

CHAPTER 8

IMPLEMENTATION PLAN, COST ESTIMATES, EVALUATION AND ACTION PLAN

8.1 Implementation Plan

8.1.1 Implementation Schedule

Various programs have been identified and proposed in the previous chapter in order to achieve the objectives of each component. Since a lot of input of fund and human resources is necessary for the implementation of these programs, priority of each program has been judged as a part of the master plan study in the previous chapter. Implementation plan for the priority programs has been prepared considering the implementation plan of the programs in each component and the relation between programs of every component.

Component 1: Water Use Management

Priority Program		1st Year				2nd Year				3rd Year				4th Year				5th Year				6th Year				7th Year							
No.	Title	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Component 1: Water Use Management																																	
1-2 Sustainable irrigation and swamp development																																	
1-2-1	Establishing development target of the Province	■																															
1-2-2	Implementation of Pre F/S	■				■				■																							
1-2-3	Implementation of F/S									■				■				■				■				■							
1-2-4	Implementation of D/D																	■				■				■							
1-3 Rainwater utilization in tidal swamp area																																	
1-3-1	Preparation	■																															
1-3-2	Providing rainwater storing and sanitation facilities	■				■				■				■				■				■				■							
1-4 Aquaculture water management																																	
1-4-1	Researching solution methods	■				■																											
1-4-2	Dissemination of the methods					■				■																							
1-6 Modeling of water use management																																	
1-6-1	Information and knowledge base management	■				■																											
1-6-2	Basing modeling development	■				■																											
1-6-3	Environmental analysis and modeling					■				■																							

Figure 8.1.1 Implementation Schedule for Component 1

Component 2: Floodplain Management

Priority Program		1st Year				2nd Year				3rd Year				4th Year				5th Year				6th Year				7th Year							
No.	Title	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Component 2: Floodplain Management																																	
2-1 Zoning and land use control program																																	
2-1-1	Confirmation of the land use control area	■				■				■																							
2-1-2	Zoning of the area									■				■				■				■				■							
2-1-3	Execution																					■				■							

Figure 8.1.2 Implementation Schedule for Component 2

Component 3: Watershed Rehabilitation and Conservation

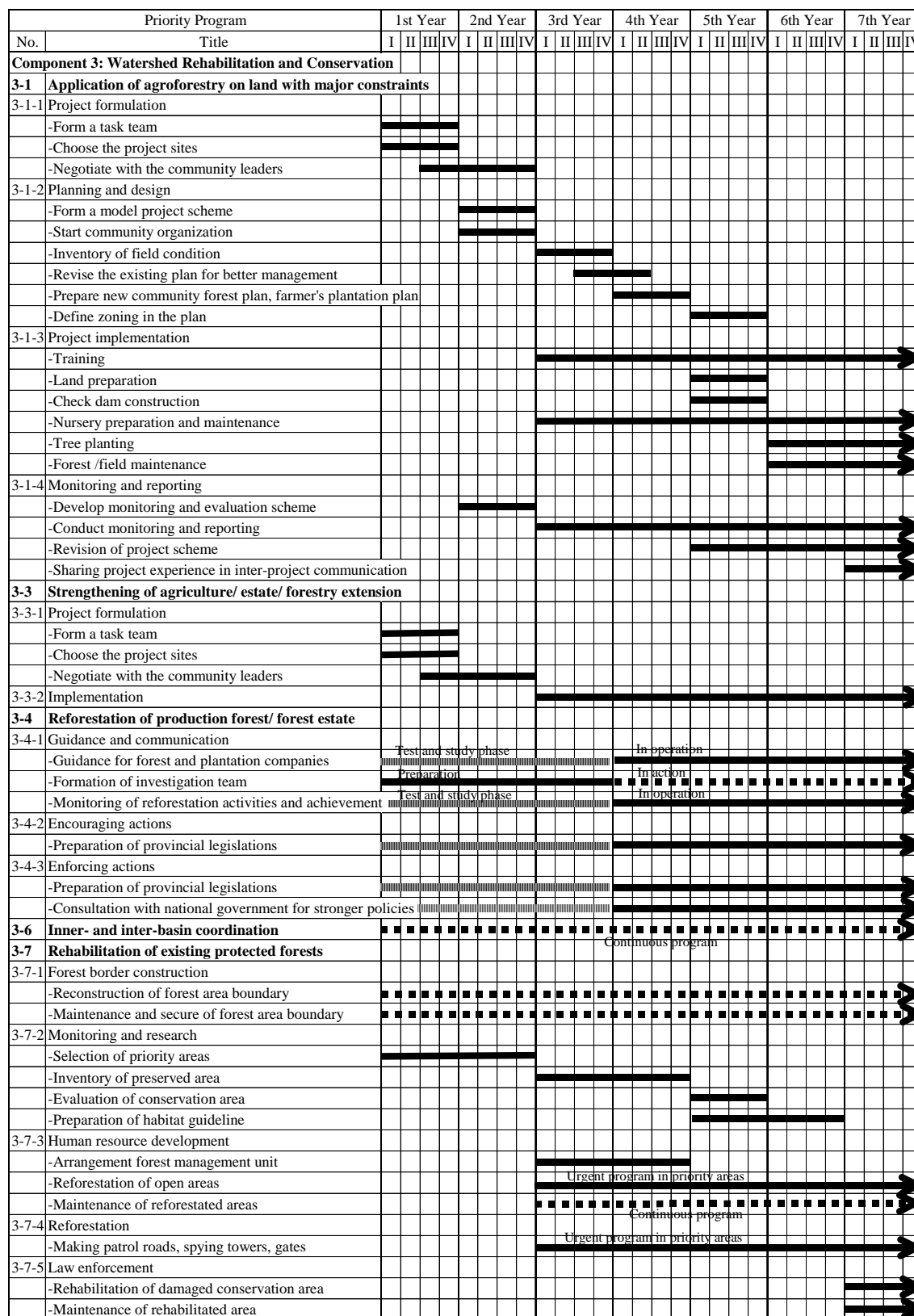


Figure 8.1.3 Implementation Schedule for Component 3

Component 4: Urban Water Environment Improvement

No.	Priority Program Title	1st Year				2nd Year				3rd Year				4th Year				5th Year				6th Year				7th Year							
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Component 4: Urban Water Environment Improvement																																	
4-1	Community drainage management																																
4-1-1	Model project	Preparation				Full Operation																											
4-1-2	Monitoring of past project																																
4-1-3	Standard implementation																																
4-3	Trunk drainage channels rehabilitation																																
4-3-1	Establishment of rehabilitation system	Preparation																															
4-3-2	Trunk channels rehabilitation	Preparation																															

Figure 8.1.4 Implementation Schedule for Component 4

Component 5: Monitoring Network Establishment

No.	Priority Program Title	1st Year				2nd Year				3rd Year				4th Year				5th Year				6th Year				7th Year							
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Component 5: Monitoring Network Establishment																																	
5-1	Hydrological monitoring system establishment																																
5-1-1	Inventory survey	Preparation				Full Operation																											
5-1-2	Establishment of organization and management																																
5-1-3	Capacity building																																
5-1-4	New construction and improvement of facilities																																
5-1-5	Monitoring																																
5-2	Water quality monitoring system establishment																																
5-2-1	Coordination between relevant agencies	Preparation																															
5-2-2	Preparation of monitoring plan	Preparation																															
5-2-3	Establishment of water quality laboratory in Musi Balai PSDA	Preparation				Full Operation																											
5-2-4	Monitoring																																
5-4	Hydrological database establishment																																

Figure 8.1.5 Implementation Schedule for Component 5

Component 6: Institutional Strengthening

No.	Priority Program Title	1st Year				2nd Year				3rd Year				4th Year				5th Year				6th Year				7th Year							
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV				
Component 6: Institutional Strengthening																																	
6-2	Promotion of transparency with public relations																																
6-2-3	Official web site of water resources management	Preparation				Test Drive				Full Operation																							
6-5	Organizational enhancement																																
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA																																
6-5-3	Activation of PTPA/PPTPA																																
6-6	Human resource development																																
6-6-1	Training for Operating Techniques for Government Employees of Balai PSDA																																
6-6-2	Training for management and planning for related government employees																																
6-6-3	Training for operation & maintenance of irrigation system																																
6-6-4	Joint training with NGOs to informal leaders and selected people																																

Figure 8.1.6 Implementation Schedule for Component 6

8.1.2 Implementation Organization and Tasks

Table 8.1.1 shows a matrix of executing, supporting and related agencies for each priority program.

Table 8.1.1 Executing, Supporting and Related Agency

Component and Program	DGWR	BMG	South Sumatra Province										Other Provinces	Kota Palembang	Kab. Muba	Kab. Banyuasin	Kab. Muara Enim	Kota Perabumulih	Kab. Lahat	Kota Pagaralam	Kab. Mura	Kota Lubuk Linggau	Kab. Oki	Kab. Oku	Private Company/setup	Community/NGOs			
			Governor's Office	BAPPEDA	Dinas PUP	Balai PSDA	Forest Service	Agriculture Service	Estate Service	Fisheries Service	UPTD	Balai KSDA															BAPEDALDA	PDAMs	
Component 1: Water Use Management																													
1-2	Sustainable irrigation and swamp development	A	B	B										B	C	C	C	C	C	C	C	C	C	C	C	C			
1-3	Rainwater utilization in tidal swamp area			A											B	B										B			
1-4	Aquaculture water management			A		B	B							B	C	C	C	C	C	C	C	C	C	C	C	C	B		
1-6	Modeling of water use management	A	C	B	C			C						B															
Component 2: Floodplain Management																													
2-1	Zoning and land use control program			B	A	B	B							C	C	C	C	C	C	C	C	C	C	C	C	C			
Component 3: Watershed Rehabilitation and Conservation																													
3-1	Application of agroforestry on land with major constraints					A	B	B									B	B	B							B			
3-3	Strengthening of agriculture /estate /forestry extension					A	B	B									B	B	B							B			
3-4	Reforestation of production forest /forest estate					A									B	B	B	B	B	B	B	B	B	B	B	B	B	C	
3-6	Inner- and inter-basin coordination		A											B	B	B	B	B	B	B	B	B	B	B	B	B	B		
3-7	Rehabilitation of existing protected forests					B				A				B	B	B	B	B									C		
Component 4: Urban Water Environment Improvement																													
4-1	Community drainage management														A													B	
4-3	Trunk drainage channels rehabilitation														A														
Component 5: Monitoring Network Establishment																													
5-1	Hydrological monitoring system establishment	B			A									C	C	C	C	C	C	C	C	C	C	C	C	C	C		
5-2	Water quality monitoring system establishment				A						B	B		C	C	C	C	C	C	C	C	C	C	C	C	C	C		
5-4	Hydrological database establishment	B			A						B	B																	
Component 6: Institutional Strengthening																													
6-2-3	Official website of water resources management				A																								
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA				A	B																							
6-5-3	Activation of PTPA/PPTPA		A	B										B	B	B	B	B	B	B	B	B	B	B	B	B	B		
6-6-1	Training for operating techniques for government employees of Balai PSDA				A																								
6-6-2	Training for management and planning for related government employees				A																								
6-6-3	Training for operation & maintenance of irrigation system				A		B																						
6-6-4	Joint training with NGOs to informal leaders and selected people				A																							B	

Note: A: Leading Agency; B: Supporting Agency; C: Related Agency

BAPPEDA of South Sumatra Province should conduct overall coordination for the implementation of the Comprehensive Water Management. It is recommended to hold periodical meetings hosted by BAPPEDA to evaluate the progress and problems for the implementation of the proposed management plan. Various organizations are involved in the implementation of the component programs of the water management.

Figure 8.1.7 illustrates different modes of priority program implementation. Some programs will be conducted mainly by a single organization, and some will be conducted through coordination between various organizations. **Table 8.1.2** describes tasks of each relevant agency for the implementation of each program.

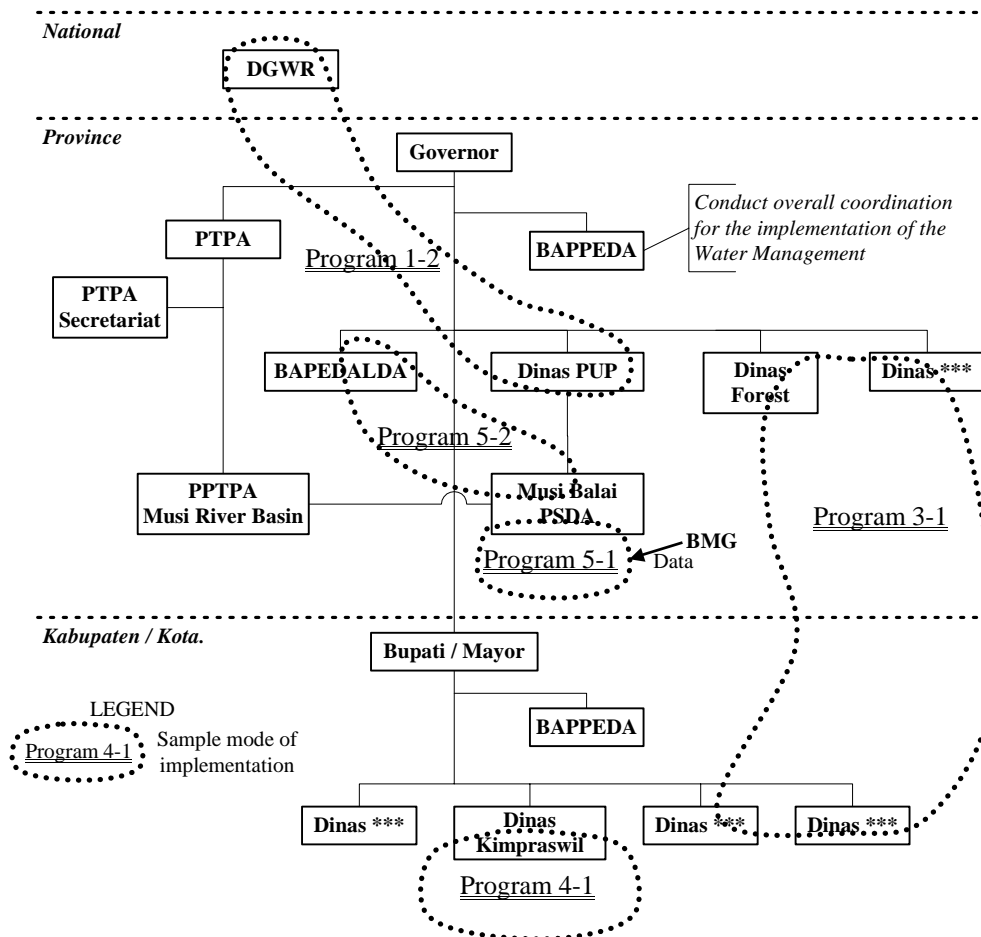


Figure 8.1.7 Image of Related Agencies for the Implementation of Priority Programs

Among others, tasks of the key organizations for the implementation of the water management are summarized as follows (in these paragraphs, water management is for the Musi River Basin):

- Governor of South Sumatra Province: Responsible for Musi River Basin comprehensive water management
- PTPA: Make recommendation to the Governor on matters declared in the New Government Regulation on Water Resources
- BAPPEDA: Conduct overall coordination and follow-up for the implementation of the proposed management plan.
- Dinas PU Pengairan: Act as a leading organization for the implementation of water management

- Musi Balai PSDA: Act as the operator for the water management
- Forest Service: Act as a leading organization for the implementation of Component 3: Watershed Rehabilitation and Conservation
- DGWR of Kimpraswil: Act as a leading organization for the implementation of national programs

Table 8.1.2 Tasks of Each Agency for Priority Program Implementation

Component and Program	
Component 1: Water Use Management	
1-2 Sustainable irrigation and swamp development	<ul style="list-style-type: none"> - DGWR: Coordinate for the national strategy for self-sufficiency of food, Conduct Pre-F/S, F/S and D/D under the coordination with Dinas PUP, Sumsel - Dinas PUP, Sumsel: Prepare target and development plan; Conduct Provincial level public consultation; conduct Pre-F/S, F/S and D/D - Governor's Office, Sumsel: Determine target and socialize it - Kab./Kota: Conduct Kab./Kota level public consultation; Support implementation of Pre-F/S, F/S and D/D - WUA: Support public consultation and implementation of Pre-F/S, F/S and D/D
1-3 Rainwater utilization in tidal swamp area	<ul style="list-style-type: none"> - Dinas PUP, Sumsel: Coordinate with local governments for conducting preparation and PCM - Regency Government of Oki, Muba (new), Banyuasin: Conduct preparation; Undertake implementation
1-4 Aquaculture water management	<ul style="list-style-type: none"> - Dinas PUP, Sumsel: Conduct researching solution methods; Disseminate the methods - Agriculture and Fisheries Services, Sumsel: Assist Dinas PUP for researching solution methods - Dinas Kimpraswil of Palembang, Muba, Banyuasin, Muaraenim, Perabumulih, Lahat, Pagaram, Mura, Lubuk Linggau, Oki, Oku, Rejang L.: Assist Dinas PUP for researching solution methods and disseminating the methods
1-6 Modeling of water use management	<ul style="list-style-type: none"> - DGWR: Implement the program - Dinas PUP, Sumsel: Involve in the implementation of the program - BMG: Support DGWR and Dinas PUP by supplying necessary data - Forest Service, Sumsel: Support DGWR and Dinas PUP by supplying land use information, etc. - UPTD: Assist implementation of the program
Component 2: Floodplain Management	
2-1 Zoning and land use control program	<ul style="list-style-type: none"> - Dinas PUP, Sumsel: Prepare map for land use control area - Balai PSDA: Assist preparation map for land use control area - Forest Dep., Sumsel: Assist preparation map for land use control area - BAPPEDA, Sumsel: Zoning of the area - Gov. of Palembang, Muba, Muaraenim, Lahat, Mura, Oki: Conduct zoning of the area; Enforcing the regulation
Component 3: Watershed Rehabilitation and Conservation	
3-1 Application of agroforestry on land with major constraints	<ul style="list-style-type: none"> - Forestry, Estate, and Agriculture Office, Sumsel and Bengkulu: Responsible for providing general guidelines, preparation of budget, and provision of outside expert. - BAPPEDA of Sumsel, Bengkulu, and of Kab. Muaraenim, Lahat, Mura, Oku: Responsible for legislative action for land use regulation. - Forest, Estate, and Agriculture Office of Kab. Muaraenim, Lahat, Mura, Oku and related Kec.: Responsible for selection of priority area, project planning, provision of technical guidance to extensions. - Forest, Estate, and Agriculture Extension Office: Responsible for contribution for the project planning, cooperation with farmers in the project execution, monitoring and reporting the achievement of the project to upper level offices.
3-3 Strengthening of agriculture /estate /forestry extension	<ul style="list-style-type: none"> - Forestry, Estate, and Agriculture Office, Sumsel and Bengkulu: Responsible for providing general guidelines, preparation of budget, and provision of outside expert. - Forest, Estate, and Agriculture Office of Kab. Muaraenim, Lahat, Mura, Oku and related Kec.: Responsible for provision of technical guidance to extensions.

3-4	Reforestation of production forest <ul style="list-style-type: none"> - Forest Dep. of Sumsel, Bengkulu: Responsible for program implementation - Forest Police: Responsible for enforcing the forest law against illegal activities - Gov. of Muba, Banyuasin, Muaraenim, Lahat, Mura, Oki, Oku: Responsible for monitoring of production forest - Agriculture Extension Office: Responsible for monitoring of production forest - Private Company (Concessionaires): Conduct reforestation
3-6	Inner- and inter-basin coordination <ul style="list-style-type: none"> - Governor's Office, Sumsel: Responsible for activation of Musi PTPA - Gov. of Palembang, Muba, Banyuain, Muaraenim, Perabumulih, Lahat, Pagaralam, Mura, Lubuklinggau, Oki, Oku: Responsible for sub-basin level organization similar to PPTPA
3-7	Rehabilitation of existing protected forests <ul style="list-style-type: none"> - Balai KSDA, Sumsel: Responsible for program development, budgeting, selecting priority area, calling for outside experts, forest border construction, evaluation of monitoring results. - Forest Office, Sumsel: Responsible for assisting preparation of nurseries, supplying seeds, policing against illegal logging - Extension Offices at Protected Forests: Responsible for implementing programs, cooperation with local communities, monitoring the forest condition and habitats, training of local residents as field workers.
Component 4: Urban Water Environment Improvement	
4-1	Community drainage management <ul style="list-style-type: none"> - Dinas Kimpraswil, Palembang: Responsible for implementation of the program - NGO: Participate in the implementation of the program - Dinas PUP, Sumsel: Give advice upon request
4-3	Trunk drainage channels rehabilitation <ul style="list-style-type: none"> - Dinas Kimpraswil, Palembang: Responsible for implementation of the program - Dinas PUP, Sumsel: Give advice upon request
Component 5: Monitoring Network Establishment	
5-1	Hydrological monitoring system establishment <ul style="list-style-type: none"> - Musi Balai PSDA: Responsible for implementation of the program - Dinas Kimpraswil of Palembang, Muba, Banyuain, Muaraenim, Perabumulih, Lahat, Pagaralam, Mura, Lubuklinggau, Oki, Oku: Cooperate for the maintenance and monitoring work. - BMG: Cooperate for the provision of rainfall data in the Musi River Basin
5-2	Water quality monitoring system establishment <ul style="list-style-type: none"> - Musi Balai PSDA: Responsible for implementation of the program - Dinas Kimpraswil of Palembang, Muba, Banyuain, Muaraenim, Perabumulih, Lahat, Pagaralam, Mura, Lubuklinggau, Oki, Oku: Cooperate for the maintenance and monitoring work. - Provincial and Municipal BAPEDALDAs and PDAMS: Cooperate for the provision of water quality data and for conducting monitoring work
5-4	Hydrological database establishment <ul style="list-style-type: none"> - Musi Balai PSDA: Responsible for implementation of the program
Component 6: Institutional Strengthening	
6-2-3	Official website of water resources management <ul style="list-style-type: none"> - Dinas PUP, Sumsel, Responsible for the implementation of the program
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA <ul style="list-style-type: none"> - Dinas PUP, Sumsel, Responsible for the implementation of the program - Musi Balai PSDA: Responsible for the operation of Water Resources Data and Information Unit
6-5-3	Activation of PTPA/PPTPA <ul style="list-style-type: none"> - Governor's Office, Sumsel, Responsible for the implementation of the program
6-6-1	Training for operating techniques for government employees of Balai PSDA <ul style="list-style-type: none"> - Dinas PUP, Sumsel, Responsible for the implementation of the program
6-6-2	Training for management and planning for related government employees <ul style="list-style-type: none"> - Dinas PUP, Sumsel, Responsible for the implementation of the program
6-6-3	Training for operation & maintenance of irrigation system <ul style="list-style-type: none"> - Dinas PUP, Sumsel, Responsible for the implementation of the program - Agriculture Office, Sumsel: Cooperate to the program implementation - WUAs: Cooperate to the program implementation
6-6-4	Joint training with NGOs to informal leaders and selected people <ul style="list-style-type: none"> - Dinas PUP, Sumsel, Responsible for the implementation of the program - NGOs: Cooperate to the program implementation

Necessary coordination with the other related projects and programs are described in **Table 8.1.3**.

Table 8.1.3 Coordination with Other Related Projects/Programs

Component and Program		DGWR	IWIRIP	WISMP
Component 1: Water Use Management				
1-2	Sustainable irrigation and swamp development	Adjustment with national policy	Program in Muba and Oku	Program in Muba and Oku
1-3	Rainwater utilization in tidal swamp area			
1-4	Aquaculture water management			
1-6	Modeling of water use management	Adjustment with other basin's application		
Component 2: Floodplain Management				
2-1	Zoning and land use control program			
Component 3: Watershed Rehabilitation and Conservation				
3-1	Application of agroforestry on land with major constraints			
3-3	Strengthening of agriculture /estate /forestry extension			
3-4	Reforestation of production forest			
3-6	Inner- and inter-basin coordination			To be monitored by WISMP
3-7	Rehabilitation of existing protected forests			
Component 4: Urban Water Environment Improvement				
4-1	Community drainage management			
4-3	Trunk drainage channels rehabilitation	Budget increase		
Component 5: Monitoring Network Establishment				
5-1	Hydrological monitoring system establishment		Accomplishment through IWIRIP	Program in WISMP
5-2	Water quality monitoring system establishment	Selection of financial source	Accomplishment through IWIRIP	Program in WISMP
5-4	Hydrological database establishment		Accomplishment through IWIRIP	Program in WISMP
Component 6: Institutional Strengthening				
6-2-3	Official website of water resources management		Accomplishment through IWIRIP	Program in WISMP
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA		Accomplishment through IWIRIP	Program in WISMP
6-5-3	Activation of PTPA/PPTPA			To be monitored by WISMP
6-6-1	Training for operating techniques for government employees of Balai PSDA		Accomplishment through IWIRIP	Program in WISMP
6-6-2	Training for management and planning for related government employees		Accomplishment through IWIRIP	Program in WISMP
6-6-3	Training for operation & maintenance of irrigation system		Accomplishment through IWIRIP	Program in WISMP
6-6-4	Joint training with NGOs to informal leaders and selected people		Accomplishment through IWIRIP	Program in WISMP

8.1.3 Necessary Preconditions

Necessary preconditions for the implementation of the Musi River Basin Comprehensive Water Management are as follow:

- Maintenance of decentralization policy by the Government of Indonesia
- Execution of New Water Resources Law and New Government Regulation on Water Resources Management

8.2 Cost Estimates

Costs for priority programs have been estimated. Total costs for each sub-program are presented in **Table 8.2.1**, while the breakdown is presented in each sector reports. **Table 8.2.1** also shows the amount of the cost by each responsible organization. Annual basis necessary budget is shown in **Table 8.2.2**.

8.3 Evaluation of the Program

The established master plan is that of comprehensive water management covering various sectors and consisting of various programs under components, thus the evaluation has been conducted for selected priority programs from the technical, economic, financial, and social viewpoints. The following conditions were considered for the evaluation.

- All the priority programs for the comprehensive water management of the Musi River Basin are basically for the proper management of the river basin, and thus it can be said that these programs have been formulated so as not to give significant negative impacts in any aspects.
- Priority programs have been selected from programs of each component considering factors, e.g. degree of prerequisite to the other programs; seriousness of the problem; necessity of early start of implementation; cost scale. Thus the selected priority programs are already those that need early implementation, and evaluation for technical, economic, financial, and environment has been conducted paying attention to the following conditions.
- Technical Aspect: The actions in each priority program were proposed paying attention to technical soundness as discussed in each sector report. Attention should be paid to those programs that need higher technology compared to the ones that are commonly applied in Indonesia.
- Economic Aspect: Quantitative economic analysis, namely by EIRR, B/C ratio and Net Present Value, has been conducted for programs that fit to this method. For the other priority programs, economic effects expected through the implementation of the program have been identified qualitatively in the preliminary basis.

Table 8.2.1 Costs for Priority Programs

Component and Program		Cost		
		Imple. (Rp. mil.)	O&M (Rp.mil /year)	Cost by Agency (approx. Rp. mil.) *1
Component 1: Water Use Management				
1-2	Sustainable irrigation and swamp development	104,835		DGWR: all
1-3	Rainwater utilization in tidal swamp area	198,700		Dinas PUP: 1,800; Oki: 19,700; Muba: 49,200; Banyuasin: 128,000
1-4	Aquaculture water management	73	6	Dinas PUP: all
1-6	Modeling of water use management	13,545	12	DGWR: all
Component 2: Floodplain Management				
2-1	Zoning and land use control program	78		Dinas PUP: all
Component 3: Watershed Rehabilitation and Conservation				
3-1	Application of agroforestry on land with major constraints	45,511		Dinas Forest: 2,155; Remaining amount shall be for governments of Muaraenim, Lahat, Mura, Oku (to be determined in planning stage)
3-3	Strengthening of agriculture /estate /forestry extension	6,663		The amount shall be for governments of Muaraenim, Lahat, Mura, Oku (to be determined in planning stage)
3-4	Reforestation of production forest /forest estate	88		Dinas Forest: all
3-6	Inner- and inter-basin coordination	-		
3-7	Rehabilitation of existing protected forests	13,487		KSDA for administration; Dinas Forest: 9,319, and 4,168 for governments of Muba, Banyuasin, Muaraenim, Lahat
Component 4: Urban Water Environment Improvement				
4-1	Community drainage management	440		Dinas Kimpraswil, Palembang: all
4-3	Trunk drainage channels rehabilitation	33,495		Dinas Kimpraswil, Palembang: all
Component 5: Monitoring Network Establishment				
5-1	Hydrological monitoring system establishment	2,548	98	Musi BPSDA: all
5-2	Water quality monitoring system establishment	6,084	291	Musi BPSDA: all
5-4	Hydrological database establishment	403	125	Musi BPSDA: all
Component 6: Institutional Strengthening				
6-2-3	Official website of water resources management	205	72	Dinas PUP: all
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA	-		
6-5-3	Activation of PTPA/PPTPA	-		
6-6-1	Training for operating techniques for government employees of Balai PSDA	45		Dinas PUP: all
6-6-2	Training for management and planning for related government employees	45		Dinas PUP: all
6-6-3	Training for operation & maintenance of irrigation system	722		Dinas PUP: all
6-6-4	Joint training with NGOs to informal leaders and selected people	128		Dinas PUP: all

Note: imple.: implementation,

*1: Shows responsible agency and amount, and actual expenditure shall be by relating agencies in some cases

Table 8.2.2 Annual Budget

(Unit: Rp. million)

Component and Program		Leading Agency	Year							
			1st	2nd	3rd	4th	5th	6th	7th	after
Component 1: Water Use Management										
1-2	Sustainable irrigation and swamp development	DGWR	664	1,270	0	14,000	7,000	13,650	27,300	40,950
1-3	Rainwater utilization in tidal swamp area	DPUP	19,870	19,870	19,870	19,870	19,870	19,870	19,870	59,610
1-4	Aquaculture water management	DPUP	36	37	6	6	6	6	6	→
1-6	Modeling of water use management	DGWR	6,773	6,772	12	12	12	12	12	→
Component 2: Floodplain Management										
2-1	Zoning and land use control program	DPUP		39	39					
Component 3: Watershed Rehabilitation and Conservation										
3-1	Application of agroforestry on land with major constraints	Forest Service	0	539	1,149	1,149	28,389	7,143	7,142	
3-3	Strengthening of agriculture /estate /forestry extension	Forest Service	-	-	1,333	1,333	1,333	1,333	1,331	
3-4	Reforestation of production forest /forest estate	Forest Service	29	29	30					
3-6	Inner- and inter-basin coordination	Governor	-	-	-	-	-	-	-	
3-7	Rehabilitation of existing protected forests	BKSDA	319	319	1,284	1,284	1,209	1,209	7,863	
Component 4: Urban Water Environment Improvement										
4-1	Community drainage management	Palemb.		220	220					
4-3	Trunk drainage channels rehabilitation	Palemb.	3,350	3,350	3,350	3,350	3,350	3,350	3,350	10,050
Component 5: Monitoring Network Establishment										
5-1	Hydrological monitoring system establishment	BPSDA	800 5	600 98	1,148 98	98	98	98	98	→
5-2	Water quality monitoring system establishment	BPSDA		3,042	3,042	291	291	291	291	→
5-4	Hydrological database establishment	BPSDA	100	303	125	125	125	125	125	→
Component 6: Institutional Strengthening										
6-2-3	Official website of water resources management	DPUP	205	72	72	72	72	72	72	→
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA	DPUP	-	-	-	-	-	-	-	-
6-5-3	Activation of PTPA/PPTPA	Governor	-	-	-	-	-	-	-	-
6-6-1	Training for operating techniques for government employees of Balai PSDA	DPUP	45							
6-6-2	Training for management and planning for related government employees	DPUP	45							
6-6-3	Training for operation & maintenance of irrigation system	DPUP	242	242	24					
6-6-4	Joint training with NGOs to informal leaders and selected people	DPUP	128							

Note: DPUP: Dinas PU Pengairan of South Sumatra Province; Forest Service: Forest Service of South Sumatra Province; Governor: Governor's Office of South Sumatra Province, BKSDA: Balai KSDA of South Sumatra Province; Palembang: Dinas Kimpraswil of Kota Palembang, BPSDA: Musi Balai PSDA

- Financial Aspect: The cost required for the implementation of each program has been compared to the budget of the implementation organization, and source of budget has been studied whether APBD is enough or input from APBN including those from foreign aid is necessary.

- **Social and Environmental Aspect:** All the priority programs are basically for the maintenance or improvement of the environment of the Basin. Social and environmental effects were discussed in the qualitative basis and checked using screening for environmental factors.

The results of the evaluation of each program are summarized as shown in **Table 8.3.1**, while detailed discussions are made in each Sector Report. Based on the results, overall evaluation for the whole Comprehensive Water Management Plan has been made as follows

Technical Aspect: Sustainable irrigation and swamp development program contains Pre-F/S, F/S and D/D for large scale development, which is usually conducted using international consultants, and it is recommended to implement in the similar manner. Modeling of water use management program contains high technology and the technical assistance from the advanced country with much experience in basin water management modeling in the Asian monsoon regions is needed. There expect no distinct technical issues in the other programs.

Economic Aspect: Quantitative analysis has been conducted for Rainwater Utilization in Tidal Swamp Area; and for Drainage Program in Palembang City (see **Table 8.3.1** for the EIRR, etc.). Expected benefits of the programs accrue from: increase of food production after implementation, improvement of living environment and economic development of the Province/Basin from component 1; prevention of flood damage increase and maintenance of river regime with less cost from component 2; dredging cost saving, increase of diversified farm products and reforestation from component 3; reduction of flood damage and water borne diseases from component 4; hydrological and water quality monitoring, and database establishment from component 5; and cost savings in communication, data collection and water use, and human resource development from component 6. As the result, some programs give direct economic effects, and others give indirect economic impacts. The economic benefit, both direct and indirect, is considered large. Economic evaluation by comparison of benefit and cost will be carried out in the implementation stage.

Financial Aspect: Financial evaluation of the programs is carried out from the viewpoint of relevant government agencies in order to confirm their capabilities of program implementation. The capability is studied by comparison of its annual budget size and annual program cost. As the result, some programs can be implemented using APBD, and some need additional input of APBN. For APBN, additional input from foreign countries in the form of loan or grant is also to be considered.

Social and Environmental Aspect: Programs are proposed considering public involvement, generally, no serious negative social impacts are anticipated and many positive impacts (strengthening of social solidarity of the local community, etc.) are expected. Environmental conservation and rehabilitation is the one of the objective of the master plan and much environmental benefit (rehabilitation of native ecosystem and biodiversity, etc.) is expected. **Table 8.3.2** shows initial screening of environmental impacts.

Table 8.3.1 Evaluation of Priority Programs

Evaluation (a: Technical, b: Economic, c: Financial, d: Social and Environmental)	
Component 1: Water Use Management	
1-2 Sustainable irrigation and swamp development	<p>a. The program is study and investigation for the determination of rice production target and conduct of Pre. F/S, F/S and D/D as commonly conducted in Indonesia using international consultants, and no special technical issues are anticipated.</p> <p>b. The program does not directly produce any economic effect, but implementation of the program shall be the necessary input for future project implementation for the increase in rice production.</p> <p>c. The total cost of Rp.104,835 million for 9-year expenditure cannot be covered by the APBD expenditure of Dinas PUP at Rp.9,704million (2002). Input of APBN including of foreign aid is needed.</p> <p>d. The program is for the self-reliance of rice and food security, thus it will give a large social benefit in the future when the actual development has been implemented, e.g. creating job opportunities, import substitution of rice and export promotion.</p>
1-3 Rainwater utilization in tidal swamp area	<p>a. Water tank and septic tank are commonly manufactured in Palembang and easy to obtain. There expect no technical difficulties.</p> <p>b. Economic analysis revealed EIRR of 10.7%, B/C ratio and NPV by 12% discount rate at 0.93 and Rp.-8,215million. Though the EIRR is slightly lower than the opportunity cost of capital in Indonesia, implementation of the program is strongly recommended in view of basic human needs and to solve distinguished unbalance in the Basin.</p> <p>c. Annual cost of Rp.19,870 million is less than 4% of the total APBD expenditure of Sumsel, Muba and Oki at Rp.548,700million, and considered financially viable.</p> <p>d. Lack of daily use water in dry season in the tidal swamp areas is one of the most serious social problems in the basin. Thus the social benefit is considered quite large, e.g. improving healthiness of the people, assisting economic activities and supporting social stabilization, effect on indigenous people, decrease in waster and excretion, improvement of local water quality.</p>
1-4 Aquaculture water management	<p>a. Establishment of reallocation and exchange of farm lots anticipate no technically significant problems.</p> <p>b. The program does not create any direct economic benefit, but production increase in both aquaculture and irrigation will be expected when the actual implementation has been conducted following the proposed methods.</p> <p>c. Annual cost of Rp.37 million can be covered by APBD of Dinas PUP at Rp.9704 million (2002).</p> <p>d. Significant social effect in; stabilization of rural farmers' livelihood; solving social conflict, etc., unknown impact includes relocation of activities sites, hydrology and water quality change.</p>
1-6 Modeling of water use management	<p>a. The program contains high technology and technical assistance from experienced country is needed. Attention should be given to technology transfer for the proper operation and maintenance of the system by Dinas PUP.</p> <p>b. The program does not directly produce any economic effect, but it will be the basis of proper management of water and thus expected for the future economic development of the basin.</p> <p>c. The total cost of Rp.13,545 million is too large against the APBD of Dinas PUP at Rp.9,704 (2002) thus APBN is expected. Annual O&M cost of Rp.12million could be covered by Dinas PUP APBD budget.</p> <p>d. This model will contribute to decision-making, scenario management, environmental assessment, and thus create better social and environmental conditions in the basin.</p>

Component 2: Floodplain Management	
2-1 Zoning and land use control program	<ul style="list-style-type: none"> a. There expects no technical issues in zoning of the area using satellite image since it is a common study. b. The economic benefit accrues from prevention of flood increase in the downstream areas, maintenance of present river regime with less cost without a large amount of investment, e.g. for construction of a dam. c. The annual cost of Rp.39 million could be covered by Dinas PUP. d. Conservation of existing water environment, resources and quality would give positive impacts in the local society. Relocation may be needed if there is illegal siting, loss of opportunity of development.
Component 3: Watershed Rehabilitation and Conservation	
3-1 Application of agroforestry on land with major constraints	<ul style="list-style-type: none"> a. Basic technology of agroforestry, e.g., terracing and mixing of useful plants is already implemented in the Province. Educational effort is most needed for wide and rigorous application. b. The program ultimately reduces soil erosion, and dredging cost in the downstream area will be reduced. Diversified products will give positive impact in farm economy. c. Requested cost is quite large for the Forestry Service, Sumsel, thus APBN is needed. Financial contribution by beneficial districts, sub-districts, and farmers for strengthening ownership should be considered. d. Selection of project area and coordination of participating farmers will empower local municipalities and promote public communication. Native ecosystems and biodiversity are expected to be recovered. Unknown impacts include; possible relocation, alternation of life style, reform of traditional custom (shifting cultivation), etc.
3-3 Strengthening of agriculture /estate /forestry extension	<ul style="list-style-type: none"> a. Basic technology of agroforestry, e.g., terracing and mixing of useful plants is already implemented in the Province. Educational effort is most needed for wide and rigorous application. b. It is expected that the program will support the local population by a stable and reliable income source. c. The annual cost is about 37% of APBD budget of Forest Service, Sumsel. APBN is needed and it will be better to be divided by related agencies and local governments. d. Stronger and more informative extension offices will make a focal point for local community that will empower local municipalities and promote public communication.
3-4 Reforestation of production forest	<ul style="list-style-type: none"> a. Indonesian Government already has good technical guidelines for reforestation of production forest. b. The program will create source of income in local communities during the reforestation period. c. Annual cost of Rp.30 million shall be covered by APBD of Forest Service, Sumsel. d. Reforestation of degraded production forest will rehabilitate social capacity of the Province greatly. It will greatly improve local and regional ecosystems and biodiversity.
3-6 Inner- and inter-basin coordination	<ul style="list-style-type: none"> a. Technical and organizational coordination and guidance will be provided by the National Government. b. Local economic interest will be directly reflected to the land use and land management plan in the Basin. c. No significant amount of additional cost will be accrued. d. The program will give positive impact to local community through coordination of related stakeholders.
3-7 Rehabilitation of existing protected forests	<ul style="list-style-type: none"> a. Indonesian Government already has good technical guidelines for reforestation of production forest. b. The program will create source of income in local communities during the reforestation period. c. Additional input of APBN is needed because of the large total cost of Rp.13,487 million. d. When existing protected forests still has border areas that local communities have not agreed on, careful negotiation and reasonable mitigation measures must be implemented to minimize social problem.

<p>Component 4: Urban Water Environment Improvement</p> <p>4-1 Community drainage management</p> <ol style="list-style-type: none"> There is no particular problem in technical matter. Implementation of the program will bring about various economic effects, e.g. reduction in flood damage, reduction of water borne diseases, reduction of inconvenience of people's livelihood. The program for the drainage improvement in Bendung and Buah systems (Program 4-4) revealed the EIRR of 12.6%, B/C and NPV of 1.06 and Rp.1,062million, thus the Program 4-1 is deemed urgent as a prerequisite of the overall drainage improvement in Palembang City. The required cost is not a burden of Kota. Palembang. Any proper scheme for the assistance to the activities of NGOs should also be taken into consideration. Positive social impacts are expected, e.g. strengthening social solidarity in the community and improvement of sanitary conditions.
<p>4-3 Trunk drainage channels rehabilitation</p> <ol style="list-style-type: none"> There is no particular problem in technical matter. Implementation of the program will bring about various economic effects, e.g., reduction in flood damage, reduction of water borne diseases, reduction of inconvenience of people's livelihood. The program for the drainage improvement in Bendung and Buah systems (Program 4-4) revealed the EIRR of 12.6%, B/C and NPV of 1.06 and Rp.1,062million, thus the Program 4-1 is deemed urgent as a prerequisite of the overall drainage improvement in Palembang City. Annual cost of Rp.3,350 million is 3% of development expenditure of Kota. Palembang. Additional input of APBN is preferable. Positive impacts in local society are expected, e.g. improvement of urban water environment and decrease of inundation..
<p>Component 5: Monitoring Network Establishment</p> <p>5-1 Hydrological monitoring system establishment</p> <ol style="list-style-type: none"> Measurement of sediment discharge using new equipment needs training of the monitoring staffs. Monitoring work itself does not create direct economic effect, but it will be the basis for the management that creates various positive economic effects. Total cost of Rp.2,548 million is a burden of Musi BPSDA and additional APBN input is needed. No negative social impact is expected.
<p>5-2 Water quality monitoring system establishment</p> <ol style="list-style-type: none"> Training of the laboratory and monitoring staffs will be needed. Monitoring work itself does not create direct economic effect, but it will be the basis for the management that creates various positive economic effects. Total cost of Rp.6,084 million is a burden of Musi BPSDA and additional APBN input is needed. No negative social impact is expected.
<p>5-4 Hydrological database establishment</p> <ol style="list-style-type: none"> GIS database has been established and training has been conducted in this Study. Numerical database could be prepared by local consultants. Establishment of database itself does not create direct economic benefit, but it will be the basis for the management that creates various positive economic effects. Total cost of Rp.403million is a burden of Musi BPSDA and additional APBN input is needed. No negative social impact is expected.
<p>Component 6: Institutional Strengthening</p> <p>6-2-3 Official website of water resources management</p> <ol style="list-style-type: none"> No technical problem is anticipated. Positive effect including; reduction in communication cost, effective water use, savings in water use by public awareness. Use of APBD/APBN is expected. Positive social effect through the promotion of transparency is expected.
<p>6-5-1 Establishment of Water Resources Data and Information Unit in Balai PSDA</p> <ol style="list-style-type: none"> No technical problem is anticipated. Saving of time and cost for data and information collection, etc. will be expected. No significant amount of additional cost will be accrued. Positive social effect through proper data and information dissemination is expected.

6-5-3 Activation of PTPA/PPTPA
a. Technical and organizational coordination and guidance will be provided by the National Government.
b. The program will contribute to the balanced economic development of the Province/Basin.
c. No significant amount of additional cost will be accrued.
d. The program will give positive impact to local community through introduction of public involvement system.
6-6 Human Resources Development
a. No technical problem is anticipated.
b. The program does not create direct economic effect, but improvement of the capacity of relevant staffs and public will be the basis for efficient water use and management.
c. Use of APBD or application of WISMP is expected.
d. The program will give positive impact to local community through the building of capacity also in the local community.

Table 8.3.2 Initial Screening for Environmental Impacts

Environmental Issues	Priority Program																	
	1-2	1-3	1-4	1-6	2-1	3-1	3-3	3-4	3-6	3-7	4-1	4-3	5-1	5-2	5-4	6-2-3	6-5-1	6-5-3
Social issues																		
Scheduled relocation	D	D	C	D	C	C	D	D	D	C	D	D	D	D	D	D	D	D
Unwilling relocation	D	D	C	D	C	C	D	D	D	C	D	D	D	D	D	D	D	D
Alternation of the right on land tenure, residence	D	D	C	D	D	C	D	D	D	D	D	D	D	D	D	D	D	D
Change of life style	D	D	D	D	D	C	D	D	D	C	D	D	D	D	D	D	D	D
Conflict between population	D	D	+	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Effect on indigenous people, minority, nomads	D	+	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Reform of traditional institution, custom	D	D	D	D	+	C	D	D	D	D	D	D	D	D	D	D	D	D
Obstruction on fishing right, water right, local regulation	D	D	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Alteration of social structure by organization, etc.	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Radical change of social structure, population increase	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Lost opportunity on production, e.g. loss of land	D	D	D	D	C	+	D	D	D	D	D	D	D	D	D	D	D	D
Transfer, conversion of foundation of economic activity	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Increase of unemployment	D	D	D	D	D	+	D	+	D	+	D	D	D	D	D	D	D	D
Enlarging income gap	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Impact on existing transportation	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Impact on schools and hospitals	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Cutting off the local society by roads, etc.	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
People's perception	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Health and hygiene																		
Occurrence of local diseases	D	+	D	D	D	D	D	D	D	D	+	+	D	D	D	D	D	D
Increase of pesticide consumption	D	D	D	D	D	D	C	D	D	D	D	D	D	D	D	D	D	D
Accumulation of remained toxic matter	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Increase of waste and excretion	D	+	D	D	+	D	D	D	D	D	+	+	D	D	D	D	D	D
Garbage and trash dump, falling standards of hygiene	D	D	D	D	+	D	D	D	D	D	+	+	D	D	D	D	D	D
Spread of vermin	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Dump of construction waste, excavated soil, sludge, etc.	D	D	D	D	+	D	D	D	D	D	+	+	D	D	D	D	D	D
Historical remains, cultural legacy, scenery																		
Destruction or damage of historical remains and cultural legacy	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Loss of precious scenery	D	D	D	D	D	D	D	D	D	+	D	D	D	D	D	D	D	D
Effects on underground resources	D	D	D	D	+	D	D	D	D	+	D	D	D	D	D	D	D	D
Change of ground features by construction of structures	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Disturbance of harmonic scenery by construction of structures	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Area of precious fauna and flora, and eco-system																		
Alteration of vegetation	D	D	D	D	D	+	D	D	D	+	D	D	D	D	D	D	D	D

Invasion and propagation of harmful fauna and flora	D	D	D	D	D	+	D	D	D	+	D	D	D	D	D	D	D	D	D
Extermination/decrease of precious/specific fauna and flora	D	D	D	D	D	+	D	D	D	+	D	D	D	D	D	D	D	D	D
Disappeared wetland	D	D	D	D	D	+	D	D	D	+	D	D	D	D	D	D	D	D	D
Loss of bio-diversity	D	D	D	D	D	+	+	D	D	+	D	D	D	D	D	D	D	D	D
Loss of rainforests and wild lands	D	D	D	D	D	+	D	D	D	+	D	D	D	D	D	D	D	D	D
Soils and lands																			
Topography and geology change	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Land devastation	D	D	D	D	D	+	D	+	D	+	D	D	D	D	D	D	D	D	D
Loss of soil fertility	D	D	D	D	D	+	D	+	D	+	D	D	D	D	D	D	D	D	D
Soil pollution by discharge or diffusion of toxic wastewater	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Soil loss/ erosion	D	D	D	D	D	+	+	D	+	D	+	D	D	D	D	D	D	D	D
Loss of top soil (after forest cutting/ land consolidation)	D	D	D	D	D	+	D	+	D	+	D	D	D	D	D	D	D	D	D
Loss of important ground features	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Loss of important geology by cut and bank	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Hydrology and water quality																			
Change of flow/ water surface	D	D	C	D	+	D	D	D	D	+	+	D	D	D	D	D	D	D	D
Occurrence of inundation and floods	D	D	C	D	+	+	D	D	D	+	+	D	D	D	D	D	D	D	D
Change of groundwater (GW) flow and groundwater table	D	D	D	D	+	+	D	D	D	D	D	D	D	D	D	D	D	D	D
Pollution or deterioration of water quality	D	+	C	D	+	+	D	D	D	+	+	D	D	D	D	D	D	D	D
Turbid water by soil erosion/ reduced discharge	D	D	D	D	+	+	D	D	D	D	D	D	D	D	D	D	D	D	D
Exhausted GW by excess extraction or lowered recharge	D	D	D	D	+	+	D	D	D	D	D	D	D	D	D	D	D	D	D
Seeped toxic water of buried materials	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Eutrophication	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Water temperature change	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Lake and river																			
Sedimentation in lake	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Sedimentation in rivers	D	D	D	D	+	+	D	+	D	D	D	D	D	D	D	D	D	D	D
Riverbed degradation	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Others																			
Increased opportunity of slope failure, accidents	D	D	D	D	D	+	D	+	D	D	D	D	D	D	D	D	D	D	D
Pollution by exhaust or toxic gas of vehicles and plants	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Noise and vibration caused traffic, pumps, etc.	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Change of temperature and wind by large scale development	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

Note: A: Serious impact anticipated, need careful assessment
 B: Anticipated impact
 C: Unknown (necessary to assess, detail could be clarified in a further assessment);
 D: No impact anticipated
 +: Positive impact, target or objective of the program

8.4 Action Plan for the Start of Management Implementation

8.4.1 Action Plan for Each Priority Program

Action plan for the smooth implementation of each priority program has been proposed herewith as shown in **Table 8.4.1**.

8.4.2 Key Actions for the Start of Management Implementation

Priority programs have been selected from the programs of each component considering the factors, e.g., prerequisite to the other programs, seriousness, necessity of early start, cost scale. Selected programs are thus those that need early implementation. For the smooth start of the implementation of the management plan, key actions are deemed important. The key actions are identified as follows:

(1) Preparatory Actions

It is recommended that **BAPPEDA** of South Sumatra Province would coordinate for the following actions.

- The proposed Comprehensive Water Management Plan should be legalized in the coming Strategic Plan 2004-2008, South Sumatra Province
- Provincial Government Decree for the implementation of the proposed master plan should be prepared and adopted.

(2) Basic Tool for Water Management

Program 1-6: Modeling of Water Use Management is one of the most urgently needed programs since the Model is the basic tool for the proper water management. The implementation of the program needs a technical assistance from the advanced countries with much experience in basin water management modeling in the Asian monsoon regions. **DGWR** is recommended to start preparation of TOR for the technical assistance.

(3) Monitoring Network Establishment

Hydrological and water quality data are needed for the use in the Water Use Management Model as discussed above. Without these data, the model cannot be properly used; hence, close coordination with the water use management modeling is needed. It is recommended that **Musi Balai PSDA** with the coordination of Dinas PU Pengairan start discussion with BMG, BAPEDALDA, PDAMs for the future monitoring network in the Basin, and to prepare TOR to obtain APBN.

(4) Floodplain Management

Floodplain management should be considered as a program in a long span of 50-100 years, but it should be started urgently before uncontrolled developments proceed in the floodplains. It can be said that the action of **Dinas PU Pengairan** greatly influences the future of the Musi River Basin. It is recommended to formulate a responsible group under Dinas PU Pengairan and to start necessary action.

(5) Watershed Rehabilitation and Conservation

Forest Service of South Sumatra Province can start leading action for the programs for watershed rehabilitation and conservation. Establishment of a task force and its activation is deemed urgent. It is also recommended to start discussion with Kimpraswil for the inclusion of the Musi River Basin into "List of Priority River Basins for Reforestation" prepared jointly by Ministry of Forest and Kimpraswil.

(6) Urban Water Environment Improvement

Dinas Kimpraswil of Palembang Municipality is recommended to start for the program implementation. Selection of NGOs who will be involved in the Community Drainage Management Program is deemed urgent. Proper schemes for the assistance of activities by NGOs should also be considered.

(7) Demarcation of the Work by WISMP

Dinas PU Pengairan is recommended to identify the program covered by WISMP. It should be conducted continuously for the progress of the program in the Musi River Basin under the WISMP.

8.5 Program Summary for Priority Projects

Program summary for priority projects are as attached after Table 8.4.1.

Table 8.4.1 Action Plan for Priority Program Implementation

Component and Program		Starting action			Mid-term check	
		Timing	Action	Responsible organization	Timing	Check item
Component 1: Water Use Management						
1-2	Sustainable irrigation and swamp development	2004.01	Formulation of a responsible Group in DPUP	DPUP	2004.06	TOR for Pre-F/S be prepared
1-3	Rainwater utilization in tidal swamp area	2004.06	Start of financial source planning	DPUP	2004.12	Financial source be determined
1-4	Aquaculture water management	2004.06	Completion of an inventory survey	DPUP	2004.09	First meeting be held between WUA and aquaculture owner
1-6	Modeling of water use management	2004.01	Preparation of TOR	DGWR	2004.09	Study implementation scheme be determined
Component 2: Floodplain Management						
2-1	Zoning and land use control program	2004.01	Formulation of a responsible group in DPUP	DPUP	2004.03	Necessary LANDSAT Image be purchased
Component 3: Watershed Rehabilitation and Conservation						
3-1	Application of agroforestry in farmer's plantations	2004.01	Establishment of a Task Force	Forest	2005.12	A model project scheme be formulated
3-3	Strengthening of agriculture /estate /forestry extension	2004.01	Establishment of a Task Force	Forest	2004.12	Project sites be determined
3-4	Reforestation of production forest	2004.01	Formulation of a Investment Team	Forest	2004.12	Order to subject enterprise be submitted
3-6	Inner- and inter-basin coordination	2003.10	Confirmation of PTPA/PPTPA setup	Governor	--	--
3-7	Rehabilitation of existing protected forests	2004.01	Formulation of a responsible group in BKSDA	BKSDA	2005.12	Priority areas be determined
Component 4: Urban Water Environment Improvement						
4-1	Community drainage management	2003.10	Selection of NOGs who will be involved in the program	Palembang	2004.01	Financial source be determined
4-3	Trunk drainage channels rehabilitation	2003.10	Budget request for the program	Palembang	2004.01	Financial source be determined
Component 5: Monitoring Network Establishment						
5-1	Hydrological monitoring system establishment	2004.04	Confirmation of completed programs by IWIRIP and proposed programs for WISMP	BPSDA	2004.06	Coordination between BPSDA and BMG on rainfall data exchange be completed
5-2	Water quality monitoring system establishment	2004.04	Confirmation of completed programs by IWIRIP and proposed programs for WISMP	BPSDA	2004.06	Coordination between BPSDA and BAPEDALDA on water quality monitoring demarcation be completed
5-4	Hydrological database establishment	2004.01	Completion of an activity program for Water Resources Data and Information Unit	BPSDA	2004.03	ACCESS database operation be started

Component and Program		Starting action			Mid-term check	
		Timing	Action	Responsible organization	Timing	Check item
Component 6: Institutional Strengthening						
6-2-3	Official website of water resources management	2003.10	Formulation of a responsible group in DPUP	DPUP	2004.09	Trial use version be completed
6-5-1	Establishment of Water Resources Data and Information Unit in Balai PSDA	2003.10	Confirmation of Water Resources Data and Information Unit setup	DPUP	--	--
6-5-3	Activation of PTPA/PPTPA	2003.10	Confirmation of PTPA/PPTPA setup	Governor	--	--
6-6-1	Training for operating techniques for government employees of Balai PSDA	2003.10	Formulation of a responsible group in DPUP	DPUP	2004.01	Training be started
6-6-2	Training for management and planning for related government employees					
6-6-3	Training for operation & maintenance of irrigation system					
6-6-4	Joint training with NGOs to informal leaders and selected people					

Note: bil: billion; DPUP: Dinas PU Pengairan of South Sumatra Province; Forest: Forest Service of South Sumatra Province; Governor: Governor's Office of South Sumatra Province, BKSDA: Balai KSDA of South Sumatra Province; Palemb.: Kota Palembang, BPSDA: Musi Balai PSDA