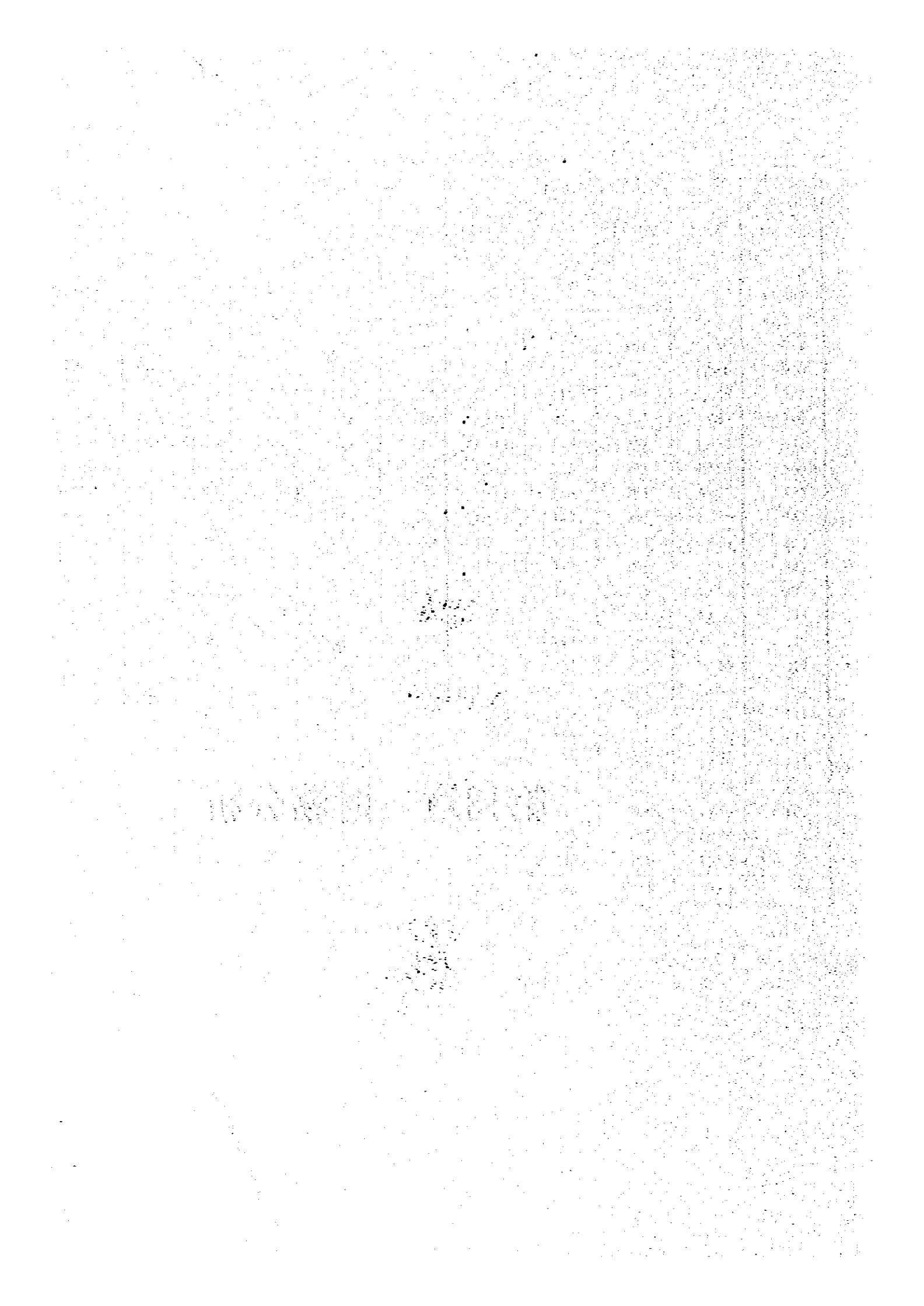


## 第13章 財務分析



## 第13章 財務分析

### 13.1. 分析の方法

本プロジェクトの投資効果について、下記の二方法で分析、評価する。

(1) DCF法によるプロジェクトの分析と評価

(2) 財務諸表によるプロジェクトの分析と評価

財務分析の目的は、当プロジェクトの投資が、港湾管理者の財務管理状況に如何なる影響を及ぼすか、或いは財務の健全性は確保できるかを分析することにある。

換言すれば、企業会計に基づく、私企業的な独立採算制を前提に、当プロジェクトの投資効果すなわち採算状況の分析を行い、資金繰りの状況を把握し、問題点と対策について述べることにある。言うまでもなく、財務の健全性とは、経営者の全体の財務内容の把握によって可能であるから、全体の財務内容を対象とするものである。

#### 13.1.1. 財務的収益率 (FRR)

DCF法によるプロジェクトの評価に際し、当プロジェクト実施による収益増を便益とし、当プロジェクトの建設コストを費用とし、FRR (財務的収益率) を、第12章の式(12・1)によって算出する。上に述べた如く、分析はソロン港の全体を対象とする。したがって、ソロン港全体の各年次毎の減価償却前、利息支払前利益が算出され、かかる利益を便益とみなす。経営が安定する1985年以降の毎期の営業利益、すなわち減価償却前、利息支払前利益が便益となる。上述の方法で、ソロン港の独立採算性のもと、FRRが算出される。

#### 13.1.2. 財務諸表

本分析に際し、財務の健全性を確認するために、財務諸表(損益計算書、資金運用表等々)が作成される。ソロン港の財務分析は、下記的前提を置く。

(1) 原価主義に基づく独立採算をとるものとする。

(2) 海外の借入によって賄う投資資金の借入条件は表13.1.1.のとおりとする。

表13.1.1. 借入条件

Rate of interest	3% per annum.
Term of grace for principle	10 years.
Term of repayment of principle	30 years.
Term of loan	40 years.

(3) 減価償却法は定額法によるものとし、耐用年数はインドネシア政府の基準に従う。

表 13.1.2 減価償却率及び耐用年数

Item	Depreciation Rate	Life Cycle (years)
Quay	0.02	50
Open Storage	0.02	50
Warehouse	0.03	33
Road	0.01	100
Office Building	0.03	33
Water Supply	0.04	25
Power Supply	0.03	33
Navigation Aids	0.04	25
Cargo Handling Equipment	0.05	20
Vessel	0.05	20

Source: Directorate General of Sea Communications.

#### (4) 剰余金

減価償却後、金利支払後の利益金より45%の租税公課並びに30.3%（総利益100% - TAX ((45%)) × 55%)の国家開発資金への納付金を控除した剰余金は内部留保されるものとする。

本分析においては、総投資額の41%を国家開発資金(無利子)によって賄うことにしている。41%と設定した理由は、当プロジェクトの全投資額の内、内貨比率が41%占めていることによる。

### 1.3.2. 収益の推定

1979年次「ソロン港財務報告書」(表5.1.3.)の実績に基づき、現行港務料金体系のもとで、下記のとおり算出する。

入港料 : 1979年の実績に基づき、1貨物屯当たりの単位料金を設定し、各年次毎のソロン港全取扱貨物量に乗じて算出する。

係給料 : 上記と同様に単位料金を設定し、各年次毎のソロン港の公共埠頭の全取扱貨物量に乗じて算出する。

曳航料 : プルタミナのタグボートによる曳航料収益は、1979年の実績に基づき、各年次毎の全貨物の増加率に比例させて算出する。新規投入のタグボートからの曳航料は、稼働時間を推定し、現行料金に従って積上げ計算する。

水先案内料 : 1貨物屯当たりの単位料金を設定し、各年次毎のソロン港全取扱貨物量に乗じて算出する。

施設利用料 : 1979年の実績に基づき、1貨物屯当たりの単位料金を設定し、公共埠頭を使用する各年次の全貨物量に乗じて算出する。当単位料金には、上屋保管料、倉庫保管料、直接運搬料、機器賃貸料を含む。

給水料：各年次毎の船種別・船型別の船舶数から必要供給量を推計し、現行料金に従って算出する。

その他：1979年の実績に基づき、各年次毎の公共埠頭取扱貨物量の増加に比例させて算出する。

表13.2.1. ソロン港全収益(1985年)

(Million Rp.)

Revenue Items	Unit Charge	Revenue in 1985	Remarks
Port Due	7.4 Rp./Cargo Ton	35	$7.4 \times 4675.9 \times 10^3$ tons
Mooring Charge	539 Rp./Cargo Ton	162	$539 \times 300 \times 10^3$ tons
Towage		92	$2.1 \times 10^6 \times \frac{4676}{2950} = 3.3$ 800 HP: $(12,450 \text{ Rp.} \times 365)$ $+ (34,445 \text{ Rp.} \times 2,433 \text{ h}) =$ $88 \times 10^5 \text{ Rp.}$ $3.3 + 88.3 = 92$
Pilotage	26.1 Rp./Cargo Ton	122	$26.1 \times 4675.9 \times 10^3$ tons
Open Storage	11.3 Rp./Cargo Ton	3	$11.3 \times 300 \times 10^3$ tons
Warehouse Storage	109 Rp./Cargo Ton	33	$109 \times 300 \times 10^3$ tons
Direct Transportation	39.4 Rp./Cargo Ton	12	$39.4 \times 300 \times 10^3$ tons
Equipment Rental	169 Rp./Cargo Ton	5	$16.9 \times 300 \times 10^3$ tons
Water Supply	300 Rp./Ton	22	$300 \times 74 \times 10^3$ tons
Others		16	$4.4 \times 10^6 \times \frac{300}{83.8}$
Total		502	

### 13.3. 費用の推定

#### 13.3.1. 建設コスト

当プロジェクトの建設コストは、表11.4.1.に示すとおり、69億1,200万ルピアであり、15%のフィジカルコンテンジェンシー及び15%のプライスコンテンジェンシーを含む。

#### 13.3.2. 運営費用

運営費用は以下の6種に区分して推計される。

- (1) 人件費
- (2) 一般管理費
- (3) 運営費
- (4) 維持・修繕費

- (5) 減価償却費
- (6) 支払利息

### 1 3.3.3. 人件費及び一般管理費

(1) これらの費用は、新規施設に対応する増加要員を各年毎に推計し、積上げ計算する。この場合1人当たりの人件費及び一般管理費を、1979年の実績に基づき、以下のとおり設定する。

人 件 費 : 48万3000 RP./人/年

一般管理費 : 11万 RP./人/年

#### (2) 要員の推定

- (1) 管 理 部 門 - 人事, 財務, 資材購入, 広報, 規則を所轄する管理・総務部門
- (2) スタッフ部門 - 技術, 維持, 運輸を所轄するスタッフ部門
- (3) 運 営 部 門 - ターミナル運営, 保管施設運営, 陸上運搬, 係船管理, 防火・安全管理 等々

一般に港湾の組織は、上記の三つに区分できる。

一方、1985年以降、当港湾管理者に、特に要求される管理機能は以下の4点である。

- (1) 収益確保とサービス業務の拡充に重点を置いた運営部門の要員の充実(主としてパイロット, 船員, 設備維持管理要員の増員)
- (2) 上記に対応した必要資機材の完備と要員の充実
- (3) 取扱貨物量の増加に対応して、UKA(港湾労働者組合)の荷役業務の効率化が要請される。したがってその荷役業務に関し、指導監督する体制と要員の充実並びに必要資機材の完備
- (4) 財務部門の要員の充実と、管理範囲の区分の明確化(港湾料金体系に対応した原価管理の実施, 予算管理の強化, 並びに港湾収入の増大に伴う代金回収, 処理業務増に伴う会計管理の強化)

上記4点に対応した1985年のソロン港の所要職員数を、表133.1.に示す。

表 13.3.1. ソロン港職員数 (1985年)

Present Organization	Present Employees	Operation Items	Number of Personnels in 1985	Remark
Chief of Port	1		1	
Administration	19	Administrative Dept.	34	
		• Chief	2	
		• General	7	
		• Personnel	3	
		• Public Relation	1	
		• Statistic	1	
		• Law	1	
		• Purchasing	1	
		• Finance	18	
Service Work	20			
Technical Work	9	Staff Dept.	21	
		• Chief	2	
		• Engineering	8	
		• Maintenance	8	
• Traffic management	3			
Pilot Work	18	Operating Dept.	64	
		• Chief	2	
		• Terminal & Warf	8	
		• Land transportation	7	
		• Domestic warehouse	5	
		• Pilot & Tug	29	
		• Water supply	3	
		• Fire and security	4	
		• Communication	6	
Total	67		120	Warehouse, equipment, mechanic, Warf, housing, office

表 13.3.2. 人件費及び一般管理費 (1985年)

(Million Rp.)

	Number	Cost
Personnel Cost	120	58
General Administration Cost	120	13
Total	120	71

### 1 3.3.4. 運 営 費

既存施設については1979年の実績を採用し、新規施設については表1 2.3.2に示されている費用とする。

表 1 3.3.3. 運 営 費(1985年)

(Million Rp.)

Existing Facilities	8
New Facilities	29
Total	37

### 1 3.3.5. 維持・修繕費

上記と同様、既存と新規の施設に区分して算出する。既存施設については1979年の実績を採用し、新規施設については表1 3.3.3に示されている費用とする。

表 1 3.3.4 維持修繕費(1985年)

(Million Rp.)

Existing Facilities	35
New Facilities	93
Total	128

### 1 3.3.6. 固定資産及び減価償却費

#### (1) 固定資産

フロン港においては、私企業的な財務管理は行われていない。したがって、既存施設については資産を再評価し、本プロジェクトにより新に取得する資産と区分して、算出する必要がある。既存施設については、取得年次を考慮して表1 3.3.5.のとおり設定し、新施設については表1 3.3.6.のとおりとする。



表 13.3.5. 既存施設の固定資産

(Million Rp.)

Facilities	Quantity	Purchased Year	Book Value at Purchased Year	Revaluated Book Value at 1980	Yearly Depreciation
Concrete Wharf	120m x 12m x 15m	1978	1,009	1,009	20.18
Wooden Wharf	132m x 12m x 11m	—	—	105	10.5
Ferry Jetty	15 m x 3 m x 3 m	—	—	(7)	—
Transit Shed (A)	97.5 m x 20 m	1978	243	243	7.36
Open Storage (A)	3,750 m <sup>2</sup>	1977	163	163	3.26
Open Storage (B)	1,475 m <sup>2</sup>	1977	64	64	1.28
Water & Oil Supply Facility	1 unit	1977	31	31	1.24
Mobile Crane	3T x 1	—	—	11	0.92
Forklift	5T x 1	—	—	7	0.58
Pilot Boat	125 PK x 2	—	—	32	2.67
Official Houses	70 m <sup>2</sup> x 3, 36 m <sup>2</sup> x 2	1977	39	39	1.18
Land	—	—	—	600	—
Land for Doom	1,450 m <sup>2</sup>	—	—	8	—
Others	Generator, Materials etc.	1978	327	327	13.08
Total				2,031	62.25

表 13.3.6. 新規施設の固定資産

(Million Rp.)

Facilities	Book Value at the beginning of 1985	Yearly Depreciation	Beginning Year of Depreciation
New Wharf	3,315	66.30	1985
Ferry Jetty	134	2.68	1983
Open Storage	25	0.50	1985
Transit Shed	963	29.18	1985
Building	10	0.30	1985
Road	141	1.41	1985
Water Supply	57	2.28	1985
Electric Power Supply	121	3.67	1985
Navigation Aids	36	1.44	1984
Tug Boat	465	23.25	1985
Pilot Boat	79	3.95	1985
Forklift	31	1.55	1984 (1 unit) 1985 (1 unit)
Land	1,535	—	1985
Total	6,912	136.51	

(2) 減価償却

減価償却は定額法によるものとし、表13.1.2の減価償却率に従って計算する。土地は償却資産としない。減価償却の計算結果を表13.3.7に示す。本表には、既存と新規の両施設の資金を含んでいる。

表 13.3.7. 固定資產原值推移表

(Million Rp.)

Year	Balance Beginning	Investment (I)		Depreciation (D)	Balance at End	Accumulated (Book Value)	Accumulated Depreciation	Progress
		New	Replace					
1980	1,934			62	1,872	2,031	159	
1981	1,872			62	1,810	2,031	221	
1982	1,810			62	1,748	2,031	283	
1983	1,748	134		65	1,817	2,165	348	564
1984	1,817	51		67	1,801	2,216	415	4,843
1985	1,801	6,727		198	8,330	8,943	613	
1986	8,330			198	8,132	8,943	811	
1987	8,132			198	7,934	8,943	1,009	
1988	7,934			198	7,736	8,943	1,207	
1989	7,736			198	7,538	8,943	1,405	
1990	7,538		105	198	7,445	8,943	1,498	
1991	7,445		50	198	7,247	8,943	1,696	
1992	7,247			198	7,099	8,943	1,844	
1993	7,099			198	6,901	8,943	2,042	
1994	6,901			198	6,703	8,943	2,240	
1995	6,703			198	6,505	8,943	2,438	
1996	6,505			198	6,307	8,943	2,636	
1997	6,307			198	6,109	8,943	2,834	
1998	6,109			198	5,911	8,943	3,032	
1999	5,911			198	5,713	8,943	3,230	
2000	5,713		105	198	5,620	8,943	3,328	
2001	5,620			198	5,422	8,943	3,521	
2002	5,422		50	198	5,274	8,943	3,669	
2003	5,274			198	5,076	8,943	3,867	
2004	5,076			198	4,878	8,943	4,065	
2005	4,878		544	198	5,224	8,943	3,719	

### 1 3.3.7. 長期借入金及び支払利息

プロジェクトコストの59%は、海外よりの長期借入金により賄い、残り41%は、国家開発資金によって賄う。

表1 3. 1. 1.の借入条件に従って計算した結果を表1 3. 3. 8.に示す。

表1 3.3.8. 長期借入金推移表

(Million Rp.)

Year	Project Cost			Loan Repayment Amount	Loan Balance at End	Interest on Loan
	National Development Fund	Long Term Loan	Total			
1982	289	409	698		409	12
1983	1,833	2,497	4,330		2,906	87
1984	744	1,140	1,884		4,046	121
1985					4,046	121
1986					4,046	121
1987					4,046	121
1988					4,046	121
1989					4,046	121
1990					4,046	121
1991					4,046	121
1992				14	4,032	121
1993				97	3,935	118
1994				135	3,800	114
1995				135	3,665	110
1996				135	3,530	106
1997				135	3,395	102
1998				135	3,260	98
1999				135	3,125	94
2000				135	2,990	90
2001				135	2,855	86
2002				135	2,720	82
2003				135	2,585	78
2004				135	2,450	74
2005				135	2,315	69
2006				135	2,180	65

### 1.3.4. 損益計算書及び資金運用表

前述に経緯を踏まえ作成された表1.3.4.1及び1.3.4.2に当プロジェクト実施後の財務状況を示す。損益計算書は、主としてソロン港の経常収支状況を示している。資金運用表（財政状態変動表）は、当プロジェクト実施後のキャッシュフローを示し、主として長期借入金の返済状況をみるためのものである。2表とも、プロジェクトコストの41%は、国家開発資金により賅う場合の財務状況を示す（ケース2：FRR3.2%と同じ）。

表1.3.4.1. ソロン港損益計算書

(Million Rp.)

	1980	1981	1982	1983	1984	1985	1986 ? 1990	1991 ? 1995	1996 ? 2000	2001 ? 2005
Operating revenues	185	204	225	249	280	502	2,510	2,510	2,510	2,510
Operating expenses	83	85	88	92	97	236	1,180	1,180	1,180	1,180
Operating profit	102	119	137	157	183	266	1,330	1,330	1,330	1,330
Depreciation	62	62	62	65	67	198	990	990	990	990
Interest on Loan	-	-	12	87	121	121	605	584	490	389
Gross profit	40	57	63	5	▲5	▲53	▲265	▲244	▲150	▲49
Tax (45%)	18	26	28	2	-	-	-	-	-	-
National development fund reserve (30.3%)	12	17	19	2	-	-	-	-	-	-
Net profit	10	14	16	1	▲5	▲53	▲265	▲244	▲150	▲49
Operating Ratio (%)	45	42	39	37	35	47	47	47	47	47

表 13.4.2 ソロン港資金運用表

(Million Rp.)

	1980	1981	1982	1983	1984	1985	1986 と 1990	1991 と 1995	1996 と 2000	2001 と 2005
<b>(A) Source of Funds</b>										
Operating profit before interest and depreciation	102	119	137	157	183	266	1,330	1,330	1,330	1,330
Depreciation	62	62	62	65	67	198	990	990	990	990
Long Term Loan			409	2,497	1,140					
National Development Fund			289	1,833	744					
Total	164	181	897	4,552	2,134	464	2,320	2,320	2,320	2,320
<b>(B) Application of Funds</b>										
Addition to Fixed Assets			698	4,330	1,884		105	50	105	594
Interest			12	87	121	121	605	584	490	389
Principal								381	675	675
Others	30	43	47	4	5	53	265	244	150	49
Total	30	43	757	4,421	2,010	174	975	1,259	1,420	1,707
<b>(C) Decrease/Increase of Net Current Assets</b>										
	134	138	140	131	124	290	1,345	1,061	900	613
Debt Service Coverage	—	—	—	255	207	383	383	240	199	1,064
Return on Net Fixed Assets	5	7	8	9	10	3	3	4	4	5

### 1 3.5. 評 価

#### 1 3.5.1. FRR による評価

各ケース毎に算出したFRRを下記に示す。

ケース 1	現行料金水準を維持し、建設コスト全額を海外よりの借款で賄うケース	FRR=不成立
ケース 2	現行料金水準を維持し、建設コストの41%を無利子の国家開発資金で賄うケース	FRR=3.2%
ケース 3	現行料金水準を一率10%値上げし、建設コストの全額を海外よりの借款で賄うケース	FRR=0.0%
ケース 4	現行料金水準を一率10%値上げし、建設コストの41%を無利子の国家開発資金で賄うケース	FRR=4.8%
ケース 5	現行料金水準を一率40%値上げし、建設コストの全額を海外よりの借款で賄うケース	FRR=3.3%
ケース 6	現行料金水準を一率40%値上げし、建設コストの41%を無利子の国家開発資金で賄うケース	FRR= 9%

建設コストの全額を、海外よりの借款で賄うケース(ケース5)は、現行料金水準を一率40%値上げすることによって、3.3%のFRRを得ることができる。しかし、建設コストの41%を無利子の国家開発資金(補助金とみなす)で賄う措置をとれば、現行料金水準のまま、3.2%のFRRを得る(ケース2)。この場合、海外よりの借入条件としての利子率は、3%と想定しているため、当利子率には耐え得る。

#### 1 3.5.2. 財務諸表による評価

前述のFRR 3.2%の場合(ケース2)の損益計算書では、每期約4,000万ルピアの欠損となっている。しかし、資金運用表で、この場合の資金繰りを判断すると、毎期の金利及び元金支払については、支障となるものはない。

したがって、新規投資分について、プロジェクトコストの41%を国家開発資金で賄う措置をとれば、港務料金を据置くことができ、かつ、海外からの借款の元利支払いの支障となるものもない。

#### 1 3.5.3. 結 論

建設コストの41%を国家開発資金で賄う場合は、FRRは3.2%となり、建設コストの59%に相当する海外からの借款の返済については、支障となるものはない。しかし、企業会計の観点からは、每期約5,000ルピアの欠損は好ましくない。結論的に、当投資により地域開発に多大なるインパクトを与え、経済分析の結果でも十分な便益が期待出来ることを考慮すれば、当投資は妥当なものと考えられる。

表 13.5.1. FRR計算表 :Case 2 FRR=3.2%

(Million Rp.)

Year		Balance			Discounted Value (B - C)
		Project Cost (C)	Operating Profit (B)	(B - C)	
1	1982	409		▲ 409	▲ 409
2	1983	2,497		▲ 2,497	▲ 2,420
3	1984	1,140		▲ 1,140	▲ 1,070
4	1985		266	226	242
5	1986		266	226	235
6	1987		266	266	227
7	1988		266	266	220
8	1989		266	266	213
9	1990		266	266	207
10	1991		266	266	200
11	1992		266	266	194
12	1993		266	266	188
13	1994		266	266	182
14	1995		266	266	177
15	1996		266	266	171
16	1997		266	266	166
17	1998		266	266	161
18	1999		266	266	156
19	2000		266	266	151
20	2001		266	266	146
21	2002		266	266	142
22	2003		266	266	137
23	2004		266	266	133
24	2005		266	266	129
25	2006		266		125
Total		4,046	5,852	1,806	▲ 3



表 13.5.2. FRR計算表:Case 3 FRR=0.0%

(Million Rp.)

Year		Balance			Discounted Value (B - C)
		Project Cost (C)	Operating Profit (B)	(B - C)	
1	1982	698		▲ 698	▲ 698
2	1983	4,330		▲ 4,330	▲ 4,330
3	1984	1,884		▲ 1,884	▲ 1,884
4	1985		315	315	315
5	1986		315	315	315
6	1987		315	315	315
7	1988		315	315	315
8	1989		315	315	315
9	1990		315	315	315
10	1991		315	315	315
11	1992		315	315	315
12	1993		315	315	315
13	1994		315	315	315
14	1995		315	315	315
15	1996		315	315	315
16	1997		315	315	315
17	1998		315	315	315
18	1999		315	315	315
19	2000		315	315	315
20	2001		315	315	315
21	2002		315	315	315
22	2003		315	315	315
23	2004		315	315	315
24	2005		315	315	315
25	2006		315	315	315
Total		6,912	6,930	18	18

表 1.3.5.3 FRR計算表: Case 4 FRR=4.8%

(Million Rp.)

Year		Balance			Discounted Value (B - C)
		Project Cost (C)	Operating Profit (B)	(B - C)	
1	1982	409		▲ 409	▲ 409
2	1983	2,497		▲ 2,497	▲ 2,383
3	1984	1,140		▲ 1,140	▲ 1,038
4	1985		315	315	274
5	1986		315	315	261
6	1987		315	315	249
7	1988		315	315	238
8	1989		315	315	227
9	1990		315	315	216
10	1991		315	315	207
11	1992		315	315	197
12	1993		315	315	188
13	1994		315	315	179
14	1995		315	315	171
15	1996		315	315	163
16	1997		315	315	156
17	1998		315	315	149
18	1999		315	315	142
19	2000		315	315	135
20	2001		315	315	129
21	2002		315	315	123
22	2003		315	315	118
23	2004		315	315	112
24	2005		315	315	107
25	2006		315	315	102
Total		4,046	6,930	2,884	13

表 13.5.4 FRR計算表:Case 5 FRR=3.3%

(Million Rp.)

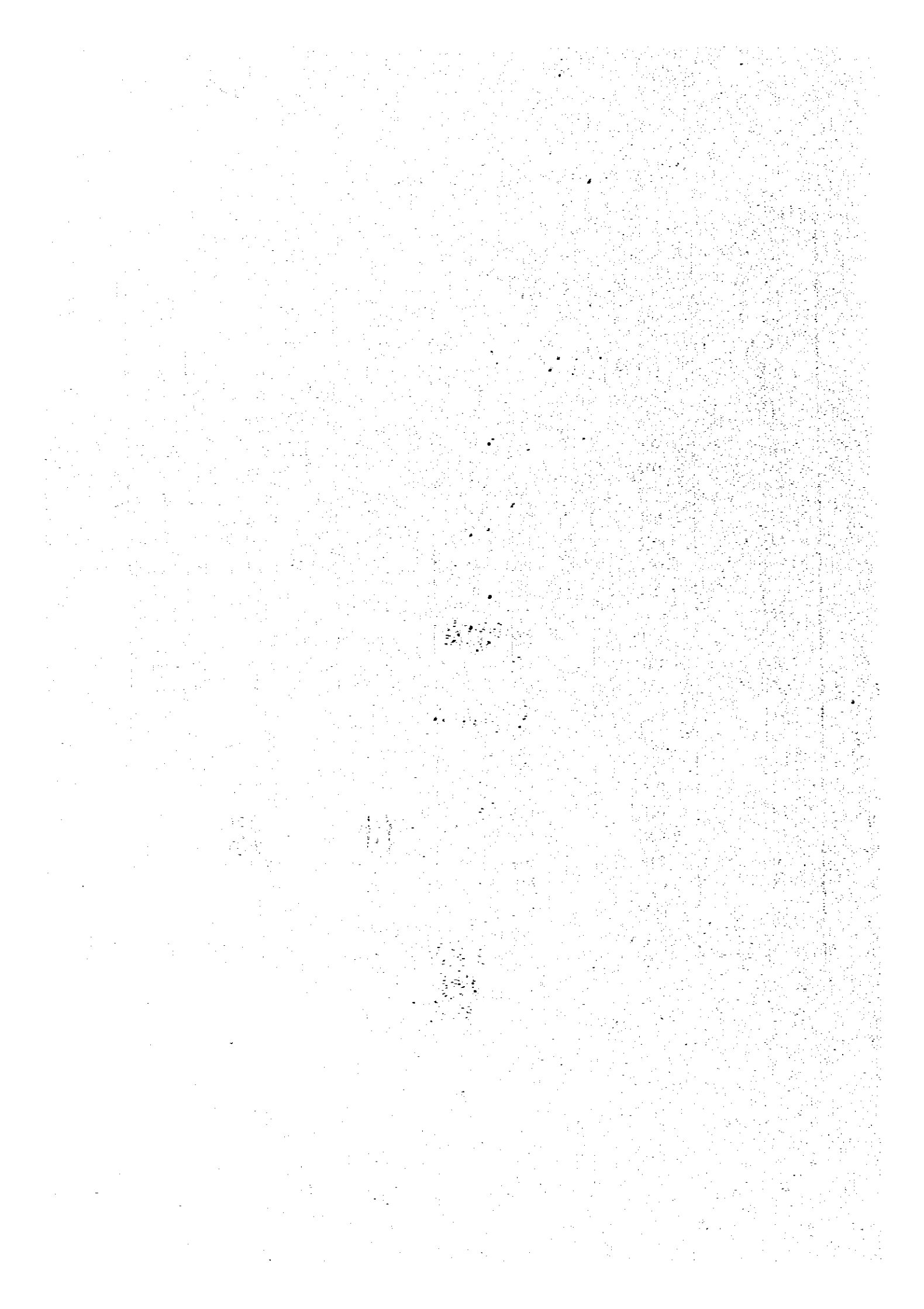
Year		Balance			Discounted Value (B - C)
		Project Cost (C)	Operating Profit (B)	(B - C)	
1	1982	698		▲ 698	▲ 698
2	1983	4,330		▲ 4,330	▲ 4,192
3	1984	1,884		▲ 1,884	▲ 1,766
4	1985		460	460	417
5	1986		460	460	404
6	1987		460	460	391
7	1988		460	460	379
8	1989		460	460	366
9	1990		460	460	355
10	1991		460	460	343
11	1992		460	460	332
12	1993		460	460	312
13	1994		460	460	302
14	1995		460	460	292
15	1996		460	460	292
16	1997		460	460	283
17	1998		460	460	274
18	1999		460	460	265
19	2000		460	460	256
20	2001		460	460	248
21	2002		460	460	240
22	2003		460	460	232
23	2004		460	460	225
24	2005		460	460	218
25	2006		460	460	211
Total		6,912	10,120	3,208	11

表 13.5.5: FRR計算表: Case 6 FRR=9.0%

(Million Rp.)

Year		Balance			Discounted Value (B - C)
		Project Cost (C)	Operating Profit (B)	(B - C)	
1	1982	409		▲ 409	▲ 409
2	1983	2,497		▲ 2,497	▲ 2,291
3	1984	1,140		▲ 1,140	▲ 960
4	1985		460	460	355
5	1986		460	460	326
6	1987		460	460	299
7	1988		460	460	274
8	1989		460	460	252
9	1990		460	460	231
10	1991		460	460	212
11	1992		460	460	194
12	1993		460	460	178
13	1994		460	460	164
14	1995		460	460	150
15	1996		460	460	138
16	1997		460	460	126
17	1998		460	460	116
18	1999		460	460	106
19	2000		460	460	98
20	2001		460	460	89
21	2002		460	460	82
22	2003		460	460	75
23	2004		460	460	69
24	2005		460	460	63
25	2006		460	460	58
Total		4,046	10,120	6,074	▲ 5

# 付 録



**TERMS OF REFERENCE  
OF  
MASTER PLAN AND PREDESIGN  
FOR  
THE PORT OF SORONG**

**June, 1979**

**Directorate General of Sea Communications  
Department of Transport, Communications and Tourism  
The Republic of Indonesia**

## I. BACKGROUND AND SUPPORTING INFORMATION

### 1. NECESSITY OF THE PROJECT

The region of Irian Jaya is abundant in natural resources such as oil, mining and agricultural products.

The region, however, which came back under jurisdiction of Indonesia, eighteen years ago, is sparsely populated and is in minor economic activity partly because of rather cold investment for its infrastructure.

Breaking out this situation, Sorong is coming before the flushlights as a "pioneer" for development of the "eastern frontier".

Looking out the future economical activity in this area, a preceded investment for infrastructure would be indispensable, especially for a deep sea port.

The port of Sorong thus selected as the "nuclear port" of Irian Jaya, where shipping requirement is rising.

### 2. INSTITUTIONAL FRAMEWORK

The masterplan and predesign of the port of Sorong is a project of the Directorate General of Sea Communications (DGSC). The functional responsibility is held on the Directorate of Ports and Dredging which carries out the project joined with the Planning Bureau, Research and Development Institution of Sea Communications, and the Port Administration of Sorong.

### 3. GOVERNMENT FOLLOW-UP

With the improvement of the port facilities, the Government of Indonesia will ensure effective and reliable shipping services as well as the influence to the growth of the regional economy and increase the transport demand.

The project is expected to consist of basic investment program and will serve as a guide to attract private investment and will be feasible for implementation.

## II. OBJECTIVES

The principal purpose of the study is to provide the Government of Indonesia with a recommendation for the future development plan of the port of Sorong as a main port in Irian Jaya.

The objectives of the study on the development project of Sorong Port area as in:

1. To prepare a comprehensive masterplan for development of the port of Sorong, based on the forecast of development of its influence area, its social and economic aspect, and the correlation to other main port.
2. To prepare a short term plan for the port of Sorong and its financial and economic analysis.



### III. PLAN OPERATION

#### III-1 Scope of Works

1. To review relevant existing studies and reports.
2. To study natural, social and economic situations of the port and its influence area.
3. To forecast the future traffic volume by land & marine transport.
4. To prepare a comprehensive masterplan of the port.
  - \* to study existing capacity of the port.
  - \* to study industries and man power relating to the port.
  - \* to study economic structure in adjacent area.
  - \* to select a site and to make layout of the port based on both natural and economic conditions.
  - \* to study access road and waterway of the port.
  - \* to study administration and operation of the port.
  - \* to study relevancy with other projects in adjacent area.
  - \* to study environmental assessment.
5. To prepare a short term plan of the port.
  - \* to study the port traffic.
  - \* to make an arrangement plan of the port facilities.
  - \* to make an arrangement plan of the cargo handling equipment and storage facilities.
  - \* to study the dredging requirement and reclamation.
  - \* to study the utilities.
  - \* to make a preliminary design of port facilities.
  - \* to make rough cost estimates and implementation program.
  - \* to study economic and financial analysis.
  - \* to make an improvement plan for the existing port facilities if necessary.
  - \* the study shall include some alternative plans.
6. To make preliminary engineering services for soil and hydraulic problems if necessary.
7. To recommend to the Government of Indonesia with some proper idea for regional development in connection with the port development.
8. To provide transfer of knowledge in the different fields relevant to this project.
9. To indicate the methodology of the study.

#### III-2 Principle of Planning

1. To meet traffic volume forecast by land and marine transportation.
2. To take into consideration the regional development plan.
3. To include proper idea as a part of regional development.
4. To consider the relationship with the ports in the influence area.
5. To synchronize the port planning with urban plan of Sorong city and road network.
6. To consider environmental assessment.
7. To make recommendations for a sound financing policy of the port in the future.
8. To consider the relationship with other project in adjacent area.

### III-3 Report

The following reports shall be submitted to the Government of Indonesia:

1. Inception report

This report shall include program of a study and survey schedule for the port of Sorong.

2. Interim report

This report shall include the following:

a. The comprehensive masterplan shall indicate a direction of the plan of Sorong Port as a main port for oceangoing vessels.

b. The short term plan shall include rough cost estimate in due consideration of alternative plan.

This report shall be submitted and explained to the Government of Indonesia within three months after the completion of field survey.

The Government of Indonesia will provide its comments within one month after the receipt of interim report.

3. Draft final report

This report shall be prepared as a draft of final report with the short term plan and the masterplan for Sorong port. This report shall be submitted to the Government of Indonesia within three months after receipt of comments on the interim report.

The Government of Indonesia will provide its comments within one month after receipt of the draft final report.

4. Final report

The final report shall be submitted to the Government of Indonesia within about three months after receipt of final comments on draft final report.

5. A summary of the each report except Interim report shall be provided.

6. The report shall be made in English and distributed as follows:

\* Inception Report : 30 copies

\* Interim Report : 30 copies

\* Draft Final Report : 30 copies

\* Final Report : 60 copies

Note: The above schedule is subject to the preparation of required information, data and comments in time by the Government of Indonesia.

### IV. UNDERTAKING OF THE GOVERNMENT OF INDONESIA

1. To provide the study team with available data and information necessary for the study.
2. To exempt the study team from taxes and duties on the materials, equipment and personal effects brought into Indonesia by the team, according to the Government of Indonesia regulations.
3. To assign the official counterparts during the survey.
4. To make arrangement for visiting the authorities concerned.
5. To provide the study team with transportation facilities such as mobile car and boat for the

field survey, and to arrange suitable accommodation facilities in the vicinity of the study areas.

### V. UNDERTAKING OF THE GOVERNMENT OF DONOR COUNTRY

The survey team of Donor country will transfer its technical knowledge concerning the project studies to the Indonesian counterparts during the field survey and processing data in Japan.

**SCOPE OF WORK THE STUDY  
ON THE DEVELOPMENT PROJECT OF THE PORT OF SORONG,  
THE REPUBLIC OF INDONESIA**

**This Scope of Work is agreed by the following two authorities concerned:**

**Directorate General of Sea Communications,  
Department of Communications the Govern-  
ment of the Republic of Indonesia.**

**Japan International Cooperation Agency, the  
Official Agency responsible for the implementa-  
tion of technical cooperation programmes of the  
Government of Japan.**

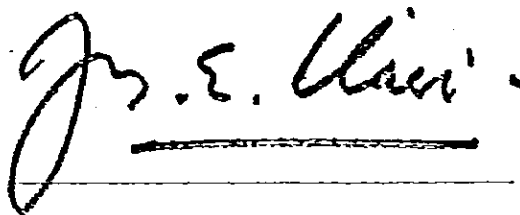
**To confirm the aforementioned, the Scope of Work is herewith attached and signed by the  
responsible personnels of the said authorities concerned.**

**Date: March 1, 1980**

**Issued at: Jakarta**

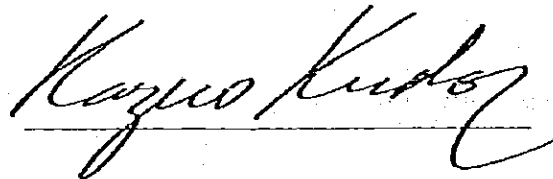
**For Department of Communications,  
the Government of the Republic of  
Indonesia.**

**For Japan International Cooperation  
Agency, the Government of Japan.**



**J. E. HABIBIE  
Secretary of the Directorate  
General of Sea Communications**

**Department of Communications  
The Republic of Indonesia**



**Kazuo Kudo  
Leader  
Japanese Preliminary Survey Team  
Director**

**Hydraulic Engineering Division  
Port & Harbour Research Institute  
Ministry of Transport  
Japan**

**SCOPE OF WORK**  
**FOR**  
**THE STUDY ON THE DEVELOPMENT PROJECT**  
**OF**  
**THE PORT OF SORONG,**  
**THE REPUBLIC OF INDONESIA**

**February, 1980**

**Japan International Cooperation Agency**

## **I. INTRODUCTION**

In response to the agreement reached between the Government of the Republic of Indonesia and the Government of Japan concerning the implementation of the Study on the Development Project of the Port of Sorong, Japan International Cooperation Agency (hereinafter referred to as JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will carry out the Study.

The present document sets for the Scope of Work in regard to the abovementioned Study, which is to be carried out in cooperation with the Government of the Republic of Indonesia and its authorities.

## **II. OBJECTIVES**

The Study intends to formulate a master plan for the Port of Sorong to support the significant growth of the regional economy, mainly in its area of influence, covering Irian Jaya and parts of Maluku islands, and to cover the increasing demand of sea traffic through the Port until about 2000.

It also includes a short term plan for the Port for the period ending 1985 with a feasibility study.

## **III. OUTLINE OF THE STUDY**

In order to achieve the objectives, the Study consists of two phases.

### **Phase I**

The Study in phase I will cover a master plan for the Port of Sorong and its vicinity.

The Inception Report on a program of the Study and the schedule for the field Surveys will be submitted by the Study Team to the Government of the Republic of Indonesia at the first meeting. After discussion between the Government and the Team on it, the Team will carry out the Surveys, which include the following items:

- a) Review and analyse all the available pertinent reports and data, furnished by the Government of the Republic of Indonesia.
- b) Carry out necessary field investigations for the Port of Sorong and its vicinity, including the present status of facilities, and operations.
- c) Assess the existing capacity of the port and define the urgent needs for improvement.
- d) Comment on possible improvement for port operation, including other related subjects such as customs, cargo forwarders etc. if any.
- e) Prepare a traffic projection of the Port for the first ten years and outline of the following ten years.
- f) Analyse and forecast shipping characteristics, such as type and size of calling vessels, type of services, lot size, etc.
- g) Review present status of town planning from the view point of port development, and comment on, if any, necessary adjustments to the appropriate authorities.

- h) Investigate and assess the present status of power, water, communication, repair facilities, ship chandling, labour size, etc. which are considered essential for the orderly development of the port.
- i) Assess the availability and costs of materials, the construction equipment, and the skilled and unskilled labour, for the different construction plans.
- j) Examine and assess the functions and relations of the Port of Sorong to all other major ports in Irian Jaya and other islands near the Port, and provide a realistic scenario for the possible course of balanced development of these ports.

Based on the above Studies, conditions and assumptions on which the master plan and feasibility study can be worked out will be summarized in the form of Provisional Report. The Report will be reviewed by the concerned government authorities, and a consensus shall be formulated before the start of the next step.

The report shall include proposals for technical investigations, such as boring and soil test, wave and current observations, which will require long survey period and are to be carried out by the Government of the Republic of Indonesia.

Based on the results of discussion on the Provisional Report, a master plan for the Port of Sorong as a guide for the orderly development of the port will be submitted in the form of the Interim Report, of which major roles will be as follows:

- a) Define the long term space requirement for the port activities, including port related industries, and work out the best space allocation with respect to the overall township development.
- b) Choose a basic arrangement of the facilities, and plan the frame work of the port, such as alignment of channels, basins, pier-head lines, and main access to the port area.
- c) Establish and maintain a smooth interface between the development of township and the port, including access to the port, and arrangement of utility supply.

## Phase II

The Study in Phase II will consist of a short term port development program, and a feasibility study, which cover the following items:

- a) Define the short term development, based on the traffic projection and urgent needs of repair for the existing port facilities, indentified in the course of the above studies, if any.
- b) Carry out preliminary design of port facilities for the short term and make realistic cost estimate, including necessary port equipment, such as cargo-handling equipment, harbour crafts, utility supply in port area, navigation aids, etc. The cost estimate should be prepared in such a manner that clearly separates foreign components, domestic components, and taxes and duties, if any.
- c) Identify and assess all the economic benefits associated with proposed short term port development. Effort should be taken to quantify economic benefits as much as possible. Then carry out benefit/cost analysis.
- d) Review and assess existing tariff structure and rates, and propose changes, if necessary.
- e) Review and assess the present status of the financial position of the port, and make necessary advices for improvement, if any.
- f) Carry out financial analysis of the port and prepare financial tables such as profit/loss statement, fund flow statement, and balance sheet, then calculate financial indicators, such as

- IFRR, return on fixed assets, and debt/service ratio.
- g) Work out outline of construction method and time schedule of the proposed first phase development.

#### **IV. TIME SCHEDULE**

The Study is to be completed within twelve months after the commencement of field surveys, which will start in the early next fiscal year of 1980. The duration of field surveys in the Republic of Indonesia will be about three months.

#### **V. REPORTS**

JICA will prepare and submit to the Government of the Republic of Indonesia the following reports in English during the course of the Study.

- 1) Inception Report (30 copies)
- 2) Provisional Report (30 copies)
- 3) Interim Report (30 copies)
- 4) Draft Final Report (30 copies)
- 5) Final Report (60 copies)

#### **VI. THE GOVERNMENTS' UNDERTAKINGS**

The Government of the Republic of Indonesia shall undertake the following items:

- 1) To provide the Study Team with necessary and available informations and data.
- 2) To arrange the appointments for visiting the appropriate authorities, and entering the necessary study areas.
- 3) To assign counter part officials to the Study Team during the study period.
- 4) To provide the Study Team with facilities, such as automobiles, boats, suitable offices with copying equipment and secretarial services and to arrange suitable accommodations in the vicinity of the study area.
- 5) To exempt the Study Team from taxes and duties for the equipment, materials and personal effects to be brought into the Republic of Indonesia according to the Government's regulations.
- 6) To exempt the Study Team's members from the Republic of Indonesia income tax and charges of any kind imposed on or in connection with the living allowance remitted from abroad.
- 7) To perform technical investigation for natural conditions in the project site.

The study will be carried out in such a manner that through this study the team will ensure technological transfer to Indonesian counterparts as much as possible.





