants.	Beneng Otamaha and other viewpoints.	Several times a year. / Up to 5 years after the construction of Tapodu gate.	Photograph taking and visual observation.
	Eels and other migratory fish, if any	O/M	Fishing output of eels	Market and each fisherman	Every day.	Report from each fisherman
5. Aquatic flora and fauna	Other fish	O/M	Eels' migration	Tapodu river and drainage channels.	Twice a month for 1 year before and after the completion of Tapodu gate.	Setup of eel trap on Tapodu river and drainage channels.
	Air pollution caused by emission gas	C	fishing output from Limboto	Market and each fisherman	Regularly, e.g., once a week.	Report from each fisherman
	Dust	C	NOx, SOx, CO	Kec. Limboto, Telaga and Kabila. Kota Barat, Selatan and Utara	Once at peak period of each construction work on Alo R., Puhu R., Biyonga R., Tapodu R., Bolango R., Bone R., Tamalate floodway, Tamalate weir and Tapodu gate./ 9 points • times in total.	Sampling and laboratory test
6. Air Quality	Noise	C	Noise Level			On-site survey using noise level meter.
	Turbidity and alkalinity in rivers and in Lake Limboto	C	TSS, Turbidity	Lake Limboto, Alo-Pohu R., Biyonga R., Tapodu R., Bolango R., Bone R., Tamalate R.	Once at peak period of each construction work on Alo R., Puhu R., Biyonga R., Tapodu R., Bolango R., Bone R., Tamalate floodway, Tamalate weir, Tapodu gate and Sediment trap. / 10 times in total.	Sampling and laboratory test
	Alkalinity in rivers and in Lake Limboto	C	pH			On-site survey using pH meter.
7. Water Quality	Water quality of Lake Limboto	O/M	pH, DO, BOD5, COD, TSS, Coliform	Lake Limboto	At 3 points and 2 times a year, i.e. in rainy season and dry season, 5 years after completion of Tapodu gate./ 6 points • times x 5 year = 30	On-site survey and Sampling and laboratory test

* C: Construction phase, O/M: Operation and Maintenance phase

Table C8.4.14 ENVIRONMENTAL MONITORING PLAN ON SOCIAL ENVIRONMENTAL COMPONENTS

Environmental Component	Management Element	Monitoring plan			
		Phase	Monitoring parameter	Monitoring Sites	
			Frequency/ Period	methodology *	
1. Resettlement	Land acquisition	PC	Compensation (esp. its conditions)	Each project site and BPN	At every meeting of Land acquisition committee - Progress of land acquisition processes At the conclusion of land acquisition process - Progress of land acquisition processes - I (Land acquisition committee) - I (affected residents)
	Land acquisition	PC	Compensation (its amount & conditions)	Each project site and BPN	At the conclusion of land acquisition process - same as mentioned in "1." above
2. Livelihood	Recruitment of workers	C	Recruited resettled residents	Each project site and contractor's office**	At the end of worker recruitment - I+Q (recruited resettled residents)
	Fishery promotion	O/M		Lake Limboto, Dinas Perikanan	- Statistics Dinas Perikanan
3. Local Population's Opposition	Dissemination activity	PC	Incident of resistance	Village of incident	When people's unrest is observed and people's frustration expressed - I+Q (villages at project sites)
	Land acquisition	PC	Compensation (amount and conditions)	Each project site and BPN	At the conclusion of land acquisition process - same as mentioned in "1." above
4. Traffic facilities	Traffic conditions	C	Crowdedness of traffic	Around Pilolodaa market and contractor's office	Before starting any construction work Once a month during construction stage, including the peak period of construction work - FO - Number of complaints received
		PC		Each project site	At the conclusion of land acquisition process - FO, I
5. Access to waters	Accessibility to rivre and lake waters	C	Utilization of river and lake waters by residents	Each project site and contractor's office	When complaints are expressed - FO, I (residents nearby) - Number of concerned complaints during construction stage - Record of consultation
		O/M		Each project site	One month after the completion of construction work - I+Q (residents along rivers)
6. Public health and sanitation	Accessibility to health services	O/M	Use of health service by affected people	Each project site and nearby health facilities	- Statistics Dinas Kesehatan - I (health facility) - I+Q (people directly affected) - Record of consultation
	Practice of waste dumping	PC	Status of waste dumping by residents	Along Tamalate FW & concerned rivers	- FO, I+Q (residents along concerned rivers)
7. Waste	Construction waste	C	Organization of waste deposit	Waste deposit for each project site & contractor's office	- FO, I (Contractor)
	Practice of waste dumping	O/M	Status of waste dumping by residents	Along Tamalate FW & concerned rivers	- FO, I+Q (residents along concerned rivers and Tamalate FW)

note: * I: Interview; Q: Questionnaire; I+Q (...): Interview and questionnaire (target groups); FO: Field observation; FW: Floodway; ** contracted company for project

**Table C8.4.15 APPROVAL LETTER
OF ENVIRONMENTAL IMPACT ANALYSIS (1/3)**

**GOVERNMENT OF GORONTALO PROVINCE
EVALUATION COMMITTEE ON ENVIRONMENTAL IMPACT ANALYSIS
(EIA)**

General Sudirman Street No. 57 Gorontalo, Phone 0435-821277 Fax 0435-828281

CHAIR OF EVALUATION COMMITTEE ON ENVIRONMENTAL IMPACT ANALYSIS,
GORONTALO PROVINCE DECREE
NO. 02, 2002

ON
ENVIRONMENTAL SUITABILITY OF FLOOD CONTROL ACTIVITY
IN LIMBOTO-BOLANGO-BONE (LBB) BASIN, GORONTALO PROVINCE
BY JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) AND
DINAS PU/KIMPRASWIL, GORONTALO PROVINCE

THE CHAIR OF EVALUATION COMMITTEE ON
ENVIRONMENTAL IMPACT ANALYSIS (EIA), GORONTALO PROVINCE,

- Considering :
- a. that based on the evaluation made by AMDAL Evaluation Committee, Gorontalo Province, the Environmental Impact Analysis (AMDAL), Environmental Management Plan (RKL), and Environmental Monitoring Plan (RPL) on flood control in LBB Basin conducted by Japan International Cooperation Agency and Dinas PU/KIMPRASWIL, Gorontalo Province, can be approved according to the committee meeting result on 29 August 2002;
 - b. that the results of Environmental Impact Analysis, Environmental Management Plan, and Environmental Monitoring Plan need to be established by a decree from the Chair of AMDAL Evaluation Committee, Gorontalo Province;
 - c. that based on consideration stated in points **a.** and **b.**, decree from the Chair of AMDAL Evaluation Committee, Gorontalo Province on *Environmental Suitability of Flood Control in Limboto-Bolango-Bone Basin*, Gorontalo Province conducted by Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province need to be established;
- Considering further :
- 1. The Law No. 5 (1990) on Biological natural Resource Conservation and its Ecosystem (State Document No. 49, 1990, addition to State Document No. 3419),
 - 2. The Law No. 24 (1992) on Spatial Planning (State Document No. 115, 1992, addition to State Document No. 3501),
 - 3. The Law No. 23 (1997) on Environmental Management (State Document No. 68, 1997, addition to State Document No. 3699),
 - 4. The Law No. 22 (1999) on Regional Government (State Document No. 60, 1999, addition to State Document No. 3839),
 - 5. Government Regulation No. 27 (1999) on Environmental Impact Analysis (State Document No. 59, 1999, addition to State Document No. 3838),

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**Table C8.4.15 APPROVAL LETTER
OF ENVIRONMENTAL IMPACT ANALYSIS (2/3)**

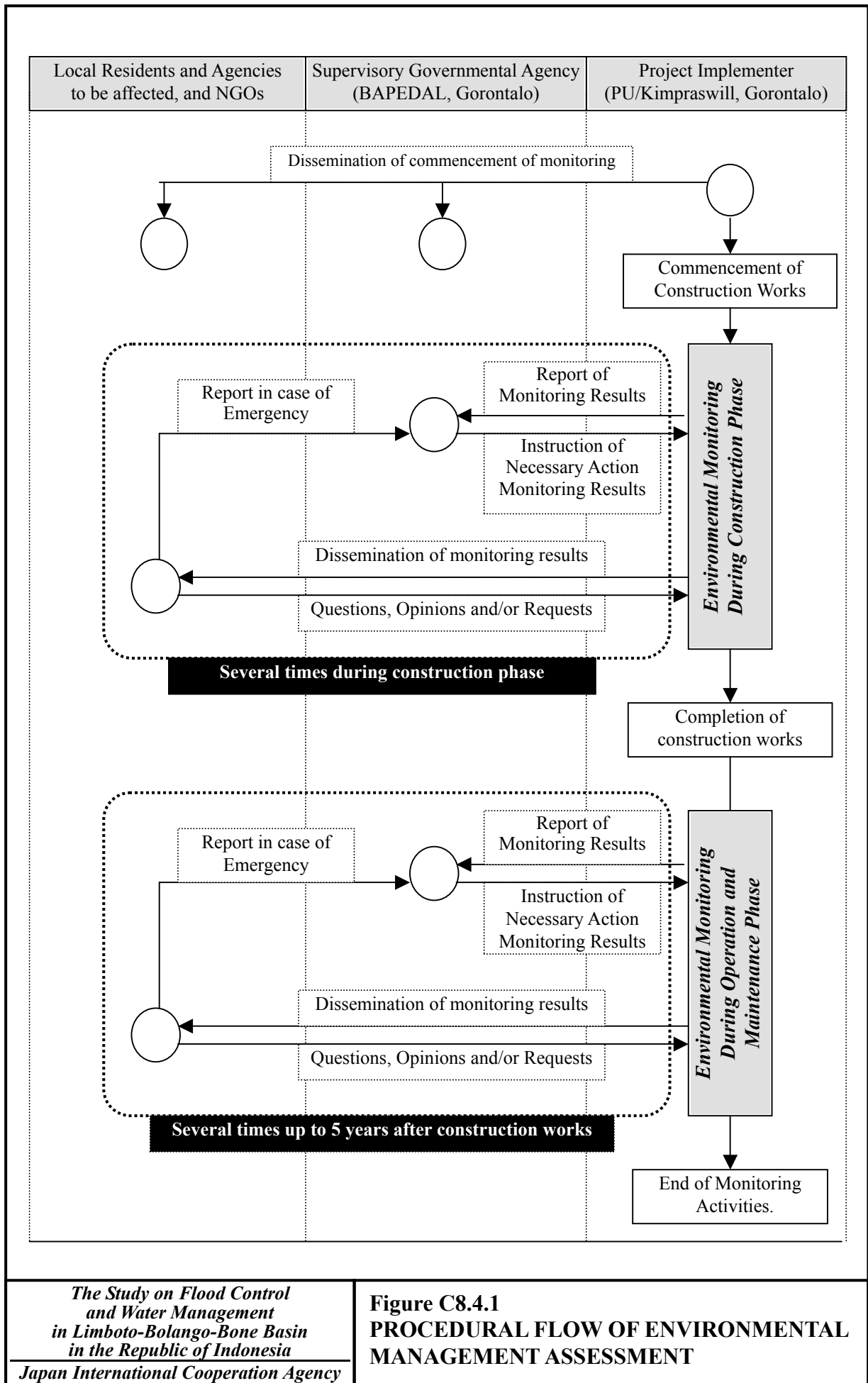
Considering further	<p>6. Government Regulation No. 10 (2000) on Environmental Impact Management Board.</p> <p>a. Decree of Environmental Ministry No. 17/Men-LH/02/2001 on Types of Activities that Required Environmental Impact Analysis,</p> <p>b. Decree of Board of Environmental Impact Control Chair No. 9 (2000) on Community Involvement and Information Transparency during the EIA Process,</p> <p>c. Decree of Board of Environmental Impact Control Chair No. 231 (2002) on Environmental Impact Analysis Arrangement Guideline,</p> <p>d. Decree of Governor No. 231 (2002) on Establishment on Evaluation Committee and EIA Technical Team in Gorontalo Province,</p> <p>e. Minutes of Gorontalo Province EIA Evaluation Committee Meeting, 29 August 2002 on Environmental Impact Analysis, Environmental Management Plan, and Environmental Monitoring Plan of Flood Control Project in Limboto-Bolango-Bone Basin conducted by Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province,</p> <p>f. Minutes of evaluation on Environmental Impact Analysis of Flood Control Project in Limboto-Bolango-Bone Basin carried out by Gorontalo Province Environmental Impact Analysis Technical Team, 22 September 2002.</p>
TO DECREE	
FIRST	: Environmental suitability of Flood Control Activity in Limboto-Bolango-Bone Basin, Gorontalo Province conducted by Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province.
SECOND	: Environmental suitability of Flood Control Activity in Limboto-Bolango-Bone Basin, Gorontalo Province conducted by Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province stated in the FIRST dictum means that the Flood Control Project Activities in Limboto-Bolango-Bone Basin, Gorontalo Province conducted by Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province is <i>suitable according to environmental viewpoint</i> .
THIRD	: Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province are required to accomplish and to obey the following procedures during their activities: <i>To perform environmental management and monitoring measures as written in the approved Environmental Management Plan and Environmental Monitoring Plan Documents,</i> <i>To report the results of perform environmental management and monitoring measures to Environmental Impact Management Board (BAPEDAL), Home Affair Minister of Republic Indonesia, Governor of</i>

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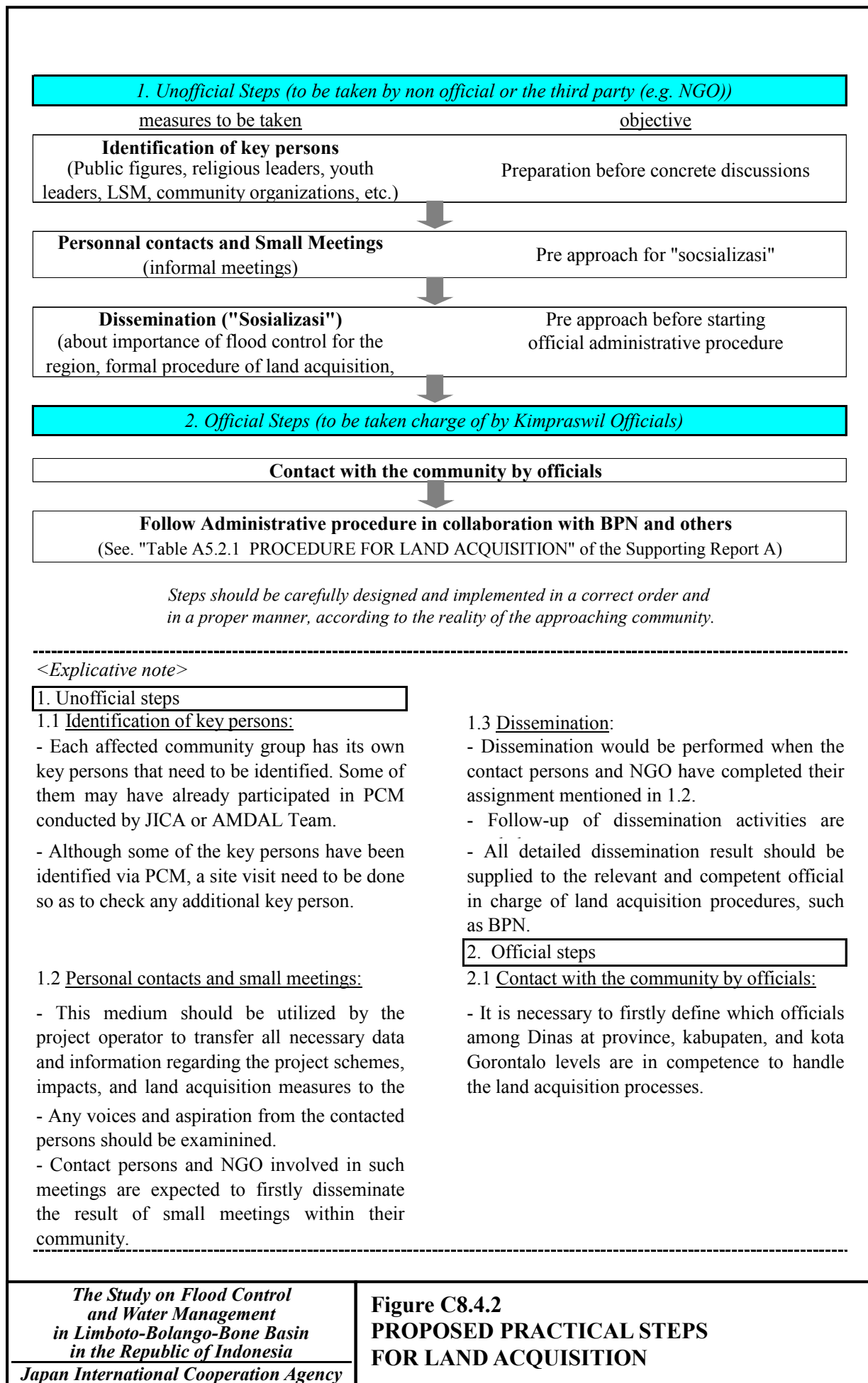
**Table C8.4.15 APPROVAL LETTER
OF ENVIRONMENTAL IMPACT ANALYSIS (3/3)**

		<i>Gorontalo, Walikota Gorontalo, and Bupati Kabupaten Gorontalo every six (6) months from the time this decree is signed.</i>
FOURTH	:	The approving authorities are <i>required to include all requirements and obligations</i> , which are not only written in this decree but in Environmental Management and Monitoring Plans, as well as regulations in permitting the flood control activities in LBB basin, Gorontalo Province.
FIFTH	:	If in the future case there will be any unpredicted and uncontrolled environmental impacts, which are not described in the approved environmental management and monitoring documents, taking place; the project operator must immediately report the impacts to the institutions mentioned in the THIRD dictum points two (2), to determine any further necessary steps.
SIXTH	:	If the flood control project activities require any extension, relocation, or change, whose impacts are not assessed and described in the approved environmental management and monitoring documents, then <i>a new Environmental Impact Analysis (EIA) must be accomplished</i> ,
SEVENTH	:	Any failure or violation acted by the Japan International Cooperation Agency (JICA) and Dinas PU/KIMPRASWIL, Gorontalo Province upon this endorsement may be <i>penalized according to the law</i> .
EIGHT	:	Any expense for issuing this decree is charged to The Environmental Impact Plan and Control Project, Regional Planning and Developing Board (Bappeda), Gorontalo Province, namely fund from additional budget (ABT).
NINETH	:	Any mistakes written in this decree must be in the future corrected accordingly.
		Decreed in Gorontalo On September the 23 rd 2002 AMDAL EVALUATION COMMITTEE CHAIRMAN
		<i>Already signed and stamped by</i> G U S N A R I S M A I L
		Copy to:
		1. Home Affair Minister in Jakarta
		2. State Minister of Environment in Jakarta
		3. Public Work/Settlement and Regional Infrastructure Minister in Jakarta
		4. Gorontalo Governor in Gorontalo
		5. Walikota Gorontalo in Gorontalo
		6. Bupati Gorontalo in Limboto
		7. The Chair of Environmental Impact Management Board in Jakarta
		8. Japan International Cooperation Agency (JICA) Team
		9. Achieve

(Remarks) Temporally English translation from original letter written in Indonesian.



**Figure C8.4.1
PROCEDURAL FLOW OF ENVIRONMENTAL
MANAGEMENT ASSESSMENT**



C9. IMPLEMENTATION PLAN

C9.1 Overall Implementation Plan

Implementation of Master Plan: The Flood Mitigation Master Plan (FM-MP) is proposed for implementation by the target year of 2019. Considering the effective and orderly implementation, early realization of project effects, and capacity building through the project implementation, the FM-MP was proposed for stage-wise implementation as follows (Figure C9.1.1):

- 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

Intensive Implementation: During the period of the Eighth 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. 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. 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.

Priority Projects Selected for Intensive Implementation: The Priority Projects include structural and non-structural measures. The structural measures selected for the intensive implementation are:

- 1) Lower Bone River Improvement
- 2) Lower Bolango River Improvement
- 3) Tapodu River Improvement with Tapodu Gate
- 4) Tamalate Floodway
- 5) Sediment Trap Works in Lake Limboto

In parallel with the structural measures, non-structural measures such as watershed management and flood plain management will also be implemented within a framework of the intensive implementation.

Structural Sub-Projects: The structural measures selected for the priority projects can be divided into following sub-projects which are expected to realize respectively the effects corresponding to the works implemented.

Work I: Bone-Bolango-Tapodu (BBT) River Improvement

Work I-1: Lower Bone River

Work I-2: Bolango Stretch-I

Work I-3: Tenda COC

Work I-4: Bolango Stretch-II_R

Work I-5: Bolango Stretch-II_L

Work I-6: Bolango Stretch-III

Work I-7: Tapodu River with Tapodu Gate

Work II: Tamalate Floodway

Work III: Sediment Trap Works in Lake Limboto

Non-structural Measures: The non-structural flood mitigation measures are the activities to be carried out in collaboration with relevant government agencies, local communities and individuals. Rolls of the agency in charge of flood mitigation would not be project-type works but rather administrative works to be performed as routine works as described below.

- 1) Watershed management by encouraging activities to be undertaken by relevant agencies and local community organizations, so as to conserve flood-water and sediment retention function by means of construction of erosion control facilities, afforestation and land use control, and dissemination activities in the watershed areas; and
- 2) Flood plain management by guiding and promoting the activities to prevent occurrence of damages by such means of flood-proofing, flood forecasting-warning and evacuation, flood fighting, and community-based flood mitigation measures, by mobilizing local community organizations and individuals in the flood prone areas.

C9.2 Preparatory Stage

During the preparatory stage until the end of the 7th National Five-Year Plan in 2004, various works and activities have to be performed for the forthcoming full-scale project. Main works and activities are presented below. Some activities below are to be

continued after in the remaining stages.

(1) Institutional and Organizational Arrangements

The preparatory works for the implementation of the FM-MP should be initiated from the establishment or reinforcement of the implementation body of the project. This works would include institutional and organizational arrangements as follows:

- 1) Institutional Arrangements: The priority project will be implemented under the management of Gorontalo Province in cooperation with Kabupaten Gorontalo and Kota Gorontalo, since the LBB basin extends across the border of Kabupaten and Kota. Gorontalo Province should make administrative decision toward the project implementation in association with Kabupaten and Kota.
- 2) Organizational Arrangements: Organizational setup should be established for the full scale implementation of the project. In the organization, staffing, roles and budgeting shall be clarified based on the coordination with relevant agencies of Province, Kabupaten and Kota. Capacity building is an important aspect to materialize the organization. For the successful implementation of the project, recruit of capable staff and training for them should be started.

(2) 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.

(3) 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.

(4) 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.

(5) 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.

(6) Training and Workshops on Watershed and Flood Plain Management

- 1) For government officials and staff: Training and workshop of the government officials and staff in charge regarding watershed management, flood plain management and their application procedures to communities, so that they can coordinate, guide and support activities undertaken by relevant agencies, communities and individuals.
- 2) For community leaders: Training and workshop of the community leaders regarding flood plain management are also necessary to be undertaken by the government officer in charge.

(7) 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.

C9.3 Intensive Implementation Stage

(1) Work I: Bone-Bolango-Tapodu (BBT) River Improvement

The implementation of Work I (BBT River Improvement), especially Works I-2 through I-5 and I-7 should be given the highest priority, because the suffering area is the center of the Gorontalo City, and that the areas related with these works are not protected by dikes in spite of inherently low ground elevations. The Work I was scheduled for its construction at site from 2005 to 2007.

(2) Work II: Tamalate Floodway

Although Work II (Construction of Tamalate Floodway) plays vital role on the flood mitigation for the city of Gorontalo, flood wall of the Tamalate River progresses almost entire stretches in the city. In view of this, priority was given lower than the Work I. The Work II was scheduled for its construction at site from 2007 to 2009.

(3) Work III: Sediment Trap Works in Lake Limboto

Considering the urgency for the establishment of countermeasures of Lake Limboto, it is advisable to start research and test work as early as possible. Therefore the Work III (Sediment Trap Works in Lake Limboto) was scheduled for its construction at site from 2005 to 2006.

(4) Non-structural Measures

Training/workshop and coordination activities initiated in the preparatory stage should be continued in this stage too. The dissemination activities of watershed management activities and flood plain management as well, community mobilization to establish the local community organizations, and other watershed and flood plain management activities should be put into practice in the selected pilot villages. All of these activities should be kept in record for future lessons and improvement including both succeeded and failed ones.

C9.4 Sequence of Implementation

It is ideal the work should be implemented on the schedule mentioned above, getting enough funds for their implementation. Even if the enough funds are not in hand, it is advisable to implement the works using the fund as available and realize the flood mitigation effects. For the selection of works in such cases, priority or sequence of works are proposed as follows:

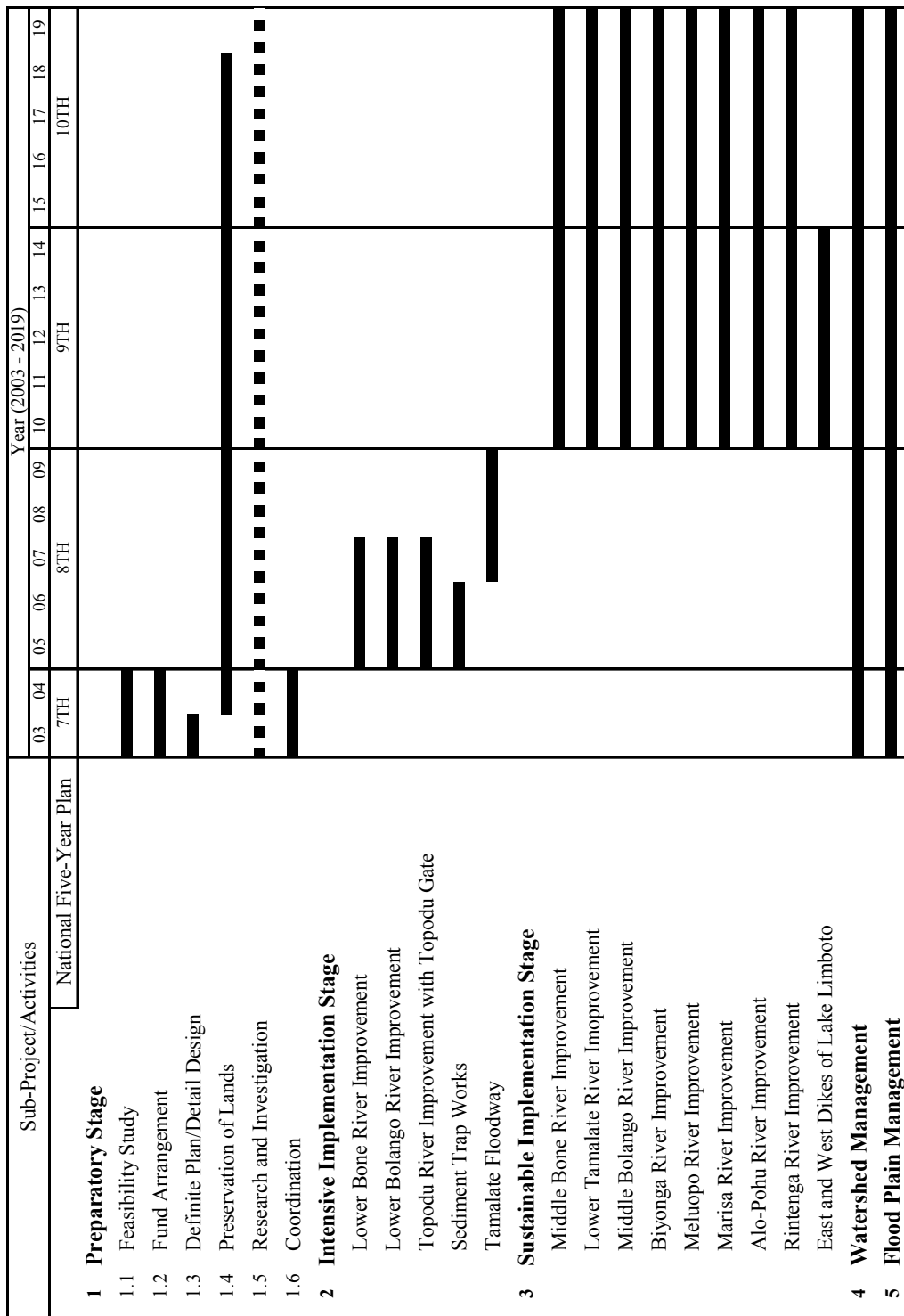
- 1) First Group: Implementation at anytime as soon as possible:
 - Work I-7: Tapodu River with Tapodu Gate
 - Work I-3: Tenda COC
 - Work I-2: Bolango Stretch-I
 - Work III: Sediment Trap Works in Lake Limboto

- 2) Second Group: Implementation at anytime after Work I-2:
 - Work I-4: Bolango Stretch-II_R
 - Work I-5: Bolango Stretch-II_L

- 3) Third Group: Implementation at anytime during intensive implementation:
 - Work II: Tamalate Floodway
 - Work I-1: Lower Bone River
 - Work I-6: Bolango Stretch-III

Works can be selected for implemented from any of the first group works, then the second and third group works, considering the fund and lands available.

The non-structural measures such as watershed management and flood plain management should be performed continuously as routine works starting from the preparatory stage



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

Japan International Cooperation Agency

Figure C9.1.1

IMPLEMENTATION SCHEDULE OF FM-MP