

## **APPENDIX 5.3.2**

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### **SAMPLE APPLICATION FORM FOR CUSTOMER INFORMATION SURVEY**







## **APPENDIX 5.9.1**

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### **EXECUTIVE SUMMARY OF THE DEVELOPMENT STUDY ON WASTEWATER DISPOSAL FOR DENPASAR (1993)**



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)  
MINISTRY OF PUBLIC WORKS  
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA

THE DEVELOPMENT STUDY  
ON  
WASTEWATER DISPOSAL FOR DENPASAR

EXECUTIVE SUMMARY

JANUARY 1993

PACIFIC CONSULTANTS INTERNATIONAL

In this report, project cost is estimated at June 1992 price and at an exchange rate of 1 US\$ = Rp. 1,270.



## PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct the development study on Wastewater Disposal for Denpasar and entrusted the study to the Japan International Cooperation Agency (JICA).

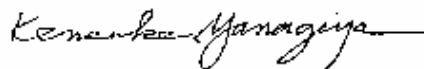
JICA sent to Indonesia a study team headed by Mr. Naohito Murata, Pacific Consultants International, three times between October 1991 and November 1992.

The team held discussions with the officials concerned of the Government of Indonesia, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the team.

January, 1993



Kensuke Yanagiya  
President

Japan International Cooperation Agency

THE DEVELOPMENT STUDY  
ON  
WASTEWATER DISPOSAL FOR DENPASAR

Mr. Kensuke YANAGIYA  
President  
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

Dear Sir,

We are pleased to submit to you the final report entitled "THE DEVELOPMENT STUDY ON WASTEWATER DISPOSAL FOR DENPASAR". This report has been prepared by the Study Team in accordance with the contract signed on 27 September 1991 and 3 June 1992 between the Japan International Cooperation Agency and Pacific Consultants International.

The report examines the existing conditions of wastewater disposal in Denpasar, presents a master plan of sanitation and sewerage development and the results of a feasibility study on sewerage development for the priority areas selected by the master plan.

The report consists of the Executive Summary, Main Report, and Supporting Study Report. The Summary Summarizes the results of all studies. The Main Report contains background conditions, overall sanitation and sewerage development plan, urgent sewerage development project, conclusions and recommendations. The Supporting Study Report includes data and technical details. In addition, a Data Book has been prepared and is submitted herewith.

All members of the Study Team wish to express grateful acknowledgement to the personnel of your Agency, Advisory Committee, Ministry of Foreign Affairs, Ministry of Construction, and Embassy of Japan in Indonesia, and also to officials and individuals of the Government of Indonesia for their assistance extended to the Study Team. The Study Team sincerely hopes that the results of the study will contribute to the socio-economic development and the improvement of health and hygiene in Denpasar.

Yours faithfully,



Naohito MURATA  
Team Leader

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## EXECUTIVE SUMMARY

### 1. Introduction

Denpasar and its vicinity, the political, economical and tourism centers of Bali, is undergoing rapid urban and tourism developments in recent years. The population has increased from 0.256 million in 1975 to 0.477 million in 1990, and is expected to grow further to 0.709 million in 2010. The number of tourists visiting there has doubled in the recent 10 years from 1.24 million in 1980 to 2.55 million in 1990.

However, the area virtually lacks an environmentally and sanitarly acceptable means of wastewater disposal in commensuration with its urbanization and tourism development.

Hence, the formulation of a comprehensive sewerage and sanitation development plan has become necessary to improve sanitary environments and to protect tourism resources of the area.

The objectives of the Study are as follows:

- Formulate a master plan of sewerage and sanitation development encompassing the whole Study Area for the target year of 2010.
- Conduct a feasibility study for sewerage development for the areas selected by the master plan.

The Study Area of the master plan, shown in Fig. 1, encompasses Denpasar and its vicinity with an area of 237 km<sup>2</sup>.

Following the master plan study, the feasibility study was conducted for central Denpasar and Sanur districts with a total area of 3,423 ha shown in Fig. 1.

This wastewater disposal project was carried out by the Study Team of the Japan International Cooperation Agency (JICA) in collaboration with the Directorate General of Human Settlements (Cipta Karya), Ministry of Public Works of the Government of Indonesia from October, 1991 to December, 1992.

The whole study, including the executive summary, consists of the following reports;

- (1) Executive Summary
- (2) Main Report
- (3) Supporting Report I (Master Plan Study)
- (4) Supporting Report II (Feasibility Study)
- (5) Data Book
- (6) Drawing

## 2. Wastewater Disposal Master Plan

### 2.1 Water Environments

The wastewater generation in the Study Area is expected to double in 2010 due to the rapid urbanization and tourism development. It will cause a serious deterioration in the water environments of the Study Area if no appropriate countermeasures are taken.

- (1) The average river water quality of central and southern Denpasar areas will worsen from 27.2 mg/l in 1990 to 55.0 mg/l in 2010 as stream BOD. In some areas, it is forecast to reach approximately 100 mg/l.
- (2) The existing sea water quality of Sanur, Kuta and Nusa Dua beaches is 5 mg/l in terms of COD<sub>Cr</sub> on an average, however, it exceeds 8 mg/l in some areas. This water quality is considered to be in a critical level for swimming and other water recreations in comparison with international standards.

The future increase of wastewater generation in the Study Area will also have a severe effect on the sea water quality.

- (3) More than 90% of the toilet waste in the Study Area is disposed into underground by leaching system. However, a large portion of gray water are directly discharged to the road side drains or rivers/canals, resulting in creation of unsanitary environments in the communities. Such unsanitary environments concentrate in the densely populated areas.
- (4) Heavy groundwater contaminations are recognized in central and southern Denpasar areas due to the human waste disposals into

underground. It is critical even in the resort areas of Sanur, Kuta and Nusa Dua.

- (5) As the consequence, the Study Area is afflicted with waterborne diseases at a high contraction rate of 57.1 cases per 1,000 population per year.

## 7.2 Zoning of Wastewater Disposal

The conditions for the environmental and sanitary improvements of the Study Area are different by region. Hence, the most appropriate wastewater disposal system shall be planned by region.

Zoning of the wastewater disposal system was established based on the following policies.

- (1) The river water quality shall be maintained below 20 mg/l in stream BOD.
- (2) The sea water quality of the resort beaches shall be maintained below 5 mg/l in COD<sub>Cr</sub> or at least, below the existing level.
- (3) Sanitary environments of the resort areas shall be maintained in a satisfactory level as international resort.
- (4) Wastewater disposal system with a high treatment level shall be applied for high population density areas, however, system with a moderate treatment level can be proposed for medium population density areas.
- (5) Wastewater disposal into underground shall carefully be managed to control groundwater contamination.

The proposed zoning of wastewater disposal system is as follows.

- (1) Conventional sewerage system capable of treating both toilet waste and gray water up to 20 mg/l in BOD is applied for central Denpasar, and Sanur, Kuta and Nusa Dua resort areas
- (2) Septic tank with up-flow filter system is proposed for southern Denpasar area. This system will treat both toilet waste and gray water up to 60 mg/l in BOD.
- (3) Septic tank with leaching pit system is recommended for the other areas.

The service area and served population in 2010 by each system are summarized below.

	Service Area (ha)	Served Population in 2010
Conventional Sewerage	4,207 (18%)	335,020 (47%)
Septic Tank with Up-flow Filter	3,614 (15%)	107,700 (15%)
Septic Tank with Leaching Pit	15,832 (67%)	266,580 (38%)
Total	23,653 (100%)	709,300 (100%)

Location of each zone is shown in Fig. 2.

### 2.3 Sewerage Development Plan

Three (3) new sewage collection systems of conventional separate type are proposed for 2,683 ha of Denpasar area, 643 ha of Kuta area and 740 ha of Sanur area. Moreover, the existing sewage collection system of Bali Tourism Development Corporation (BTDC) of conventional separate type is developed to cover the whole Tanjung Bendoa area of 136 ha including Nusa Dua beach.

Wastewater of Denpasar, Kuta and Sanur areas are almost all treated by one (1) common treatment plant of aerated lagoon type proposed in the Suwung Swamp Area along Bendoa Bay. A portion of the wastewater of Kuta area is treated by the treatment plant of the on-going East Java and Bali Urban Infrastructure Development Project. However, wastewater of Tanjung Bendoa area is treated by remodelling the existing treatment plant of oxidation pond type in aerated lagoon type.

The main features of the proposed sewerage master plan are shown in Table 1. Location of the sewerage systems are shown in Fig. 2.

The total project cost of sewerage development is estimated at Rp.253.6 billion at 1992 price. The total operation and maintenance (O&M) cost of the sewerage system is estimated to be Rp.2,670 million per annum under the full operation in 2010 at 1992 price.

Break-down of the project cost and O&M cost of the proposed sewerage master plan are shown in Table 2.

## 2.4 Project Evaluation

### (1) Water Pollution Abatement

The proposed wastewater disposal project will control the future river water quality of the Study Area below the target one of 20 mg/l in BOD. The existing and future river water quality of central and southern Denpasar areas are compared below.

	(Unit : BOD <sub>5</sub> mg/l)	
	Range	Average
Existing (1990)	15.6 - 52.1	27.2
Future without Project (2010)	21.7 - 101.5	55.0
Future with Project (2010)	9.3 - 23.1	16.4

The proposed project will also reduce the pollution loads to the sea from the Study Area. The pollution loads under the existing, future without project and future with project conditions are shown below.

	Pollution Load to Sea (BOD <sub>5</sub> , ton/day)	
	Existing (1990)	10.8
Future (2010) without Project	21.9	
Future (2010) with Project	10.2	

The proposed project will maintain the future sea water quality of the Study Area around the existing level. The existing and future polluted sea areas exceeding the target water quality of 5 mg/l in COD<sub>cr</sub> are compared below.

	Polluted Sea Area (km <sup>2</sup> )	
	Existing (1990)	28.3
Future without Project (2010)	36.5	
Future with Project (2010)	28.6	



(2) Reduction of Water-borne Disease

Contraction of the water-borne diseases causes two (2) major economic costs: medical cost and opportunity cost of time spent by a hospitalized patient.

The total annual economic cost across the Study Area is calculated to be Rp.3,809 million under the existing conditions. A considerable portion of this economic cost will be reduced by the proposed project.

(3) Increase of Tourism Income

The tourism income of the Study Area is estimated to increase from Rp.183 billion in 1990 to Rp.717 billion in 2010 if wastewater disposal and the other all related infrastructures are well developed in future. However, it is expected that the future tourism income will much decrease from the above estimated one if the sea and river environments get worse in future than present.

The proposed project will much contribute to the increase of tourism income.

(4) Financial Aspects

The total amount of willingness to pay of the households and establishments in the proposed sewerage service area in 2010 is estimated to be Rp.1,460 million/year. It is more than the required O&M cost of Rp.2,679 million/year in 2010.

The development budget for infrastructures of the Study Area over the 17 years of the project implementation period from 1994 to 2010 is estimated at Rp.3,246 billion at 1992 price. This amount is adequate to carry out the proposed sewerage development project with the initial cost of Rp.254 billion at 1992 price.

### 3. Feasibility Study of Sewerage Development

The feasibility study area covers 2,683 ha in central Denpasar and 740 ha in Sanur, adding up 3,423 ha.

#### 3.1 Sewerage Development Plan

##### (1) Sewer Network Plan

###### (i) Overall Plan

The detailed sewer network plans of Denpasar and Sanur areas, targeting the year of 2010 were prepared based on the policies and frames established by the master plan study.

The proposed overall plan of Denpasar covers the net sewerage service area of 2,663 ha with a total served population of 284,100 in 2010. The entire service area is covered by conventional separate sewer system.

The overall plan proposed for Sanur covers the net sewerage service area of 726 ha and serves the population of 27,800 in 2010. The entire service area is covered by conventional separate sewer system.

The collected wastewater of Denpasar and Sanur areas are transferred to the common treatment plant by a conveyance sewer of 4.4 km and a force main with booster pump of 5.2 km respectively.

The main features of the proposed overall sewerage plans for Denpasar and Sanur areas are shown in Table 3. The proposed overall main sewer networks for Denpasar and Sanur areas are shown in Fig. 3.

###### (ii) Urgent Plan

The urgent sewer networks of Denpasar and Sanur areas, targeting the year 2000 were selected from the respective overall sewer networks.

The urgent plan of Denpasar covers the most developed central area of Denpasar with a high population density where the highest cost effectiveness of sewerage development is expected. The planned service area and served population in 2000 are 1,030.8 ha and 117,864 respectively. The proposed urgent plan, however, covers the service area combined with the conventional separate sewer system covering 714.6 ha and interceptor collection system covering 316.2 ha to minimize the project cost and to facilitate the project implementation.

The urgent plan of Sanur covers the Sanur beach area of 331.8 ha in view of the importance of ensuring its continued tourism potential. The planned served population is 11,513 in 2000. The entire urgent service area is covered by conventional separate sewer system.

The collected wastewater of the urgent plan are transferred to the treatment plant in the same way as the overall plan.

The main features of the proposed sewerage urgent plans for Denpasar and Sanur areas are shown in Table 3. The proposed urgent main sewer networks of Denpasar and Sanur areas are shown in Fig. 3.

## (2) Treatment Plant

The proposed treatment plant of aerated lagoon system is located at Suring Swamp Area along Bonoa Bay.

The treatment plant is planned to treat only the wastewater of Denpasar and Sanur areas until 2000, thereafter it is expected to treat the wastewater of Kuta area as well. Required capacity of the treatment plant in the year 2000 and 2010 are 44,000 m<sup>3</sup>/day and 117,000 m<sup>3</sup>/day respectively.

The urgent plan of the treatment plant targeting the year 2000 consists of inflow pump station of capacity of 70 m<sup>3</sup>/min., aerated lagoon with 450 kW of aerator, facultative aerated lagoon with 132 kW of aerator, polishing pond, sludge drying bed and other facilities. The required land space of the urgent plan is 9.2 ha.

(3) Estimated Cost and Implementation Programme

Project cost of the urgent sewerage development is estimated to be Rp.82,400 million at 1992 price. Annual O&M cost of the urgent project is estimated at Rp.1,194 million/year at 1992 price. Break down of the project cost and O&M cost of the proposed sewerage urgent plan are shown in Table 4.

3.2 Economic Social and Environmental Evaluation

(1) Water Pollution Abatement

The proposed urgent project will control the future river water pollution of the most developed central and southern Denpasar areas to a large extent. The control effects are shown below.

	(Unit : BOD <sub>5</sub> mg/l)	
	Range	Average
Existing (1990)	22.9 - 51.8	32.2
Future without Project (2000)	35.1 - 80.3	52.7
Future with Project (2000)	15.3 - 30.8	23.0

The urgent project will reduce the pollution load to the sea from the Study Area under the existing, future without project in 2000 and future with urgent project are shown below.

	Pollution Load (BOD <sub>5</sub> , ton/day)
Existing (1990)	10.8
Future (2000) without Project	17.2
Future (2000) with Urgent Project	11.6

As the consequence, the sea water quality of the Project Area in 2000 will be maintained around the existing level. The existing and future polluted areas exceeding 5 mg/l in COD<sub>Cr</sub> are compared as follows.

	Polluted Sea Area (km <sup>2</sup> )
Existing (1990)	28.3
Future without Project (2000)	35.3
Future with Project (2000)	31.1

(2) Reduction of Water-borne Disease

The annual number of water-borne disease contraction and the related economic costs in the urgent project area are estimated to be 7,387 cases and Rp.1,032 million respectively in 2000.

The urgent project will greatly contribute to the reduction of these water-borne diseases and related economic costs.

(3) Increase of Tourism Income

The tourism income of the sewerage development areas of Denpasar and Sanur is expected to increase from Rp.40,388 million in 1990 to Rp.94,986 million in 2000 and Rp.161,250 million in 2010 if wastewater disposal and the other all related infrastructures are well developed in future.

However, it is forecast that the future tourism incomes will much decrease from the above estimated ones, if the sea and river environments get worse in future than present.

Tourism benefits to be produced by the sewerage development project of Denpasar and Sanur areas are estimated to be Rp.10,788 million in 2000 and Rp.36,628 million in 2010.

(4) Economic Evaluation

Economic efficiency of the sewerage development project of Denpasar and Sanur areas is evaluated as follows.

Net Present Value (NPV)	: Rp.42,321 million
Benefit Cost Ratio (B/C)	: 1.40
Economic Internal Rate of Return (EIRR)	: 14.1%

#### (5) Environmental Assessment

The anticipated environmental impacts due to the project activities are mostly beneficial as the Project in itself is an environmental improvement project. No significant long term adverse environmental effects by the Project are identified since the treatment plant is located far from residential areas and expected to be surrounded by mangrove forestation in future.

### 3.3 Financial and Institutional Aspects

#### (1) People's Willingness to Pay

The total amount of annual willingness to pay in the urgent sewerage service area is estimated to be Rp.1,314 million in 2000 at 1992 price. In 2010, the sewerage services are expected to cover the entire sewerage development area of Denpasar and Sanur. As a result, the total annual willingness to pay will reach Rp.3,582 million in 2010.

These annual willingness to pay are more than the required annual O&M costs of Rp.1,194 million in 2000 and Rp.2,670 million in 2010 respectively.

#### (2) Affordability and Contribution of Tourism Industry

The Project is primarily economically motivated, although it has an important social role by improving public health. Therefore, the major part of project costs will be borne by beneficiaries themselves. And the balance will be borne by the government.

Hotels are the prime beneficiary of the clean, clear and beautiful sea which will be kept that way by the Project. Accordingly, hotels in the sewerage service area will bear the initial investment cost that are to be duly expected of them. The construction costs of household package treatment plant are considered as the upper limit that hotels can bear.

The sewerage development project in Denpasar and Sanur areas will have beneficial effects on tourism industry more or less over the entire master plan study area. Therefore, a substantial part of the

remaining initial investment costs will be borne by the tourism industry sector, represented by hotels and restaurants.

(3) Proposed Sewerage Charge

(i) Sewerage Service Charge

Sewerage service charge is levied on all the beneficiaries having direct connection to the sewers. The proposed monthly charge is summarized below.

Households	: Rp.22/m <sup>2</sup>
Hotels	: Rp.125/m <sup>2</sup> for classified hotels Rp.50/m <sup>2</sup> for other hotels
Restaurants	: Rp.50/m <sup>2</sup>
Shops	: Rp.70/m <sup>2</sup> for large shops Rp.30/m <sup>2</sup> for other shops
Offices	: Rp.30/m <sup>2</sup> - Rp.50/m <sup>2</sup>

A household will pay 0.935% of average monthly income.

The present value of the cumulative sewerage service charge accounts for 140.5% of that of the cumulative O&M costs.

(ii) Capital Works Charge

Capital works charge will be applied to all the existing and future hotels located within the sewerage service areas. The proposed capital works charge is Rp.1.97 million/room for classified hotels and Rp.1.41 million/room for non classified hotels/other accommodations.

The contribution of the capital works charge to the initial investment costs of the Project is estimated at 5.8%.

(iii) Tourism Tax

Hotels and restaurants in the master plan study area are subjected to the tourism tax of 2% at present. Out of 2%, 0.7% will be appropriated for the recovery of the initial investment costs of

the sewerage development project along with the above capital works charge.

This tourism tax will be collected by the government and later will be transferred to the sewerage organization as subsidy.

The contribution of the tourism tax to the initial investment costs of the Project is estimated to be 55.4%.

#### (4) Financial Analysis

It is proposed that :

- (i) The central/local governments will grant 35% of the initial investment costs and further the central government will extend a loan for the remaining 65% of the initial investment costs.
- (ii) The entire replacement cost will be self-financed by the sewerage organization.
- (iii) The entire O&M cost will be recovered by sewerage service charge.
- (iv) The initial investment costs borrowed from the central government will be recovered by capital works charge and tourism tax.

For the above financial conditions, the financial internal rate of return (FIRR) of the Project is estimated at 5.5% which is considered as sufficient and reasonable.

#### (5) Sewerage Organization

It is recommended to set up a new department for wastewater management in the existing PDAM rather than establishing an independent organization.



#### 3.4 Recommendations

- (1) An immediate implementation of the Project is necessary for both development of the tourism industry and improvement of the overall sanitary environments of the Project Area.

Hence, it is recommended to commence the necessary financial procurement at the earliest.

- (2) Monitoring system of the water quality of rivers, coastal sea and groundwater shall be developed for better environmental management of the Project Area.

For this purpose, a laboratory with sufficient experimental equipment shall be immediately established.

Table 1 Main Features of Sewerage Master Plan

Item	Denpasar	Kuta	Sanur	Tanjung Bena	Total
Service Area (ha)	2,683	648	740	136	4,207
Served Population in 2010	284,100	21,580	27,800	1,540	335,020
Wastewater Generation (m <sup>3</sup> /day)	75,300	18,400	16,800	4,220	114,720
Secondary & Tertiary (km)	413.4	65.7	97.2	3.1	584.4
Main (km)	50.9	12.5	10.9	3.4	77.7
Conveyance Sewer (km)	4.4	1.2	-	-	5.6
Force Main (km)	-	5.2	5.2	-	10.4
Sub-total	473.7	84.6	113.3	6.5	678.1
Lift/Booster Pump (place)	2	4	4	1	11
Treatment Plant		1		1	2

Table 2 Project Cost and O&M Cost of Sewerage Master Plan

	Denpasar	Kuta	Sanur	Tanjung Bena	Total
<b>Project Cost (million Rp.)</b>					
Direct Const. Cost	129,335	41,640	33,199	7,135	211,309
Collection Sewer	113,794	33,673	23,078	3,957	174,502
Force Main	-	4,965	6,644	-	11,609
Treatment Plant	15,541	3,002	3,477	3,178	25,198
Administration Cost	2,869	554	642	161	4,226
Engineering Cost	11,477	2,218	2,567	643	16,905
Physical Contingency	14,366	2,776	3,214	804	21,160
<b>Total</b>	<b>158,047</b>	<b>47,188</b>	<b>39,622</b>	<b>8,743</b>	<b>253,600</b>
<b>O&amp;M Cost (million Rp./yr.)</b>	<b>1,581</b>	<b>424</b>	<b>537</b>	<b>128</b>	<b>2,670</b>

Note: The construction cost and O&M cost of the integrated treatment plant are allocated for Denpasar, Kuta and Sanur in proportion to the wastewater generation of each area.

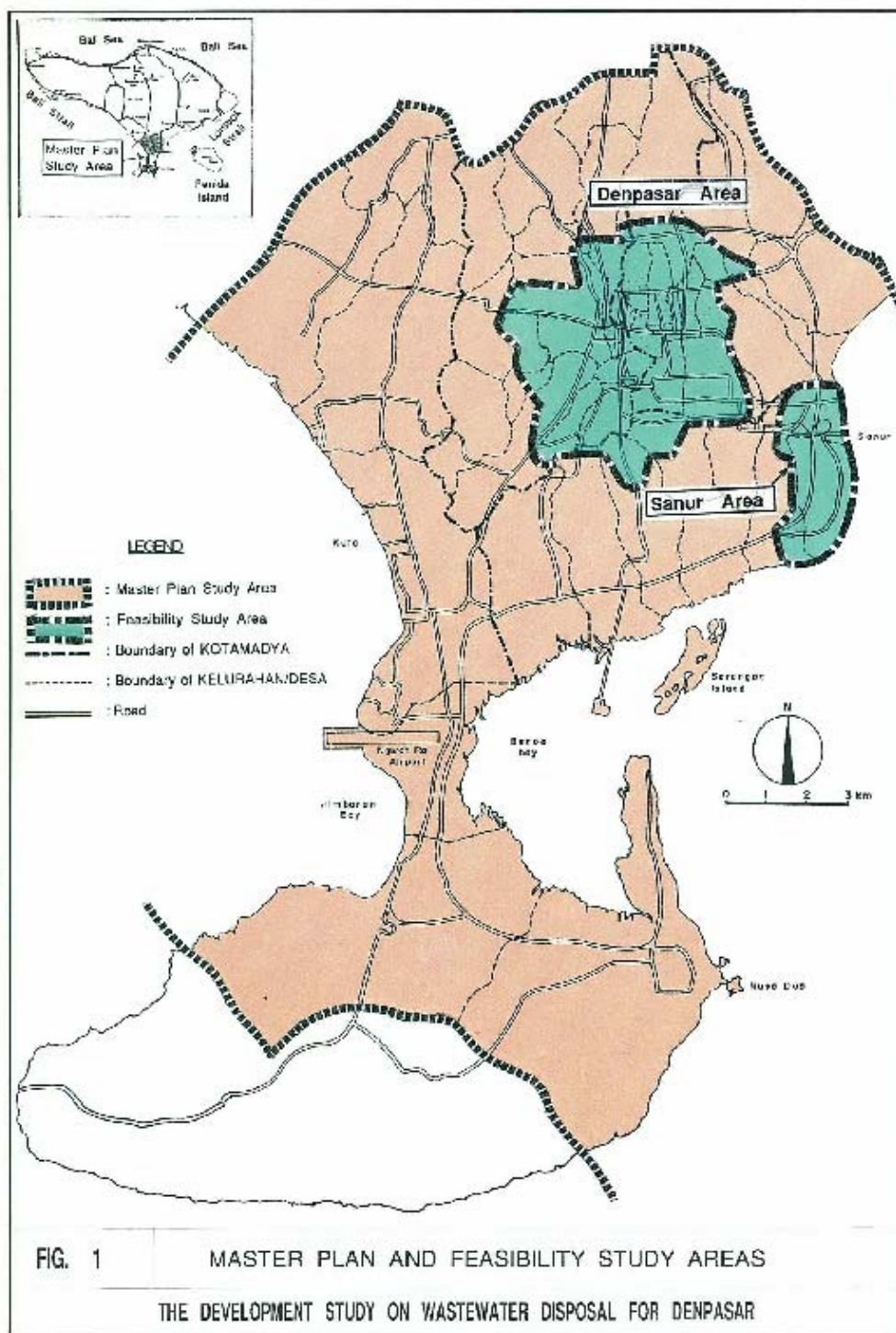
Table 3 Main Features of Sewerage Overall and Urgent Plans

Item	Denpasar		Sanur		Total	
	Overall	Urgent	Overall	Urgent	Overall	Urgent
Service Area (ha)	2,663	2,030.8	726	531.8	3,389	1,562.6
Served Population	284,100	117,864	27,800	11,513	311,900	129,377
Secondary & Tertiary Sewer (km)	418.4	126.02	97.22	32.72	515.62	158.74
Main Sewer (km)	48.75	15.14	10.94	4.31	59.69	19.45
Conveyance Sewer (km)	4.39	4.39	-	-	4.39	4.39
Force Main (km)	1.07	-	5.16	5.16	6.23	5.16
Total (km)	472.61	145.55	113.32	42.19	585.93	187.74
Lift/Booster Pump (piece)	3	-	4	3	6	3
(m <sup>3</sup> /min.)	54.0	-	43.38	23.17	97.28	23.17
Treatment Plant (m <sup>3</sup> /day)	-	-	-	-	117,000*	44,000

Note: \* Including wastewater of Kuta area

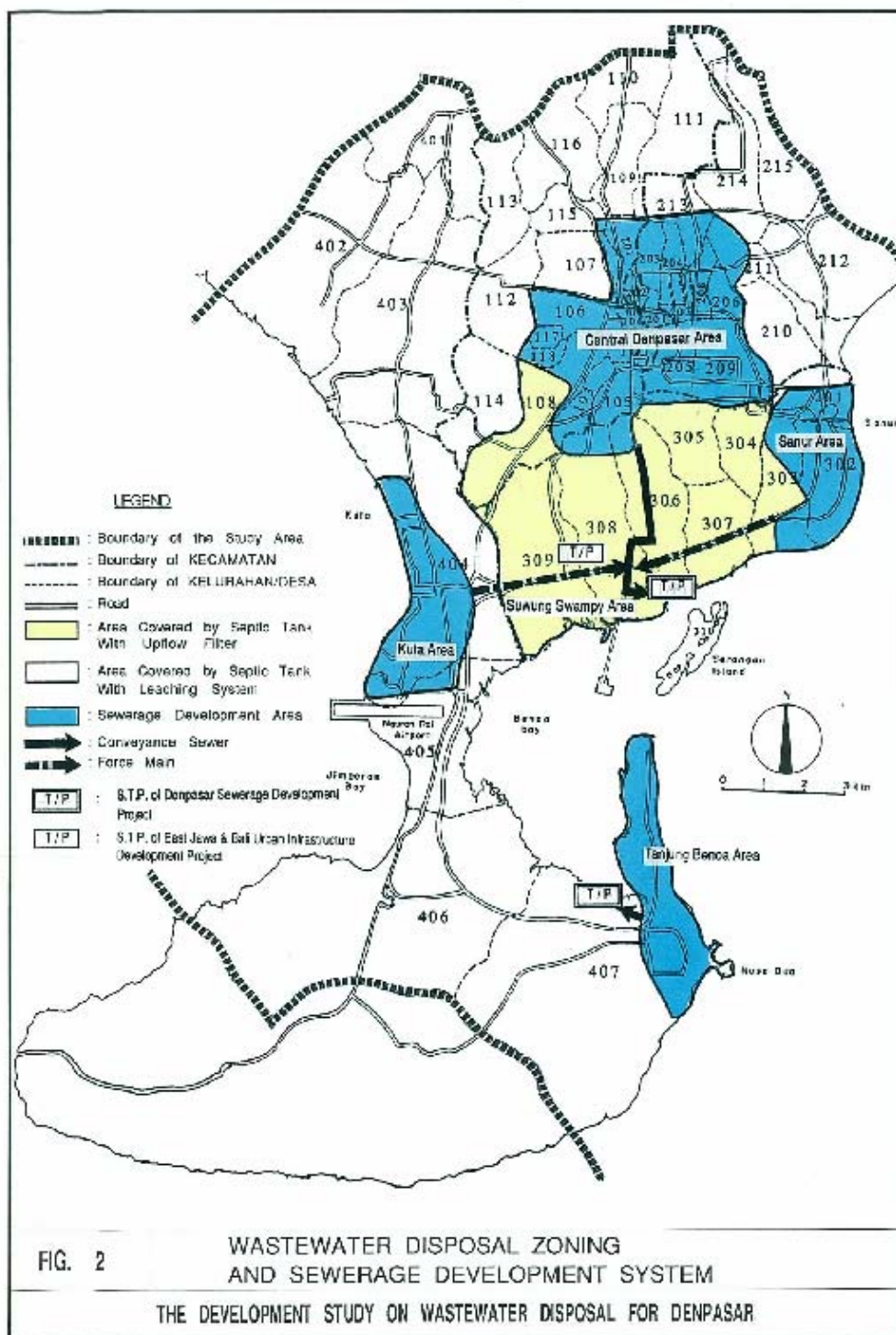
Table 4 Project Cost and O&M Cost of Sewerage Urgent Plan

	(1992 price)		
	Denpasar	Sanur	Total
<b>Project Cost (million Rp.)</b>			
<b>Direct Const. Cost</b>			66,000
Collection System	42,634	11,166	53,800
Secondary & Tertiary Sewer	16,933	3,657	20,590
Main Sewer	14,143	4,222	18,365
Conveyance Sewer	11,558	-	11,558
Force Main	-	1,992	1,992
Lift/Booster Pump	-	1,295	1,295
Treatment Plant			12,200
Land Acquisition			500
Administration Cost			1,320
Engineering Cost			7,970
Physical Contingency			6,660
<b>Total</b>			82,400
<b>O&amp;M Cost (million Rp./year)</b>			
Collection System			160
Treatment Plant			849
Overhead			185
<b>Total</b>			1,194



S - 17

JICA A.D 1998



S - 18

JICA A.D.1992





## **APPENDIX 5.11.1**

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### **BUISINESS STRATEGIC PLAN IN 2010 - 2014 OF DSDP-BLUPAL**





**BUSINESS STRATEGIC PLAN**  
**DENPASAR SEWERAGE DEVELOPMENT**  
**PROJECT -AGENCY OF PUBLIC SERVICE**  
**FOR WASTE WATER**  
**2010 -2014**



**AGENCY OF PUBLIC SERVICE FOR WASTE WATER**

**JUNE 2009**

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### ENCLOSURE

# I. INTRODUCTION

## 1.1 Background of Denpasar sewerage Development Project (DSDP)

The environment quality improvement in Bali is very important to do in order to the prosperity of Denpasar city and its surrounding is getting better, in addition to that is meant to keep Bali reputation, considering that Bali is the gate of international tourism. Tourism development in Bali makes the population growth is growing fast which makes apprehension about the bad impact to cleanliness and environmental health, therefore the central government with local government of Bali, Denpasar city, and Regency of Badung make follow up by building the system of waste water processing, initiated by the implementation of Master Plan and Feasibility Study by JICA (Japan International Cooperation Agency) in 1992-1993, which was then issued the Loan Assistance Fund of IP-431 from Japanese government (JBIC: Japan bank for International Cooperation) effective on 15 December 1994, with the loan limitation up to 2008. The implementation of survey, investigation, and creating the Plan Program and Design had started since 1994, and the activity of physical development which covers the constructing of pipes network, installation of sewerage processing (IPAL) and the booster pump just began in 2004, today the Denpasar sewerage Development Project for the stage I had finished in 2008, then it would continued with the implementation of DSDP stage II which is planned in 2009-2014 to develop facility and infrastructure of waste water processing.

## 1.2. Agency of Public Service for Waste Water Management (BPUPAL)

To be able in managing the result of development of DSDP, the government of Bali province cooperates with the local government of Badung and Denpasar city, agree to join in managing of the development result as the agreement noted in “Joint Regulation of Bali Governor, regent of Badung and Mayor of Denpasar” on 7 December 2006 (No. 37A year 2006, no 1 year 2006, No.36A year 2006) regarding “Joint Processing of sewerage System. And for its institution truth Decree of Bali Governor No. 404/04-F/HK/2007 regarding The Deciding of Steering Committee for Agency of Public Service for Waste Water Management (BLUPAL) has decided the steering committee of Agency of Public Service for Waste Water Management (BLUPAL) as the work unit of SKPD of Agency of Public Work in processing waste water.

## ORGANIZATION CHART OF AGENCY OF PUBLIC SERVICE FOR WASTE WATER MANAGEMENT

According to JOINT REGULATION of Governor of Bali, Regent of Badung and Major

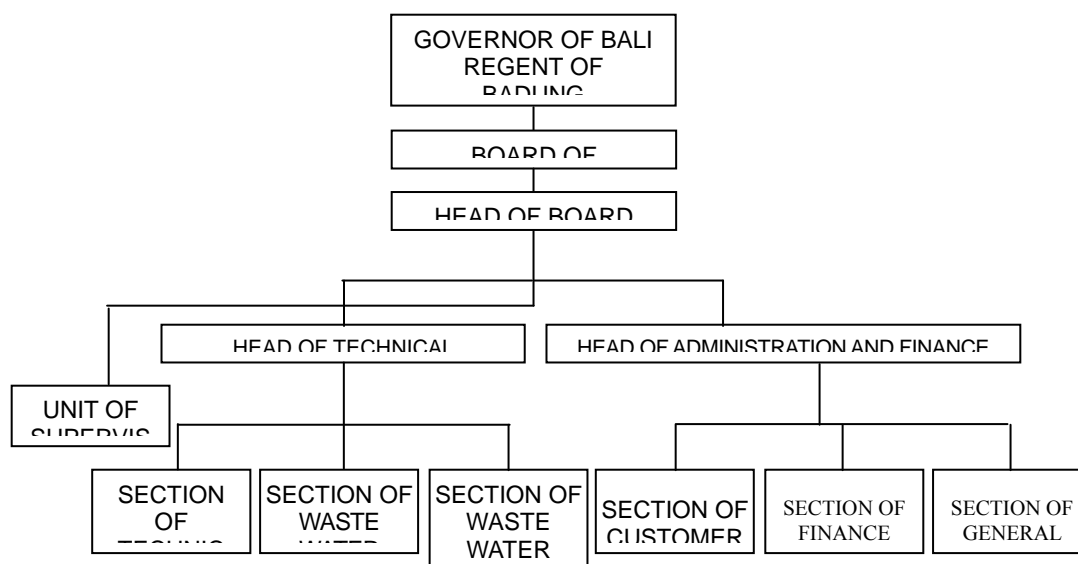
DATE 7 December 2006

NUMBER 37 A year 2006

NUMBER 1 Year 2006

NUMBER 36A Year 2006

### JOINT MANAGEMENT OF SEWERAGE SYSTEM ORGANIZATION CHART OF AGENCY OF PUBLIC SERVICE FOR WASTE WATER MANAGEMENT



Legal Basis which had issued by the government to support the existence of BLUPAL so that become the basis for BLUPAL in running its duty and function as the institution of waste water management are:

1. Acts No.1 year 2004  
Regarding the State Treasury
2. Regulation of Government No. 23 year 2005  
Regarding the Finance Management of Public Service Agency
3. Regulation of Ministry of Home Affairs No.61 year 2007  
Regarding the Technical Guideline for Finance Management of Local Public Service Agency

4. Joint Decree of Governor of Bali, Regent of Badung, and Major of Denpasar  
No.10 year 2002  
No.640 year 2002  
No. 276 year 2002  
Regarding the Implementation of Joint Management of sewerage System
5. Joint Regulations of Governor of Bali, Regent of Badung, and Major of Denpasar  
No. 37A year 2006  
No.1 Year 2006  
No.36A Year 2006  
Regarding the Joint Management of sewerage System
6. Decree of Governor of Bali No. 404/04-F/HK/2007  
Regarding the Implementer Decision of agency of Public Service of Waste Water Management (BLUPAL)

### **1.3 Main Duty, Function, Vision and Mission**

#### **Main Duty**

To implement sewerage system in order, smooth and continuing

#### **Function**

1. To make plan and work program for short, medium and long periods in order to develop sewerage system and waste water management
2. To make and apply the program of survey, data collection, analysis, and to make technical guideline for sewerage service and system of waste water processing
3. To operate and maintain the system of sewerage system and installation of processing that has built so that it can produce the waste which requires the quality standard
4. To serve the application of sewerage in its service area
5. To supervise and control the quality of customer waste water that will be processed so that it can meet the requirement of installation settled
6. To give socialization to public about the local government plans in the development of sewerage system and its processing
7. To organize the tariff collection for waste water service and other eligible incomes according to the effective regulation
8. To organize work relationship with various parties to achieve the objective as decided.

### **Vision and Mission of BLUPAL of BALI:**

In order to make Bali as a clean, healthy, and comfortable cultural tourism region then it needs to be concerned not only by Bali people but also the local government, one of them by processing the waste water becomes the clean water which today has been done by Denpasar sewerage System Development Project and managed by the Agency of Public Service for Waste Water Management (BLUPAL) of Bali.

#### **❖ Vision of BLUPAL OF BALI:**

To develop the Integrated Waste Water Management, to create Bali as the a clean, healthy, and comfortable cultural tourism region to Bali Dwipa Jaya (Bali Prosperous)

#### **❖ Mission of BLUPAL OF BALI:**

1. To improve the awareness, willingness, and ability of the people to have clean, and healthy attitudes, thru the improvement of environment sanitation
2. To improve the service access of waste water thru the system On site or Off site in urban area
3. To implement the optimization of waste water management system for the people benefit, as the technology capability and human resources
4. To implement the institution as the unity characteristic of program of central government, local government, and stake holder, according to the application of Finance Management Pattern of Public Service Agency (PPK-BLU)



## II. IMPLEMENTATION STAGES STRATEGY OF DSDP

### 2.1. SERVICE AREA

#### SERVICE AREA OF DSDP



		Feasible Study	Analysis on Environmental Impact	Design of Engineering Details	Notice
Stage I	<input checked="" type="checkbox"/> Area that has been worked (urgent area in M/P JICA)	√	√	√	Finished in September 2008
Stage II	<input type="checkbox"/> Urgent area in M/P JICA A-45 ha	√	√	√	Analysis on environmental impact has finished
	<input type="checkbox"/> Area selected (stage II area in M/P JICA), A=265 ha	√	√	√	Analysis on environmental impact has finished
Stage III	<input type="checkbox"/> Future Development Area (Stage II Area in M/P JICA)A= 2295 ha	√	-	-	It needs more Installation of Waste Water Processing (IPAL) and Pump Booster Station

Based on the wide of priority area, it is planned the development implementation stages of DSDP-Into 3 stages:

- Stage I : 2004 up to 2008
- Stage II : 2010 up to 2014
- Stage III : 2014 -2035

## 2.2 DENPASAR SEWERAGE DEVELOPMENT PROJECT (DSDP) STAGE II

The implementation of Denpasar sewerage Development Project (DSDP) stage I began in 2004 until 2008 which consists of 7 packages of contract which cover two packages of ICB financed by Loan JBIC IP-431, three packages financed by the State Budget Income and two packages financed by the Local Budget Income of City/Regency. The contract packages cover the construction of Installation of waste Water Processing (IPAL) Pump House, sewerage system, Wet Pit and house connection. The fund details consist of:

- Loan of OECF/JBIC IP-431 (central government) : 5400 million JPY
- Central government (the State Budget Income) : Rp 66.4 billion
- Government of Bali province (the local budget income) : land Of 10 ha for IPAL
- Government of Badung regency (the local budget income) : Rp 6.6 billion
- Government of Denpasar City (the local budget income) : Rp 15.3 billion

### ❖ Service Area Target of DSDP on Stage I

Service area in DSDP-Is in two administration regions they are Denpasar City and Badung Regency, where for DSDP of stage I covers Denpasar city, Sanur and Legian -semyak that is planned to serve about 10,000 house connections.



**Table. Service Area Target of DSDP on stage I**

NO	DESCRIPTION	DENPASAR	SANUR	KUTA	TOTAL
1	Service Area (ha)	520	330	295	1145
2	Served Population (persons)	73,700	16,500	13,000	103,200
3	Total pipes length (km)	68,0	32,4	21,7	122,1
	Ø 200 mm - Ø 250 (Km)	44,7	19,2	16,9	80,8
	Ø 300 mm - Ø 1200 mm (km)	16,2	19,3	19,4	54,9
	Ø 1000 mm - Ø 1200 mm (km)	16,6	-	10,8	27,4
4	Force main	10,5	13,9	14,6	39
5	House connection	5,350	1,890	1,860	9100

❖ **The Implementation achievement of DSDP on stage I till December 2008**

Total the house connections that can be applied on DSDP of stage I decreasing against the early target, it is caused by the obstacles occurred in practice.

The pump house:

- o Sanur : capacity of 12.4 m<sup>3</sup>/min (3 units of pump/1 reserve)
- o Kuta : capacity of 23.8 m<sup>3</sup>/min (3 units of pump/1 reserve)

**2.3 DENPASAR SEWERAGE DEVELOPMENT PROJECT (DSDP) of STAGE II**

DSDP Stage II is also the cooperation between Indonesian government and Japanese Government which is loaned by JBIC IP-550 with contract package consists of 5 packages, the fund details consist of:

- Loan JBIC IP-550 (central government) : 6.004 million JPY
- Government of Bali Province (the local budget income) : Rp 35.07 billion
- Government of Bandung Province (the local budget income) : Rp 39.84 billion
- Government of Denpasar City (the local budget income) : Rp 30.04 billion

Today the process of international bidding for DSDP on stage II for consultant procurement is being done, while the process of international bidding for physical work of DSDP on stage II will start in January-November 2009 and the physical implementation of DSDP on stage II is expected to start in 2011-2013, the target of total house connections in DSDP-II that is 7200 house connections consists of:

**Table. Plan of Total House Connections of DSDP on stage II**

No	Service Area	Total House Connections
1	Denpasar	3800
2	Sanur	900
3	Kuta	2500
<b>Total</b>		<b>7200</b>

In implementation of DSDP on stage II is expected that the achievement strategy of total house connections is 25% each year for 4 years begins in 2011 till 2014 so that the total house connections of DSDP-I and DSDP-II are as follows:

**Table. Achievement strategy of total house connections of DSDP on stage II**

IMPLEMENTATION STAGE	TOTAL HOUSE CONNECTIONS
DSDP of Stage I	8,674
DSDP of Stage II	7,200
<b>Total House Connections</b>	<b>15,874</b>

**Table. Achievement of total house connections for the implementation of DSDP on stage I**

No	Name of Project Package	Total House Connections
1	Package LCB-1 (the State Budget Income 2007)	2,779
2	Package LCB-2 (the State Budget Income 2007)	1,140
3	Package LCB-3 ( the State Budget Income 2007)	160
4	Package LCB-4 ( the Local Budget Income 2007)	1,300
5	Package LCB-5 ( the Local Budget Income 2007)	1,200
6	Package of Local Budget Income of Bali Province 2007	152
7	Package LCB -6 (the State Budget Income 2008)	800
8	Package LCB -4 (the State Budget Income 2008)	1,116
	<b>TOTAL</b>	<b>8,647</b>

### **System of Waste Water Processing**

The System of Waste Water Processing of DSDP-Is the off-site system where the processing finally concentrates on the Installation of Water Processing (IPAL) located in Suwung, village of Pemogan, Denpasar City with details as follows:

- o Location : Suwung, Village of Pemogan, Denpasar
- o width of area : 10 ha and the used/built is 5.5 ha
- o capacity : 51,000 m<sup>3</sup>/day and already served is 48, 600 m<sup>3</sup>/day
- o quality of effluent : BOD<30 mg/l; SS<40 mg/l

Buildings:

- o Inflow Pumping System
- o Building/Electrical Room
- o Office and Laboratory

### **System of Collection and Distribution**

Pipes network:

- o Main Pipe: Ø 300 mm - Ø 1200mm (pipe RC, L=41,653 m)
- o Secondary Pipe/Tertiary: Ø 200mm - Ø 250mm (pipe RC, L=70,693 m)
- o Lateral Pipe: Ø 150 mm (pipe PVC)
- o Pipe force main: Ø 500 mm - Ø 600mm (steel pipe, L=8495)
- o WET PIT with submersible pump (7 locations)



## 2.4. STRATEGY OF PHYSICAL IMPLEMENTATION TARGET FOR DSDP

### NUMBER PROGRAM OF HOUSE CONNECTIONS

#### DSPD of I

No	CATEGORY	TOTAL SR	ROOMS
A	PIPING		
1	Social	366	
2	Household Type A	1945	
3	Household Type B	1944	
4	Household Type C	942	
5	Institution	708	
6	Star Hotel per room	38	5,045
7	Non star hotel per room	112	2,676
8	Inn	48	
9	Resturant-small	24	
10	Resturant -medium	75	
11	Resturant-Large	75	
12	Commercial-Small	1091	
13	Commercial-medium	858	
14	Commercial-Large	520	
15	Public facility	361	
16	Industry	22	
B	NON-PIPING		
1	Cleaning Septi tank	0	
2	Service Truck for feces	0	
<b>TOTAL</b>		<b>9,129</b>	

### REALISATION FOR NUMBER OF HOUSE CONECTION FOR

No	CATEGORY	TOTAL SR
1	PACKAGE OF LCB-1 OF LCB-1	2,779
2	PACKAGE OF LCB-2 OF LCB-1	1,140
3	PACKAGE OF LCB-3 OF LCB-1	160
4	PACKAGE OF LCB-4 OF LCB-1	1,300
5	PACKAGE OF Local Budget Income OF LCB-1	1,200
6	PACKAGE from Bali Province	152
7	PACKAGE LCB 6 ((State of Budget Income 2008	800
8	PACKAGE LCB-4 <sup>th</sup> (State of Budget Income)	1,116
<b>TOTAL</b>		<b>8,647</b>

### PLAN FOR NUMBER OF HOUSE CONNECTION OF DSDP ON STAGE II

No	CATEGORY	TOTAL SR
1	Denpasar	3,800
2	Sanur	900
3	Kuta	2,500
<b>TOTAL</b>		<b>1,800</b>

### NUMBER PER CATEGORY OF CUSTOMER 2010

No	CATEGORY	TOTAL SR	ROOMS
A	PIPING		
1	Social	32	
2	Household Type A	4,357	
3	Household Type B	3,446	
4	Household Type C	628	
5	Institution	40	
6	Star Hotel per room	-	-
7	Non star hotel per room	4	121
8	Inn	-	
9	Resturant-small	28	
10	Resturant -medium	-	
11	Resturant-Large	-	
12	Commercial-Small	112	
13	Commercial-medium	-	
14	Commercial-Large	-	
15	Public facility	-	
16	Industry	-	
B	NON-PIPING	-	
1	Cleaning Septi tank	-	
2	Service Truck for wastewater	-	
<b>TOTAL</b>		<b>8,647</b>	

### NUMBER PER CATEGORY OF CUSTOMER 2011

No	CATEGORY	TOTAL SR	ROOMS
A	PIPING		
1	Social	150	
2	Household Type A	4,383	
3	Household Type B	3,472	
4	Household Type C	814	
5	Institution	289	
6	Star Hotel per room	16	1,261
7	Non star hotel per room	46	815
8	Inn	20	
9	Resturant-small	32	
10	Resturant -medium	31	
11	Resturant-Large	31	
12	Commercial-Small	446	
13	Commercial-medium	350	
14	Commercial-Large	212	
15	Public facility	147	
16	Industry	9	
B	NON-PIPING	-	
1	Cleaning Septi tank	-	
2	Service Truck for wastewater	-	
<b>TOTAL</b>			<b>10,447</b>

**NUMBER PER CATEGORY OF CUSTOMER 2012  
CUSTOMER 2013**

No	CATEGORY	TOTAL SR	ROOMS
A	PIPING		
1	Social	222	
2	Household Type A	4,767	
3	Household Type B	3,856	
4	Household Type C	1,000	
5	Institution	429	
6	Star Hotel per room	23	2,523
7	Non star hotel per room	68	1,484
8	Inn	29	
9	Resturant-small	37	
10	Resturant -medium	45	
11	Resturant-Large	45	
12	Commercial-Small	661	
13	Commercial-medium	520	
14	Commercial-Large	315	
15	Public facility	219	
16	Industry	13	
B	NON-PIPING	-	
1	Cleaning Septi tank	-	
2	Service Truck for wastewater	-	
	<b>TOTAL</b>	<b>12,247</b>	

**NUMBER PER CATEGORY OF**

No	CATEGORY	TOTAL SR	ROOMS
A	PIPING		
1	Social	294	
2	Household Type A	5,150	
3	Household Type B	4,239	
4	Household Type C	1,185	
5	Institution	568	
6	Star Hotel per room	31	3,784
7	Non star hotel per room	90	2,153
8	Inn	39	
9	Resturant-small	41	
10	Resturant -medium	60	
11	Resturant-Large	60	
12	Commercial-Small	876	
13	Commercial-medium	689	
14	Commercial-Large	417	
15	Public facility	290	
16	Industry	18	
B	NON-PIPING	-	
1	Cleaning Septi tank	-	
2	Service Truck for wastewater	-	
	<b>TOTAL</b>		<b>14,047</b>

**NUMBER PER CATEGORY OF CUSTOMER 2014**

No	CATEGORY	TOTAL SR	ROOMS
A	PIPING		
1	Social	366	
2	Household Type A	5,534	
3	Household Type B	4,622	
4	Household Type C	1,371	
5	Institution	708	
6	Star Hotel per room	38	
7	Non star hotel per room	112	
8	Inn	48	
9	Resturant-small	46	
10	Resturant -medium	75	
11	Resturant-Large	75	
12	Commercial-Small	1,091	
13	Commercial-medium	858	
14	Commercial-Large	520	
15	Public facility	361	
16	Industry	22	
B	NON-PIPING		
1	Cleaning Septi tank	-	
2	Service Truck for wastewater	-	
	<b>TOTAL</b>	<b>15,847</b>	

## **2.5. ACTIVITY PROGRAM OF O & M FOR WASTE WATER FACILITY AND INFRASTRUCTURE OF DSDP-BLUPAL**

In management of facility and infrastructure of waste water referring to Main Duty of BLUPAL as the facilitator of waste water facility an infrastructure that covers such as:

- ❖ To operate and maintain the system of sewerage and processing installation that have been built so they can produce waste which requires the quality standard
- ❖ To monitor and control the waste water quality of customers that will be processed in order to meet the settled installation requirements
- ❖ To socialize the local government plans in the development of sewerage system and its processing
- ❖ To organize the collection of service tariff for waste water and other eligible incomes according to the effective regulation.

As the support for implementation activity of this operational and maintenance, it is prepared a strategy based on financial projection which has been analyzed by the Team of SAPI (Special Assistance for Project Implementation) in 2007, based on the analysis above for the first 5 years counted since 2010 it still needs subsidy from the central and local government to support the expenses of operational and maintenance so that can achieve the maximum service and the service to all stakeholders that have been reached by the system. Fund allocation need for this as written on the table and enclosed program.

**TABLE. RECAPITULATION OF SUPPORTING ACTIVITY AND THE SUPPORT OF O & M FOR WASTE WATER  
INFRASTRUCTURE OF DSDP**

BUDGET ALLOCATION	FUND ALLOCATION/ YEAR							NUMBER	NOTICE
	2008	2009	2010	2011	2012	2013	2014		
Central	2,974,000	11,213,596	7,092,787	4,794,278	3,334,001	3,165,081	1,893,353	<b>34,615,606</b>	
Province	967,000	1,619,804	3,045,385	2,895,385	1,938,371	1,602,828	958,813	13,027,586	
Regency of Badung	-	800,000	702,487	702,487	875,762	594,057	355,365	4,030,158	
City of Denpasar	-	774,000	1,714,341	1,414,341	1,509,867	1,196,034	715,469	7,324,081	
Service -Tariff	-	-	-	-	-	-	-	-	
<b>TOTAL</b>	<b>3,941,000</b>	<b>14,407,400</b>	<b>12,555,000</b>	<b>9,955,000</b>	<b>7,658,000</b>	<b>6,558,000</b>	<b>3,923,000</b>	<b>58,997,400</b>	

**TABLE. RECAPITULATION OF SUPPORTING ACTIVITY AND THE SUPPORT OF O & M FOR WASTE WATER  
INFRASTRUCTURE OF DSDP 2010 -2014**

BUDGET ALLOCATION	FUND ALLOCATION/YEAR					NUMBER	NOTICE
	2010	2011	2012	2013	2014		
Central	7,092,787	4,942,787	3,334,001	3,165,081	1,893,353	34,615,606	
Province	3,045,385	2,895,385	1,938,371	1,602,828	958,813	13,027,586	
Regency of Badung	702,487	702,487	875,762	594,057	355,365	4,030,158	
City of Denpasar	1,714,341	1,414,341	1,509,867	1,196,034	715,469	7,324,051	
Service -Tariff	-	-	-	-	-	-	
<b>TOTAL</b>	<b>12,555,000</b>	<b>9,955,000</b>	<b>7,658,000</b>	<b>6,558,000</b>	<b>3,923,000</b>	<b>58,997,400</b>	



### **III. FINANCIAL ANALYSIS OF AGENCY OF PUBLIC SERVICE OF WASTE WATER MANAGEMENT (2010-2014)**

Agency of Public Service of Waste Water Management (BLUPAL) of Bali should be able to support its operational needs from the income comes from service tariff and other services. Based on the analysis of Team of Special Assistance for Project Implementation (SAPI) for Denpasar sewerage Development Project (DSDP) which was noted in the Final Report for October 2007 already designed the service tariff of waste water and Financial Projection of BLUPAL of Bali. In the Financial projection of BLUPAL there are expenses needed to consider such as early expenses, expenses of O & M and substitute expenses detailed as follows:

#### **3.1 Early Expenses**

Early expenses which are counted in this analysis is the result of surplus from the previous year income after spent to cover the expenses of O & M.

#### **3.2. The Income of BLUPAL**

The income of BLUPAL will be allocated its use to cover the expenses of O & M and the substitute expenses for facility and infrastructure as the equipment period of use. In this analysis is designed that the BLUPAL income comes from:

##### **3.2.1 Subsidy of Central Government (State Budget Income), Government of Bali Province, Regency of Badung and the city of Denpasar**

It is expected that in the early years of the BLUPAL operational, some subsidy of government will be needed because the tariff hasn't applied yet and although the tariff is already applied, still needs subsidy for some time before the income gained is sufficient to recover the operational and maintenance expenses of BLUPAL. In this case, the subsidy of government is targeted for 5 years since the application of service tariff claim for waste water service.

##### **3.2.2 Tariff Service**

The rate of service tariff for sewerage system of BLUPAL per month is adjusted

to customer class. The service tariff for sewerage of BLUPAL is claimed every month on the next month, which the effectivity of claim is assumed every year in a row is 40% for the first year, 60% for the second year, 80% for the third year claim and 95% for the next years claim.

The service tariff proposal of DSDP/BLUPAL of Bali (for early tariff claim in 2010)

During the implementation of physical development of DSDP on stage I which was applied in 2004 till 2008, there were obstacles so that the achievement target of house connections (9.129 SR) not achieved as it should be. Therefore it needs to do the projection calculation against the BLUPAL of Bali income to ensure that the income of BLUPAL from service tariff of waste water processing is used as maximum as can be to cover the expenses of O & M that already spent so that the government subsidy can be decreased gradually. The tariff table proposed previously in the study of the SAPI Team is found out still unable to recover the expenses of O & M for the service area today, so it needs to settle the new tariff table before the claim for 2010 is applied.

**Table. Proposal for Service Tariff of DSDP/BLUPAL of Bali (for early tariff claim in 2009)**

NO	CUSTOMER CLASSIFICATION	Rp/month
<b>A.</b>	<b>PIPING</b>	
<b>I.</b>	<b>Social</b> Social Foundation, Orphanage, School	10,000.-
<b>II.</b>	<b>Household</b>	
1.	Type A housing which is in front of the house there is a road where its width including the drain is below 7m	15,000.-
2.	Type B housing which is in front of the house there is a road where its width including the drain is 7-10m	20,000.-
3.	Type C housing which is in front of the house there is a road where its width including the drain is above 10m	25,000.-
<b>III.</b>	<b>Institution/Office</b>	70,000.-
<b>IV.</b>	<b>Hotel</b>	
1.	Star Hotel Tariff is counted for each room	
2.	Non star/Jasmine hotel Tariff is counted for each room	100,000.-
3.	Inn	50,000.-
		150,000.-
<b>V.</b>	<b>Restaurant</b>	
1.	Restaurant-small has seats below 50	
2.	Restaurant-medium has seats between 50 till 100	400,000.-
3.	Restaurant-Large has seats more than 100	500,000.-
		700,000.-
<b>VI.</b>	<b>Commercial</b>	
1.	Commercial-Small small business license	
2.	Commercial-medium medium business license	45,000.-
3.	Commercial-Large large business license	100,000.-
		150,000.-
<b>VII.</b>	<b>Public facility</b>	
<b>B.</b>	<b>NON-PIPING</b>	40,000.-
1.	Cleaning Septi tank with truck for feces per m <sup>3</sup>	
2.	Service Truck for feces that dispose the domestic waste to the Installation of Waste Water of Suwung per m <sup>3</sup> .	150,000.-
		25,000.-

### 3.3 Expenses of O & M

Because BLUPAL of Bali is founded based on the regulation regarding Agency for Public Service then the agency is required to be able to recover the expenses of O & M thru the tariff claim.

Table. Expenses of O & M Rp. Billion/year

DESCRIPTION	Case 1	Case 2	Case 3
Electricity	2.803	5.141	9.569
Chemical	50	50	100
Fixing of supporting equipment	204	204	492
Fixing of main equipment	552	900	1.104
Rehabilitation of sewerage	341	624	1.370
Salary	3.094	3.406	5.155
Expenses of office operational	684	684	1.260
Expenses of Claiming (Collecting Service)	27	51	109
<b>Total</b>	<b>7.755</b>	<b>11.060</b>	<b>19.159</b>

### 3.4 Substitute Expenses

In the operational financing of DSDP -BLUPAL of Bali also counting the substitute expenses to ensure the autonomy and continuing of business from the agency of waste water management, although BLUPAL Bali is not required to recover the substitute expenses. The substitute expenses is prepared for 10 -15 years since the beginning of operational of DSDP -BLUPAL Bali (since 2009 -2019) with total substitute expenses with amount of Rp 48,902 billion, which is elaborated with 20% every year from the total substitute expenses for 5 years.

Table. Substitute Expenses Rp. Billion/year

DESCRIPTION	Case 1	Case 2	Case 3
Administration equipment	9.564	11.322	11.122
Pump and machine	23.035	37.580	46.000
Total	32.599	48.902	57.122

### 3.5. Operational Financial Projection of BLUPAL

From the calculation result, the income estimation of BLUPAL by using the tariff proposal above where the number of house connections still using the data of house connection used by the SAPI Team, it is found out that the income of DSDP/BLUPAL of Bali per year has covered the expenses of O & M (scenario 1 = 7,755 mil/year) and even able to cover the expenses of O & M + Substitute (scenario 2 = 11,817 mil/year) per year, yet in the implementation of physical development of DSDP on stage 1 got obstacles so that the number of house connections already

planned not achieved. According to the contract package of LCB 1 until LCB 5, package of the local budget income 2007 and LCB 6, the number of house connections contracted is 8,647 as detailed on the table below:

**Table. Number of House Connections for DSDP-Implementation on stage I**

No	Name of Project Package	Total House Connections
1	Package LCB-1 (the State Budget Income 2007)	2,779
2	Package LCB-2 (the State Budget Income 2007)	1,140
3	Package LCB-3 ( the State Budget Income 2007)	160
4	Package LCB-4 ( the Local Budget Income 2007)	1,300
5	Package LCB-5 ( the Local Budget Income 2007)	1,200
6	Package of Local Budget Income of Bali Province 2007	152
7	Package LCB -6 (the State Budget Income 2008)	800
8	Package LCB -4 (the State Budget Income 2008)	1,116
	<b>TOTAL</b>	<b>8,647</b>

The decrease number of house connections that happened still cannot indicate the decrease to income of BLUPAL before the analysis further. Income will increase depends on the number of connections for each category mainly from the category of Tourism business and other commercials, yet we also still unable to count the income because it is unknown the number of house of connections for each category. So in ahead for implementation of DSDP on stage II it is better to define earlier the number of house connections for each category as the early program so it will be easier in calculating the income estimation of BLUPAL in the next days.

Today, BLUPAL has made data collection by the survey team comes from several staffs of BLUPAL in which the survey is meant to get the number of house connections for each category of customer. Customer candidate complete the administration data by signing the statement letter and fill up the application form for customer of BLUPAL and from the outdoor investigation result, the number of house connections that have been surveyed until December 2008 are as follows:

**Table. Number of House Connections Per category of DSDP 1 per December 2008**

No	Name of Project Package	Total House Connections
A	PIPING	
1	Social	32
2	Household Type A	4,357
3	Household Type B	3,446
4	Household Type C	628
5	Institution	40
6	Star Hotel per room	-
7	Non star hotel per room	4
8	Inn	-
9	Restaurant-small	28
10	Restaurant -medium	-
11	Restaurant-Large	-
12	Commercial-Small	112
13	Commercial-medium	-
14	Commercial-Large	-
15	Public facility	-
16	Industry	-
B	NON-PIPING	
1	Cleaning Septic tank	-
2	Service Truck for feces	-
<b>TOTAL CONNECTIONS</b>		<b>8,647</b>

From the data of house connections above we can calculate the income estimation of BLUPAL as follows:

**Table. Income Estimation of BLUPAL per month and per year (after DSDP on stage II)**

No	CUSTOMER CLASSIFICATION	Number of House Connections	Number of Rooms	Rate (Rp)	Income/month	Income/year
A	PIPING					
1	Social	32		10.000,00	318,060	3,816,724
2	Household Type A	4,357		15.000,00	65,361,397	784,336,758
3	Household Type B	3,446		20.000,00	68,913,070	826,956,842
4	Household Type C	628		25.000,00	15,690,976	188,291,712
5	Institution	40		70.000,00	2,820,135	33,841,618
6	Star Hotel per room	-	-	100.000,00	-	-
7	Non star hotel per room	4	121	50.000,00	6,043,146	72,517,754
8	Inn	-		150.000,00	-	-
9	Restaurant-small	28		400.000,00	11,026,091	132,313,095
10	Restaurant -medium	-		500.000,00	-	-
11	Restaurant-Large	-		7000.000,00	-	-
12	Commercial-Small	112		45.000,00	5,057,159	60,685,910
13	Commercial-medium	-		100.000,00	-	-
14	Commercial-Large	-		150.000,00	-	-
15	Public facility	-		40.000,00	-	-
16	Industry	-		-	-	-
B	NON-PIPING	-			-	-
1	Cleaning Septi tank	-		150.000,00	-	-
2	Service Truck for feces	-		25.000,00	-	-
	<b>TOTAL</b>	<b>8,647</b>			<b>175,230,034</b>	<b>2,182,768,612</b>

Based on the number of house connections after the Implementation of DSDP on stage II (15,847 SR) is assumed that the income of BLUPAL detailed as follows:

**Table. Proposal of House Connections Program per Category (after DSDP-II)**

No	Name of Project Package	Total House Connections
A	PIPING	
1	Social	366
2	Household Type A	5,534
3	Household Type B	4,622
4	Household Type C	1,371
5	Institution	708
6	Star Hotel per room	38
7	Non star hotel per room	112
8	Inn	48
9	Restaurant-small	46
10	Restaurant -medium	75
11	Restaurant-Large	75
12	Commercial-Small	1,091
13	Commercial-medium	858
14	Commercial-Large	520
15	Public facility	361
16	Industry	22
B	NON-PIPING	
1	Cleaning Septi tank	-
2	Service Truck for feces	-
	TOTAL CONNECTIONS	15,847



Based on the number of house connections above we can calculate the income estimation of BLUPAL as follows:

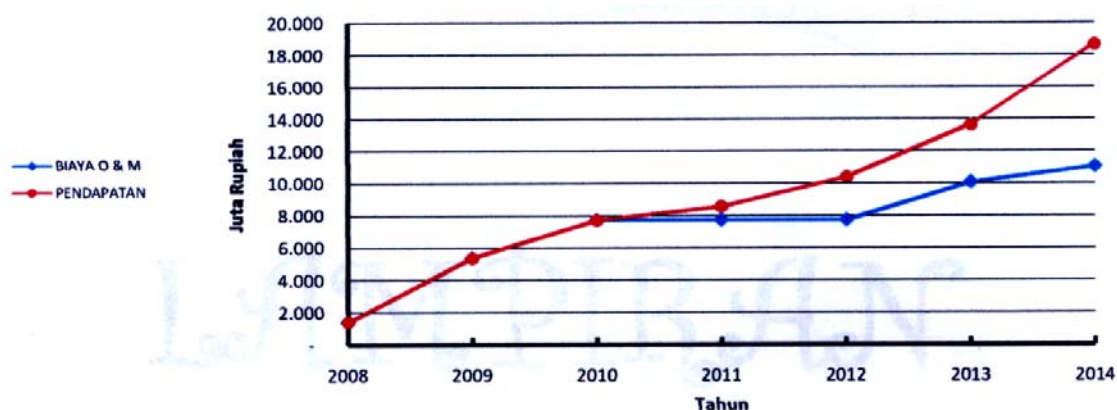
No	CUSTOMER CLASSIFICATION	Number of House Connections	Number of Rooms	Rate (Rp)	Income/month	Income/year
A	PIPING					
1	Social	366		10,000	3,660,000	43,920,000
2	Household Type A	5,534		15,000	83,008,897	996,106,758
3	Household Type B	4,622		20,000	92,443,070	1,109,316,842
4	Household Type C	1,371		25,000	34,275,000	411,300,000
5	Institution	708		70,000	49,560,000	594,720,000
6	Star Hotel per room	38	5,045	100,000	504,500,000	6,054,000,000
7	Non star hotel per room	112	2,797	50,000	139,843,146	1,678,117,754
8	Inn	48		150,000	7,200,000	86,400,000
9	Restaurant-small	46		400,000	18,400,000	220,800,000
10	Restaurant -medium	75		500,000	37,500,000	450,000,000
11	Restaurant-Large	75		700,000	52,500,000	630,000,000
12	Commercial-Small	1,091		45,000	49,095,000	589,140,000
13	Commercial-medium	858		100,000	85,800,000	1,029,600,000
14	Commercial-Large	520		150,000	78,000,000	936,000,000
15	Public facility	361		40,000	14,440,000	173,280,000
16	Industry	22		-	-	-
B	NON-PIPING					
1	Cleaning Septi tank	-		150,000	-	-
2	Service Truck for feces	-		25,000	-	-
<b>TOTAL</b>		15,847			1,250,225,113	15,002,701,354

## OPERATIONAL FINANCIAL PROJECTION OF BLUPAL OF BALI 2010-2014

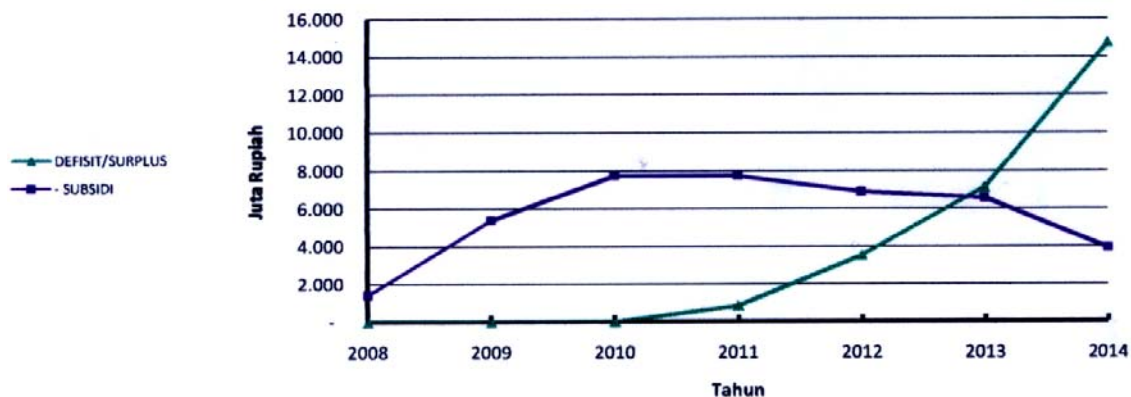
TABLE OF FINANCIAL PROJECTION OF BLUPAL (2010-2014)

DESCRIPTION	DSDP-I+II						
	2008	2009	2010	2011	2012	2013	2014
INITIAL CAPITAL	0	0	0	0	841	3,515	7,125
INCOME	1,424	5,400	7,755	8,596	10,429	13,692	18,699
- TARIFF SERVICE	0	0	0	841	3,515	7,125	14,764
- OTHER SERVICES	0	0	0	0	0	0	0
- SUBSIDY	1,424	5,400	7,755	7,755	6,914	6,567	3,935
EXPENSES O & M	1,424	5,400	7,755	7,755	7,755	10,082	11,060
- EMPLOYEE EXPENSES	629	959	3,094	3,094	3,094	4,022	3,406
- EXPENSES OF GOODS/SERVICE	795	3,003	4,661	4,661	4,661	6,059	7,654
- CAPITAL EXPENSES	0	1,437	0	0	0	0	0
DEFICIT/SURPLUS	0	0	0	841	3,515	7,125	14,764

GRAPHIC OF O & M EXPENSES and INCOME



GRAPHIC OF DEFICIT/SURPLUS



# ENCLOSURE

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2008**

No	Main Activity	Expenses	Year 1					Notice
			Central	Province	City of DPS	Regency BDG	Service Tariff	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	<b>DSDP-In Current Year (2008)</b>							
	1. Equipment Procurement of DSDP mechanical system to support O & P system of DSDP (Denpasar/Kuta)	1,290,000	1,290,000	-	-	-	-	Tourism department 2008
	2. Equipment Procurement of Electrical and DSDP system pump to support O & P system of DSDP (Denpasar/Kuta)	1,264,000	1,264,000	-	-	-	-	Tourism department 2008
B	<b>Supporting Unit, Operational Expenses and maintenance of waste water processing of DSDP</b>							
	1. operational subsidy and maintenance of waste water processing of DSDP	1,387,000	420,000	967,000	-	-	-	Local Budget Income of Province: Bintek
	<b>TOTAL (in thousands)</b>	<b>3,941,000</b>	<b>2,974,000</b>	<b>967,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2009**

No	Main Activity	Expenses	Year 1					Notice
			Central	Province	City of DPS	Regency BDG	Service Tariff	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>A</b>	<b>DSDP-In Current Year (2008)</b>							
	1. Equipment Procurement of DSDP mechanical system to support O & P system of DSDP (Denpasar/Kuta)	2,930,000	2,930,000					
	2. Equipment Procurement of Electrical and DSDP system pump to support O & P system of DSDP (Denpasar/Kuta)	6,000,00	600,000					
<b>B.</b>	<b>PROGRAM DSDP 2</b>							
	1. Equipment Procurement for Lab of Installation of Waste Water Processing	200,000	200,000					
	2. Procurement of Aid Device of O&M of DSDP	200,000	200,000					
<b>C</b>	<b>Supporting Unit, Operational Expenses and Maintenance of waste water processing of DSDP</b>							
	1. Operational Subsidy and maintenance of waste water processing of DSDP	5,400,000	2,606,196	1,319,804	674,000	800,000		
	2. Procurement for DSDP Operational and Maintenance system equipment	3,777,400	3,777,400					
	3. Procurement for work aid of O/P of DSDP processing	450,000	450,000					
	4. Procurement for Lab equipment to control the quality of Installation of Waste Water Processing of DSDP	550,000	450,000		100,000			
	5. Transportation means procurement of BLUPAL/ DSDP (pick up+Box) 3 units.	300,000		300,000				
	<b>TOTAL</b>	<b>14,407,400</b>	<b>11,213,596</b>	<b>1,619,804</b>	<b>774,000</b>	<b>800,000</b>		

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2010**

No	Main Activity	Expenses	Year 1					Notice
			Central	Province	City of DPS	Regency BDG	Service Tariff	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	Program of DSDP 2							
	1. Procurement for DSDP Lab of Installation of Waste Water Processing	300,000	300,000	-	-	-	-	PACKAG E
	2. Procurement of Boat for DSDP-Installation of Waste Water Processing (special equipment for Aerator pool)	650,000	650,000	-	-	-	-	PACKAG E
	3. DSDP Network maintenance	700,000	-	400,000	300,000	-	-	PACKAG E
B.	<b>Supporting Unit, Operational Expenses and Maintenance of waste water processing of DSDP</b>							
	1. Operational Subsidy and maintenance of waste water processing of DSDP	7,755,000	3,742,787	1,895,385	1,414,341	702,487	-	Expenses Year per year
	2. Procurement for DSDP Operational and Maintenance system equipment	2,250,000	2,250,000	-	-	-	-	
	3. Procurement for Lab equipment to control the quality of Installation of Waste Water Processing of DSDP	150,000	150,000	-	-	-	-	Public Work Proposal of Sarbagita
	4. Providing BLUPAL -DSDP office and operational and maintenance supporting unit	750,000	-	750,000	-	-	-	Land
	<b>TOTAL</b>	<b>12,555,000</b>	<b>7,092,787</b>	<b>3,045,385</b>	<b>1,714,341</b>	<b>702,487</b>	-	

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2011**

No	Main Activity	Expenses	Year 1					Notice
			Central	Province	City of DPS	Regency BDG	Service Tariff	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	<b>Supporting Unit, Operational Expenses and Maintenance of waste water processing of DSDP</b>							
	1. Operational Subsidy and maintenance of waste water processing of DSDP	7,755,000	3,742,787	1,895,385	1,414,341	702,487	-	State Electricity Enterprise
	2. Providing BLUPAL -DSDP office and operational and maintenance supporting unit	2,200,000	1,200,000	1,000,000	-	-	-	Building
	<b>TOTAL</b>	<b>9,955,000</b>	<b>4,942,787</b>	<b>2,895,385</b>	<b>1,414,341</b>	<b>702,487</b>	<b>-</b>	

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2012**

No	Main Activity	Expenses	Year 1					Notice
			Central	Province	City of DPS	Regency BDG	Service Tariff	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<b>Supporting Unit, Operational Expenses and Maintenance of waste water processing of DSDP</b>							
	1. Operational Subsidy and maintenance of waste water processing of DSDP	6,914,000	3,334,001	1,688,371	1,263,875	627,753	-	
	2. Providing BLUPAL -DSDP office and operational and maintenance supporting unit	750,000	-	250,000	250,000	250,000	-	Office Equipment
	<b>TOTAL</b>	<b>7,664,000</b>	<b>3,334,001</b>	<b>1,938,371</b>	<b>1,513,875</b>	<b>877,753</b>	<b>-</b>	

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2013**

No	Main Activity	Expenses	Year 1					Service Tariff	Notice
			Central	Province	City of DPS	Regency BDG			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
A	<b>Supporting Unit, Operational Expenses and Maintenance of waste water processing of DSDP</b>								
	1. Operational Subsidy and maintenance of waste water processing of DSDP	6,567,000	3,162,334	1,601,437	1,204,812	598,417	-	PLN/PDN	
<b>TOTAL</b>		<b>6,567,000</b>	<b>3,162,334</b>	<b>1,601,437</b>	<b>1,204,812</b>	<b>598,417</b>	<b>-</b>		

**Table. Supporting Activities for O & P of Waste Water of DSDP-In 2014**

No	Main Activity	Expenses	Year 1					Service Tariff	Notice
			Central	Province	City of DPS	Regency BDG			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
A	<b>Supporting Unit, Operational Expenses and Maintenance of waste water processing of DSDP</b>								
	1. Operational Subsidy and maintenance of waste water processing of DSDP	3,935,000	1,893,353	956,668	727,749	361,465	-	PLN/PDN	
<b>TOTAL</b>		<b>3,935,000</b>	<b>1,893,353</b>	<b>956,668</b>	<b>727,749</b>	<b>361,465</b>	<b>-</b>		



## **APPENDIX 5.13.1**

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# **REGIONAL LONG-TERM DEVELOPMENT PLAN IN 2005 - 2025 OF DENPASAR CITY**



**REGIONAL REGULATION OF DENPASAR  
NUMBER 1 YEAR OF 2009**

**ON**

**REGIONAL LONG TERM DEVELOPMENTAL  
PLAN (RLTDP)  
DENPASAR CITY YEAR OF 2005-2025**





DENPASAR MAJOR

**DENPASAR REGIONAL REGULATION  
NUMBER 1 YEAR OF 2009  
ON  
REGIONAL LONG TERM DEVELOPMENTAL PLAN (RLTDP)  
DENPASAR CITY YEAR OF 2005-2025**

**WITH THE BLESSING OF GOD THE ALMIGHTY**

**DENPASAR MAJOR**

- Considering :
- that to implement the provision of Article 13 paragraph (2) the Decree Number 25 of 2004 on the National Developmental Plan System, it is necessary to stipulate the Regional Regulation on the Regional Long Term Development Plan of Denpasar City 2005-20025.
  - that based upon the consideration as meant in letter a, it is necessary to compose the Regional Regulation on the Regional Regulation on the Regional Long Term Development Plan (RLTDP) of Denpasar City 2005-20025.
- In View of :
- The Decree Number 1 of 1992 on the Establishment of Municipality of Denpasar Region Level II (State Gazette of Republic of Indonesia of 1991 Number 9, supplement to the State of Gazette Republic of Indonesia Number 34856);
  - The Decree Number 17 of 2003 on National Budget (State Gazette Republic of Indonesia of 2003 Number 47, Supplement to State Gazette of Republic of Indonesia Number 4287);
  - The Decree Number 10 of 2004 on the Establishment of Laws and Regulations (State Gazette of Republic of Indonesia Number 53, supplement to the State of Gazette Republic of Indonesia Number 4389);
  - The Decree Number 25 of 2004 on the National Development Plan System (State Gazette of Republic of Indonesia of 2004 Number 104, supplement to the State of Gazette Republic of Indonesia Number 4421);
  - The Decree Number 23 of 2004 on the Regional Government (State Gazette of Republic of Indonesia of 2004 Number 125, supplement to the State of Gazette Republic of Indonesia Number 4487); as



- amended for several times and at last with the Decree Number 12 of 2004 on the Second Amendment of the Decree Number 32 of 2004 on the Regional Government (State Gazette of Republic of Indonesia of 2004 Number 59, supplement to the State of Gazette Republic of Indonesia Number 4844);
6. The Decree Number 33 of 2004 on the Financial Balance between Central Government and Regional Government (State Gazette of Republic of Indonesia of 2004 Number 126, supplement to the State of Gazette Republic of Indonesia Number 4438);
  7. The Decree Number 17 of 2007 on the National Long Term Development Plan of 2005-2025 (State Gazette of Republic of Indonesia of 2007 Number 33, supplement to the State of Gazette Republic of Indonesia Number 4700);
  8. The Decree Number 26 of 2007 on the Space Management (State Gazette of Republic of Indonesia of 2007 Number 68, supplement to the State of Gazette Republic of Indonesia Number 4725);
  9. The Government Regulation Number 36 of 2007 on the Affair Distribution Between the Central Government, Provincial Government and Regental Government/Municipality (State Gazette of Republic of Indonesia of 2007 Number 82, supplement to the State of Gazette Republic of Indonesia Number 4737);
  10. The Government Regulation Number 8 of 2008 on the Phase, Composition Management, Controlling and Evaluation for the Implementation of Regional Development Plan (State Gazette of Republic of Indonesia of 2008 Number 21, supplement to the State of Gazette Republic of Indonesia Number 4817);
  11. The Government Regulation Number 23 of 2008 on National Territorial Space Management Plan (State Gazette of Republic of Indonesia of 2008 Number 48, supplement to the State of Gazette Republic of Indonesia Number 4833);

**With the joint approval between**

**REGIONAL HOUSE OF REPRESENTATIVE OF  
DENPASAR CITY**

**And**

**DENPASAR MAJOR**



ii

**HAS DECIDED:**

To Stipulate : REGIONAL REGULATION ON REGIONAL LONG TERM DEVELOPMENT  
PLAN (RLTDP) OF DENPASAR CITY 2005-2025

**CHAPTER I  
GENERAL PROVISION**

**Article 1**

That which is meant in this lay by:

1. City is Denpasar City
2. City Government is the Government of Denpasar City
3. Major is Denpasar Major
4. Regional Long Term Development Plan of Denpasar City 2005-2025 hereafter referred to RLTDP of Denpasar City is a Document of Regional Development Plan in the period of 20 (twenty) years from the year of 2005 to the year of 2025.

**CHAPTER II  
CONTENT MATERIAL AND FUNCTION OF  
REGIONAL LONG TERM DEVELOPMENT PLAN  
(RLTDP)**

**Article 2**

RLTDP of Denpasar City contains vision, mission and direction of regional government in reference to the National LTDP.

**Article 3**

Regional LTDP of Denpasar City 2005-2025 is as contained in the Appendix of this Regional Regulation and is one unit of inseparable parts of this Regional Regulation.

**Article 4**

Middle Term Development Plan of Denpasar City shall be stipulated with the Major Regulation.

**CHAPTER III  
WRITING SYSTEMATIC**

**Article 5**

ii



The Regional Long Term Development Plan of Denpasar City 2005-2025 is composed under the following systematic:

CHAPTER I	:	INTRODUCTION
CHAPTER II	:	GENERAL CONDITION
CHAPTER III	:	VISSION AND MISSION OF 2005-2025 REGIONAL DEVELOPMENT
CHPATER IV	:	DIRECTION OF 2005-2025 LONG TERM DEVELOPMENT
CHPATER V	:	CLOSING

#### CHAPTER V CLOSING PROVISION

##### Article 6

The Regional Government shall come into effective on the issuance date.  
In order that every one may take cognizance hereof order that this Regional Regulation be promulgated by publishing it in the Regional Gazette of Denpasar City.

Enacted in Denpasar  
On 20 FEBRUARY 2009  
DENPASAR MAJOR  
*Signed*  
**RAIDHARMAWIJAYAMANTRA**

Enacted in Denpasar  
On 20 FEBRUARY 2009

PLT. DENPASAR CITY SECRETARY  
GOVERNMENT ADMINISTRATION ASSISTANT  
*Signed*  
**I KETUT NATHA WIBAWA**

REGIONAL GAZETTE OF DENPASAR CITY OF 2009  
NUMBER 1



iv

ELUCIDATION  
ON  
REGIONAL REGULATION OF DENPASAR CITY  
NUMBER 1 2009

ON  
REGIONAL LONG TERM DEVELOPMENT PLAN (RLTDP)  
OF 2006-2025

**I. GENERAL**

The Government of Denpasar city shall have a duty and obligation to stipulate the Regional Long Term Development Plan (RLTDP) as a further elaboration from National LTDP. The RLTDP shall have an effort of developing and implementing the accountability system accurately, clearly, and legitimately so that the government administration and development can go on effectively, usefully, cleanly, and accountably and be free from corruption, collusion, and nepotism. This RLTDP is stipulated under the consideration of factors of natural resources, environment, population, education, health, HR, Gender, Economy, politic, law, and Science and Technology and to take account of public aspirations that grow and develop in Denpasar City.

**II. ARTICLES**

- Article 1  
Sufficiently clear
- Article 2  
Sufficiently clear
- Article 3  
Sufficiently clear
- Article 4  
Sufficiently clear
- Article 5  
Sufficiently clear
- Article 6  
Sufficiently clear



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Appendix : DENPASAR REGIONAL REGULATION  
DATE : 20 FEBRUARY 2009  
NUMBER : 1 OF 2009  
ON : 2005-2025 REGIONAL LONG TERM DEVELOPMENT PLAN

**REGIONAL REGULATION OF DENPASAR  
NUMBER 1 OF 2009**

**ON**

**REGIONAL LONG TERM DEVELOPMENTAL PLAN (RLTDP)  
DENPASAR CITY  
YEAR OF 2005-2025**

**YEAR OF 2009**



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**CHAPTER I GENERAL PROVISION**

**CHAPTER II WRITING SYSTEMATIC**

**CHAPTER IV CLOSING PROVISION**

**ELUCIDATION ON REGIONAL REGULATION OF DENPASAR NUMBER 1 OF 2009 ON  
REGIONAL LONG TERM DEVELOPMENTAL PLAN (RLTDP) DENPASAR CITY YEAR  
OF 2005-2025**

**CHAPTER I INTRODUCTION**

I.1 FORWARD

I.2 MEANING

I.3 PURPOSE AND OBJECTIVE

I.4 FOUNDATION

I.5 SEQUENCE

**CHAPTER II GENERAL CONDITION**

II.1 CURRENT CONDITION

II.2 CHALLENGES

II.3 ASSET

**CHAPTER III VISSION AND MISSION OF REGIONAL  
DEVELOPMENT 205-2025**

**CHAPTER IV DIRECTION OF PHASE AND PRIORITY OF LONG TERM  
DEVELOPMENT 2005-2025**

IV-1 DIRECTION OF 2005-2025 LONG TERM DEVELOPMENT

IV.1.1 IMPLEMENTATION EMPOWERMENT TRADITION  
FOUNDATION, CULTURE AND RELIGION PIETY

IV.1.2 IMPLEMENTATION OF SOCIETAL ECONOMIC SYSTEM  
ENFORCEMENT TO SUPPORT MORE DISTRIBUTIONAL  
AND FAIR DEVELOPMENT



IV.1.3 IMPLEMENTATION OF HUMAN RESOURCES QUALITY,  
INCREASE

IV.1.4 IMPLEMENTATION OF SAFETY AND CONDUICVE  
ENVIRONMENT

**IV.2 PHASE AND PRIORITY SCALE**

IV.2.1 THE 1<sup>ST</sup> RLTD (2005-2010)

IV.2.2 THE 2<sup>ND</sup> RLTD (2010-2015)

IV.2.3 THE 3<sup>RD</sup> RLTD (2015-2020)

IV.2.4 THE 4<sup>TH</sup> RLTD (2020-2025)

**CHAPTER V CLOSING**



## INTRODUCTION



## CHAPTER IV

### DIRECTION, PHASE AND 2005-2025 LONG TERM DEVELOPMENT PRIORITY

The objective of 2005-2025 long term development is to implement Denpasar with cultural, progressive, and competitive insights as a base of the following development toward the society which can make welfare with their own.

As a benchmark of Denpasar with the cultural city on the basis of Tri Hita Karana, the Denpasar development within the next 20 years shall be directed to reach the following main targets:

**A. The Implementation of Pakraman Foundation Empowerment, Culture and Religious understanding shall be in the sense of:**

1. The implementation of tough, competitive and high-moral Denpasar City characters, which are characterized with human character and behaviour and city people with faith and piety to God the Almighty, with a good character, tolerance, cooperation, patriotic, dynamic, and science and technology oriented.
2. The stronger Bali culture as an integral part of national culture reflected in the improvement of civilization, public prestige and dignity, and self integrity and Denpasar city personality.
3. The implementation of a Cooperation moved by Pakraman village, on the activities adapted to the comparative winning of the related Pakraman village.
4. The implementation of Village Crediting Institution (VCI) management professionally.
5. The implementation of Subak (Reservoir) Foundation sustainability and Sekehe art functioning as a production unit from Pakraman village Cooperation on the basis of various business ethic considerations.
6. The implementation of Sekehe-Young Man and Woman Farmer as educational media.

**B. The Implementation of Public Economic System shall be signed by:**

1. The development level distributes more evenly, the implementation of living quality improvement and public welfare including the decrease of social gap.
2. The availability of food guarantee instrument for household level or the safe level and sufficient nutrient quality.



3. Synergy between Government, Private and the public to strengthen the public-based economy.

**C. The Implementation of Human Resource Quality Development (HRD) is shown by:**

1. The sustainably-economic growth in order in the year of 2005 the Income per capita reaches a moderate point with a low unemployment level and the poor people not more than 5 percent.
2. The more improvement of HR Quality, Including woman roles in the development. In general the HR quality improvement is signed by the improvement of IPM and IPG and the achievement of equal growth population.
3. A strong economic structure establishment on the basis of competitive winning and social-economy as a base of economic activities managed efficiently to produce qualified commodity, globally competitive manufacture industries becomes a motivator of economy and service with the role improvement followed by competitive and qualified service quality.
4. The construction of transportation infrastructure nets reliable and integrated one another. The implementation of post and telecommunication efficiently and modernly to create information for the public. The implementation of water competitive resource conservations which are able to keep the water resource function sustainability.
5. The improvement the government official professionalism to implement a good governance, with clean, powerful, responsible and professional sides to support the development through:
  1. Official development to have a capability of developing and improving network system.
  2. Official development to have a capability of comprehending every need and aspiration of the public.
  3. Official development to have a knowledge and wide sight,
  4. Official development so that the knowledge and his sight support each duty implementation.
  5. Official development to have a capability of creativity and innovative on any changes, and
  6. Official development to have an integrity behaviour, fairness and high discipline.



- D. The Implementation of Security and Conducive Environment signed by the synergy between security, law-based democracy and Denpasar city with sustainable and beautiful condition.**

1. The improvement of appeasement and order condition in the territory of Denpasar city.
2. The decrease of breaking law especially the Regional Regulation breaking to create the public safety.
3. The decrease in number of breaking law to create the public safety.
4. The protection of a tense and conflict menace among social groups or interactions.
5. The decrease of drug-abuse addicts.
6. The Increase in social obedience and discipline on law.
7. The improvement of social security to use goods and services and prevent negative issues from using goods and services disturbing the tourism stability.
8. Law-based democracy is shown by:
  - a. The creation of law supremacy and Human Right Re-enforcement, and the law system management which reflects truth, justice, accommodative and aspiration.
  - b. The implementation of democracy consolidation on the various political aspects measurable with the law-based government, neutral and professional bureaucracy, civil society, political society, Independently-economic society, and its independency.

Beauty and Sustainability are signed by:

- a. The improvement of HR management and efficient use and environmental function sustainability and supporting power, and restoration capability to support social and economic living quality harmoniously, evenly, and sustainably.
- b. Maintenance of wealth in diversity of social type and speciality in the management of HR to implement additional values and competitiveness and development assets.
- c. The improvement of awareness, mental attitude, and social behavior in the HR and the sustainability of environments: function to keep the living comfort and quality.

To reach the cultural level, on the basis of the expected Tri Hita Karana, the direction of Long Term Development within the next 20 years shall be as the following:



#### IV.1 2005-2025 LONG TERM DEVELOPMENT DIRECTION

##### IV.1.1 IMPLEMENTATION OF PAKRAMAN FOUNDATION EMPOWERMENT, CULTURE AND RELIGIOUS UNDERSTANDING

The moral and ethical social condition is very urgent for the social living with a full of tolerance, sense of belonging, and harmony. In addition, the awareness of culture provides a direction for the implementation of city identity in accordance with gloriously-cultural values and creates harmonious and conducive climates so that the local-wisdom values will be able to respond modernisation positively and productively in line with the civilised living values.

1. Pakraman Village Foundation and institutional substance sets owned such as subak, Sekoha Young Man and Woman Farmer, Pesañan Sekoha, LPD, Banjar, Art Sekoha shall also be oriented as economic and social-cultural activities other than religious traditional activity Vehicles to be competitive in globalisation era.
2. The religious development is directed to solidify the religious function and role as a moral and ethic foundation in the development, builds a glorious moral and cultivates working ethos, appreciates achievement, and becomes a motivator strength to reach the developmental progress. Further, the religious development shall also be directed to improve the living harmony of inter-religious followers in the improvement of trust and harmony inter-social groups to create fully a living condition with tolerance, sense of belonging, and harmony.
3. The development and self-confidence solidification shall be referred to implement the city character and rooted social system, unique, modern, and winning. The self-confidence is a combination between glorious values such as religious, togetherness, and unity and universal modern values such as working ethos and good governance management principles. The development of self-confidence is conducted through transformation, revitalisation, re-actualization of Bali cultural value management with the winning potential and the application of modern values in the development. To strengthen self-confidence and pride, the sport development is directed to the cultural enhancement and sport achievements.
4. Science and technology-oriented innovative culture is continuously developed so that the Denpasar city commands of the science and technology and is able to defeat the global competition in this era. The development of science and technology is conducted by improving the social appreciation on science and technology through the development of reading and writing





culture, social-learner, smart, critical and creative society to develop the science and technology tradition, along with the direction of consumptive cultures toward productive ones. The creativity expression of among others through arts must be motivated to implement the equality the material, spiritual and emotional aspects. The science and technology and arts development is placed to improve the social civilized, dignity and prestige.

#### IV.1.2 IMPLEMENTATION OF SOCIAL ECONOMIC SYSTEM STRENGTH TO SUPPORT EQUAL AND FAIR DEVELOPMENT

The equal development and enjoyed by all the public component will support the improvement of the active-social participation in the development and will decrease the security disturbance and abolish social conflict potential for the achievement of Denpasar in the sight of progressive and competitive culture.

##### A. Strengthen Social Economy on the Global Competitive and Orientation

1. The economy is developed by strengthening the social economy and on the orientation of global competitiveness. Accordingly, it shall transform gradually the comparative winning-based economy to become competitive winning-based economy. On the development of production system relation, the distribution and service will be strong. Such efforts are done under basic principles: managing sustainably the productivity improvement through authority, distribution, application, and creation (innovation) of science and technology toward knowledge based economy; managing sustainably economy foundation conducting the best practice and good governance and managing sustainably the HR according to the winning and competition.
2. The economy is developed based upon economic democracy principles on the account of the city needs to guarantee business and work opportunities for the all people and motivates the poverty eradication achievement. The economy policy management requires to take into account of globalization dynamics accurately by a commitment of prioritizing the weak social groups.
3. The economy capacity is developed according to the economic progress dynamic by applying a good governance management principles in the composition of efficient, effective, and non-discriminative permits and regulations; keeping the business competition healthily and consumer protection; boosting the product and service standardization development to improve the competitiveness; formulating the technological-



development policy and strategy according to the economy development and improvement of Small and Medium Enterprise competitiveness (SME) to become an integral part of the entire economic activities and to strengthen the economic basis.

4. The effective and optimal government role is implemented as facilitator, regulator, and as the developmental catalyst at various level for the public service efficiency and effectiveness, the creation of a conducive and competitive business environment, and the market mechanism sustainability.
5. The economic structure is strengthened by placing an industrial sector as a motivator supported by agriculture in a wide sense, including marine, producing products efficiently, modernly, and sustainably and effective services, applying the best practice and a good management to implement a strong economic defense.
6. The science and technology development for economy directs to the improvement of quality and benefit of it to support the competitiveness globally. This is done through the improvement of mastering and applying the science and technology widely in the production system, the development of independently-financial research foundation, the implementation of acknowledgement system on finding outcomes (royalty system, patent, intellectual right) and product quality (INS, ISO), application to the quality standard in reference to the measuring system, standardization, testing and quality, improvement quantity and quality of science and technology facilities and infrastructures. Such various steps are conducted to support the knowledge-based economy development, and capacity building for the innovation system functional relationship to boost the business activity development.
7. The policy of work market mechanism in justice is directed to boost the creation of as many formal job opportunities as possible and to increase the worker welfare in the informal works. Flexible work markets, harmonious industrial relationships with a deserved protection, sufficient-work safety, and the implementation of industrial settlement process to satisfy all parties characterizing the expected-fair work market. In addition, workers are expected to have high productivities to compete and to produce high additional values on the training management and provision of supports for strategic training programmers for the effective and efficient worker quality improvement as an





in the business scale will be strengthened by making small and medium industries be a basis of healthy industries, able to grow and integrated in the value addition chains.

12. The competitive industries shall be established on the basis of comparative winning. Accordingly, the industrial development within the next 20 years shall be held based upon 4 (four) main principles: (1) the treatment industry development to produce an highly-additional value in the account of sustainability; (2) industry development to strengthen capability and development of network of interaction, communication, and information both for internal interest, communication, and information in relation with globalization dynamic; (3) Industry development that is able to respond domestic and global market dynamics; and (4) industry development to strengthen Regional economic integration, regional independence, and inter-industry relation in the future.
13. To strengthen the economic competitiveness globally, it is necessary to develop industries on the activity foundation of creating micro (local) business environment which can stimulate the growth of healthy and strong industry clumps on the basis of 3 (three) basic principles: (1) the development of value addition chain through product diversification (downstream development), the deepening the upstream structure, or the entire development (downstream-upstream); (2) Strengthening inter-industry relationship horizontally including supporting and complement industries, including related Multinational Corporation network (MNC), and the strengthening relationship with the primary and service sector activity which support it and (3) Supply for various infrastructures for the collective capacity development which among other consists of physical facilities and infrastructures (transportation, communication, and technological facilities and infrastructures; infrastructures of Metrology, standardization, testing, and quality control (MSTQ); and infrastructures for education and training to industrial workers.
14. Service, including infrastructure service and regional financial policy, is developed according to the regional economy development policy to support effectively the production enhancement and global competition on the application of management system and standard according to best practice of Inter-region, which is able to boost the defence enhancement and economic additional value that can support strategic interest in the HR development and professionalism, mastering, and



technological utilities, and certain professional development, and support the Regional interest in the poverty eradication and development of village economic activity.

15. The trade is directed to support economy to maximize benefit as well as to minimize the negative effects of the integration process with globalization dynamics. Such efforts hold through: (a) Regional position internal strengthening in various trade work pattern (global scale), to enhance the competitiveness and regional-export market access as well as to save regional strategic interest in the poverty eradication, and protection for Regional economic activity and unhealthy trade practices; (b) development of image, qualified service and goods product standards, and competitive trade facilities.
16. The trade is directed to strengthen the efficient and effective regional distribution system and to guarantee business certainties to implement: (a) the capacity development of effective trade in the consumer protection and healthy business competitiveness, (b) the integration of regional economy activity and the establishment of awareness of domestic product using, (c) the improvement of inter-regional/territorial trade and (d) the guarantee of availability of principle material and other strategic goods within reachable prices.
17. Tourism is developed to encourage the economic activity and to improve image, and to enhance public welfare, and job opportunity extension. Tourism development utilizes wisely and sustainably diversities of natural beauty enchantments and Regional potential.
18. Small and Medium Enterprise (SME) and cooperation development is directed to be an economic actor which becomes more science and technology based, competitive in import products especially in the supply of goods and services for the public needs to contribute significantly the structural changes and strengthen economy. Therefore, the development of SME and cooperation shall be conducted through the enhancement of enterprise competence and enhancement of productivities supported with the effort of improvement in adaptation to market needs, utility of innovation result and technological application in a healthy business climate. The real SME development will integrate in an agribusiness and agro-industry modernization, including to support food defence, and the strengthening of production basis and industrial



- competitiveness through industrial clump development, technological transference acceleration, and enhancement of HR quality.
19. Financial sectors are developed to have capability of maintaining economic stability and financing the qualified economic growth and having capability of resistance against crisis turbulences through: implementation of Financial Sector Pacifier Network, improvement in contribution for Financial Service Foundation such as Village Crediting Foundation (VCF) in the development financing, and quality improvement. Accordingly, Each investment type (either short or long term) will receive a financing resource suitable with the financial service characteristic. In addition, the more various financial institutions, the more financial alternatives for all public layers.
  20. Improvement to regional financial management relies on the budget system in transparency, responsibility and guarantee for the utility effectiveness, is kept on the safe level. Meanwhile, the effectiveness of main source of development originating from tax shall be continuously developed. The main interest of the government financing is the developmental financing creation which can guarantee the capability of public service enhancement either in the basic service supply, facilities and physical infrastructure and economy, and support the improvement of economy competitiveness.
  21. The developmental acceleration and strategic territorial growth and growth fast are encouraged to develop the unmanaged regions optimally. In the synergetic economic development, more emphasized on the relation consideration of industrial and distributional process chain. This effort can be done through the regional winning products, and the encouragements to implement coordination, synchronization, integration and inter-sector cooperation, inter-region, business world, and the people to support the business and investment opportunity.
  22. The city development is controlled in a compact developmental territory system, comfortable, efficient in the management, and on the consideration of the sustainable development, through: (1) Application to city management comprising of optimizing and controlling space utilities and buffering zone safe guard surrounding the core city under a strict and fair law enforcement, and enhancement in the city role and function. (2) The development of city economy activity which is friendly to environment such as financial service industries, banking, insurance,



communication industries and others; and the enhancement of regional capacity capability and (3) revitalization of city zone comprising of re-functioning of zone through re-development of the said zone; environmental quality improvement in physical, social, cultural sides; and re-management of the public facility service, mainly the public transportation system development integrated in inter-modes. The enhancement of technology and knowledge is especially to support the transportation smoothness and the infrastructures shall be supported and anticipated in the preparation of planning and the future implementation.

23. The government supports are enhanced to develop the zone so that the said zone can grow and develop immediately. The developmental approach required to do other than the public empowerment directly through public service guarantee also needs to strengthen the relationship between economy activities and the quick-grow and strategic zones in an economic-developmental zone system.
24. The territorial border is developed by changing the direction of developmental policy which so far tends to be inward looking oriented to become outward looking, so that the said zone can be utilized as economy activity gate and neighboring regional trade. The developmental approach is conducted not only using the security approach in nature, but also requiring welfare approach.
25. City development growth shall be equalized in a city development system. This effort is required to prevent the urban sprawl and conurbation. Therefore, it is necessary to improve economic activities from the beginning phase of industrial chains, in-between production process phase, final phase of production, to the phase of consumption. Further, it is necessary to support the enhancement of accessibility and mobility of people, goods and services.
26. The city development acceleration is enhanced to take a role as a zonal development activator at surrounding and to serve the city's citizen need. The developmental approach which requires to be conducted, among others, is to meet the city basic service need according to the city typology.
27. The development conducted in one zone is still conducted without considering the sustainability. The eagerness to obtain a short term economic benefit frequently results in an eagerness to exploit natural





Resources excessively which decrease quality (degradation) and quantity (depletion) of NR and environment. In addition, it frequently produces a conflict of inter-sector space utility. One causes of the problems is due to the development conducted in the territory has yet to use a space management plan as a coordination reference and inter-sector and inter-region developmental synchronization. Therefore, it is necessary to utilize the space management plan as a foundation or a reference for spatial policy of cross-sectoral development and territory so that the space utility can be synergized, harmonious, and sustainable. The Territorial Space Management is composed in appropriate with the city need aspects.

28. The application of efficient, effective land management system and implementation of law enforcement on the land right on the application of fair principles, transparency, and democracy. In addition, it is necessary to complete the mastery of, ownership, using, and utility of land through the formulation of various land form implementation regulation, and the creation of tax disincentive/incentive in accordance with the width, location, and land using so that the weak-economy class people can be easier to obtain land rights. Further, to complete law systems and law products of land through inventory and the completeness of laws and regulations of land on the consideration of traditional-social regulation, and the improvement on efforts to settle land dispute both through administration authority, justice, and alternative dispute resolution; further, the land institution will be completed according to the regional autonomy spirit, mainly in the relation with HR capacity improvement in the land field.
29. The capacity development on regional government is continuously developed through the improvement of the regional government official capacity, increase in the regional government capacity building; increase in the regional government financial capacity including the efforts of partnership enhancement with society and private in the regional development financing; the strengthening of legislative institution. In addition, the public empowerment will be continually increased through: the knowledge enhancement and skill; access increase on operating capital and Natural Resources; provision a broad opportunity to convey aspiration or the policy and regulation in relation with their living; the increase in opportunity and capability to manage the productive





- economic business which can bring about prosperity and eradicate poverty.
30. The improvement in inter-regional cooperation will be continuously increased to utilize the comparative and competitive winning; and to avoid the inefficiency in the public service. The inter-regional cooperation development will be very useful as a means of sharing experiences, benefit by that cooperation and sharing in responsibility financing proportionally, either in the development or maintenance of facilities and infrastructure, also other development.
  31. Cooperation is boosted to develop extensively in which it is also supported by a strong LPD condition according the needs to become an effective vehicle to increase bargaining position and collective efficiency of its member, both producer and consumer at various economic activity sectors. Accordingly, it becomes an economic move to play a role in reality in the effort improvement of public social and economic welfare. Meanwhile, the empowerment of micro businesses becomes a strategic choice to boost incomes of social groups with low incomes to reduce the income gap and poverty, through business capacity development and business management skill as well as to encourage the certainty, protection and business elucidation.
  32. In the frame of fair development, the development of HR shall also be conducted by more taking into account of the unfortunate social groups, including poor people.
  33. The social welfare development is directed to the service range increase and qualified social rehabilitation including the effective-social empowerment for the PMKS, supported by laws and regulation and social protection, increase in HR quality, social welfare, the construction and management Regional Social Welfare System (RSWS) and the provision of sufficiently social service facilities.
  34. Protection and social guarantee system is constructed, managed, and developed to assure and solidify the public rights of the basic social service. The existing Regional Social Guarantee System (RSGS) requires completing gradually and Regional Social Protection System (RSPS) can provide fully the extensive society supported by the laws and regulations and financing and demography registered number (DRN). The development of RSPS and RSGS is conducted on the



consideration of culture and system which has been rooted in the extensive public arena.

35. The poverty coping is directed to accolade, protection and fulfillment of social basic rights gradually on the priority of equality principle and non-discrimination. In line with democratization process, the social basic right fulfillment is directed to the increase of understanding of the social basic right implementation interest. The policy of poverty eradication is also directed to improve the regional-autonomy execution quality as a part of efforts to meet the poor social basic rights.

#### IV.1.3 IMPLEMENTATION OF HUMAN RESOURCE (HR) QUALITY INCREASE

Capability to compete is a key for the achievement of progress and prosperity. The high competitiveness will make Denpasar City ready to encounter globalisation challenges and able to utilise the existing opportunity. To strengthen the competitiveness, the long term development is directed to:

- a. prioritize the qualified HR development and competitiveness;
- b. increase in mastery, utility and knowledge creation; and
- c. establish a progressive infrastructure and reform the law field and the government officials.

##### A. Development of Qualified HR

1. HR development has a very significant role to implement the advanced and independent HR so that it will be able to compete in the globalisation era. Therefore, the HR development is directed to improve the HR quality signed by the increase in IPM and IPG, and the creation of equal-grow population signed by the Net Reproduction Figure (NRF) the same as 1, or the total fertility figure (TFF) the same as 2, 1.
2. The total-population control and population speed growth are directed to improve the family planning service and reachable reproduction health, qualified and effective toward the establishment of qualified-small family. In addition, the management of population distribution and mobility is directed toward the more equal distribution according to supporting power and environmental accommodate power through the economic and territorial development distribution on the account of the variety in ethnics and cultures and sustainable development. The population administration system is necessary to do to support the planning and implementation of regional development and encourage the accommodation of the population rights and social protection.



3. Educational development is an investment in improving HR quality and has an important role to improve the economic growth and decrease the poverty level. The educational development is directed to improve the dignity, prestige and quality of human to compete in the global era on the basis of social living norms and without any discrimination. It is necessary to provide qualifiedly and reachably the educational service encompassing all fnes, types, levels followed by participation of educational costs. The educational service shall be adapted to the economic social development need in the future including to boost the sustainable economic growth through technological mastery insight. The educational development is directed to foster pride, glorious moral and learner ability to live together in the social-multi-culture based on by an accolade to Human Right. The supply for long live educational service according to the science and technological advances requires to encourage continuously to boost the living quality and population productivity including to provide knowledge and skill for the productive-aged population in which the total is high.
4. The health development is directed to improve the public health degree through the health effort increase, health financing, health HR, drugs and health supply, public empowerment and health management. Such effort shall be done on the consideration of demographical dynamic, epidemiology, ecological and environmental changes, science and technological advances, and globalization under a spirit of partnership, and cross-sectoral cooperation. Special attention shall be given to improve public behavior and independency, and the promotive and preventive efforts.
5. The development of woman and kid empowerment; and is directed to improve the living quality and woman role, and welfare and child protection in the various developmental fields; the decrease of violence acts, exploitation, and discrimination to woman and child; and capacity building and pengarasutamaan gender including data availability and gender statistics.
6. The youth development is directed to improve the youth quality and participation in various developmental sectors, mainly in the fields of economy, social-culture, science and technology, and politic. In addition, the sport development is directed to improve sport and achievement culture in the social arena.

**B. Mastery, Development and Utility of Science and Technology**

1. The science and technology is directed to create and master the basic and applied knowledge, and social and humanistic knowledge to produce technology and technological utility of research result, development, and engineering for



the public welfare, independency and competitiveness through the increase in capability and science and technology capacity which are usually in the guidance of religious values, cultural values, aesthetic values, local wisdom, and on the consideration of resources and environmental function sustainability.

2. The science and technology are directed to utilize information technology and communication, transportation technology supply, health technology, material technological development, and the development of amount of discovery and its utility in the production sector. Such support is conducted through science and technology HR development, in harmony with the market need, the development of facilities and infrastructure of science and technology and the development of science and technology intermediary mechanism. The support is expected to strengthen the innovation system to boost the knowledge-based economy knowledge. Further, it also endeavours to improve a research cooperation of inter-institution such as university and business world, venture capital and product-based new industry growth.

#### C. Sufficient and Advance Facilities and Infrastructure

1. Transportation development is directed to boost the trade transaction as movable resources of people, goods, and services to become a transportation business market segment through mutual political trading; to create inter and intra-mode transportation service networks through the development of facilities and infrastructures of transportation, and followed by utility of e-commerce in the context of paperless document; to synchronize regulation encompassing of either investment or transportation service performance to provide law certainties for all pleased parties; to support investment and infrastructure operation and transportation facilities; to boost all stakeholder to participate in the service supply beginning from the phases of planning, development, to its operation; to abolish all types of monopoly to provide an choice alternative for the service user; maintain the government supports as regulator for the public service; to unite perception and steps for transportation service supplier actors in the context of global services; to accelerate and smooth passenger and goods loading movement, to build public transportation facilities; to create Transportation System Blue Print.
2. The telecommunication development is directed to stipulate long term competition platform in the implementation of telecommunication; anticipation of telecommunication convergence implication; information technology and broadcasting both on the institution and regulations including issues related to



safety, secret, privacy, and information integrity; Intellectual Right; and legality which later can result in market and industry convergence; optimality on development and post and telecommunication infrastructure utility and non-telecommunication infrastructures in the telecommunication performance; utility of neutral technological concept responsive to the industry and market needs, but still maintaining the existing system intact; the public understanding and knowledge increase on the telecommunication utility potential and information technology-based application utility; and development of content industries and application as an efforts of creating additional values and information.

#### D. Law and Bureaucracy Reform

1. Law development is directed to support the implementation of sustainable economic growth, regulating economy-related problems, mainly the business and industrial worlds, and the creation of investment certainty, mainly law re-enforcement and protection. The law development is also directed to abolish the possibility of criminal acts on corruption and to handle and settle completely the CNN related problems. The law development is conducted through law material reform, on the consideration of acceptable law pattern pluralism and globalisation impacts as an effort of improving law certainty and law protection, re-enforcement of law and Human Right, law awareness, and law service in the core of justice and truth, order and welfare in the frame of government implementation in more order, regular-arranged, smoother and global competitiveness.

#### IV.1.4 IMPLEMENTATION OF SECURITY AND CONDUCIVE ENVIRONEMNT

- A. **Security and Conducive Environment** is to solidify security and in order condition to maintain self confidence and regional dignity in external and internal pattern (regional, national and international) so that it is able to support a good image. This is very important because Denpasar City realizes the regional income resource to support developmental programmers depends very much on tourism, while tourism is very susceptible to a security factor. This condition can be established synergistically with all stakeholders (Pakraman village, Potabes, business world, public and government) on the establishment of more accurate system and handling network of security and order. To implement the security and conducive environment, the policy direction which will be led is as the following:

1. Improving the public participation and related institutional professionalism with security problem to guarantee the public security and order.



2. The order and law enforcement, and the implementation of protection, guarding, and services to public.
3. Coping and prevention of communal conflict on the background of ethnic, race, religious groups.
4. Coping and preventing the Public security and order disturbance.
5. The prevention of cases due to consuming goods and services.
6. Conducting a comprehensive synergized effort to decrease drug abuses' addict figures.
7. Empowerment of Security Potential and Terrorism Coping Coordination.

This Policy direction refers to approach police and public to encourage the public to cooperate with the police through the public elucidation in helping the main police duty to create the public security and order. The main orders which will be conducted are:

1. Public empowerment through the establishment of anti-crime public groups.
2. The empowerment of public members for their own accord
3. Guidance and elucidation for security.
4. Maintenance of the Public Appeasement and Order..

This policy direction aims at implementing the public security and order system to protect all city citizen of the public appeasement and order disturbance according to the acceptable laws and regulation. The main principles which will be conducted are:

1. Improvement in quality of civil service police through regional regulation Enforcement;
2. Public guiding, guardianship, and protection;
3. Public order and regulation through regional regulation enforcement.
4. Increase in quality and civil official investigator quantity

#### B. Law-Based Democracy

Denpasar in democracy and law based is a important foundation for the achievement of an advanced, independent, and fair development. Democracy will improve public participation in various developmental fields and maximize public potential and transparency. Meanwhile, law basically assures the appearance of positive aspects of humanity and combat negative aspect of humanity. Law application obeyed and followed will create an order and the guarantee of public potential expression maximally. To implement the Denpasar in democracy and fairness it is necessary to solidify strong democracy institution; strengthen civil society role; strengthen quality of regional autonomy and decentralization; guarantee media development and media freedom to communicate the public interest;



improve law structure and develop law culture and enforce law fairly, consequently, indiscriminately, and poor public support.

1. Political structure completeness that emphasizes on democracy institutional process shall be conducted by: (a) promoting and socializing the importance of stronger constitutional existence and with a high credibility as basic instruction for a sustainable democracy process; (b) Managing relation Inter-political institution in the life; (c) improving governmental institutional performances in conducting authority and function given by Constitution and laws and regulations; (d) solidifying the Implementation of decentralization and regional autonomy, and preventing disintegration and disunion; (e) reconciling completely; and (f) creating a further democracy institution to support the sustainable democracy consolidation.
2. The government role management and the people that emphasize on the public adultery and independency, the establishment of a strong middle class in the field of economy and education. In addition, the government and public role management is directed to positive function management of the public pattern, law institution and political institution to establish public independency in managing the destructive social conflict potential.
3. The political process management that emphasizes on the representation/ allocation process of authority in the implementation of: (a) improving in writing continuously the quality process and mechanism of more open public selection for the public and political officials. Implementing a strict political commitment of the mass media freedom interest, freedoms of unity, assemble, and state opinion of each citizen based on each political aspiration.
4. Development of political culture that emphasizes on democracy values establishment process in the effort of: (a) the creation of cultural awareness and democracy political values establishment, mainly the Human Right value accolade, equality values, anti-violence, and tolerance values, through various discourses and media; (b) the implementation efforts of various dialogues for the awareness improvement on the importance of maintaining unity and togetherness.
5. The improvement in role of communication and information that emphasizes on the public mind development process with: (a) implementing of more established and institutionalized press freedom and guarantee the public right widely to state their opinion and control the government implementation intelligently and democratically; (b) implementing of bigger information distribution by encouraging the independent mass media; (c) implementing of





higher deregulation so that it can guarantee more the information distribution and prevent information monopoly; (d) creating more interactive information network in nature between the public and the political decision maker sides to create easier policies understandable by wide society; (e) Creating information and communication technology able to connect all information links as one unity to bind and expand national and regional integrity; (f) utilizing the information and technological network effectively to give more comprehensive information to the public in order not to produce a misunderstanding which can make the government in difficult position.

6. Law development is directed to implement more a firm Regional law system on the source of Five Principle and the Constitution 1945, which encompass of law material development, law structure including law official, facilities and infrastructure of law and the public implementation which have a high awareness and law culture to implement law supremacy, creating democratic and fair society. Law development is conducted through law reform on the account of acceptable law management plurality and globalization Impact as an effort to improve law protection and certainty and Human Right, law awareness, and law service in core of justice and truth, order and welfare to implement the government that is more order and regular-arranged, and the smoother development implementation.
7. Law material development is directed to continue law reform which reflects social values and social interest and is able to encourage the creativity growth and public involvement that are very necessary to support the implementation of government end development performance which include law planning, law establishment, research and law development. On the other side, it shall fill in the law vacuum as quickly-changed strategy environment. The law planning as a part of law material developmental process shall be implemented on the account of influencing aspects either in the internal society or in a global social intercourse conducted integrally and including all developmental fields. Accordingly, the law products resulted can meet the living needs of public, government and can anticipate the era development. Meanwhile, the law establishment holds under the process of integration and democracy, and result in law products along with implementation regulation which can be applied effectively, supported by research and law development based upon the aspiration of the public needs. The research and law development are directed to such all aspects of living that the law can follow the progress and dynamic development according to current needs and in the future. To improve





the research quality and law development, it needs cooperation with related various institutional components.

8. The development of law structure is directed to solidify and make various organization and law institution effective, law profession and justice board so that the law regulation is able to perform their duties and obligation professionally. The law official capability and quality shall improve through the development of quality and professionalism on the basis of education and training system under an accommodative curriculum on each developmental progress; and the law official attitude improvement that respects highly honesty, truth, openness, and justice, free from corruption, collusion, and nepotism, and responsibility for the model behaviour form. The law official in the implementation of duties and obligations professionally needs to be supported by sufficient law facilities and infrastructure so that it can work well.
9. The increase in public implementation to have a high-law awareness must be increased continuously by giving more access of information needed by the society, providing access to the society on the involvement of various decision making process on the Regional developmental executors. Accordingly, each social member realize and comprehend fully the right and obligation as citizen and the establish citizen behaviour to have sense of belonging and law obedience.
10. The fulfillment of the governmental authority misuse coping reaches under the application of good governance principles on each level and government line and all aspects of activity; the sentence on as heavy sanction to actors of authority misuse as possible according to the acceptable provision; the improvement of intensity and effectiveness of official monitoring through internal, functional and social monitoring; the improvement of bureaucracy and work culture and taken knowledge and understanding of the government executive on a good governance.

### C. Beautiful and Sustainable Denpasar

Natural resources and environment are the Regional developmental asset and as the living system support. The sustainable natural resources will guarantee the availability the sustainable resources for the development. The beautiful environment will increase the human living quality. Therefore, to implement the Denpasar with culture-oriented, progressive and competitive the human resource and environment must be managed equally to guarantee the sustainable development. The application of sustainably developmental principles at all sectors and zones become the main requirement in the implementation of developmental activities.



1. Utilize Newest natural resource. Newest natural resources such as city forest, agriculture, aquaculture, and waters must be managed and utilized rationally, optimally, efficiently and accountably by utilizing all functions and benefit equally. The newest natural resource management in the critical condition shall be directed to the effort of rehabilitation and reforestation the supporting power, and then is directed to the environmental service utility in order not to destroy more and abolish the capability as assets of the sustainable development. The result of revenue originating from the newest natural resource utility is re-invested to grow the reforestation efforts, rehabilitation, and reserve for today's or future's generation.
2. Keep and make sustainable water resources. The management of water resources is directed to guarantee the supporting power sustainability by maintaining water capturing regional function sustainability and soil water existence; implement equality between supply and need through demand management approach referred to improve effectiveness and efficiency of water consumption and using and supply management approach referred to improve capacity and water supply reliability, strengthening water supply institution to improve integrity and service quality to the public.
3. Develop the marine resource potential. The direction of the next 20 years development requires to take into account of the existing marine potential utility. The marine potential utility and coverage are very extensive. Accordingly, the utility direction shall be done through the multi-sector approach integrally and comprehensively to minimize conflicts and to maintain to keep its sustainability. In addition, in view of the problem complexity of coastal, marine resource, the integrated approach in the policy and planning becomes a key requirement to guarantee the social, economic and environmental sustainability process. Further, the policy and marine developmental management shall integrate between marine and land sectors and unite into the Regional development strategy. Therefore, marine and land strength can be utilized optimally for the public welfare.
4. Geographically, Denpasar lies in the tectonic intersection plate. The developmental policy in the sight of environment provides space to develop the early detection system: application and capability, early socialization and information dissemination on the natural disaster disturbance threat to the people. It therefore requires to increase identification and mapping in the sensitive natural disaster regions to anticipate early before it happens. This can provide a big benefit to the people



- and provides a human and property protection under a care/sensitiveness to natural disaster.
5. Controlling the environmental pollution and damages. To improve the environmental quality it is necessary to apply sustainable development principles in all aspects. The economic development is directed to the utility of environment service which is friendly to environment in order not to accelerate degradation and environmental pollution. Recovery and rehabilitation of environmental condition is prioritized on the efforts of improving environmental supporting power to support the sustainable development.
  6. Increasing capacity of Natural Resources management capacity and environment. The policy of Natural Resources management requires to be supported by the increase in Natural Resources and environment executive capacity; a credible law enforcement which is fair and strict; a credible ethical system to control conflict; Qualified HR; environmental ethic application extension; stronger culture and social assimilation. Thus, the environment can provide a comfort and beauty for the living. Thereafter, the way of sight on the environment on the view of environmental ethic requires to be encouraged through the internalization into production and consumption activities, the implementation of daily environmental ethic and values, including the social learning process, and formal education at all levels.
  7. Improving the public awareness to love the environment. This policy is directed mainly for the young generation to create the qualified HR that concerns to the Natural Resources and Environment issues. Accordingly, in the future they are able to play their role as motivators for the sustainable development concept application in daily living.

#### IV.2 PHASE AND PRIORITY SCALE

To reach the main target as meant in the long term development, it requires phases and priority scales. This will become an agenda in the planning of middle short term. This priority scale will reflect the problem urgency encountered. The priority scale emphasize can be varied, but having a sustainable characters from one phases to another in the corridor of implementing the long-term development principle target.

##### IV.2.1 RMTDP 1<sup>RT</sup> (2005-2010)

Following up the development result on the previous phases, MTDP 1<sup>st</sup> is directed to re-manage and develop Denpasar and city self-confidence and



character through the institutional empowerment of pakraman, culture and religious understanding.

The development of self-confidence and city of Denpasar character is signed by City communicative development encompassing a dynamic effort to revitalize human and public basic capability to survive sustainably in the changing security and order environment. Human basic capability such as having an innovative thinking creatively to develop and grow adaptively, not to grow to leave their culture. This human basic capability is packaged into a very strategic priority and human expectation, and the city public have a position as subject in a complex developmental position and multi-dimension without leaving their self confidence, cultural synergy, religion and education which as strong buffering zones in the effort of maintaining self-confidence in the changing and dynamic city habitat.

#### IV.2.2 RMTDP 2<sup>ND</sup> (2010-2015)

On the basis of implementation and achievement and as a follow up of RMTDP 1<sup>ST</sup>, the 2<sup>nd</sup> RMTDP emphasizes on the social economic system strengthening to support fair and equal distribution development, reducing social gap gradually and completely, social supports, decrease in poverty sustainably, provision of a straight access for the public on various social service and economic facilities and infrastructure and decrease in discrimination in various aspects sustainably.

The strengthening of social economic system in supporting the more equal development has many dimensions. Of those dimensions the regulation dimension will become a core of social economy strengthening through simplicity of regulation related to a targeted-investment system. The creation of conducive investment system makes opportunities and chances to do business for the public opened widely. This condition will create a dynamic and equal capital cycle.

A logical consequence from the social system strengthening policy is to drive economic structure consistently and sustainably such as agriculture, mine and digging, processing industrial, gas and electricity and fresh water, building, trade, hotel and restaurant, transportation and communication, financial, renting and company service.

#### IV.2.3 RMTDP 3<sup>RD</sup> (2010-2020)

In reference to the implementation and achievement result and various RMTDP 2<sup>nd</sup> result, the 3<sup>rd</sup> RMTDP aims at implementing the human resource (HR)



quality increase to direct the winning of competitive HR in the priority of quality and competitiveness, increasing science and technological utility involvement, an advanced infrastructure development.

At such condition, public independency plays a very important role. The government shall facilitate the public provisions only in the direction of progressiveness, various developmental innovations is expected to create HR quality improvement. Accordingly, the expectation to implement the public welfare improvement will get more a significant finding point.

The Human Resource (HR) quality improvement with the priority of improvement in competitiveness and science and technological mastery is directed to create and command of science either basic or applied science, and contribute social science and humanity to produce technology and engineering for the public welfare, independency and competitiveness through capability improvement and science and technological capacity which are always guided by a glorious values.

#### IV.2.4 The 4<sup>th</sup> RMTDP (2010-2025)

In reference to the success and achievement and various sustainability of the 3<sup>rd</sup> RMTDP, the 4<sup>th</sup> RMTDP emphasizes on security and conducive environment, solidifying conducive security condition to maintain self-confidence and regional dignity in the external or internal pattern to support a good image and prestige. This becomes very strategic considering that Denpasar City has no sufficient natural resources to contribute a high national income. Many involved in interest of tourism provide the reliable regional income source to support the development. This condition can be established through synergy by several stakeholders such as tourism sides, traditional village, Regional Police and related component.

Security to have a very strategic value to support the public welfare improvement, under maintained security condition and comfort, investment climate will move increasingly and can create sufficient job opportunities for the public.



## CHAPTER V CLOSING



## **APPENDIX 5.13.2**

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# **SANITATION SECTOR PART OF DENPASAR CITY DEVELOPMENT STRATEGY**





Volume 8  
FINAL REPORT

# DENPASAR CITY SANITATION STRATEGY FINANCIAL CONDITIONS AND FUNDING ARRANGEMENTS

DENPASAR CITY GOVERNMENT  
SANITATION WORK GROUP  
DENPASAR CITY

March 2008

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## PREFACE

Our praise and gratitude to God Almighty (Ida Sang Hyang Widhi Wasa), for by His Grace the Final Report on Financial Condition and Funding Arrangements was finished by the Sanitation Work Group of Denpasar City on the account of Indonesia Sanitation Sector Development Program (ISSDP), in which Denpasar City takes part as one of its participants.

The financial condition and funding arrangements have become an important issue during the planning and the implementation of sanitation sector development program. The limited budget of city government to fund the development requires further innovations to dig the internal and external funding potentials. In this report, Denpasar City Sanitation Work Group describes the funding strategy which elaborates the funding sources and potentials which can be used and the attempts of improving the financial performance.

The City Sanitation Strategy Document has been described comprehensively during the City Sanitation Strategy Public Consultation on March 25<sup>th</sup>, 2008. Various inputs and suggestions have proved to be incredibly valuable in finalizing the Final Report on Financial Condition and Funding Arrangements.

Lastly, hopefully this report will be useful for the development of sanitation sector.

Denpasar, March 31<sup>st</sup>, 2008

**HEAD OF DENPASAR CITY  
SANITATION WORK GROUP**

*[sealed and signed]*

**Ir. A. A. Bagus Sudharsana, Dpl. Plg**

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# CHAPTER I

## INTRODUCTION

### 1.1 Backgrounds

Denpasar City government places sanitation sector development as one of the city development priorities in order to achieve the 2005 -2010 Denpasar City Development Vision and Mission of “becoming a cultured city based on harmony in continuous balance”. To achieve the goals of sanitation sector development, Denpasar City government realizes that a large amount of budget will be needed for this purpose.

Analysis on the funding and financial condition is carried out to obtain an understanding of the actual financial condition, including potentials which may be optimized or expense that might be minimized. Empirically, the understanding of financial condition will direct the steps towards revenue improvement and cost minimization, such as mobilization of income sources and intensification (PAD) and optimizing the usage of expense budget. The PAD sources which can be optimized are regional tax and retribution as well as separable asset. The Regional Enterprise Empowerment and Optimization (BUMD) are highly needed to improve the service quality to the public and contribute to the PAD. Aside from PAD, potential funding sources besides City APBD which can be mobilized for the development of sanitation sector include Provincial APBD, APBN, grants, Private Corporate Social Responsibilities, Clean Development Mechanism by the UN, etc.

### 1.2 Purpose and Intention

The financial condition and funding arrangements are meant to guide the improvement of financial performance so that it may become more effective and efficient.

The purpose of this Financial Condition and Funding Arrangement is the capacity building of city government and other urban stakeholders to identify and map the city government’s financial conditions, establish financial performance improvement strategies, compile action plans and carry out financial performance improvement, especially in the development and management of 2008 -2010 Denpasar City sanitation sector.

### 1.3 Approach and Method

In compiling this Financial Condition and Funding Arrangements, the following approaches were carried out:

- Regular meeting with work group members coordinated by the Bappeda of Denpasar City as Head of work group
- Panel discussion with stakeholders concerning the sanitation sector management
- Conducting Denpasar City Sanitation Strategy Workshop

The following methods were used in compiling the strategy:

- focus group discussions
- interviews with various sources/in depth interviews

#### **1.4 Report's Systematics**

The systematics of this report on Financial Conditions and Funding Arrangements go as follows:

- Chapter I is an introduction which describes the backgrounds, purpose and intention, approach and methods used and systematics of report
- Chapter II contains financial condition and problems including general views on city finance, sanitation funding, sources of fund used, 2008-2010 sanitation budget, and financial problems
- Chapter III consists of potential fund sources including potential sources for general program funding and large scale programs
- Chapter IV describes funding strategy, including cost minimization, funding from budget surplus, improvement of sanitation service's cost recovery, mobilization of local fund sources, improvement of coordination with provincial and central government, city government as facilitator and regulator, foreign loans and grants and private sector investment
- Chapter V describes program in the form of action plans
- Chapter VI is the closure
- Appendix consists of supporting data

## CHAPTER II

### FINANCIAL CONDITIONS AND PROBLEMS

#### 2.1 General Views on City Finance

The Denpasar City income development in 2005 -2007 Budget Year can be seen in the following table:

Table 2.1 2005 -2007 Denpasar City Income Development (millions of IDR)

No.	Description	Realization		Budget	Growth (%)
		2005	2006	2007	
<b>1.</b>	<b>Regional Original Income</b>				
1.1	Regional Tax	75,653	68,622	75,200	-0.6%
1.2	Regional Retribution	29,059	40,493	37,445	28.9%
	• Retribution outside Sanitation Sector	26,784	38,226	35,178	31.3%
	• Retribution of Sanitation Sector:	2,275	2,267	2,267	-0.4%
	– Garbage Retribution	2,275	2,267	2,267	-0.4%
	– Market Garbage Retribution				
1.3	Regional Business Profit Share	4,081	5,108	4,633	13.5%
1.3	Other Legitimate Regional Original Income	7,509	11,925	6,889	-8.3%
	Total Regional Original Income	116,303	126,148	124,167	6.8%
<b>2.</b>	<b>Equilibrium Fund</b>				
2.1	Tax/Non Tax Profit share (with the Central government)	53,281	69,353	61,119	14.7%
2.2	General Allocation Fund	187,085	283,845	331,448	77.2%
2.3	Special Allocation Fund	7,420	18,850	7,935	6.9%
2.4	Tax Profit Share and Financial Aid from the provinces	38,585	41,055		6.4%
	Total Equilibrium Fund Income	286,371	413,102	400,502	39.9%
<b>3.</b>	<b>Other Legitimate Income</b>				
3	Total Legitimate Income	12,287	2,143	43,607	254.9%
	<b>Total City Income</b>	<b>414,961</b>	<b>541,394</b>	<b>568,276</b>	<b>36.9%</b>

Source: 2005, 2006 and 2007 Budget Realization

The 2005-2007 Denpasar City expense development can be seen in the following table.

**Table 2.2 2005-2007 Denpasar City Expense Development (IDR million)**

No.	Description	Actual		Budget	Growth (%)
		2005	2006	2007	
<b>1. Regional Apparatus Expense</b>					
1.1	General Administrative Expense	201,246	237,575		
1.2	Operational and Maintenance Expense	19,322	22,406		
1.3	Asset Expense	7,174	13,652		
<b>2. Indirect Expense</b>					
2.1	Employee's Expense			318,146	
2.2	Subsidized Expense			5,000	
2.3	Grant Expense			2,650	
2.4	Social Aid Expense			4,211	
2.5	Profit Share Expense to Province/Regency/Town and Village government			4,261	
2.6	Financial Aid Expense to Province/Regency/Town and Village government			11,497	
2.7	Unexpected Expense			1,500	
<b>Total Regional Apparatus Expense &amp; Indirect Expense</b>		<b>227,743</b>	<b>273,633</b>	<b>347,264</b>	<b>52.5%</b>
<b>3. Public Service Expense</b>					
3.1	General Administrative Expense	11,325	11,947		
3.2	Operational and Maintenance Expense	65,678	112,642		
3.3	Asset Expense	17,683	58,485		
3.4	Profit Share Expense and Financial Aid	43,451	55,393		
3.5	Unexpected Expense	2,247	894		
<b>4. Direct Expense</b>					
4.1	Employee Expense			50,930	
4.2	Goods and Service Expense			184,589	
4.3	Asset Expense			96,359	
<b>Public Service Expense &amp; Direct Expense</b>		<b>140,385</b>	<b>239,361</b>	<b>331,878</b>	<b>136.4%</b>
<b>Total Expense</b>		<b>368,128</b>	<b>512,994</b>	<b>679,142</b>	<b>84.5%</b>

Source: 2005, 2006 and 2007 budget realization

## 2.2 Sanitation Funding

Sanitation sector funding in the 2005 -2007 Budget Year can be seen in the following table:

**Table 2.3 2005 -2007 Sanitation Sector Funding (IDR)**

No.	SUBSECTOR		2005	2006	2007
1	Waste Water	OM	307,735,000	572,349,680	1,492,377,651
		Investment			
2	Garbage	OM	13,682,895,000	20,569,028,500	22,141,581,430
		Investment	621,201,000	2,004,248,300	968,494,000
3	Drainage	OM	1,299,750,000	2,713,942,700	2,090,660,800
		Investment	2,245,240,000	6,453,123,100	2,852,299,000
4	PHBS	OM	121,980,000	743,896,500	827,412,116
		Investment			
Total			17,971,066,000	32,484,239,100	28,880,447,346
Total APBD Expense			368,128,100,000	512,994,264,848	679,142,073,182
% of APBD Expense			4.88	6.33	4.25

Source: 2005,2006 and 2007 Budget realization



## 2.3 Source of Fund Used

Generally the source of fund used for the development of sanitation sector in Denpasar City is the Denpasar City PAD, Bali Province APBD, and APBN. The sources of income of Denpasar City aside from equilibrium fund and other legitimate income sources are shown in the following table:

Table 2.4 Denpasar City Income Sources in 2005-2007 (IDR million)

No.	Description	Income		
		2005	2006	2007
1	PAD	116,302	126,148	124,167
		28.0%	23.3%	21.8%
2	Equilibrium Fund	286,371	413,102	400,501
		69.0%	76.3%	70.5%
3	Other Legitimate Income	12,287	2,143	43,607
		3%	0.4%	7.7%
<b>Total</b>		<b>414,961</b>	<b>541,394</b>	<b>568,276</b>

### Regional Original Income (PAD)

If seen from the collected data, Denpasar City PAD contributes between 21 -28% of the total city income with decreasing trend, but it cannot be predicted only from the above data which is obtained every three years. With such proportion of PAD budget, it is very likely that the sanitation development needs cannot be fulfilled by PAD alone. The following table shows the components of PAD income:

Table 2.5 2005 -2007 PAD Component (IDR million)

No.	PAD Component	Income		
		2005	2006	2007
1	Regional tax	75,653	68,622	75,200
		65.0%	54.4%	60.6%
2	Regional Retribution:	29,059	40,493	37,445
		24.9%	32.1%	30.2%
	– Non-Sanitation Retribution	26,784	38,226	35,178
		23.0%	30.3%	28.3%
	– Sanitation Retribution	2,275	2,267	2,267
		1.9%	1.8%	1.8%
3	Regional Business Profit Share	4,081	5,108	4,633
		3.5%	4.0%	3.7%
4	Other Regional Original Income	7,509	11,925	6,889
		6.5%	9.5%	5.5%
<b>Total PAD</b>		<b>116,303</b>	<b>126,148</b>	<b>124,167</b>

- **Regional Tax**

Regional Tax is the largest contributor of PAD (around 54 -65% of total PAD). Therefore, regional tax is one of the most important components of PAD of which the performance must be maintained. According to the acquired data, the largest contributing tax object is not yet identified. In order to maintain the tax performance, other potential tax objects must be used as far as it is still within legal limits and is not counterproductive towards Denpasar City's economic activities.

- **Regional retribution**

Aside from regional tax, other PAD component which also gives a significant contribution is the regional retribution component. In 2005 -2007, the regional retribution contributes as much as 24% - 32% with annual growth rate of 28.9% in 3 budget years. With such

significant contribution and positive growth rate the component's contribution percentage tends to rise in the total PAD mount. In 2005, the regional contribution reached 24.9%, but it then decreased to 30.2% in 2007. With the development of Denpasar City, retribution must also rise along with the city's development.

In order for the sanitation sector to give a more significant contribution, profound study must be carried out, supported by the establishment of regional regulations, especially to ensure the continuity of the sanitation services.

As initial analysis, the potentials for tax and retribution income -especially sanitation retribution -obtainable by Denpasar City can be determined. With the specification of the income potentials, the future sanitation development plans can also be established.

- **Equilibrium Fund**

The limited ability of city funding to pay for all government service functions in a legal and formal manner shall be aided with the equilibrium fund. This is in accordance to the decentralization mechanism regulated in Law No. 32/2004. Considering Denpasar City's income source composition, the proportion of equilibrium fund towards Denpasar City's total income is still very dominant, and will be even more dominant in 2005 -2007. The proportion of equilibrium fund in 2005 is 78.2%. It went down to 76.30% in 2006 and increased to 78.0% in 2007. This shows the high level of dependency on the Central government to fund for Denpasar City government activities. Therefore, it is important to improve self-financing ability (PAD) to decrease the dependency on Central government. The proportion of each sub-component in the equilibrium fund is shown in the following table:

Table 2.6 2005 -2007 Equilibrium Fund (IDR Million)

No.	Description of Equilibrium Fund	Income		
		2005	2006	2007
1	Tax/Non-Tax Profit Share (with Central)	53,281	69,353	61,119
		18.6%	16.8%	15.3%
2	General Allocation Fund (DAU)	187,085	283,845	331,448
		65.3%	68.7%	82.8%
3	Special Allocation Fund (DAK)	7,420	18,850	7,935
		2.6%	4.6%	1.9%
4	Equilibrium Fund and Financial Aid from the Province	38,584	41,055	42,373
		13.5%	9.9%	9.6%
<b>Total Equilibrium Fund</b>		<b>186,371</b>	<b>413,102</b>	<b>443,239</b>

- **Tax/Non-Tax Profit Share with Central**

Tax/Non-Tax Profit Share with Central gives around 18% contribution and has decreased to 15% in 2007 of the total equilibrium fund for Denpasar City. The data shows that the proportion of this sub-component towards the total equilibrium fund tends to decrease. This must be observed considering that the profit share tax subject has been specified according to the existing laws. Therefore, re-inventorisation of Denpasar City profit share tax subjects must be carried out and attempts must be made to increase the tax subject income.

- **General Allocation Fund (DAU)**

DAU is the most dominant sub-component of Equilibrium Fund. The proportion of contribution given by DAU towards the equilibrium fund reaches more than 65% with tendency of increasing up to almost 82% of the total equilibrium fund of Denpasar City in 2007. Considering the DAU fund allocation for regional state employee paycheck, there

was no salary raise for State employee in Denpasar City in 2005 -2007. This indicates that the DAU fund was used to cover the fiscal gap needed by Denpasar City to conduct public services.

However, considering the low development of sanitation basic facilities in Denpasar City, it is likely that the fund was used for other priorities of Denpasar City. Based on this fact, it is possible that in the future, a part of DAU can be used to fulfill the needs for development of sanitation sector.

- **Special Allocation Fund (DAK)**

DAK is APBN budget allocated for regional administrative to carry out programs specified by the Central. According to its purpose, the amount of DAK budget for Denpasar City has been very fluctuative from 2005 to 2007. Therefore, DAK budget cannot be assigned entirely for sanitation, and strategic attempts must be made to encourage the Central to prioritize sanitation in DAK allocation plan.

- **Tax Profit Share and Financial Aid from the Province**

Just like the Tax/Non-Tax Profit Share with Central government, the Tax profit share subject with the province is also specified through a provision of law. From the collected data, it seems that the contribution made by this sub-component is fluctuating, from 9.90% in 2005 to 12.60% in 2006 and then decreased significantly to 7.90% in 2007. This sub-component's fluctuation towards the total equilibrium fund must also be observed to maximize the potential income of Denpasar City. For initial analysis, improvement of consolidation and coordination between the Denpasar city government with the Bali Province government must be carried out.

- **Regional Funding**

According to the new financial regulations (Law No. 17/2003 concerning State Finance), the budget surplus is designated as one of the income posts. In the case of Denpasar City, the budget surplus seems to decrease to -16.3% in 2007 (12.7% in 2005).

According to Government's Regulations No. 58/2005 concerning Regional Finance Management, APBD is a unity of: regional income, regional expense and regional funding. In this case the regional funding consists of funding income and expense.

Funding income consists of:

- Surplus from the previous year budget;
- Liquidation of reserve fund;
- Separated Regional Asset Sales;
- Loan Income; and
- Re-Loan Income

Whereas funding expense consists of:

- Establishment of reserve fund;
- Regional government's asset accompaniment
- Debt Payment; and
- Loan procurement

The Denpasar City budget surplus is described in the following table:

**Table 2.7 2005-2007 Budget Surplus Development (IDR Million)**

Budget Surplus Development	Actual		Budget 2007	Growth (%)
	2005	2006		
Total Income	414,961	541,394	568,276	36.9%
Total Expense	368,128	512,994	679,142	84.5%
Surplus/Deficit	46,833	28,399	-110,866	-336.7%
Surplus/Deficit % of total expense	12.7%	5.5%	-16.3%	

The above data shows the budget deficit in 2007 (unaudited). However, data of the previous years show a surplus of budget between 5 to 12%.

## 2.4. 2008 -2010 Sanitation Budget

The 2008 -2010 sanitation sector budget can be seen in the following table.

**Table 2.8 2008 -2010 Sanitation Sector Budget Plan (IDR)**

No.	SUBSECTOR	2008	2009	2010
1	Waste Water	1,638,586,000	1,205,000,000	4,845,000,000
2	Garbage Disposal	509,841,050	26,445,000,000	32,250,000,000
3	Drainage	5,343,600,000	14,320,000,000	14,820,000,000
	Total	5,853,441,050	40,765,000,000	47,070,000,000

## 2.5 Financial Problem

### 2.5.1 Regional Original Income (PAD)

If seen from the APBD Data of Denpasar City for 2005-2007, the city's PAD is still relatively small compared to the total budget. Therefore, equilibrium fund is still the main motor in establishing Denpasar City's budget. In this case, Denpasar City PAD contributes up to 21 -28% of the total income, but tends to increase within the last 3 years (2005-2007).

**Table 2.9 2005-2007 PAD Development (IDR million)**

PAD Development	2005	2006	2007	Growth (%)
Total PAD	116,302	126,148	124,167	6.8%
% of PAD from the total income	28.0%	23.3%	21.8%	
Regional Tax	75,653	68,622	75,200	-0.6%
% of Tax from the total income	18.2%	12.7%	13.2%	
Regional Retribution	29,059	40,493	37,445	28.9%
% of Retribution from the total income	7.0%	7.5%	6.6%	
% of tax + retribution from the total income	25.2%	20.2%	19.8%	

The regional tax sub-component shows a decrease from 18.2% in 2005 to 12.7% in 2006 and 13.2% in 2007. Retribution shows a fluctuating tendency from 7% in 2005 to 6.6% in 2007, although it does have a positive growth of up to 17.4% in 2005 -2007.

According to the above data, the development of retribution, especially sanitation retribution, must be improved considering that the growth of Denpasar City as well as its population will serve as a potential for improving the sanitation retribution. Aside from that, studies and improvement of tax subject and retribution must also be carried out as far as it is not opposed to the provisions of law or becoming counterproductive against Denpasar city's economy. The sanitation retribution is especially aimed at the city's sanitation management to make Denpasar City's sanitation condition well. The prime condition of sanitation is expected to draw more investment on Denpasar City -in tourism, trade and other commercial sectors -which in turn will increase the city's economy. Also, regional tax and retribution improvement will strengthen the city's PAD and decrease the city's dependency on fund from the Central Government, thus improving Denpasar City's financial independence.

### 2.5.2. Sanitation Service's Cost Recovery

Denpasar City's public services often have problems of funding, which mainly comes from DAU. The limited amount of available fund is not enough and therefore other means of funding must be found in order to execute the services optimally. One of such manners includes the involvement of private sector and the society. In sanitation sector, the society has been involved in managing garbage, in which the people pay for garbage disposal services run by the local area, KSM or the village, or for stool mud suction service by private companies. However, the city government still find it difficult to withdraw the garbage retribution to move the garbage from temporary disposal site to final disposal site (TPA) as well as the garbage management in TPA. This problem has become an issue of its own, often related to how the Denpasar City government can give urban sanitation services in a continuous basis.

- **Waste Water**

At the moment, Denpasar City's centralized waste water management system is still not operational. Denpasar City government is still budgeting the connection of homes to DSDP project waste water channel. SANIMAS is run by the people to cover the direct cost of the communal waste water management basic facilities' operational and maintenance.

- **Garbage Management**

The income gained from Denpasar City's garbage management service retribution shows an increase. Generally the income and expense budget for garbage management can be seen in the following table:

**Table 2.10 Expense and Income for Garbage Collection (IDR)**

Year	Garbage Expense			Retribution	% of income from	
	Operational	Investment	Total		Total	Operational
2005	13,683	621	14,304	2,275	15.9%	16.6%
2006	20,569	2,004	22,573	2,267	10.0%	11.0%
2007	22,142	968	23,110	2,267	9.8%	10.2%

Source: 2005, 2006 and 2007 Budget Realization

The important thing about the above data is the decreasing retribution income towards garbage management services' operational expense. With a relatively stable amount, it seems that the total expense and operational expense continue to increase. The cause for the increasing garbage management service's operational cost must be observed and studied even further. The above data can also serve as an input to calculate the cost recovery value of the current garbage management service or the cost recovery of the future garbage management service's development plan.

Aside from cost recovery of the garbage management service, retribution per capita for garbage management sector can also be calculated to compare the society's level of ability in giving garbage service retribution. The amount of garbage management retribution per capita can also be used as an input for the comparison between Denpasar City's inhabitants' ability to pay and the amount of subsidy that must be given by the Denpasar City government.

### 2.5.3 The Lack of Regional Regulations on Sanitation Retribution

To establish the amount of sanitation retribution, not only investment, operational and sanitation infrastructure maintenance costs that must be calculated, but also the public's willingness and ability to pay for the sanitation services. In the case of sanitation retribution in Denpasar City, it seems that the public's willingness and ability to pay is still low, except for essential needs such as neighborhood garbage collection retribution that is usually organized by the Banjar or

village authority. There is still no obligation to pay for further retribution of garbage management of urban scale.

Therefore, Denpasar City government must be able to create a breakthrough among the people, so that they would pay for the retribution of urban-scale garbage management on the basis of beneficiary pays (polluter pays principle). The establishment of sanitation retribution has become obligatory considering that it is costly -in terms of infrastructure investment and its operation and maintenance -to provide a continuous sanitation service.

In relation to the public's ability to pay for the retribution, the government must also establish a subsidy scheme for sanitation service retribution by calculating the city's financial strength; because based on experience, the sanitation investment cannot yet make any cost recovery. Therefore, Denpasar City Regional Regulations must be made to govern matters of sanitation retribution, complete with legal sanctions for those who violate it. To maintain efficiency and effectiveness of retribution collection, regional tax or retribution on sanitation can be combined with drinking water, electricity or Land and Building tax retribution.

#### **2.5.4 Lack of Guide to Access Internal and External Funding Sources**

The procurement of public service in Denpasar City is often limited by the development fund itself. Based on the existing provisions of law, sources of fund which can be used to cover the loss of development fund have been listed. However, further issue rises concerning the lack of guide to access the list of fund sources, or the difficulties faced by the regional government when trying to access one. Aside from that, there is funding information -especially through Central project -that can be used by the regional government but is not being socialized properly.

## CHAPTER III

### POTENTIAL FUNDING SOURCES

#### 3.1 General Program

##### 3.1.1 APBD

APBD is the main source of funding for the development of sanitation in Denpasar City. Generally, APBD is the regional income in the execution of decentralization, which consists of Regional Income and expense. In details, there are income and expense components that can be used as sanitation funding source. From the income component, there are sub-components of PAD, DAU and DAK which can be optimized. In PAD sub-component, the sanitation retribution can still be maximized to strengthen Denpasar City's PAD. In DAU sub-component which has quite significant increase, the usage of DAU budget for sanitation is seen as viable. DAK sub-component is also expected to become one of the sanitation funding sources considering that sanitation sector is becoming increasingly important for the Central government. Based on the DAK allocation for 2008, Denpasar City obtained the following sanitation budget allocation (if sanitation can be related to health, clean water, basic facilities and the environment).

**Table 3.1 DAK Allocation in 2008**

No.	Development Field	DAK Allocation (IDR billion)
1	Education	12,877
2	Health	4,928
3	Demography	0,690
4	Road	5,682
5	Irrigation	0,000
6	Clean Water	1,818
7	Fishery	1,631
8	Agriculture	1,824
9	Basic Facilities	0,000
10	Living Environment	1,557
11	Forestry	0,000
Total		31,007

The expense component consists of excess amount of regional budget calculation, regional loan income, regional reserve fund, and separated regional asset sales. From this expense component, the sub-component of remaining surplus from the previous fiscal budget year can be a source of sanitation founding for the current fiscal year.

##### 3.1.2 WASAPD Grant

WASAP-D is a grant given to the ISSDP partner cities -including Denpasar City -to test the implementation of City sanitation development strategies at hand. The fun, which comes from donor country, is distributed through World Bank/WSP to the Indonesian Government, and therefore follows the provisions posed by the World Bank<sup>7</sup>.

Unlike the previous fund from the Central government, WASAP-D does not recognize the term 'accompanying fund'. The general definition of 'accompanying fund' is that the initiatives come from the Central government (especially in terms of funding) and the City/regional government only provides an accompanying fund (generally as much as 10%).

<sup>7</sup> The detailed provision concerning the matter will be delivered further by the World Bank



In WASAP-D, the initiatives come from the City government -in this case Denpasar City -in the attempts of improving the sanitation condition and funding. The existence of these initiatives (including the funding) will be given 'bonus' by the Central Government so that the target specified by the City government can be achieved. The grant will be given mainly to test the strategic steps defined by City government, aside from familiarizing the City government in paying attention to non-physical matters (such as public preparation, sanitation campaign, the preparation of DED, etc.). If a portfolio with format on preparedness to solve sanitation problems in an integrate manner according to the specified Strategic Plan has been made, it will bring with it a sale value to the State or other donor body. The Central government will have a 'tool of sales' to obtain other fund that can be granted to the City in the field of sanitation. At first, it was planned that the WASAP-D fund would be liquefied for the 2009 TA since at that time the sanitation development strategy was already established. However, due to various considerations, the initial fund would be given in the 2008 TA. The fund is available, but several matters related to the Central government's administrative still requires more time to be finished.

### 3.1.3 Private Sector and the Public

Private sector is a potential partner whose participation can be further developed in building and developing the sanitation sector in Denpasar City. Private sector's involvement can be improved in the form of cooperation contract for the construction, maintenance, and operation of sanitation facilities as well as investment in sanitation sector -large or small scale alike.

For example, in Denpasar City the waste water sanitation infrastructure is dominated by the on-site system, in which septic tank is provided by the people themselves or by the housing developer. Neighborhood garbage collection is also paid by the people to private sector to transport their garbage to the temporary disposal site or TPA. Meanwhile, neighborhood drainage infrastructure is mainly built by the housing developer, and the cost for its maintenance is included in the garbage management fee.

In this case, sanitation infrastructure investment from small to large scale is still possible to carry out by private sector as long as the Denpasar government is willing to give a suitable amount of incentives for the investment. Investment for sanitation management in small scale can be carried out by building public bathroom, cleaning stool mud, building communal septic tank (off-site system), up to management and development of integrated waste water or garbage system of city and regional scale. For this investment category, the Denpasar City government will refer to President's Regulation No. 67/2005 concerning the Cooperation between the Government and Enterprise in the Procurement of Infrastructure.

Generally there are already sanitation management items that can be processed by the private sector and the people to aid the government in creating an optimum sanitation condition.



### **3.2 Large Scale Program**

#### **3.2.1 Integration of Sanitation Program to Large-Scale Program**

As is mentioned in the Government's Regulation No. 16/2005 concerning the Development of Drinking Water Procurement System, sanitation is a part of the drinking water system. Meanwhile, in MDG, sanitation is closely related to the attempts of eradicating poverty, decreasing birth mortality, and environmental issues. Also, considering the DAK allocation budget, sanitation is also included in the fields of healthcare, clean water, basic facilities and living environment. Therefore, the Denpasar City sanitation development program can be integrated to such related programs. This is also an alternative for Denpasar City's sanitation funding.

#### **3.2.2. Central and Provincial Budget**

Central and Provincial Budget can be another alternative source of sanitation development funding in Denpasar City. At the moment, the Department of Public Works has designed RPIJM (Mid-Term Investment Program Plan), which is a reference document for the Department of Public Works in planning, funding and investing on constructions at regency/city level. The suggestions funded by the Government include City program suggestions related to public works and sanitation sector. Therefore, the currently-planned Denpasar City sanitation development strategy can be included in the Denpasar City suggestion to be integrated into the RPIJM.

Meanwhile, Bali province budget can also be used, especially to fund the Provincial sanitation sector. The usage of provincial budget can be carried out through related grant. The program will be executed by the Bali provincial government or with the help of Denpasar city government.

#### **3.2.3 Foreign Grants and Loans**

Foreign grants and loans are aimed to cover the lack of development fund from the Indonesian government. Foreign loans and grants can come from: foreign countries, multilateral organization, foreign financial and non-financial organizations, which reside and conduct business outside the Indonesian territory. The activities which may be suggested by the Regional government to obtain foreign grants and loans include:

- Activities funded by foreign load for the loan agent;
- Activities funded by the loan agent and initiated by the Ministry/Organization; or
- Activities funded by foreign grants for grant agent.

The criteria of suggestion for Regional Government's program which can be proposed to obtain foreign loans and grants include:

- General criteria:
  - The activity is in accordance with the RPJM's directions and goals
  - The achievement of the activity's goals is a priority for national development
  - The activity must consider the executive ability;
  - Activity is technically more cost-efficient if funded by foreign loans and/or grants; and
  - The results of the activity can be operated by domestic resources and can be extended for other activities.
- Specific Criteria:
  - The investment activity for facilities and/or basic facilities which generate income on the APBD obtained from collection from usage of the facilities/basic facilities;
  - The activity is a matter of the regional government;

- The activity's goal achievement is a priority in RPJMD and is in accordance with the RPJM's programs;
- The activity gives direct benefit to the local public services; and
- The regional government has the fiscal ability to fulfill the loan obligations.

Seeing the requirements and criteria for the foreign loans/grants, the Denpasar City sanitation development can actually be funded by foreign loans/grants. The matter of utmost importance is the tendency or the characteristics of the sanitation program in generating income to pay for the loan obligations. According to lesson learned, among all three sanitation sectors (waste water, garbage and drainage), the most potential sector to gain cost recovery is garbage; whereas waste water and drainage has difficulties of obtaining cost recovery, and tend to be included in the Public Service Obligation (PSO) which require central/regional government's subsidy for operational costs. With such characteristics, it will be much safer to use foreign loans to develop a large-scale (regional) garbage management infrastructure, whereas the regional waste water management and drainage shall be funded by grants.

## CHAPTER IV

### FUNDING STRATEGY

#### 4.1 Cost Minimization

The cost minimization for Denpasar City sanitation is carried out by designing a more efficient sanitation program, especially with the principles of good governance. However, degradation of quality must be avoided -in terms of works or materials used -since it will boost the operational and maintenance cost. Meanwhile, the reduction of maintenance and operational cost will boost the risk of damages, premature repairs and even loss of trust from the consumer (society).

Suppressing cost also includes considering the supporting and replacement cost. In this case, the identification of the most capable parties to carry out supporting and repairs must be established before.

#### 4.2 Funding from Budget Surplus

As has been explained above, the budget surplus is one of the funding sources which can be used for the development of Denpasar City sanitation sector. The only problem related to the budget surplus is that it cannot be estimated until the end of the current fiscal year.

Therefore, the alternative strategy that can be applied in relation to the usage of this budget surplus consist of:

- Perfecting the development plan so that the development fund absorption can be carried out according to plans
- Inputting budget surplus into the reserve fund to be used for the development of Denpasar City sanitation sector. The accumulation of surplus in the reserve fund must be continuously carried out until it reaches the expected amount.

In this case, Denpasar City sanitation development strategy holds an important role, especially in determining the type and amount of funding needed for its development.

#### 4.3 Improving Sanitation Service's Cost Recovery

The sanitation sector's cost recovery must be calculated so that the sanitation service can be continuously carried out. Therefore, the most suitable sanitation retribution amount must be studied further along with its subsidy scheme. One of the most important thing to do in determining the amount of retribution is specifying the optimum variable between service business needs and the people's affordability to pay for the sanitation service. If the people's estimated willingness and ability to pay cannot cover the entire service investment and O&M cost, the subsidy scheme must be developed further by Denpasar City. Aside from retribution amount, retribution collection is also important, especially in terms of collection area and the efficiency of collection. In this case, it can be carried out in cooperation with more experienced institutions in terms of collection, such as PDAM and PLN.

#### 4.4 Local Funding Source Mobilization

Regional income fund must be mobilized with the approval of the APBD and must be inputted in the budget. For the sake of flexibility of income fund usage without having to wait for its

input in the APBD, the usage of financial management pattern by the Regional General Service Body (PPK-BLUD) can be carried out. In relation to the sanitation, management through PPK-BLUD is seen as most suitable, considering that BLUD can still obtain subsidy from regional government, and possibly gain profit from it. Also, BLUD still has the administrative flexibility to ease its operation.

The management of waste water in Denpasar City that has been carried out all these years by PDAM will burden the PDAM budget considering the deficit caused by the waste water management. PDAM as a business entity should be able to conduct its business in a commercial manner and to at least be profit-oriented. The commercial characteristic is still difficult to apply for waste water, since most people still think that the management of waste water is included in the PSO (Public Service Obligation) and should be subsidized by the government. Therefore, the Denpasar City waste water management delegation to the Waste Water Manager BLUD is still far from reality.

#### **4.5 The Improvement of Coordination with Provincial and Central Government**

Considering the possibility of the existence of budget for the development of sanitation in Denpasar City in Bali Province and the Central Government, Denpasar City will improve coordination with the Bali province and Central government. Coordination can be carried out through Sanitation Work Group that has been established in Denpasar City, especially with the Sanitation Development Technical Team at Central and by related stakeholders in the province of Bali (at the moment there are Drinking Water and Environmental Healthcare/AMPL Work Group in the province of Bali). Intensive coordination is believed to be the basis for the establishment of national sanitation network system.

By improving the coordination with Bali Province and Central government stakeholders, the following things should be expected:

- Knowing the Provincial and Central fund that can be used by Denpasar City to improve and develop its sanitation sector.
- Establishing an integrated sanitation development strategy to ensure the support from Provincial and Central government.
- Encouraging the province to establish a policy or plan for the development of sanitation sector (through the establishment of such policy or plan, the province's support for the development of City sanitation will be guaranteed).
- Supporting the Denpasar City sanitation program suggestion which will be funded by the Central, whether using the Central Government's fund or with foreign loans or grants.

#### **4.6 City Government as Facilitator and Regulator**

To reinforce the sanitation services in Denpasar City, Denpasar government will be assigned as sanitation sector's facilitator and regulator. However, self-service can be carried out by Sanitation BLUD or private sector. This can improve the efficiency and effectiveness of Denpasar City's sanitation service. In this case, Denpasar City government will participate in monitoring through the establishment of objective sanitation regulation as well as sanctions for violation carried out by the operator of by the public.

#### **4.7 Foreign Loans and Grants**

To cover the lack of fund for the development of Denpasar City's sanitation sector, foreign loans and grants can be made as alternative means of funding. To be able to make use of foreign

grants and loans optimally, the city's financial ability must be observed thoroughly so as not to burden Denpasar City's APBD. In this case, the separation of sanitation programs suggested to be funded using foreign loans and grants must be carried out, considering that the characteristic of the sanitation program does not allow it to make amends for cost recovery. The regional garbage management program is most likely to be funded using foreign loans, whereas other programs (such as the development of regional waste water management system and drainage) shall be funded using grants.

#### **4.8 Private Sector Investment**

To improve private sector's participation in the development of Denpasar City sanitation, Denpasar City government will open opportunities for private sector to conduct cooperation in the field of sanitation. The procurement of cooperation contract (for maintenance or operation of sanitation management system) will be carried out through public announcement in Denpasar City, whereas neighborhood-scale or city-scale sanitation investment will be given incentives (specified later on) by the city government. To support the neighborhood-scale and city-scale investment, city government will also improve the roles of institutions related to regional cooperation program.

## CHAPTER V

### ACTION PLAN

#### 5.1 City Sanitation Asset Inventorisation

After the Denpasar City development targets have been identified, according to the White Book, funding and program shall be assigned for each sanitation sub-sector. Each program will be planned thoroughly and in sequence to ease its integration into the performance budget. In this case, program needs is not only limited to the development of sanitation infrastructure but also campaign, socialization and capacity building needed. Each necessity will be adjusted to the related stage period.

#### 5.2 City Budget Prediction

Based on the funding components that have been explained in the previous section, Denpasar City government will predict the amount of fund sources especially for relatively predictable fund sources such as PAD and DAU (DAK APBD component is not as predictable because it highly depends on the central government's priority program).

#### 5.3 Sanitation Program Staging Based on Funding Source

For the separation and staging of Denpasar City sanitation development, RPJM and RPJMD must always be used as guides. Therefore, until 2009 the main target of the development is the waste water management, meaning that all households must be equipped with toilet. In order to achieve such target, it is best to use the previously predicted fund source, especially PAD and DAU. Aside from the target, it is possible to compile other program that can be funded using the PAD and DAU.

#### 5.4 Preparation for the Execution of WASAP D

To maximize WASAP D fund, project/program scale will be determined (as was identified before). The selection of a suitable program/project will be the subject of further coordination with World Bank and the Department of Public Works facilitated by ISSDP.

#### 5.5 Preparation of Sanitation Program with Foreign Loans and Grants

Large scale sanitation program can be funded through foreign loans and grants. The suggestion will be made according to the existing provisions of law. In this attempt, Denpasar City government will also coordinate with Sanitation Technical Team to ease the suggestion process.

#### 5.6 Improvement of Coordination with the Provincial and Central Government

The improvement of coordination on sanitation development will be carried out by the Denpasar City government through coordinative meetings of which schedule will be established. Also, meetings and communication will be maintained especially if there is a matter of urgent related to the development of sanitation in Denpasar City.

### **5.7 Study and Compilation of Sanitation Policy**

To improve the sanitation conditions, including its funding, Denpasar City government will study all regional regulations related to sanitation. Regulations which refer to outdated provisions will be renewed, and new regulations will be made as necessary. The emphasize will be on study, especially on the regulations concerning sanitation retribution, regional sanitation management (including sanitation operator institutional setup) as well as the attempt of improving the private sector's roles in sanitation development.

## **CHAPTER VI**

### **CLOSURE**

Various alternative fund sources, internal and external of the Denpasar City government, has become a potential that can be optimized and mobilized for development sector funding, including sanitation sector. The Denpasar City Government's financial performance can be improved if the optimization of the fund sources can be carried out effectively.

Also, the improvement of expense efficiency/effectiveness through cost minimization program can be carried out to prevent high-economy development or unnecessary spending. One of the existing potentials is the involvement of private sector through corporate social responsibility-CSR. The collected CSR fund can be used to fund the development of sanitation sector.

In the ISSDP context, the usage of Component D grant fund (WASAP-D) can be optimized for the implementation of several sanitation sector pilot projects which have been planned in Denpasar City Sanitation Strategy.



## **APPENDIX 5.13.3**

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### **PARTS OF GUIDELINE OF MINITORING ON ENVIRONMENT QUALITY OF BAPPEDAL**



APPENDIX 5.13.3  
May, 2012

MONITORING ON ENVIRONMENT QUALITY (WATER QUALITY  
OF RIVER, SEA, LAKE, WASTE, NOISY AND AIR QUALITY)

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## CHAPTER III METHODOLOGY

### 3.1 METHOD OF WATER QUALITY ANALYSIS

The examination of water quality done with two ways they are in site examination and laboratory examination. The water quality that examined in site covers the water temperature, taste, pH, Dissolved oxygen (DO), any of floating things and oil layer. While the examination to the other parameters done by taking water sample to be analyzed further in laboratory. The method of water quality analysis for each parameter of water quality is presented on the table 3.1.

Table 3.1. Method of analysis on parameter of water quality

No	Parameter	Unit	Analysis Method	Tools
1	Odor		Qualitative	Organoleptive
2	Suspended solution	mg/L	Gravimetric	Analytic scales
3	Floating thing		Qualitative	Visual
4	Oil layer		Qualitative	Visual
5	Temperature	°C	Expansion	Thermometer
<b>CHEMICAL</b>				
1	pH		Potentiometric	Ph meter
2	Dissolved Oxygen	mg/L	Potentiometric	Do-meter
3	BOD <sub>5</sub>	mg/L	Titrimetric	Buret
4	COD	mg/L	Titrimetric	Buret
5	Free ammonia (NH <sub>3</sub> -N)	mg/L	Spectrophotometric	Spectrophotometer
6	Nitrite (NO <sub>2</sub> -N)			
7	Nitrate (NO <sub>3</sub> -N)	mg/L	Spectrophotometric	Spectrophotometer
8	Phosphate (PO <sub>4</sub> -P)	mg/L	Spectrophotometric	Spectrophotometer
9	Oil and fat	mg/L	Spectrophotometric	Spectrophotometer
10	Lead (Pb)	mg/L	Spectrophotometric	Spectrophotometer
11	Cadmium (Cd)	mg/L	Spectrophotometric	Spectrophotometer
12	Mercury (Hg)	mg/L	Spectrophotometric	Spectrophotometer
13	Copper (Cu)	mg/L	Spectrophotometric	Spectrophotometer
<b>MICROBIOLOGY</b>				
1	Coliform	MPN/100ml	MPN	Table of MPN
2	Feces coli	MPN/100ml	MPN	Table of MPN



### 3.2 METHOD OF THE TAKING OF WATER SAMPLE

The taking of water sample which will be analyzed in laboratory on each sample point using jerrycan with capacity 2 litre of full water. The taking water sample is done in the middle of water. Before it is brought to laboratory, the water sample is preserved with H<sub>2</sub>SO<sub>4</sub> until pH2. For examination of BOD, the water sample is taken on the spot with DO dark bottle container that is filled up fully without air bubble and closed tight.

### 3.3 METHOD OF DATA ANALYSIS

Referring to the laboratory analysis result of river water quality, the river water analysis quality between regencies in Ball Province is done as examined parameter in 2007.

#### • Chemical parameter

- BOD
- COD
- NO<sub>2</sub>
- NO<sub>3</sub>
- NH<sub>3</sub>
- PO<sub>4</sub>
- Fat oil
- Detergent
- Pb
- Cd

#### • Biology parameter

- E. Coli
- Total Coliform

#### 3.3.1 Observation on Parameter of River Water Quality

##### 1. Water Temperature

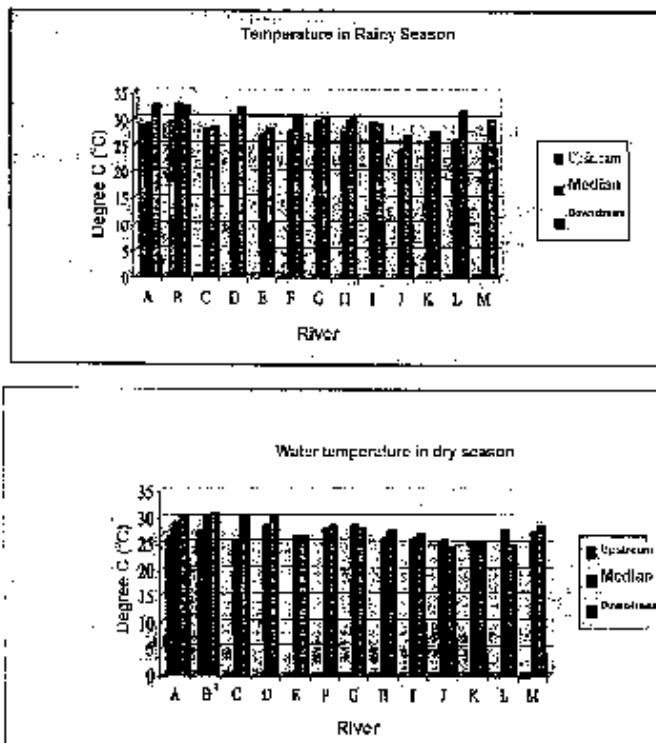
The temperature of water body is affected by time in days, seasons, position of latitude, the place altitude from the sea level, air circulation, cloud coverage, vegetation covering, the concentration of waste/pollutant, the stream and the depth of water. The temperature change affects on the physical, chemical and biology processes. The water temperature has influence to water animal metabolism, the higher the water temperature on optimum limits then the water animals metabolism is getting higher. The water temperature also affects to activity of microorganism in elaborating the organic materials, where the higher the temperature then the microorganism activity is getting higher that causes the taking or using the dragged when is getting higher. The temperature also affects the toxicity level of hazardous



MONITORING ON ENVIRONMENT QUALITY (WATER QUALITY OF RIVER, SEA, LAKE, WASTE, HOUSING AND AIR QUALITY)

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compounds in water, such as the compound pollutant of nitrogen (free ammonia and nitrite), heavy metal which its toxicity will grow up with the increase of water temperature.



Picture 3.1. Graphic Sample of Water Temperature In Rainy Season and Dry Season

## 2. Total Suspended Solids (TSS)

Suspended solids are the materials of particle with size more than 0.45 um that existing in water column. The suspended solids is formed from the sediment particles, organic materials (composed detritus) also the phyto plankton cells and other living microorganism.

In real all waters (river, lake, and sea) contain the solid materials and in some situations are found out in high concentrate as the result of land erosion, waste flowing, and so on. Sediment particles is formed from mud and clayey soil, can be suspended in water column as the result of water movement by the stream and wind shaking, or washed into the waters thru the run off process. The higher solid concentrates in water then the higher of muddiness water. Solid suspended of the high inorganic materials in waters stimulates the increase of organism activity to elaborate it so that the need of dragged oxygen will increase.



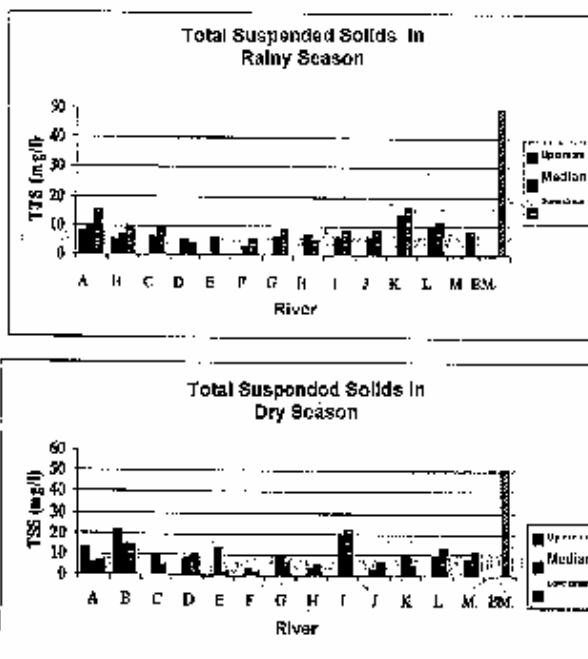
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Table 3.2. The influence of TSS contents against the waters living

No	Concentrate	The influence to water living
1	<25 mg/l	Not influence to waters biologic living
2	25-80 mg/l	Influence to the fisher interest
3	>80 mg/l	Not good for the fisher interest

Menurut alabsater dar Lloyd (1982)



Picture 3-2. Sample of Graphic of River water TSS In Rainy Season and Dry Season

### 3. pH

pH is a solution which describes ion hydrogen concentrate in a solution. pH relates to carbon dioxide and alkalinity. The higher pH degree, the higher the alkalinity degree and the lower is the free carbon dioxide content. The more acids the solution then is lower the pH and on the other hand the more bases then is higher the pH. The change of pH degree of the waters is affected by the existing of buffer carbonate system.

pH of the waters can be used as the indicator of pollution especially the organic material pollution. The fission of organic materials by microorganism will produce carbon dioxide. The



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increase of carbon dioxide will cause the decrease of pH degree if the buffer carbonate system is on the shallow waters. The waters that have low pH will increase the toxicity of some fusion of chemical compounds, such as ammonium compound which can be ionized, many found out in the waters with low pH. On neutral pH, ammonium is toxic, yet in the alkaline nuance (high pH) there are more ammonium found out not ionized and toxic. Non ionized ammonium is easier to be absorbed into aquatic microorganism body than ammonium. The metal toxicity performs the increase on low pH. pH degree against the waters biological community shown on the table 3.3.

Table 3.3. Range of pH Degree

pH Degree	General affectness
6.0 - 6.5	<ol style="list-style-type: none"> <li>1. Diversity of plankton and benthos less decrease</li> <li>2. Total abundance, biomass, and productivity get change</li> </ol>
5.5 - 6.0	<ol style="list-style-type: none"> <li>1. The decrease of diversity value of plankton and benthos are getting clear.</li> <li>2. Total abundance, biomass, and productivity still have no significant change</li> <li>3. Green filament algae begins to come up in littoral zone</li> </ol>
5.0 - 5.5	<ol style="list-style-type: none"> <li>1. The decrease of diversity and kind composition of plankton, periphyton and benthos are getting large</li> <li>2. The decrease of total abundance, biomass of zooplankton and benthos occurs,</li> <li>3. Green filament algae is getting a lot</li> <li>4. Nitrification process is obstructed</li> </ol>
4.5 - 5.0	<ol style="list-style-type: none"> <li>1. The decrease of diversity and kind composition of plankton, periphyton and benthos are getting large</li> <li>2. The decrease of total abundance, biomass of zooplankton and benthos</li> <li>3. Green filament algae is getting a lot</li> <li>4. Nitrification process is obstructed</li> </ol>

#### 4. Nitrite (NO<sub>2</sub>) and Nitrate (NO<sub>3</sub>)

In natural waters, nitrite usually is found in very few numbers. It is fewer than nitrate, because it is not stable with the existence of oxygen. Nitrite is the transition between ammoniac and nitrate (nitrification) and between nitrate and nitrogen (denitrification). Denitrification happens in anaerob condition.

The existence of nitrite in waters describes the continuance of biological process of the organic material radical changes which have very low dragged oxygen content.

Nitrite sources can be in form of waste of industry and domestic. Nitrite contents in waters relatively few because they are soon oxidized become nitrate. The nitrite contents in

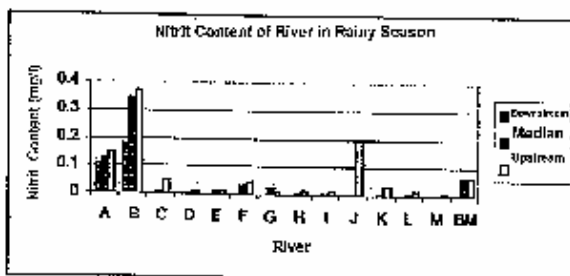


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natural waters are about 0.001 mg/l, the nitrite contents which are more than 0.05 mg/l are toxic for waters organisms. (Moore, 1991). Nitrate is nitrogen that is very easy drag into water and stable. Nitrate is produced from perfect oxidant process of nitrogen compound in waters. In aerob condition, nitrification is the ammoniac oxidant process becomes nitrite and nitrate. The main sources for nitrate come from disposal waste (waste of domestic and industry) and waste of agriculture. The organic nitrogen wastes which go to waters will transform becomes ammoniac. In aerob condition (if oxygen which drags into water is sufficient) ammoniac will have nitrification by bacterial of *Nitrosomonas* and *Nitrobacter* becomes nitrate with nitrite as the transition product.

Nitrification is affected by some factors such as dragged oxygen, temperature and water's pH. In dragged oxygen contents less than 2 mg/l, the reaction is slow. The optimum pH for nitrification process ranges between 8-9 and the optimum temperature is between 20-25°C.



Picture 3.3. Sample of Graphic of Nitrite Contents in water during rainy season

The nitrate contents in non polluted waters usually are higher than the ammonium contents. The nitrate contents in natural waters almost never more than 0.1 mg/l, the nitrate contents that more than 5 mg/l describe the antropogenic pollution which comes from human activities and animal feces. The nitrate contents that more than 0.2 mg/l can cause water's eutrofication, which next stimulates algae and water plants growth in blooming. So that the nitrate contents in waters generally used as parameter to measure the water's fertility level and analyze probability of eutrofication.

Table 3.4. The water's fertility level based on the nitrate contents

Nitrate Contents	Water's Fertility Level
0-1 mg/l	Water's of oligotrophic
1-5 mg/l	Water's of mesotrophic
1-50 mg/l	Water's of eutrophic

(volunweider, 1989 dalam Wetzel, 1975)





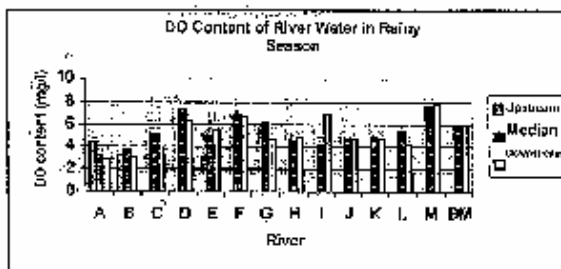
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### 5. Dissolved Oxygen (DO)

Contents of dissolved oxygen (DO) in waters have variations, depends on the temperature, salinity and atmosphere pressure. The larger the temperature and the altitude place the fewer the atmosphere pressure, the dissolved oxygen contents are getting small (Jeffries and Mills, 1996). The contents of dissolved oxygen also fluctuate daily and seasonally, depend on the mixture and move of water mass, photosynthetic activity, respiration and waste that come into water body.

The temperature increase 1 degree Celsius will increase the oxygen consumption about 10%. Decomposition of organic materials and oxidized of non organic materials can decrease the contents of dissolved oxygen up to zero (anaerob). The dissolving of oxygen and other gases also decrease with the increase of salinity. So that the contents of dissolved oxygen in the sea tends to lower than the contents of dissolved oxygen in pure waters.



Picture 3-4. Sample of Graphic of dissolved oxygen contents in rainy season river water

### 6. Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand (BOD<sub>5</sub>) is the volume of oxygen that is demanded by microorganism to elaborate organic materials which can be easily elaborated. Organic materials that are easily elaborated usually come from domestic waste, while the hard ones usually come from waste of agriculture, mining and industry.

Naturally, the oxygen contained in water used by microorganism to elaborate organic materials like nitrogen compound, sulfide and ferro compound and organic materials. Organic materials that go to waters are divided two, they are the organic materials that are easily elaborated such as carbohydrate, protein, and fat and organic materials that are difficult to be elaborated such as DDT, PCB and PAH. The volume of oxygen demanded by microorganism depends so much on the number and kind of organic materials which go to waters.

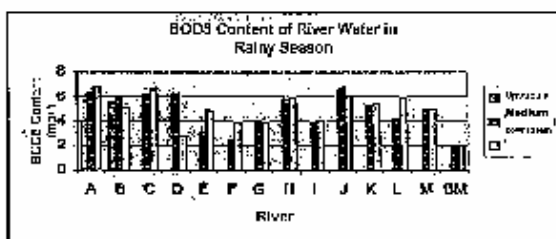


The test of BOD<sub>5</sub> is to measure the volume of oxygen used for 5 days by microorganisms of the elaborator, at certain volume on temperature of 20 degree Celsius and is declared in

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ppm or mg/l. The incubation length of 5 days for BOD<sub>5</sub> test is the selection based on arbitrary only which is during the period 70 - 80 % of organic materials contents have been elaborated. Indirectly, BOD<sub>5</sub> describe the organic materials contents can be decomposed biologically. In natural waters the degree of BOD<sub>5</sub> is between 0.5 - 7.0 mg/l. The waters which have BOD degree more than 10 mg/l is assumed to get pollution. The degree of BOD of food industry waste is between 500-4000 mg/l.



Picture 3-5. Graphic Sample of BOD<sub>5</sub> Contents in rainy season river water

#### 7. Chemical Oxygen Demand (COD)

The Chemical Oxygen Demand (COD) describes volume of oxygen to oxidize organic materials chemically, whether those can be degraded biologically or those difficult to be degraded biologically become CO<sub>2</sub> and H<sub>2</sub>O. Many organic materials have no elaborating during the BOD<sub>5</sub> test even have no fixation at all, yet the materials or compounds affect to water quality.

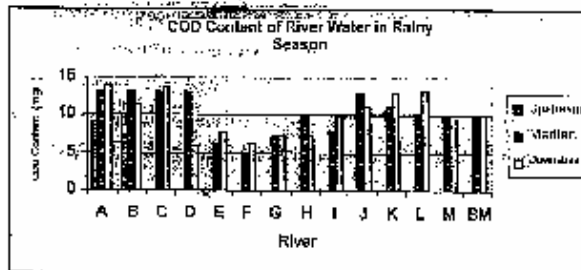
The measure of COD is based on the fact that almost all organic materials can be oxidized become CO<sub>2</sub> and H<sub>2</sub>O with the assistance of strong oxidator (potassium dichromate/potassium dichromate) in acid nuance. Some pollutant materials which usually become the support for the high of COD degree are protein, carbohydrate, detergent fat and surfactant. Therefore, the COD test score will greater than the BOD degree for the same sample. The test of COD will give score to:

1. Organic compounds that have biodegradation like used to be done during the test of BOD<sub>5</sub>.
2. Organic compounds that have biodegradation but not elaborated during the test of BOD<sub>5</sub>, yet they can be elaborated in water and can affect to water quality and
3. Organic compounds that have no biodegradation.



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Picture 3-6. Graphic Sample of COD contents in rainy season river water.

### 8. Oil

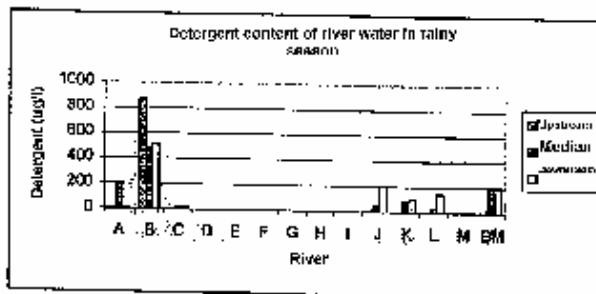
Sources of oil pollution in waters can be from dropping or spilling of oil, urban waste, and waste of road run off. The presence of oil in waters besides in form of oil layer in surface also in form of dragged and emulsion. The oil waste has a wide impact to the food chain and the living of waters creatures. Direct impact of oil to phytoplankton and zoo plankton that is toxic that can cause the death. Hydrocarbon oil can go to the food chain in waters. Hydrocarbon oil can go to aquatic organism body thru particle absorption, thru fish gills water to drink. In organism body, that will accumulate then thru the food network and will be transferred into organism in higher trophic level and some are excreted.

### 9. Detergent

Water pollution that caused by detergent mainly related to the problem of surfactant or the former material. Surfactant is the organic material which roles as active agent for detergent, soap, shampoo. Surfactant that many used today is different with used some years ago. The main difference is because the one is used today has character that can be fissioned biologically, that is able to fissioned by bacteria found out in the environment, while surfactant used before 1965 unable to fissioned by bacteria so that found in form of unchanged form for long period.

Problem caused by the detergent not only related to surfactant, but also related to the volume of polyphosphate which also composed the detergent. Polyphosphate from this detergent is estimated to give contribution about 50% of all phosphate contained in waters.



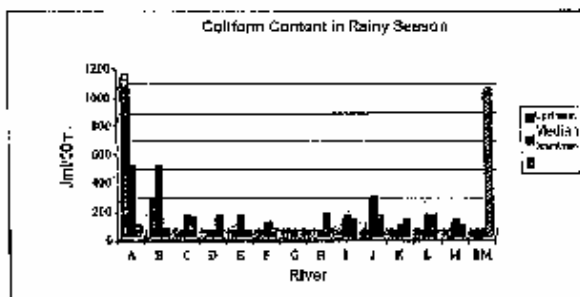


Picture 3-7. Graphic sample of detergent contents in rainy season river water.

### 10. Fecal Coli (Escherichia Coli) and Coliform

The abundance level of coliform bacteria is commonly used as the indicator of water contamination by feces, whether human feces or hotheaded animals. It is called coliform bacteria because they represent *Escherichia coli* bacteria which normally live in human digestion especially in intestine that is useful in helping the digesting process. *E. coli* bacteria is one of coliform bacteria which normally is non-pathogenic, yet some other coliforms are pathogenic. The presence of *E. coli* in water in abundance describes that the water is polluted by human feces or feces of hotheaded animals like cattle. The feces could be accompanied by pathogenic bacteria. Bacteria of Coliform covers all kinds of aerobic bacteria, anaerobic facultative, and bacteria in form of stick which are able to make fermentation of lactose and produce gas within 48 hours at a temperature of 35 degrees Celsius. Total bacteria of coliform consists of *Escherichia*, *Citrobacter*, *Klebsiella*, and *Enterobacter*. Coliform can survive only a few hours or a couple of days out of its brood, depending on the environment condition. Coliform is the bacteria of gram-negative in form of stick. The very common test used to find out coliform in water is by inoculation on liquid media or selective jelly media. Selective media which is used containing lactose that is a kind of sugar fermented by coliform produces acid and gas. To count the volume of coliform bacteria in water sample is done by the assumption method that is the method of Most Probable Number (MPN) or can be grown on other selective media such as EMBA and McConkey.





Picture 3-7. Graphic sample of coliform contents in rainy season river water.

### 3.3.2 Analysis of Parameter on River Water Quality

The checking result of parameter on water quality is analyzed descriptively and compared with the standard of water quality as its allocation according to the Decree of Governor of Bali no. 8 year 2007. The checking result of river water quality compared with the Standard of Water Quality for Class B.

To find out the status of river water is used the method of STORET (decree of ministry of environmental affairs No. 115 year 2003 regarding the Guideline to determination of Water Quality Status). In principle, the method of STORET is to compare between data of water quality with the standard of water quality adjusted with its allocation. Determination of scoring system to classify the status of water quality is as follows:

Table 3.5. Table of Status of Water Quality STORET Method

Number of parameter	Score	Parameter		
		Physical	Chemical	Biological
< 10	Maximum	-1	-2	-3
	Minimum	-1	-2	-3
	Average	-3	-6	-6
≥ 10	Maximum	-2	-4	-6
	Minimum	-2	-4	-6
	Average	-6	-12	-18

Decree of Ministry of Environmental Affairs No. 115/2003

Classification of water quality is: (1) Class A: very good, score = 0; meet the standard of quality; (2) Class B: good, score = -1 up to -10; light pollution; (3) Class C: average, score = -11 up to -30; average pollution; and (4) Class D: bad, score: > -30; heavy pollution.



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Evaluation of river water periodically applied by comparing data of survey result in rainy season and dry season and annual evaluation during 2002 up to 2004 according to same season to find out tendency of water quality within three years of survey.



## CHAPTER V DATABASE AND GEOGRAPHICAL INFORMATION SYSTEM OF SURVEY ON RIVER WATER QUALITY

Geographical Information System (GIS) of Survey on Environment Quality is applied with purpose to get periodic data which is collected in a database and map whether in form of table or documentation. So that it makes easier the data users to plan and evaluate the quality of river water, including the point survey location which never changes from year to the next year, because the survey location already coordinated correctly and written in digital map which already coordinated, too, the steps of the making of GIS for Survey on River Water Quality is as follows:

### 5.1. OUT DOOR SURVEY

The activity of outdoor survey in this activity is divided into 2 (two) parts, they are survey of secondary data and primary data.

#### a. Survey of Secondary Data

Secondary data that will be collected for the needs or to support the study above, not only the statistic data from Central Bureau of Statistic (BPS) but also will collect them directly from technical institution where the data exists. It is done with purpose to find out in details the existing condition of environment, mainly river and programs related to sector of environment quality, whether it relates to policy, rehabilitation program and other recovery of environment including technical institution that handles it.

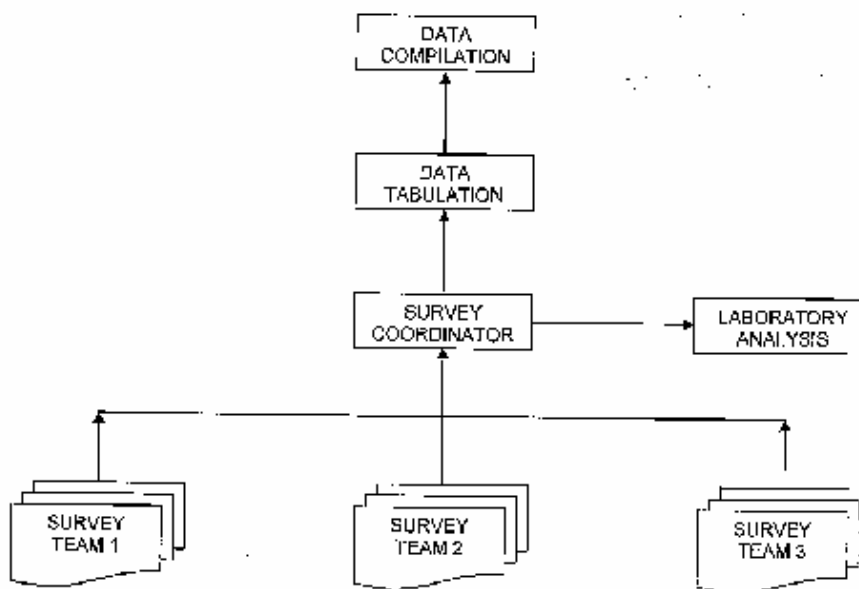
#### b. Survey of Primary Data

Survey of primary data (outdoor) will be done by directly going out door using the GPS device to find out the location coordinate, sampling documentation, and outdoor data measuring (insitu) mainly the physical parameter of river water.



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Picture 5-1. Flowchart of Outdoor Survey Implementation

Data which will be surveyed cover:

- ▶ Physical data of river water (for measuring in situ)
- ▶ Sampling for each survey point (2 sample for each point)
- ▶ Sampling documentation
- ▶ Coordinate of survey point
- ▶ Condition of weather and environment around the survey point
- ▶ Data of land usage (field, housing, forest, lake, garden, swamp, etc)







