

## **5.5 Selection of Priority Programs**

### **5.5.1 Selection Criteria**

Priority programs are selected based on the following criteria:

#### **(1) Prerequisite to Other Programs**

Higher priority (score) is given to programs that will be the basis or prerequisite of other programs, as follows:

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High Priority (score = 5):	Basis or prerequisite of other programs
Middle Priority (score = 3):	None
Low Priority (score = 1):	Not basis or prerequisite of other programs

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#### **(2) Degree of Seriousness**

Higher priority (score) is given to programs which degree is serious in the aspect of “what is the problem of water use management in the Basin”, as follows:

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High Priority (score = 5):	Problems relating to more severe BHN (basic human needs)
Middle Priority (score = 3):	Problems relating to BHN or economic development
Low Priority (score = 1):	Other problems

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#### **(3) Requirement of Early Start**

Higher priority (score) is given to programs that, if the start of this program is delayed, implementation of this program becomes difficult due to the progress of problems, as follows:

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High Priority (score = 5):	Expected to be almost impossible to implement
Middle Priority (score = 3):	Expected to become difficult to implement
Low Priority (score = 1):	Expected to be still possible

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#### **(4) Degree of Accelerating Economic Recovery of the Basin**

Higher priority (score) is given to programs that accelerate economic recovery, namely, create job opportunities and support economic development, as follows:

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High Priority (score = 5):	Expected to accelerate economic recovery
Middle Priority (score = 3):	Expected to be medium contribution to the acceleration
Low Priority (score = 1):	Expected not to accelerate economic recovery

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## 5.5.2 Selection of Priority Programs

Scores of each program is determined using the criteria, as follows:

**Table I5.5.1 Score of Each Program**

<b>Program</b>	<b>Prere- quisite</b>	<b>Serious ness</b>	<b>Early Start</b>	<b>Accele- ration</b>	<b>Total Score</b>
1-1 Sustainable Water S. to Wide Area	1	3	1	3	<b>8</b>
1-2 Sustainable I&S Development	5	3	3	5	<b>16</b>
1-3 Rainwater U. in Tidal Swamp Area	3	5	5	3	<b>16</b>
1-4 Aquaculture Water Management	3	5	5	3	<b>16</b>
1-5 Enhancing W. Utilization for Tourism	1	3	1	3	<b>8</b>
1-6 Modeling of Water Use Management	5	5	5	5	<b>20</b>

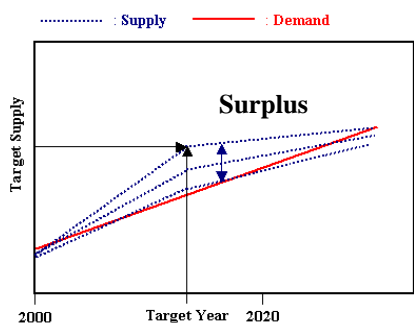
Based on the results, programs 1-1 and 1-5 are judged to have less priority. Therefore, the following programs are selected as priority programs:

- Program 1-2: Sustainable Irrigation and Swamp Development
- Program 1-3: Rainwater Utilization in Tidal Swamp Area
- Program 1-4: Aquaculture Water Management
- Program 1-6: Modeling of Water Use Management

Summary sheets of the priority programs are shown from the next page:

<p><b>1. Program Title:</b> Program 1-2 Sustainable Irrigation and Swamp Development</p>																	
<p><b>2. Location</b> Program Site: South Sumatra Province</p>																	
<p><b>3. Objectives</b></p> <p>South Sumatra Province is designated as potential food resources area for the rice self-reliance at the national level, and provincial goals of water resources development include supporting stabilization of the rice self-reliance. Therefore, irrigation and swamp development is to be promoted in a sustainable way. In order to ensure sustainability of the development, the results of this Study, especially the potential irrigation and swamp development area, should be considered. The objectives of this program are:</p> <table border="1"> <thead> <tr> <th colspan="2">Potential Irrigation and Swamp Development Area in the Basin</th> </tr> <tr> <th>Development Type</th> <th>Potential Development Area (ha: in equivalent Double Cropping)</th> </tr> </thead> <tbody> <tr> <td>Technical</td> <td>86,200</td> </tr> <tr> <td>Semi Technical</td> <td>28,600</td> </tr> <tr> <td>Simple</td> <td>4,540</td> </tr> <tr> <td>Communal</td> <td>87,200</td> </tr> <tr> <td>Non-tidal</td> <td>158,000</td> </tr> <tr> <td>Tidal</td> <td>219,000</td> </tr> </tbody> </table> <p>Note) For details, refer to "Table I4.2.4 Potential Irrigation and Swamp Development in the Basin" and "Annex I4.2.4 Potential Irrigation and Swamp Area in Sub-basins"</p> <ul style="list-style-type: none"> <li>■ To promote stable self-reliance of rice and food security at provincial and national level</li> <li>■ To carry out Pre F/S, F/S and D/D aiming to realize sustainable irrigation and swamp development in South Sumatra Province</li> </ul>		Potential Irrigation and Swamp Development Area in the Basin		Development Type	Potential Development Area (ha: in equivalent Double Cropping)	Technical	86,200	Semi Technical	28,600	Simple	4,540	Communal	87,200	Non-tidal	158,000	Tidal	219,000
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<p><b>4. Executing Agency</b></p> <ul style="list-style-type: none"> <li>■ Ministry of Settlement and Regional Infrastructure, and Water Resources Service of South Sumatra Province with cooperation of Jambi, Bengkulu and Lampung Provincial Governments</li> <li>■ Related Agency: Regency/Municipality Governments in the Province</li> </ul>																	
<p><b>5. Program Description</b></p> <p>In order to realize the objectives of the program, the main activities are:</p> <p><u>Sub-Program 1-2-1: Establishing Development Target of the Province</u></p> <p>(1) Determining target areas and year of irrigation and swamp development based on the results of this Study; (2) Determining candidate locations for irrigation and swamp development; and (3) Public Consultation.</p> <p><u>Sub-Program 1-2-2: Implementation of Pre F/S</u></p> <p>(1) Preparation of Pre F/S; (2) Executing Pre F/S; and (3) Public Consultation.</p>																	

### 5. Program Description (continuous)

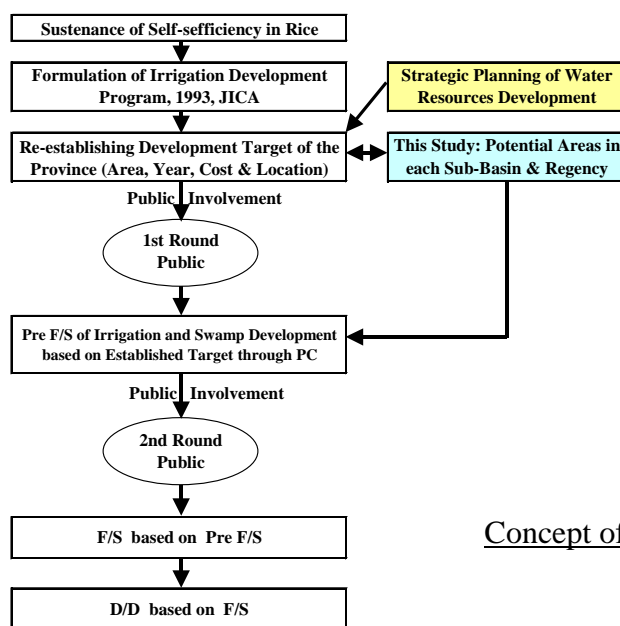


#### Sub-Program 1-2-3: Implementation of F/S

(1) Preparation of F/S; and (2) executing F/S.

#### Sub-Program 1-2-4: Implementation of D/D

(1) Preparation of D/D; and (2) executing D/D.



Concept of Program

### 6. Implementation Schedule

Implementation period is 8.5 Years:

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
<b>1-2</b>	<b>Sustainable irrigation and swamp development</b>																												
1-2-1	Establishing development target of the Province																												
1-2-2	Implementation of Pre F/S	Preparation																											
1-2-3	Implementation of F/S									Preparation																			
1-2-4	Implementation of D/D																											Another 1.5 year	

### 7. Program Cost

Establishing Development Target:	Rp. 30 million
Pre F/S:	Rp. 1,905 million
F/S:	Rp. 21,000 million
D/D:	Rp. 81,900 million
<b>Total:</b>	<b>Rp. 104,835 million</b>

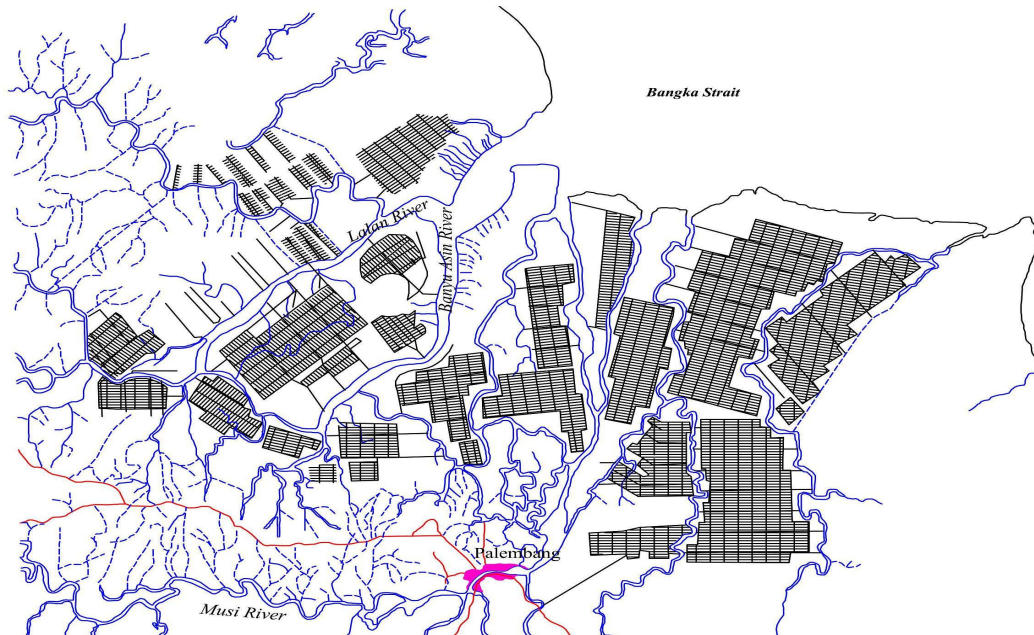
### 8. Others

**1. Program Title:** Program 1-3

Rainwater Utilization in Tidal Swamp Area

**2. Location**

Program Site: Tidal swamp areas in South Sumatra Province



**3. Objectives**

Water supply is the major basic human needs to the farmers in the tidal swamp area in the Province. However, those farmers do not have the facilities to utilize the rainwater effectively, which rainwater is the major available water resources for drinking and cooking. Therefore, rainwater utilization is to be promoted in the tidal swamp area. In the promotion, bottom up approach is necessary in order to make it sustainable.

Rainwater storing facilities (one polyethylene water tank, 3m<sup>3</sup>) are to be provided to subject farm households to store rainwater during rain season, and use for drinking and cooking during dry season. Sanitation facilities (septic tank placing on the ground) are to be provided to subject households in order to avoid water related diseases accrue from the surface water use for washing and bathing.

The objectives of this program are:

- To provide rainwater storing and sanitation facilities to farmers in tidal swamp area in South Sumatra Province
- To increase the physical and mental happiness of the farmers

#### 4. Executing Agency

- Water Resources Service of South Sumatra Province, and OKI, MUBA (new) and Banyuasin Regency Governments

#### 5. Program Description

In order to realize the objectives of the program, the main activities are:

##### Sub-Program 1-3-1: Preparation

- Surveying number of the target farmers, their present facilities of water supply and sanitation, and costs
- Opening public consultation



##### Sub-Program 1-3-2: Providing Rainwater Storing and Sanitation Facilities

- Providing one (1) water tank and one (1) septic tank to each subject household

Domestic Water Tank (provided by SSSIP)

#### 6. Implementation Schedule

Implementation period is 10 Years:

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
1-3	Rainwater utilization in tidal swamp area																												
1-3-1	Preparation	■																											
1-3-2	Providing rainwater storing and sanitation facilities					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

#### 7. Program Cost

Facilities: Rp. 2 million (water tank 1 million, septic tank 1 million per HH) × 92,000 (HH) = Rp. 184 billion

Preparation and Administration (8%): Rp. 14.7 billion

Total: Rp. 198.7 billion

#### 8. Others

**1. Program Title:** Program 1-4

Aquaculture Water Management

**2. Location**

Program Site: Whole Musi River Basin (59,932 km<sup>2</sup>)

At present, conflicts between aquaculture and irrigation occur in the Basin. The following table shows present aquaculture areas:

**Present Aquaculture Area of Fishpond (ha)**

<b>OKU</b>	<b>OKI</b>	<b>Muaraenim</b>	<b>Lahat</b>	<b>MURA</b>
3,550	164	409	1,552	703
<b>MUBA</b>	<b>PLB</b>	<b>Pagaralam</b>	<b>Prabumulih</b>	<b>Rejang L.</b>
275	29	169	12	545

**3. Objectives**

Aquaculture in paddy fields experiences severe conflicts with irrigation water use. Irrigation water cannot reach to the downstream of irrigation system due to aquaculture. On the other hand from aquaculture side, quantity and quality of water is not stable due to irrigation.

Aquaculture and irrigation are important from the viewpoint of their quantities of consumptive water uses as well as economic sectors. Those water use activities will be activated in the future. Therefore, methods for solving these conflicts are to be developed through bottom up approach.

In order to solve the conflicts, areas for aquaculture and irrigation are better to be separated from the viewpoint of water management, e.g., gate operation and farm conditions, etc. If land uses cannot be controlled, aquaculture areas are better to be gathered by reallocation or exchange of farm lots. Implementation of the program is to be carried out by each regency/municipality.

The objectives of this program are:

- To develop solving methods of conflicts between aquaculture and irrigation water uses
- To realize equitable and sustainable regional development

**4. Executing Agency**

- Water Resources Service, Agriculture Service and Fishery Service of South Sumatra Province with cooperation of Bengkulu Provincial Government
- Related Agency: Regency/Municipality Governments in the Basin

## 5. Program Description

In order to realize the objectives of the program, the main activities are:

### Sub-Program 1-4-1: Researching Solution Methods

- Holding public consultation
- Investigating situations of conflicts, including their background and history, locations, numbers of cases, land tenure system, etc.
- Surveying methods of reallocation or exchange of farm lots, consisting of (may be similar to the methods adopted in land consolidation):
  - Intension survey on reallocation or exchange of farm lots
  - Cadastral mapping
  - Evaluation of farm lots
  - Determination of prices of the lots
  - Liquidation methods
  - Registration of reallocated or exchanged lands

### Sub-Program 1-4-2: Disseminating of the Methods

- Disseminating the methods to regencies/municipalities

## 6. Implementation Schedule

Implementation period is 2 Years:

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
<b>1-4</b>	<b>Aquaculture water management</b>																												
1-4-1	Researching solution methods	■	■	■	■																								
1-4-2	Dissemination of the methods							■	■																				

## 7. Program Cost

PC: 100 (person/day) x 150,000 (Rp./day) = Rp. 15 million

Research and dissemination: 3 (person) x 24 (month) x 5 (day/month) x

150,000 (Rp./day) = Rp. 54 million

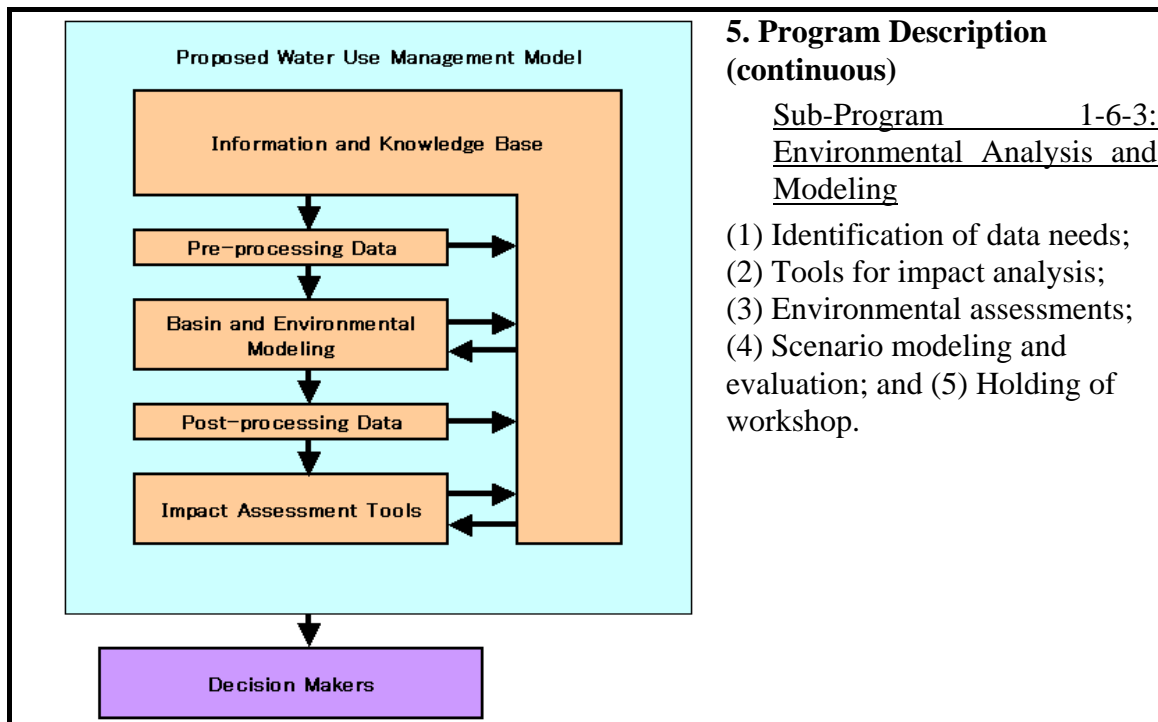
Administration (5%): Rp. 3.5 million

Total: Rp. 72.5 million

## 8. Others



<p><b>1. Program Title:</b> Program 1-6 Modeling of Water Use Management</p>
<p><b>2. Location</b> Program Site: Whole Musi River Basin (59,932 km<sup>2</sup>)</p>
<p><b>3. Objectives</b></p> <p>Indonesia faces five major problems, and one of them is the slow process of economy recovery. Economic recovery is aimed to restore the economic growth and equity to a reasonable rate and to attain sustainable development. Propenas 2000-2004 stipulates that this aim can be realized only with the management of natural resources that ensures the preservation of the supporting capacity of the environment and the conservation of natural resources.</p> <p>In order to achieve and realize the sustainable water management, equitable and balanced water uses, and conservation of environment in Musi River Basin, water management model is to be developed. In the modeling, people's participation is necessary in order to make this model sustainable. The objectives of this program are:</p> <ul style="list-style-type: none"><li>■ To promote a mechanism to improve sustainable water management in the Musi River Basin</li><li>■ To promote equitable and balanced water uses in the Musi River Basin</li><li>■ To enhance conservation of environment of the Musi River Basin</li></ul>
<p><b>4. Executing Agency</b></p> <ul style="list-style-type: none"><li>■ DGWR of Ministry of Settlement and Regional Infrastructure, and Water Resources Service of South Sumatra Province with cooperation of Jambi, Bengkulu and Lampung Provincial Governments</li><li>■ Related Agency: Forestry Service of South Sumatra Province, BMG and UPTD</li></ul>
<p><b>5. Program Description</b></p> <p><u>Sub-Program 1-6-1: Information and Knowledge Base Development</u></p> <p>(1) Review of relevant programs; (2) Identify actual modeling needs and data requirement; (3) Determination of database structures, and computer and communication networks; (4) Determination of database access; (5) Preparation of procurement packages; (6) Information and knowledge base development; and (7) Holding of public consultation/workshop.</p> <p><u>Sub-Program 1-6-2: Basin Modeling Development</u></p> <p>(1) Hydrological review; (2) Review of historic water resources development and water use; (3) Review of available models; (4) Design of modeling structure; (5) Preparation of procurement packages; (6) Development of models; and (7) Holding of workshop.</p>



### 5. Program Description (continuous)

Sub-Program 1-6-3:  
Environmental Analysis and  
Modeling

- (1) Identification of data needs;
- (2) Tools for impact analysis;
- (3) Environmental assessments;
- (4) Scenario modeling and evaluation; and
- (5) Holding of workshop.

### 6. Implementation Schedule

Implementation period is 2 Years:

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
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					■	■	■	■																				

### 7. Program Cost

Engineering: 60 (m/m) x 200 (Rp. million/m/m) = Rp. 12,000 million

Hardware, Software and Workshop: Rp. 900 million

Administration (5%): Rp. 645 million

Total: Rp. 13,545 million

### 8. Others

## 5.6 Cost Flow and Evaluation of Priority Programs

### 5.6.1 Program 1-2: Sustainable Irrigation and Swamp Development

#### (1) Cost Flow

Cost flow of this program is, as follows (implementation period is 8.5 years):

**Table I5.6.1 Program 1-2: Cost Flow** (Unit: Rp. million)

Cost	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year	6 <sup>th</sup> Year	7 <sup>th</sup> Year	8 <sup>th</sup> Year	9 <sup>th</sup> Year
Program	664.9	1,270	0	14,000	7,000	13,650	27,300	27,300	13,650
O/M	0	0	0	0	0	0	0	0	0
Total	664.9	1,270	0	14,000	7,000	13,650	27,300	27,300	13,650

#### (2) Program Evaluation

##### (a) Technical Aspects

This program is mainly to carry out Pre F/S, F/S and D/D of irrigation and swamp development, therefore, is judged to be technically feasible.

##### (b) Economic and Financial Aspects

The economic internal rate of return (EIRR) of Komerang Irrigation Project (Stage II) is estimated at 12.6%, indicating economic viability. On the other hand, EIRR of South Sumatra Swamp Improvement Project was re-evaluated at 7.4%, less than the original projection of 13.7%. This difference occurs because the planned benefit has not yet been realized. As for financial aspects, both developments are viable. Referring these cases, the program can be made viable from the viewpoints of economic and financial aspects.

##### (c) Social Aspects

This program is aiming to promote self-reliance of rice and food security at provincial and national level. Therefore, there are large social benefits, e.g. creating job opportunities, import substitution of rice, and export promotion, etc. Direct beneficiaries are provincial population of 6.9 million persons (2000), and indirectly 206 million population of Indonesia (2000).

##### (d) Overall Aspects

Considering economic and financial viability, and large social benefits, the program can be justified.

**(3) Financial Sources**

Program cost (annual maximum Rp. 27,300 million) will be burdened by the Province. As its provincial development budget was Rp. 919 billion (2001), this annual maximum cost is equivalent to 3.0% of the budget. Therefore, the Province is judged to be capable of bearing the program cost.

**5.6.2 Program 1-3: Rainwater Utilization in Tidal Swamp Area****(1) Cost Flow**

Cost flow of this program is, as follows (implementation period is 10 years):

**Table I5.6.2 Program 1-3: Cost Flow** (Unit: Rp. billion)

Annual Cost	1 <sup>st</sup> – 10 <sup>th</sup> Year
Program	- Province: 0.18 - OKI: 1.97 - MUBA: 4.92 - <u>Banyuasin: 12.8</u> Total: 19.87
Government O/M	0
Total	19.87

**(2) Program Evaluation****(a) Technical Aspects**

Water tank and septic tank are manufactured in Palembang. Those tanks will be used in this program. Therefore, this program is judged to be technically feasible.

**(b) Economic Aspects**

Results of economic analysis indicated that the program has slightly lower economic efficiency with EIRR of 10.7% compared to the opportunity cost of capital in Indonesia (12%). The benefit cost ratio (B/C) is 0.93, and the net present value is -8,215 (Rp. million) with the discount rate of 12%. Detailed calculation is in **Annex I5.6.1**. Although the EIRR is slightly lower than the opportunity cost of capital in Indonesia, the program is for the purpose of basic human needs and to solve regional unbalance in the Musi River Basin, and thus the implementation using the government fund is strongly recommended.

(c) **Social Aspects**

This program will not produce tangible benefits. However, this program will produce large social benefits, covering 370,000 persons: namely, improving healthiness of the people; assisting economic activities; and supporting social stabilization, etc.

(d) **Overall Aspects**

This program will contribute supporting human basic needs, showing large economic and social benefits. Therefore, this program can be justified.

(3) **Financial Sources**

Program costs (**Table I5.6.2**) will be burden by the Province, OKI, new MUBA and Banyuasin, respectively. Development budgets of these governments were Rp.919 billion (Province 2001), Rp.293.6 billion (old MUBA 2002) and Rp.142.2 billion (OKI 2002). Therefore, those annual costs are equivalent to 1.4% (OKI) and 6.0% (old MUBA) of each budget. Based on these figures, those governments are judged to be capable of bearing this program costs.

**5.6.3 Program 1-4: Aquaculture Water Management**

(1) **Cost Flow**

Cost flow of this program is, as follows (implementation period is 2 years):

**Table I5.6.3 Program 1-4: Cost Flow** (Unit: Rp. million)

Cost	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year
Program	36.3	36.3			
O/M*	0	0	6	6	6
Total	36.3	36.3	6	6	6

\*) Assumed at: Rp.500,000 /month for each regency/municipality

(2) **Program Evaluation**

(a) **Technical Aspects**

This program is to establish the methods of reallocation or exchange of farm lots in order to solve the conflicts. Therefore, no significant technical aspects are expected in this program.

**(b) Social Aspects**

This program will not produce tangible benefits, but contribute enormously equitable and sustainable regional development in the Basin. This is because aquaculture and irrigation will be significant economic sectors, and solving conflicts between both sectors will be indispensable for the equitable and sustainable development.

**(c) Overall Aspects**

This program is evaluated as socially desirable, and can be justified.

**(3) Financial Sources**

Program cost (Rp.36.3 million annually) will be burden by Water Resources, Agriculture and Fishing Services of the Province. As their total expenditure (APBD 2001) was Rp.21.7 billion, this annual cost is equivalent to 0.2% of the expenditure. Therefore, the Services are judged to be capable of bearing the program cost.

O/M cost (Rp.6 million per regency/municipality) will be burden by each regency/municipality. As their APBD 2002 (water resources and irrigation) is approximately more than Rp.1 billion, this O/M cost is equivalent to less than 0.6% of the APBD. Therefore, O/M by regency/municipality is judged to be capable.

**5.6.4 Program 1-6: Modeling of Water Use Management****(1) Cost Flow**

Cost flow of this program is, as follows (implementation period is 2 years):

**Table I5.6.4 Program 1-6: Cost Flow** (Unit: Rp. million)

Cost	1 <sup>st</sup> Year	2 <sup>nd</sup> Year	3 <sup>rd</sup> Year	4 <sup>th</sup> Year	5 <sup>th</sup> Year
Program	6,772.5	6,772.5			
O/M*	0	0	12	12	12
Total	6,772.5	6,772.5	12	12	12

\*) Assumed at: Rp.1,000,000 /month

**(2) Program Evaluation****(a) Technical Aspects**

This program contains: information and knowledge base development; basin modeling; and environmental modeling, which development and

modeling include high technology. Therefore, the program will be sublet to international firm. Musi Balai PSDA will operate and maintain the system. This O/M will be no problem because technology transfer is to be included in the scope of program.

**(b) Social Aspects**

This program will not produce tangible benefits, but contribute decision make, transparent and flexible management, and scenario management, etc. Thus, the system will contribute enormously sustainable development of the Basin, benefiting 6.3 million people in the Basin (2002).

**(c) Overall Aspects**

The program is evaluated to be technically feasible, and socially desirable. Therefore, the program can be justified.

**(3) Financial Sources**

Program cost (Rp.6,722.5 million annually) will be burden by the Province. As its development budget (2001) was Rp.919 billion, this annual cost is equivalent to 0.7% of the budget. Therefore, the Province is judged to be capable of bearing the program cost.

As for O/M cost (Rp.12 million annually), it will be burden by Water Resources Service of the Province. As its APBD 2002 was Rp.19.8 billion, this O/M cost is equivalent to less than 0.1% of the APBD. Therefore, the Service is judged to be capable of this O/M.

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