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# **GOVERNMENT OF MALAYSIA**

# NATIONAL WATER RESOURCES STUDY, MALAYSIA PERLIS-KEDAH-PULAU PINANG REGIONAL WATER RESOURCES STUDY PART 2 BERIS DAM FEASIBILITY STUDY

# VOL. 7

- J. ECONOMIC ANALYSIS
- K. LAND ACQUISITION COST AND ENVIRONMENTAL STUDIES
- L. LEGAL AND INSTITUTIONAL ARRANGEMENT

**MARCH 1985** 

JAPAN INTERNATIONAL COOPERATION AGENCY

# NATIONAL WATER RESOURCES STUDY, MALAYSIA

# PERLIS - KEDAH - PULAU PINANG REGIONAL WATER RESOURCES STUDY

# PART 2

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K. LAND ACQUISITION COST AND ENVIRONMENTAL STUDIES

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# **ABBREVIATIONS**

# (1) Organization/Plan

4MP (5MP) : Fourth (Fifth) Malaysia Plan

DID (JPT) : Drainage and Irrigation Department

EPU : Economic Planning Unit

FELCRA: : Federal Land Consolidation and Rehabilitation Authority

FELDA : Federal Land Development Authority

IBRD : The World Bank

JICA : Japan International Cooperation Agency
MADA : Muda Agricultural Development Authority

MOH : Ministry of Health

MTR : Mid-Term Review of 4MP

NEB (LLN) : National Electricity Board

NWRS : National Water Resources Study
PWA : Pulau Pinang Water Authority

PWD (JKR) : Public Works Department

RESP : Rural Environmental Sanitation Program

RISDA: Rubber Industry Smallholders Development Authority

WHO : World Health Organization

# (2) Others

B : Benefit

BOD : Biochemical Oxygen Demand

C : Cost

COD : Chemical Oxygen Demand
D&I : Domestic and Industrial

dia. : Diameter

EIRR : Economic Internal Rate of Return E1: : Elevation Above Mean Sea Level

Eq. : Equation Fig. : Figure

GDP : Gross Domestic Product
GNP : Gross National Product
H : Height, or Water Head
HWL : Normal High Water Level
O&M : Operation and Maintenance

Q : Discharge Ref. : Reference

SS : Suspended Solid

VA : Value Added

# ABBREVIATIONS OF MEASUREMENT

# Length

= millimeter = centimeter

= meter = kilometer km

= foot yd = yard

## Area

 $cm^2$  = square centimeter

m<sup>2</sup> = square meter

ha = hectare

 $km^2$  = square kilometer

# Volume

cm<sup>3</sup> = cubic centimeter

1 = lit = liter

kl = kiloliter m<sup>3</sup> = cubic meter

gal.= gallon

# Weight

= milligram

= gram

kg = kilogram

ton = metric ton

lb = pound

# Time

= second

min = minute

h = hour

d = day

= year

# Electrical Measures

= Volt

= Ampere

= Hertz (cycle)

= Watt

kW = Kilowatt

MW = Megawatt

= Gigawatt GW

## Other Measures

= percent

= horsepower

= degree = minute

= second

°C = degree in centigrade

 $10^3$ = thousand

 $10^6$  = million

 $10^9$  = billion (milliard)

# Derived Measures

 $m^3/s = cubic meter per second$ 

cusec= cubic feet per second

mgd = million gallon per day

kWh = kilowatt hour

MWh = Megawatt hour

GWh = Gigawatt hour

kWh/y= kilowatt hour per year

kVA = kilovolt ampere

BTU = British thermal unit

psi = pound per square inch

# Money

M\$ = Malaysian ringgit

US\$ = US dollar

= Japanese Yen

# CONVERSION FACTORS

	From Metric System	To Metric System
Length	1  cm = 0.394  inch	1  inch = 2.54  cm
	1  m = 3.28  ft = 1.094  yd	1  ft = 30.48  cm
	1  km = 0.621  mile	1  yd = 91.44  cm
		1 mile = 1.609 km
Area	$1 \text{ cm}^2 = 0.155 \text{ sq.in}$	$1 \text{ sq.ft} = 0.0929 \text{ m}^2$
	$1 \text{ m}^2 = 10.76 \text{ sq.ft}$	$1 \text{ sq.yd} = 0.835 \text{ m}^2$
	1 ha = 2.471 acres	$1 \ acre = 0.4047 \ ha$
	$1 \text{ km}^2 = 0.386 \text{ sq.mile}$	$1 \text{ sq.mile} = 2.59 \text{ km}^2$
Volume	$1 \text{ cm}^3 = 0.0610 \text{ cu.in}$	1 cu.ft = 28.32 lit
	1 lit = 0.220 gal.(imp.)	1 cu.yd = $0.765 \text{ m}^3$
	1  kl = 6.29  barrels	1 gal.(imp.)= 4.55 lit
	$1 \text{ m}^3 = 35.3 \text{ cu.ft}$	1 gal.(US) = 3.79 lit
	$10^6 \text{ m}^3 = 811 \text{ acre-ft}$	1 acre-ft = $1,233.5 \text{ m}^3$
Weight	1 g = 0.0353  ounce	1 ounce = $28.35 \text{ g}$
	1  kg = 2.20  lb	1 1b = 0.4536  kg
	1 ton = 0.984 long ton	1  long ton = 1.016  ton
na filiknik in ingel Si Hilland Miland	= 1.102 short ton	1 short ton $= 0.907$ ton
Energy	1 kWh = 3,413 BTU	1 BTU = 0.293 Wh
<u>Temperature</u>	$^{\circ}C = (^{\circ}F - 32) \cdot 5/9$	$^{\circ}F = 1.8^{\circ}C + 32$
Derived	$1 \text{ m}^3/\text{s} = 35.3 \text{ cusec}$	$1 \text{ cusec} = 0.0283 \text{ m}^3/\text{s}$
Measures	$1 \text{ m}^3/\text{s} = 35.3 \text{ cusec}$ $1 \text{ kg/cm}^2 = 14.2 \text{ psi}$	1 psi = $0.703 \text{ kg/cm}^2$
- <del> </del>	1 ton/ha = 891 lb/acre	1 1b/acre = 1.12 kg/ha
	$10^6  \text{m}^3 = 810.7  \text{acre-ft}$	$1 \text{ acre-ft} = 1,233.5 \text{ m}^3$
	$1 \text{ m}^3/\text{s} = 19.0 \text{ mgd}$	$1 \text{ mgd} = 0.0526 \text{ m}^3/\text{s}$
Local	1 lit = 0.220 gantang	1 gantang = 4.55 lit
Measures	1 kg = 1.65 kati	1  kati = 0.606  kg
	1 ton = 16.5 pikul	1  pikul = 60.6  kg
		Exchange Rate
		(at the end of 1983)
		US\$1 = M\$2.312 \$100 = M\$0.998

# ANNEX J ECONOMIC ANALYSIS

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#### 1. INTRODUCTION

The water output of the Beris dam can be utilized in the major demand centres in the integrated Kedah-Muda-Perai river system. It will not have a specified service area whoes demand just meet the net water output of the Beris dam, but it will contribute to augment the supply capacity of the controlled water in the integrated river system.

In this Annex, economic and financial analyses were conducted for the overall source development plans in the integrated river system as well as the proposed Beris dam project.

In economic evaluation of the Beris dam, a sensitivity analysis was carried out against variations in major parameters for the Beris dam evaluation.

On the other hand, the financial analysis included the fund requirement of the Beris dam project, allocation of the cost to beneficiaries of the project, financial statement of the project and unit water cost analysis. A farm budget analysis is carried out in Annex C "Agriculture".

Since the procedures applied for the economic analysis and cost allocation for the study were same as those used for the Part 1 Study, a general procedure and the updated and revised points are discussed in this Annex.

The major differences from Part 1 Study are;

- (1) The demands of irrigation, and domestic and industrial water supply were updated in this study, and a single projection of demand was applied instead of two alternative cases of projection for Part 1 Study.
- (2) Accordingly, the analysis of water deficit by cause by affected area was revised.
- (3) Net water output of source facilities were revised on the basis of the integrated operation study.
- (4) The prices of internationally marketable crops and farm inputs were updated by the latest forcasts of the World Bank.
- (5) The cost of the Beris dam was estimated on the basis of the design and construction planning for the feasibility study.
- (6) The estimate of the cost and benefit was based on the price level at the end of 1983.

# 2. ALLOCATION OF WATER OUTPUT

# 2.1 Water Demand and Deficit

The water demand and supply balance of the integrated Kedah-Muda-Perai river system was examined in Annex F, for three Alternatives of allocation of the Muda river water to the Kedah river basin at the Jeniang weir.

The major water uses in the integrated river system are classified into the following purposes in which it is defined that Main stream is a river stretch upstream of which a source project is assumed while no source project is assumed in Tributary.

- (1) Kedah river
- (1-1) MADA main; the major irrigation scheme in the MADA area
- (1-2) Main minor; minor irrigation schemes depending on offtakes of the MADA canal and in the main stream
- (1-3) Tributary minor; minor irrigation schemes depending on tributaries
- (1-4) D&I; domestic and industrial water supply
- (2) Muda-Perai river
- (2-1) Main minor; minor irrigation schemes in the main stream located both in the States of Kedah and Pulau Pinang
- (2-2) Tributary minor; minor irrigation schemes depending on tributaries which are located only in the State of Kedah
- (2-3) D&I; domestic and industrial water supply both for the States of Kedah and Pulau Pinang.

Annual water demand in the integrated river system is estimated for two cases of irrigation water development plan, i.e. Case A with new minor irrigation projects and Case B without new minor irrigation projects, while the D&I water demand of the State of Pulau Pinang is estimated under the condition that the water demand of intensive-industries will not grow after 1985. The annual water demand for 1983, 1990 and 2000 is summarized in Tables 1 and 2, which are based on Tables 71 and 72 of Annex F.

The Pinang Tungal irrigation scheme and public water supply system in the State of Pulau Pinang conjunctively utilize water in the Muda and Perai river. Their water demand is counted for only the portion which is supplied from the Muda river in estimating water demand in the main stream of the Muda-Perai river system.

The rate of river maintenance flow in Table 3 is a reproduction of Table 19 of Annex F.

Average annual water deficit is shown in Tables 4 and 5 for Case A and Case B by cause by affected area, which is a reproduction of Tables 84 and 85 of Annex F. The water deficits in affected area are those occurring in the main stream of the Kedah and Muda rivers on an average for 1961 to 1983 under the condition with existing and ongoing source facilities.

# 2.2 Water Output

The water demand and supply balance for various combinations of source facilities were evaluated by a simulation model under 1961-1983 hydrological condition in Annex F. The allocation of the water output to causes is estimated for 3 different operation rules of the Jeniang weir as discussed in Annex F "Study on Operation of Water Resources System". The alternatives are;

Alternative 1 : Muda priority

Alternative 2: Even distribution

Alternative 3: Kedah priority

Tables 6 to 11 show the net water output of source facilities allocated by cause of water deficit.

# 3. ECONOMIC BENEFITS AND COSTS

#### 3.1 Economic Benefit

# (1) Irrigation benefit

The economic farm gate price was revised from M\$609/ton to M\$548/ton in 1983 constant price level, based on the latest projected price for 1990-1995 by IBRD for the standard 15% broken Thai grade, and assuming an average mill return of 65%. Table 12 shows the average paddy yield, gross production value, production cost and the resulting net production value, which are expressed as values per ha.

The net incremental production value which is the balance between the net production values with and without project conditions in 2003 onward is shown in Table 13.

Net production value streams with and without project conditions are prepared for the Kedah river basin as shown in Table 14 and for the Muda river basin as shown in Table 15.

# (2) Domestic and industrial water supply benefit

The benefit arising from domestic and industrial water supply is estimated based on the least-costly alternative method.

The least-costly alternative dam of the Beris dam shall be a dam to be ranked next to the dam, and the Tawar-Muda dam was selected as the least costly alternative. The unit value of water is calculated to be the annual equivalent cost of the dam divided by the net water output to be developed by the dam assuming a discount rate of 8%. Table 16 shows the unit water value of the Beris dam and the Tawar-Muda dam. In the table different unit water value is calculated for the Kedah and Muda-Perai rivers because of difference in expected net water output between these rivers. The unit water values of the Tawar-Muda dam is applied for the evaluation of domestic and industrial water supply benefit.

# (3) Hydropower benefit

The possibility of hydropower development is evaluated in Annex I "Design and Cost Estimate". The economic benefit for the hydropower development is calculated in the following consideration.

The energy benefit is counted for the benefit of hydropower generation of the Beris dam, while the capacity benefit cannot be claimed because the power generation is possible during only half a year. The energy value used in this Study is M\$0.145/kWh, which is the same as that estimated in Annex O of Part 1 Study.

# (4) Adverse effect of tributary irrigation and D&I water supply

The adverse effect of tributary irrigation and D&I water supply is calculated as shown in Table 17 for Case A (with new minor irrigation projects). The calculation procedure is herein explained according to column number in Table 17.

- (a) Net production value in MADA with-project in Table 14,
- (b) Net production value in Main minor with-project in Table 14,
- (c) Percentage of water deficit caused by Tributary minor and affecting on MADA and Main minor in Table 4 to the water demand of MADA and Main minor in the Kedah river system in Table 1,
- (d) Percentage of water deficit caused by D&I water supply and affecting on MADA and Main minor in Table 4 to the water demand of MADA and Main minor in the Kedah river system in Table 1,
- (e) (c) x ((a) + (b))/100,
- (f) (d) x ((a) + (b))/100,
- (g) Net production value in Main minor with-project in Table 15,
- (h) Percentage of water deficit caused by Tributary minor and affecting on Main minor in the Muda-Perai river system in Table 4 to water demand of the Main minor in Table 1,
- (i) Percentage of water deficit caused by D&I water supply and affecting on Main minor in the Muda-Perai river system in Table 4 to water demand of the Main minor in Table 1,
- (j) (g) x (h)/100, and
- (k) (g) x (i)/100.

#### (5) River maintenance flow

No economic benefit is assumed for the river maintenance flow.

## 3.2 Economic Cost

The financial cost of the dam is converted to the economic cost by applying the national economic conversion factors prepared by EPU as shown in Table 18. The resulting economic cost of the Beris dam is shown in Table 19. The land acquisition cost in the financial cost was replaced by production forgone expected in the area to be flooded by the impoundment. Table 20 shows the breakdown of production forgone for economic evaluation.

The cost of Tawar-Muda dam is also revised by using the unit cost for the Beris dam. The costs of the other source facilities are the same as those estimated in Part 1 Study. Table 21 summarizes the cost of source facilities. The cost streams of these source facilities are shown in Table 22 assuming the year of commission to be 1990 for the Jeniang system and 1991 for the other source project.

A minor adjustment of cost for irrigation facilities are made as discussed in Annex D. The cost stream of the irrigation facilities is shown in Table 23.

# 4. ECONOMIC ANALYSIS OF OVERALL SOURCE DEVELOPMENT PLAN

The Beris dam is characterized as a source project for the Integrated Kedah-Muda-Perai river system.

The overall development plan of the integrated river system herein evaluated is based on the plan including the Jeniang system as a new source facility and irrigation development projects for Case A and domestic and industrial water supply projects in the integrated river system. A source project to be implemented following to the Jeniang system is economically justified if the incremental benefit is greater than the incremental cost, or incremental net benefit is positive. In this sense, the incremental net benefit of the overall plan was evaluated if the Beris dam and other potential dams are involved in the overall development plan for the following combinations of source projects.

- (1) Jeniang
- (2) Jeniang + Beris
- (3) Jeniang + Beris + Reman
- (4) Jeniang + Beris + Tawar-Muda
- (5) Jeniang + Beris + Khlong Thepha
- (6) Jeniang + Beris + Reman + Khlong Thepha
- (7) Jeniang + Beris + Reman + Merbok

Among these combinations (1), (2) and (3) are evaluated for three alternative operation rules of Jeniang system of Alternatives 1, 2 and 3, while the combinations (4) to (6) are for Alternatives 1 and 3. The case of (7) involving the Merbok storage is evaluated for Alternative 3, in which the storage is required to remove the deficit in the Muda-Perai river system.

A detailed breakdown of the present values of benefit and cost assuming variable discount rate is shown in Tables 24 to 31 for the above-mentioned combinations of source projects.

Table 24 shows the combination of Jeniang + Beris + Reman + Khlong Thepha for Alternative 1, Muda priority, assuming that these facilities are implemented in this order. The incremental net benefit is positive if the Beris and the Reman dams are involved for the discount rate up to 18%, but that of the Khlong Thepha dam is negative if the discount rate is higher than 10%. The same is found for Alternatives 2 and 3 as shown in Tables 25 and 26, though Tables 25 and 26 show the combination of Jeniang + Beris + Reman. Tables 27 and 28 show the combination of Jeniang + Beris + Tawar-Muda for Alternatives 1 and 3. The net incremental benefit is negative if the discount rate is higher than 6%. In case that the Khlong Thepha dam is implemented following to the Beris dam, the project is justified only for discount rate lower than 10% as shown in Tables 29 and 30. Table 31 shows that the net incremental benefit of the Merbok storage is negative for the discount rate higher than 6%.

Consequently, the Beris and Reman dam project are economically justified as new source facilities following to the Jeniang project in the integrated Kedah-Muda-Perai river system, while the other potential dams would not be economically justified.

The background of the above-mentioned tables are compiles as follows:

Tributary minor and D&I water supply have priority to take river water over Main minor and MADA and are not affected by water deficit in the main stream. Therefore it is assumed that the benefit arising from Tributary minor and D&I water supply is obtained under the condition without new source facilities.

The irrigation benefit of Tributary minor is calculated in Table 32.

The D&I benefit is calculated in Table 33. Column (a) in the table shows benefit for the Kedah river system: unit water cost of Tawar-Muda for the Kedah river system multiplied by the water deficit caused by D&I. In column (b), the D&I benefit for the Muda-Perai river system is calculated to be unit water cost of Tawar-Muda for the Muda-Perai river system multiplied by the water deficit caused by D&I.

The benefit of new source facilities will arise from the affected area i.e. MADA and Main minor in the Kedah river system and Main minor in the Muda river system. The benefit is calculated in Tables 34 to 39 by source facilities. The calculation procedure is described for these tables.

- (a) Total supply with Jeniang is total demand in Table 1 deducted by caused deficit in Table 4 and added by net water output of Jeniang in Table 6. Regarding MADA and Main minor in the Kedah river system, percentage of total supply with Jeniang to water demand in Table 1 is calculated.
- (b) Percentage of Beris net water output for the Kedah river system in Table 6 to MADA + Main minor water demand in the Kedah river system in Table 1.
- (c) Percentage of Reman output for the Kedah river system in Table 9 to MADA + Main minor water demand in the Kedah river system in Table 1.
- (d) Percentage of Tawar-Muda output for the Kedah river system in Table 9 to MADA + Main minor water demand in the Kedah river system in Table 1.
- (e) Percentage of Khlong Thepha output for the Kedah river system in Table 9 to MADA + Main minor water demand in the Kedah river system in Table 1.
- (f) Increase in incremental net production value by Jeniang; Net production value in MADA with-project in Table 14 multiplied by (a) less the same value for 1983.

- (g) (o) Similar to (f)
- (p) Total supply with Jeniang is total demand in Table 1 deducted by caused deficit in Table 4. Regarding Main minor in the Muda-Perai river system, percentage of total supply with Jeniang to water demand in Table 1 is calculated.
- (q) Percentage of Beris output for the Muda-Perai river system in Table 6 to Main minor water demand in the Muda-Perai river system in Table 1.
- (r) Increase in incremental net production value by Jeniang; Net production value in Main minor with-project in Table 15 multiplied by (a) less the same value in Main minor without-project.
- (s) Net production value in Main minor in Table 15 multiplied by (q).

The same calculation assuming that the Khlong Thepha dam, Tawar-Muda dam and Merbok storage can be implemented among the potential dams is shown in Tables 36 to 39.

# 5. ECONOMIC ANALYSIS OF BERIS DAM

# 5.1 Economic Internal Rate of Return

The economic internal rate of return (EIRR) of the Beris dam project is calculated in this section. The net irrigation benefit of a purpose (MADA, minor or tributary irrigation) is given as the net production value less irrigation direct cost as shown in Table 40. It is assumed that the Beris dam can claim the net benefit in the affected area i.e. MADA and Main minor in the Kedah river system and Main minor in the Muda river system. The net water output allocated to causes in Tables 6 to 8 produces the benefit in the affected area in proportion to the water deficit in the affected area.

The EIRR of the project was calculated for Case A and Case B as follows:

:	EIRR of Beris D	am Project
Alternatives	Case A	Case B
1	14.8%	15.3%
2	14.8%	15.3%
3	14.6%	14.9%

Table 40, compiled from Tables 14, 15 and 23, shows the net irrigation benefit as the net production value less irrigation direct facilities cost.

The benefit stream of the Beris dam project is calculated in Tables 41 to 46 by Alternatives and Cases. Table 41 shows the benefit stream of the Beris dam project for Alternative 1, Case A. The calculation procedure for Table 41 is described hereunder:

- (a) Net water output allocated to MADA in Table 6.
- (b) (e) Similar to (a)
- (f) Benefit obtained in the affected area by the net water output allocated to MADA:
  - (a)/(total water deficit in the affected area in the Kedah river in Table 4) x (net irrigation benefit of MADA plus Main minor irrigation in the Kedah river derived from Table 40).
- (g) (j) Similar to (f)
- (k) Total benefit in the Kedah river system: (f) + (g) + (h) + (i) + (j).

- (1) Net water output allocated to Main minor of the State of Kedah in the Muda river in Table 6.
- (m) (p) Similar to (1)
- (q) Benefit obtained in the affected area by the net water output allocated to Main minor:

(1)/(total water demand of the Main minor in the Muda river in Table 1) x (net production value in Main minor with-project in Table 15 less the direct facility cost of Main minor in Table 23).

- (r) (u) Similar to (q)
- (v) Total benefit in the Muda-Perai river system: (q) + (r) + (s) + (t) + (u).

The same calculation is shown in Tables 42 to 46.

# 5.2 Sensitivity Analysis

The calculation of the EIRR in the previous section was based on the most probable value of key factors. Sensitivity tests are carried out to evaluate the extent of changes in the EIRR if key factors change within a reasonable range.

The key factors and their percentage changes examined are:

(1) Investment costs

10% increase

(2) Benefits

25% decrease

(3) Delay in commissioning project

one year

(4) Combination of (1), (2) and (3)

Table 47 shows the resulting EIRR and the sensitivity indicator (SI), where SI is defined as the percentage change of EIRR due to percentage change in the factor tested.

# 6. FINANCIAL ANALYSIS

# 6.1 Fund Requirement

The financial cost of the Beris dam project is estimated in Annex I "Design and Cost Estimate", as shown in Table 48 which includes direct construction cost, compensation cost, engineering and government administration costs and contingencies.

The compensation cost is estimated in Annex K "Land Acquisition Cost and Environmental Studies" for variable reservoir water levels as shown in reservoir water level of El. 87.7 m.

The disbursement schedule of the project cost was prepared as shown in Table 50 according to the construction time schedule, in which it is assumed that the detailed investigation and design works are commenced in 1985 and all the construction works are completed at the end of 1989.

The disbursement schedule of the Jeniang system and the direct facilities of irrigation and domestic and industrial water supply facilities are shown in Table 51.

# 6.2 Financial Cost Allocation

The cost of the Beris dam is allocated to purposes which are the causes of water dificit to be met by the Beris dam project. The separable costs-remaining benefits method is applied as a cost allocation rule since it is the common practice for water resources development project as discussed in Part 1 Study.

The capital and 0 & M costs are allocated in terms of the present value at a discount rate of 8%. The results of the calculation are shown in Tables 52 to 57 for Alternatives 1, 2 and 3, and Cases A and B respectively. The sum of the separable costs is 66 to 77% of the total construction cost, indicating the allocation to be highly use-oriented.

The construction cost is allocated to the agencies concerned for reference as shown in Table 58, assuming the following relationship:

MADA : MADA main in the Kedah river

Kedah DID : All minor irrigation schemes including MADA

minor, and river maintenance flow

Kedah PWD : D&I private and public in the Kedah river

Pulau Pinang DID: Main minor irrigation schemes in the Muda-

Perai river

PWA : D&I private and public in the Muda river

# 6.3 Financial Farm Budget

In order to assess the capacity to pay by benefited farmers, a farm budget analysis is made for typical farmer operating an average farm size under with- and without-project conditions as shown in Table 59.

The annual net reserve or capacity to pay in the future under withproject condition would increase markedly as compared with the condition without project implementation. The increase in net reserve would also offer to be farmers incentives for further development and a substantial capacity to pay would be greatly in excess of irrigation fee.

## 6.4 Financial Statement

# (1) Financial analysis for Federal Government

The financial statement for the Beris dam project is prepared from the viewpoint of the Federal Government assuming Alternative 2 for Case A.

The cost of the Beris dam is allocated to the MADA irrigation project, minor irrigation projects for the States of Kedah and Pulau Pinang, and domestic and industrial water supply for the States of Kedah and Pulau Pinang.

It is assumed that the cost allocated for these purposes are financed under the following conditions.

The foreign currency portion of the investment costs of the Beris dam is financed by an international financing agency. The repayment condition is assumed to be an annual interest rate of 4% and a term of 25 years including 7 years of grace period.

The investment cost allocated to MADA irrigation project is financed by own fund of the Federal Government.

The investment cost allocated to the minor irrigation projects is firstly paid by the State DID and then reimbursed by the Federal Government.

The investment cost allocated to urban water supply project is financed by the Federal loan, while the rural water supply projects are financed by the Federal grant.

The operation and maintenance costs are born by own funds of purposes.

Table 60 shows the financial cash flow from the view point of the Federal Government. The annual peak of the fund requirement of the Federal Government is estimated at M\$34.45 x 10<sup>6</sup> at 1983 price level, which appears in 1987.

# (2) Cash flow by purpose

From the view point of MADA, it is assumed that the investment cost is covered by the Federal fund and O&M cost of the Beris dam allocated to MADA is born by own fund of MADA as shown in Table 61.

The analyses for the Kedah and Pulau Pinang DID are shown in Tables 62 and 63 for minor irrigation projects respectively. It is assumed that the State DID will obtain the reimbursement from the Federal Government one year later.

From the viewpoint of PWA for domestic and industrial water supply, a cash flow table is shown in Table 64. Because of repayment on loan to the Federal Government, M $\$0.42 \times 10^6$  of the peak deficit appears in 1990.

Table 65 shows the cash flow for PWD of the State of Kedah. Since the proportion of the rural area is 65% in the State of Kedah, repayment amount is relatively small.

# (3) Unit water cost

The unit water cost for irrigation project is calculated herein assuming that the irrigation projects bear only the operation and maintenance costs of source and direct facilities. The cost per unit water volume is estimated to be M\$0.024/m³ in 2000 for MADA and M\$0.025/m³ for minor irrigation projects. Since the increase in income from paddy production is estimated at M\$0.049/m³ to M\$0.059/m³, the farmers benefited by the project seem to be able to bear the O&M cost as water charge.

For domestic and industrial water supply, unit water cost is estimated for the cost including investment and 0 & M costs. The resulted unit water cost of the Beris dam for the domestic and industrial water supply is M\$0.26/m³ for PWA and M\$0.24/m³ for PWD respectively. These costs are in the order of the present water rate for domestic use.

# TABLES

Table 1 ANNUAL WATER DEMAND FOR CASE A

Unit:  $10^6 \text{ m}^3$ 

	•				OHEC: 10 m		
Description	198	33	199	0	200	0	
edah river system				٠.			
Tributary	32		41		67		
MADA main	1,309		1,278		1,243		
Main minor							
fringe	23		21		21		
main stream	. 0		. 1		. 6		
D & I	33		55		137		
Total	1,397		1,396		1,474		
Muda-Perai river system							
Tributary	49		85		136		
Main minor							
Kedah	58		97		98		
Pulau Pinang	300	(212)	261	(185)	261	(185)	
D&I							
Kedah	10		21		59		
Pulau Pinang	141	(37)	191	(41)	333	(153)	
Total	558		655		887		
Grand Total	1,955		2,051		2,361		

Remark: Figures between parentheses show the withdrawals from the Muda river.

Table 2 ANNUAL WATER DEMAND FOR CASE B

Unit: 106 m<sup>3</sup>

Description	1983	1990	2000
Kedah river system			
Tributary	32	32	33
MADA main	1,309	1,278	1,243
Main minor			
fringe	23	21	21
main stream	0	O	.0
D&I	33	55	137
Total	1,397	1,386	1,434
		en de la companya de La companya de la co	
Muda-Perai river system			
Tributary	49	50	59
Main minor	•		
Kedah	58	58	58
Pulau Pinang	300 (212)	261 (185)	261 (185)
D&I			
Kedah	10	21	59
Pulau Pinang	141 (37)	191 (41)	335 (152)
Total	558	581	770
Grand Total	1,955	1,967	2,204

Remark; Figures between parentheses show the withdrawals from the Muda river.

Table 3 RIVER MAINTENANCE FLOW

Unit: m<sup>3</sup>/s

		ewerage opment	Without sewerage development		
River system	1990	2000	1990	2000	
Kedah	2.7	5.9	5.3	17.0	
Muda	0	0	0	0	
Perai (Kulim)	0.3	1.1	0.5	5.3	

Source: Table 19 in Annex F.

Table 4 AVERAGE ANNUAL WATER DEFICIT BY CAUSE BY AFFECTED AREA (CASE A)

unit:  $10^6 \text{ m}^3$ 

		Affected Area by Kedah River System			Muda-Perai River System				
	Cause of	MADA	Main			Main	minor		
	Water Deficit	main	minor	D&I	Total	Kedah	P.Pinang	D&I	Total
1983	Kedah System		÷						
	MADA main	383.3	6.7	0	390			·····	
	Main minor	6.9	0.1	0	7			· · · · · · · · · · · · · · · · · · ·	
	Tributary minor	6.9	0.1	0	7				
	D&I	4.9	0.1	0	5				
	Total	402.0	7.0	ó	409				
	Muda-Perai System								
	. Kedah: Main minor					0.2	0.8	0.	1
	Tributary mino	or				0.2	0.8	0	1
	D&I					0	0	0	0
	. P.Pinang: Main minor				· · · · · · · · · · · · · · · · · · ·	0.9	3.1	0	4
	D&1				····	0.2	0.8	0	1
		······································	· · · · · · · · · · · · · · · · · · ·			1.5	5.5	0	7
	Total						3.3		
990	Kedah System			_	200				
	MADA main	338.2	5.8	0	344	···			<del></del>
	Main minor	6.9	0.1	0	<u>7</u>	·			
	Tributary minor	6.9	0.1	0	7	<del></del>			
	DEI	0	0	0	0 (+46)				
	Total	352.0	6.0	0	358 (404)	<del></del>		<del></del> -	
	Muda-Perai System								
	. <u>Kedah: Main minor</u>	· · · ·	·			1.0	2.0	0	3
	Tributary mine	or				1.4	2.6	0	4
	DEI		<del></del>			0.7	1.3	Ū	2 .
	. P.Pinang: Main minor	·	·			1.0	2.0	. 0	3
	DEI					0	0	0	0 (+)
	Total	· · · · · · · · · · · · · · · · · · ·	·	<del></del>		4.1	7.9	0	12 (1
000	Kedah System	•				•			
	MADA main	332.8	7.2	00	340				
	Main minor	8.8	0.2	0	9				
	Tributary minor	19.6	0.4	0	20				
	D&I	15.7	0.3	0	16(+45)				
	Maintenance flow	13.7	0.3	0	14				
	Total	390.6	8.4	0	399 (444)				
	Muda-Perai System					1			
	. Kedah: Main minor	· · · · · · · · · · · · · · · · · · ·	-	···		1.0	2.0	Ö	3
	Tributary mine	or				3.5	6.5	0	10
	D&1					0.7	1.3	0	2
	. P. Pinang: Main mino	r				1.0	2.0	0	3
	D&I		<del></del>			1.7	3.3	0	5 (+1
٠.	Total					8.0	15.0	0	23 (3

Remark; Figures between parentheses in row of D&I indicate supply from Ahning or Mengkuang dam, those in row of total indicate deficit if Ahning and Mengkuang dams are not

Table 5 AVERAGE ANNUAL WATER DEFICIT BY CAUSE BY AFFECTED AREA (CASE B)

Unit: 106 m3

			Affected Area by Water Deficit						
			dah Riv			Muda-Perai River Sy			stem
	Cause of Water Deficit	MADA main	Main minor	D&I	Total		minor	Def	Total
983	:	WG Z I	MILIOL	Dar	TOTAL	Kedah	P.Pinang	D&1	TOCAL
303									
	MADA main	383.3	6.7	0	390				
	Main minor	6.9	0.1	0	7				
	Tributary minor	6.9	0.1	0	7	· · · · · · · · · · · · · · · · · · ·			
	D&1	4.9	0.1	0	5	<del></del>			
	Total	402.0	7.0	0	409				
	Muda-Perai System								
	. Kedah: Main minor					.0.2	0.8	0	1
	Tributary mino	r				0.2	0.8	0	1
	D&I					0	0	0	0
	. P.Pinang: Main minor					0.9	3.1	0	44
	D&I		<del></del> -			0.2	0.8		<u> </u>
	Total	<del></del>				1.5	5.5	0	7
990	Kedah System								
	MADA main	334.5	5.5	0	340				
	Main minor	6.9	0.1	0	7				
	Tributary minor	6.9	0.1	0	7			<del></del>	
	Del	0	0	0	0 (+46)		<del></del>		
•	Total	348.3	5.7	0	354 (400)				
		340.5			334 (400)				
	Muda-Perai System						•		
	. Kedah: Main minor	<del> </del>			_,	0.2	8.0	0	1
	Tributary mino	r				0.2	0.8		1
:	D&I	·				0.5	1.5	0	. 2
	. P.Pinang: Main minor					0.7	2.3	0	3 .
	D&I	<del></del>				0	0	0	0 (+4)
	Total					1.6	5.4	0	7 (11
000	Kedah System								
000		224 4			340				
	MADA main Main minor	334.4 6.9	5.6 0.1	0	340 7				
	Tributary minor				7		······································		
		6.9	0.1	0	<del></del>				
	D&I	15.7	0.3	0	16 (+45)	·		<u> </u>	
	Maintenance flow	13.8	0.2	. 0	14				
	Total	377.7	6.3	0	384 (429)	<del></del>			
	Muda-Perai System				•				
	. Kedah: Main minor	··				0.2	0.8	0	. 1
	Tributary mino	r				0.2	0.8	0	1
	D&I					0.5	1.5	0	2
						0.7	7 7	0	3
	. P.Pinang: Main minor					0.7	2.3	. 0	3
	. P.Pinang: Main minor D&I					1.2	3.8	0	5 (+9

Remark: Figures between parentheses in row of D&I indicate supply from Ahning or Mengkuang dam, those in row of total indicate deficit if Ahning and Mengkuang dams are not operated.

Table 6 NET WATER OUTPUT OF SOURCE FACILITIES BY CAUSE OF WATER DEFICIT (ALTERNATIVE 1, MUDA PRIORITY) (1/6)

Unit:  $10^6 \text{ m}^3$ 

a	Jeniano	System	Beris			
Cause of Water Deficit	Case A	Case B	Case A	Case B		
Water Delicie						
1990						
Kedah System				•		
MADA	178.4	178.3	45.1	50.0		
Main minor	3.6	3.7	0.9	1.0		
Tributary minor		:	7.0	7.0		
D&I			! ;			
Sub-total	182.0	182.0	53.0	58.0		
Made Demai						
Muda-Peraì						
Kedah						
Main minor	•		3.0	1.0		
Tributary minor			4.0	1.0		
D & I			2.0	2.0		
Pulau Pinang			2			
Main minor			3.0	3.0		
D& I						
Sub-total	:		12.0	7.0		
Total	182.0	182.0	65.0	65.0		
2000				٠.		
Kedah System						
	166.0	2000	20.0			
MADA	166.0	166.8	20.6	42.4		
Main minor Tributary minor	4.4	3.4	0.6 20.0	7.0		
D&I	7.8	7.9	1.0	2.0		
Maintenance flow	6.8	6.9	0.8	1.7		
Sub-total	185.0	185.0	43.0	54.0		
Muda-Perai System	•			3		
Kedah						
Main minor			3.0	1.0		
Tributary minor			10.0	1.0		
D&I		•	2.0	2.0		
Pulau Pinang				na nazaria di Salah Sala		
Main minor		•	3.0	3.0		
D&I			5.0	5.0		
Sub-total			23.0	12.0		
Total	185.0	185.0	66.0	66.0		
		. =	00.0			

Table 7 NET WATER OUTPUT OF SOURCE FACILITIES
BY CAUSE OF WATER DEFICIT
(ALTERNATIVE 2, EVEN DISTRIBUTION) (2/6)

Unit:	$10^{6}$	<sub>m</sub> 3

		:			
Cause of	Jeniang	System	Beris		
Water Deficit	Case A	Case B	Case A	Case E	
1000					
1990					
Kedah System					
MADA	178.4	178.4	46.1	51.0	
Main minor	3.6	3.6	0.9	1.0	
Tributary minor			7.0	7.0	
D&I		·		,-,,,,	
Sub-total	182.0	182.0	54.0	59.0	
Muda-Perai System	•				
Kedah			·	٠.	
Main minor			2.5	0.8	
Tributary minor			4.0	1.0	
D&I			2.0	2.0	
Pulau Pinang			:		
Main minor			2.5	2.2	
D&I					
Sub-total		:	11.0	6.0	
Total	182.0	182.0	65.0	65.0	
2000			•		
Kedah System					
MADA	166.0	166.8	23.3	45.1	
Main minor	4.4	3.4	0.6	0.9	
Tributary minor			20.0	7.0	
D&I	7.8	7.9	1.1	2.1	
Maintenance flow	6.8	6.9	1.0	1.9	
Sub-total	185.0	185.0	46.0	57.0	
Muda-Perai System			•		
Kedah					
Main minor			1.5	0.2	
Tributary minor			10.0	1.0	
D&I	• .		2.0	2.0	
Pulau Pinang	٠.		٠.,		
Main minor			1.5	0.8	
D&I			5.0	5.0	
Sub-total			20.0	9.0	
Total	185.0	185.0	66.0	66.0	

Table 8 NET WATER OUTPUT OF SOURCE FACILITIES BY CAUSE OF WATER DEFICIT (ALTERNATIVE 3, KEDAH PRIORITY) (3/6)

 $10^6 \, \text{m}^3$ Unit: Beris Jeniang System Cause of Case A Case B Case A Case B Water Deficit 1990 Kedah System 53.9 53.9 178.4 178.4 MADA 1.1 1.1 3.6 3.6 Main minor 7.0 7.0 Tributary minor D&I 182.0 62.0 62.0 182.0 Sub-total Muda-Perai System Kedah Main minor Tributary minor D&I Pulau Pinang Main minor D&I Sub-total 0.0 0.0 Total 182.0 62.0 62.0 182.0 2000 Kedah System MADA 167.8 168.7 41.3 53.2 Main minor 4.4 3.5 1.1 1.1 Tributary minor 20.0 7.0 7.9 7.9 1.9 2.5 Maintenance flow 1.7 6.9 6.9 2.2 Sub-total 187.0 187.0 66.0 66.0 Muda-Perai System Kedah Main minor Tributary minor D&I Pulau Pinang Main minor D&I Sub-total 0.0 0.0

187.0

187.0

66.0

66.0

Total

Table 9 NET WATER OUTPUT OF SOURCE FACILITIES
BY CAUSE OF WATER DEFICIT
(ALTERNATIVE 1, MUDA PRIORITY) (4/6)

Unit:  $10^6 \text{ m}^3$ 

Cause of		nan	Tawar-N	luda	Khlo The <u>r</u>	_	Mer	ook
Water Deficit	Case A	Case B	Case A	Case B	Case A	Case B	Case A (	Case I
1990								
Kedah System								
MADA Main minor Tributary minor	87.2 1.8	87.2 1.8	18.6 0.4	18.6	42.1 0.9	42.1 0.9	·	
D&I						in the second		
Sub-total	89.0	89.0	19.0	19.0	43.0	43.0		
Muda-Perai System			÷				÷	
Kedah			. :			*:		
Main minor Tributary minor				*.				
D&I								
Pulau Pinang							4.0	
Main minor D&I								
Sub-total				·			0.0	0.0
Total	89.0	89.0	19.0	19.0	43.0	43.0	0.0	0.0
2000				٠.				
Kedah System								
MADA	87.0	87.4	20.6	20.7	38.6	38.8		
Main minor Tributary minor	2.3	1.8	0.5	0.4	1.0	0.8		
D & I	4.1	4.1	1.0	1.0	1.8	1.8		
Maintenance flow	3.6	3.6	0.9	0.9	1.6	1.6		·
Sub-total	97.0	97.0	23.0	23.0	43.0	43.0		
Muda-Perai System				*				
Kedah		:	·					
Main minor Tributary minor		:	•					
D&I				٠, .				
Pulau Pinang				•			•	
Main minor D&I				and the second s	· 10· · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
Sub-total							0.0	0.0
Total	97.0	97.0	23.0	23.0	43.0	43.0	0.0	0.0

Table 10 NET WATER OUTPUT OF SOURCE FACILITIES
BY CAUSE OF WATER DEFICIT
(ALTERNATIVE 2, EVEN DISTRIBUTION) (5/6)

Unit:  $10^6 \text{ m}^3$ 

		An and a second			
Cause of	Ren	nan		Mer.	
Water Deficit	Case A	Case B	Case	<u> A</u>	Case B
1990					
Kedah System					
	07.7	81.3			+ - + + + + + + + + + + + + + + + + + +
MADA	87.2 1.8	1.7			
Main minor Tributary minor	1.0	1			
D&I		· .		: .	
Sub-total	89.0	83.0		÷	
Muda-Perai System	•				: '
Kedah					
Main minor					*-
Tributary minor		•			
D&I					Mary Bark
Pulau Pinang					
Main minor					:1. :
D&I					4
Sub-total			0.	<u> </u>	0.0
	20.0	03.0	0.		0.0
Total	89.0	83.0	٥.		0.0
2000					
Kedah System		:			
MADA	74.4	74.8	<u>.</u>		++± - 1
Main minor	2.6	1.6		*	
Tributary minor					٠.
D & I	3.5	3.5			e e
Maintenance flow	3.1	3.1			
Sub-total	83.0	83.0	-		
Muda-Perai System					
Kedah		•			1 1
Main minor					
Tributary minor					
D&I					
Pulau Pinang					
Main minor					1.1
D&I			-		e e e e e e e e e e e e e e e e e e e
Sub-total			0.	0	0.0
Total	83.0	83.0	0.	0	0.0

Table 11 NET WATER OUTPUT OF SOURCE FACILITIES
BY CAUSE OF WATER DEFICIT
(ALTERNATIVE 3, KEDAH PRIORITY) (6/6)

Unit: 10<sup>6</sup> m<sup>3</sup>

Cause of	Ren	ıan	Tawar-Muda		Khlo Ther		Merbok		
Water Deficit	Case A Case B		Case A Case B		Case A		Case A		
1990	:							•	
Kedah System							٠		
MADA Main minor Tributary minor D & I	81.3	81.3	16.7	16.7 0.3	42.1	42.1 0.9			
Sub-total	83.0	83.0	17.0	17.0	43.0	43.0	:		
Muda-Perai System									
Kedah								-	
Main minor Tributary minor D & I						÷	3.0 4.0 2.0	1.0 1.0 2.0	
Pulau Pinang		: 1							
Main minor D&I							3.0	3.0	
Sub-total							12.0	7.0	
Total	83.0	83.0	17.0	17.0	43.0	43.0	12.0	7.0	
2000									
Kedah System	•	٠							
MADA Main minor Tributary minor	74.4	74.8	17.0 0.5	17.1	32.3 0.9	32.5 0.7			
D&I	3.5	3.5	0.8	0.8	1.5	1.5			
Maintenance flow	3.1	3.1	0.7	0.7	1.3	1.3			
Sub-total	83.0	83.0	19.0	19.0	36.0	36.0			
Muda-Perai System									
Kedah									
Main minor Tributary minor D&I	:			÷			3.0 10.0 2.0	1.0 1.0 2.0	
Pulau Pinang				٠				•	
Main minor D&I	•						3.0 5.0	3.0 5.0	
Sub-total						<u></u>	23.0	12.0	
Total	83.0	83.0	19.0	19.0	36.0	36.0	23.0	12.0	

Table 12 ESTIMATED AVERAGE PADDY YIELD AND ECONOMIC NET PRODUCTION VALUE

			in the state of th	Gross Pro-	Pro- duction	Net Production
			Yield	duction value	Cost	Value
	· · · · · · · · · · · · · · · · · · ·	Scheme	(ton/ha)	(M\$/ha)	(M\$/ha)	(M\$/ha)
1.	With	Insufficient Irrigat	ion Water Su	pply		
	1.1	MADA	• • • •			
		- Without tertiary development	4.0	2,192	892	1,300
	1.2	Rainfed	2.2	1,206	796	410
	1.3	Existing minor irrigation	3.2	1,754	844	910
					*	
2.	With	Sufficient Irrigation	n Water Supp	ly		
	2.1	MADA			·.	
		<ul><li>With tertiary development</li></ul>	5.0	2,740	938	1,802
		- Without tertiary development	4.0	2,192	892	1,300
	2.2	Minor irrigation				
		- New projects	4.5	2,466	916	1,550

Remarks; Economic production value is projected to 1995 onward at 1983 constant price.

Table 13 TOTAL ECONOMIC NET PRODUCTION VALUE
IN 2003 ONWARD UNDER WITH- AND WITHOUTPROJECT CONDITIONS

	Without Project	With Project	Increment
Kedah River System			
MADA	210.3	331.6	121.3
Minor projects depending on MADA canal/main stream	6.0	9.7	3.7
Minor projects in tributaries	2.7	6.5	3.8
Muda River System			
Minor projects depending on main stream	29.5	50.5	21.0
Minor projects in tributaries	3.7	13.3	9.6

Remark; In 1983 constant price.

Table 14 FLOW OF NET PRODUCTION VALUE WITH- AND WITHOUT-PROJECT CONDITION FOR THE KEDAH RIVER BASIN

٠		мата		М	Main Minor			Tributary Minor		
Year	W/O	MADA W/P	I/B	W/O	W/P	I/B	W/O	W/P	I/B	
				6.02	6.02	_	2.70	2.70	· _	
1982	210.34	210.34	_		4	•	2.70	2.70	_	
1983	210.34	210.34	web.	6.02	6.02	i			٠	
1984	210.34	210.34	<u> </u>	6.02	6.02	· .	2.70	2.70	0.10	
1985	210.34	210.34	-	6.02	6.02		2.70	2.82	0.12	
1986	210.34	210.34	_	6.02	6.02		2.70	3.14	0.44	
1987	210.34	210.34		6.02	6.02	. <del>.</del>	2.70	3.19	0.49	
1988	210.34	210.34	_	6.02	6.02	. <del>-</del> ':	2.70	3.24	0.54	
1989	210.34	210.34		6.02	6.02	-	2.70	3.45	0.75	
1990	210.34	252.40	42.06	6.02	8.80	2.78	2.70	3.70	1.00	
1991	210.34	271.57	61.23	6.02	8.86	2.84	2.70	4.51	1.81	
1992	210.34	276.96	66.62	6.02	8.91	2.89	2.70	4.62	1.92	
1993	210.34	281.75	71.41	6.02	8.95	2.93	2.70	4.72	2.02	
1994	210.34	287.14	76.80	6.02	8.95	2.93	2.70	5.05	2.35	
1995	210.34	292.53	82.19	6.02	9.05	3.03	2.70	5.24	2.54	
1996	210.34	297.48	87.14	6.02	9.25	3.23	2.70	5.52	2.82	
1997	210.34	303.03	92.69	6.02	9.29	3.27	2.70	5.60	2.90	
1998	210.34	308.92	98.58	6.02	9.38	3.36	2.70	5.65	2.95	
1999	210.34	317.99	107.65	6.02	9.48	3.46	2.70	5.84	3.14	
2000	210.34	324.65	114.31	6.02	9.63	3.61	2.70	6.31	3.61	
2001	210.34	328.49	118.15	6.02	9.67	3.65	2.70	6.37	3.67	
2002	210.34	330.79	120.45	6.02	9.72	3.70	2.70	6.43	3.73	
2003	210.34	331.56	121.22	6.02	9.73	3.71	2.70	6.47	3.77	
•	. •	•	•	•	•	•	•	•		
•	•	•	•		•	•	•	•	•	
2022	210.34	331.56	121.22	6.02	9.73	2 71	2 70	·	יים כ	
2032	210.34	22T 20	121.22	0.02	9.73	3.71	2.70	6.47	3.77	

Remarks; (1) W/O: Without project W/P: With project

I/B : Incremental net production value

(2) In 1983 constant price.

Table 15 FLOW OF NET PRODUCTION VALUE WITH- AND WITHOUT-PROJECT CONDITION FOR THE MUDA RIVER BASIN

		Main Minor		Tr	Tributary Minor			
Year	W/O	W/P	I/B	W/O	W/P	I/B		
1982	30.79	30.79	<u></u>	4.20	4.20	unia		
1983	30.79	30.79	. <del></del> .	4.20	4.20			
1984	30.79	30.79	-	3.70	3.70	===		
1985	30.64	37.69	7.05	3.66	4.48	0.82		
1986	30.48	41.61	11.13	3.66	5.30	1.64		
1987	30.44	44.21	13.77	3.66	5.47	1.81		
1988	30.44	46.86	16,42	3.66	5.65	1.99		
1989	29.60	46.11	16.51	3.66	6.90	3.24		
1990	29.54	45.80	16.26	3.66	8.29	4.63		
1991	29.54	49.74	20.20	3.66	8.58	4.92		
1992	29.54	49.81	20.27	3.66	8.85	5.19		
1993	29.54	49.85	20.31	3.66	8,99	5.33		
1994	29.54	49.86	20.32	3.66	9.54	5.88		
1995	29.54	49.92	20.38	3.66	10.12	6.46		
1996	29.54	50.02	20.48	3.66	10.90	7.24		
1997	29.54	50.04	20.50	3.66	11.10	7.44		
1998	29.54	50.06	20.52	3.66	11.23	7.57		
1999	29.54	50.19	20.65	3.66	12.31	8.65		
2000	29.54	50.37	20.83	3.66	12.77	9.11		
2001	29.54	50.51	20.97	3.66	12.98	9.32		
2002	29.54	50.55	21.01	3.66	13,18	9.52		
2003	29.54	50.57	21.03	3.66	13.28	9.62		
•	. •	•	•	•	•	•		
•	•			•	•	•		
		•	•	•	•			
2032	29.54	50.57	21.03	3.66	13.28	9.62		

Remarks; (1) W/O: Without project

W/P : With project

I/B : Incremental net production value

(2) In 1983 constant price.

Table 16 DOMESTIC AND INDUSTRIAL WATER SUPPLY BENEFIT BASED ON ALTERNATIVE FACILITIES COST

Alternative Facilities	Annual Equivalent of Cost (M\$10 <sup>6</sup> )	For Kedah Net Water Output (106 m3)	System  Benefit (M\$/m <sup>3</sup> )	Annual Equivalent of Cost (M\$10 <sup>6</sup> )	For Muda-P Net Water Output (106 m3)	erai System Benefit (M\$/m3)
Beris	5.46	66.0	0.08	6.00	24.8	0.24
Tawar-Muda	8.77	37.0	0.24	9.66	16.8	0.58

## Remarks; (1) Benefit is not unit value of raw water but unit value of water deficit met for the purpose of domestic and industrial water supply.

- (2) Based on alternative facilities cost of the source projects.
- (3) In 1983 constant price.

Table 17 CASH FLOW AND PRESENT WORTH OF
ADVERSE EFFECT DUE TO TRIBUTARY
IRRIGATION AND D&I WATER SUPPLY

KEDAH SYSTEM

MUDA-PERAI SYSTEM

	NET PROD		ROPORTION		ADVERSE	EFFECT		PROPORTIO		ADVERSE	eppect	TOTAL
YEAR	MADA	MAIN -	<del></del>	1	RIBUTARY	D&I	IN HAIN			TRIBUTARY	D&I	EFFECT
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	MAIN (M\$10 <sup>6</sup> ) (a)	(M\$10 <sup>6</sup> ) (b)	(Z) (C)	D&I (2) (d)	HINOR (M\$10 <sup>6</sup> ) (e)	(M\$10 <sup>6</sup> ) (f)	MINOR (M\$10 <sup>6</sup> ) (g)	TRIBUTARY (I) (h)	D&1 (%) (i)	MINOR (M\$10 <sup>6</sup> ) (j)	(M\$10 <sup>6</sup> ) (k)	(M\$10 <sup>6</sup> )
1984	210.34	6.02	.0.53	0.33	1.15	0.70	30.79	0.52	0.42	0.16	0.13	2.14
1985	210.34	6.02		0.27	1.15	0.59	37.69		0.47	0.25	0.18	2.17
1986	210.34	6.02		0.22	1.16	0.47	41.61	0.82	0.52	0.34	0.21	2.18
1987	210.34	6.02	0.54	0.16	1.16	0.35	44.21	0.97	0.56	0.43	0.25	2.19
1988	210.34	6.02	0.54	0.11	1.16	0.23	46.86	1.12	0.61	0.52	0.29	2 21
1989	210.34	6.02	0.54	0.05	1.17	0.12	46.11	1.27	0.66	0.59	0.30	2.17
1990	252.40	8.80	0.54	0.00	1.41	0.00	45.80	1.42	0.71	0.65	0.33	2.39
1991	271.57	8.86	0.64	0.13	1.80	0.35	49.74	1.63	0.89	0.81	0.44	3.41
1992	276.96	8-91	0.75	0.25	2.13	0.72	49.81	1.84	1.06	0.92	0.53	4.30
1993	281.75	8.95	0.85	0.38	2.47	1.10	49.85	2.05	1.24	1.02	0-62	5.21
1994	287.14	8.95	0.95	0.50	2.82	1.49	49.86	2.26	1.41	1.13	0.71	6.14
1995	292.53	9.05	1.05	0.63	3-18	1,90	49.92	2-48	1.59	1.24	0.79	7.11
1996	297.48	9.25	1.16	0.76	3,55	2.32	50.02	2.69	1.77	1.34	0.88	8.10
1997	303.03	9.29	1.26	0.88	3.94	2.75	50.04	2.90	1.94	1.45	0.97	9.11
1998	308.92	9.38	1.36	1.01	4.34	3,21	50.06	3.11	2.12	1.56	1.06	10.17
1999	317.99	9.48	1.47	1.13	4.80	3.71	50.19	3.32	2.29	1.67	1-15	11.33
2000	324.65	9.63	1.57	1.26	5.25	4.21	50.37	3.53	2.47	1.78	1.24	12.48
2001	328 49	9.67	1.57	1.26	5.31	4.26	50.51	3.53	`2.47	1.78	1.25	12.60
2002	330.79	9.72	1.57	1.26	5.35	4.29	50-55	3-53	2.47	1.78	1.25	12.67
2003	331.56	9.73	1.57	1.26	. 5.36	4.30	50.57	3.53	2.47	1.79	1-25	12.69
2010	331.56	9.73	1.57	1.26	5.36	4.30	50.57	3.53	2.47	1.79	1.25	12.69
2011	331.56	9.73	1.57	1.26	5.36	4.30	50.57	3.53	2.47	1.79	1.25	12.69
2032	331.56	9.73	1.57	1.26	5.36	4.30	50.57	3.53	2.47	1.79	1.25	12.69
2033	331.56	9.73	1.57	1.26	5.36	4.30	50.57	3.53	2.47	1.79	1.25	12.69
NEV( 6Z)	4389.43	131.56	<del></del>		50.82	34.49	742.28	3		17.74	11.80	114.85
NPV( 8%)	3296.06	98.94			35.32	22.87	566.93	3		12.40	8.16	78.75
NPV(10%)	2592.64	77 • 87			25.78	15.89	452.47	ì		9.08	5.91	56.67
NPV(12%)	2115.01	63.50			19.61	11.51	373.45	5		6.91	4.45	42.49
NPV(14%)		53.25			15.45	8.65	316.40			5.43	3.46	32.99
NPV(16%)	1524.09	45.65			12.52	6.71	273.59	9		4.38	2.77	26.38
NPV(18%)	1332.14	39.83			10-40	5.35	240.42	2		3.61	2.27	21-64

Table 18 NATIONAL ECONOMIC CONVERSION FACTORS

Category	444	Factor
Opportunity Cost of Capital		0.10
General Conversion Factor		0.89
Rubber		1.22
Agricultural inputs		0.86
Port handling		0.72
Transport services		0.66
Construction services		0.77
Construction materials		0.88
Transport equipment		0.76
Power and fuel		0.97
Public services		0.89

Source: National Parameters for Project Appraisal in Malaysia Vol. 1 to Vol. V; The Opportunity Cost of Labour (in Peninsular Malaysia) Vol. III; Conversion Factors for Tradeable and Non-tradeable Goods and Services, Economic Planning Unit, Prime Minister's Department.

Table 19 ECONOMIC COST OF BERIS DAM

Items	Financial Cost (M\$10 <sup>3</sup> )	Conversion Factor	Economic Cost (M\$10 <sup>3</sup> )
. Investment Cost			
River Diversion	2,150	0.88	1,890
Main Dam			
Excavation and concrete	8,480	0.88	7,460
Grouting	1,520	0.77	1,170
Sub total	10,000		8,630
Stilling Basin	710	0.88	620
River Outlet			
Concrete	105	0.88	90
Mechanical works			
Equipment	1,165	0.88	1,030
dia saisa	3 400		3 220
Sub total	1,400		1,220
Saddle Dam	- "		
Excavation and embankment	2,802 1,568	0.88 0.77	2,470
Sub total	4,370	0.77	3,680
		0.00	
Relocation Road	7,230	0.89	6,440
Preparatory Works	4,040	0.88	3,560
Compensation —	4,360	0.89	3,880
Engineering Services and	8,400	0.77	6,470
Government Administration (Design and Supervision)	:	1 +	
Contingency /2	8,530		7,280
Total	51,190		43,670
. Annual Operation and Maintenance (O&M) Cost			
Personnel expenses	95	0.77	73
Administration and maintenance	65	0.88	57
Total	160		1.30

Remarks; /1 : Excluding land acquisition cost

/2 : Excluding price escalation

Table 20 ESTIMATED PRODUCTION FORGONE IN THE PROPOSED BERIS RESERVOIR AREA

		Max.	imum Water	Level (E)	L. m)
	Item	79.5	85.5	87.7	90.5
1.	Paddy	12	21	24	29
2.	Rubber	310	558	639	771
3.	Mixed Horticulture	12	22	26	30
4.	Alienated Forest	20	79	91	109
5.	Unalienated Forest	**************************************	16	19	22
	Total	362	696	799	961

## Remark;

## NET PRODUCTION VALUE

	Unit: M\$/ha
Item	Amount
Paddy	170
Rubber	1,300
Mixed Horticulture	100
Forest: Alienated	650
Unalienated	33

Table 21 ECONOMIC INVESTMENT COST, ANNUAL COST
AND PRODUCTION FORGONE OF JENIANG
SYSTEM, PROPOSED DAMS AND POTENTIAL DAMS

	Investment Cost (M\$10 <sup>6</sup> )	Annual Cost + Production Forgone $(M\$10^6/y)$
Jeniang system	60.13	0.66
Beris dam	43.67	0.93
Tawar-Muda dam	78.68	0.89
Khlong Thepha dam	72.00	1.40
Reman dam	65.10	4.75
Merbok scheme (High)	99.77	1.40
(Low)	79.82	1.12

Remarks; (1): Values at the optimum scale

(2): In 1983 constant price

Table 22 COST STREAM AND PRESENT WORTH OF SOURCE FACILITY

ڪ جي ني بلند الب پرن رين ر	and the same table at the best species and						
RVOIR	MERBOK RESE	REMAN DAM	KHLONG- THEPHA	AGUM-T MAG	BERIS DAM	JENIANG SYSTEM	ybar
	(HIGH)	:	DAM				
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1984
0.00	0.00	0.00	0.00	0.70	0.70		1985
0.00	0.00	2.31	3.60		the second second	1.73	1986
11.98	14.97			4.00		22.88	1987
23.94	29.93	12.98	21.60	33.23	12.17	20.42	1988
23.94	29.93	26.68	21.60	20.50	14.04	15.10	1989
19.95	24.94	21.59	18.00	4.42	0.93	0.67	1990
1.12	1.40	4.75	1.40	0.89	0.93	0.64	1991
1.12	1.40	4.75	1.40	0.89	0.93	0.64	1992
1.12	1.40	4.75	1.40	0.89	0.93	0.64	1993
1.12	1.40	4.75	1.40	0.89	0.93	0.66	1994
1.12	1.40	4.75	1.40	0.89	0.93	0.65	1995
1.12	1.40	4.75	1.40	0.89	0.93	0.65	1996
1.12	1.40	4.75	1.40	0.89	0.93	0.65	1997
1.12	1.40		1.40	0.89	0.93	0.69	1998
1.12	1.40	4.75	1.40	0.89	0.93	0.67	1999
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2000
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2001
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2002
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2003
1.77	2.21	4.75	1.40	2.77	1.73	0.66	2010
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2011
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2032
1.12	1.40	4.75	1.40	0.89	0.93	0.66	2033
69.06	86.33	94.38	66.32	68.07	43.21	52.61	NPV( 6%)
59.78	74.73	74.59	56.80	59.87	37.32	46.60	NPV( 8%)
52.50	65.63	60.96	49.53	53.33	32.84	41.78	NPV(10%)
		51.04	43.72	47.93	29.28	37.76	NPV(12%)
41.61	52.02		38.93	43.35	26.34	34.33	NPV(14%)
37.38	46.73	37.59	34.89	39.40	23.86	31.34	NPV(16%)
33.73	42.17	32.81	31.44	35.95	21.73	28.72	NPV(18%)

Table 23 COST STREAM AND PRESENT WORTH OF IRRIGATION DIRECT FACILITY

		KEDAH		MUDA			
YEAR	MADA	MAIN	TRIBU-	MAIN	TRIBU-		
	MAIN	MINOR	TARY	MINOR	TARY		
	. Tw		MINOR	· · · · · ·	MINOF		
1984	20.88	0.00	0.81	2.45	3.94		
1985	21.17	0.00	0.30	1.14	2.19		
1986	24.45	0.25	0.30	1.58	0.36		
1987	31.82	0.34	0.76	3.96	0.66		
1988	39.16	0.25	0.79	4.09	0.66		
1989	42.65	0.01	0.41	2.07	0.40		
1990	43.24	0.01	0.05	0.27	0.18		
1991	43.83	0.01	0.44	1.22	0.18		
1992	44.42	0.15	0.86	2.66	0.18		
1993	47.47	0.46	1.27	3.89	0.18		
1994	51.01	0.50	0.95	3.01	0.18		
1995	54.54	0.29	0.54	1.54	0.18		
1996	57.67	0.44	0.41	1.92	0.24		
1997	50.03	0.72	1.10	3.93	0.33		
1998	33.99	0.64	1.20	3.93	0.33		
1999	17.95	0.20	0.72	2.01	0.26		
2000	9.94	0.06	0.15	0.58	0.19		
2001	9.94	0.06	0.15	0.58	0.19		
2002	9.94	0.06	0.15	0.58	0.19		
2003	9.94	0.06	0.15	0.58	0.19		
2010	9.94	0.06	0.15	0.58	0.19		
2011	9.94	0.06	0.15	0.58	0.19		
2032	9.94	0.06	0.15	0.58	0.19		
2033	9.94	0.06	0.15	0.58	0.19		
IPV( 6%)	433.27	2.65	7.37	27.70	9.46		
IPV( 8%)	358.28	2.12	6.13	23.18	8.55		
iPV(10%)	302.71	1.74	5.21	19.83	7.88		
PV(12%)	260.02	1.45	4.50	17.26	7.37		
PV(14%)	226.30	1.22	3.95	15.22	6.96		
PV(16%)	199-11	1.04	3.50	13.57	6.62		
PV(18%)	176.81	0.90	3.14	12.21	6.32		

Table 24 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 1 (1/8)

	•	N	T PRESENT VALUE	WITH VARIABLE			107
 •	5.	5% £	t 10%	121	14%	16%	181
							6.01
TRIBUTARY MINOR	34.	66 13.6	6 16.91				5.93
	32.	83 22.2	2 15.81				-10.40
	~50,	82 -35.3	2 -25.78				-5.35
	-34.	49 -22.0	7 -15.89	-11-51			
	537.	22 355.0	6 . 244-54	174.32			73.64
	20.	41, 14.0	8 10-12	7.52	100		3.57
	93.	17 64-6	5 46.95	35.43	27 - 54		17.92
	39.	24 27 .	2 19.95	15-16	11-92	9.63	7.97
			0 -9.08	-6.91	-5.43	-4.38	-3.61
•			6 ~5.91	-4.45	-3.46	-2.77	-2.27
· ·			à 337.20	110.90	91.97	77.83	66-93
				325.11	250 69	198.36	160.34
TAL BENEVIT		, ,		professional and the			
		. 46	ιο Δ1.78	37.76	34 - 33	31.34	28.72
JENIANG SISTEM		<del>-</del>	-		4.7	3,50	3-14
TRIBUTARY MINOR				and the second second			176.81
HADA HAIN			The second secon	•			0.90
MAIN MINOR						and the second second	6.32
TRIBUTARY MINOR	9.						
MAIN HINGE	27 •	70 23.	8 19.83			+ t	12.21
TAL COST	533	06 444-1	379.15	328.36	287.98	255.18	228-10
	143		84 55.67	-3.25	~37.29	-56.82	-67.76
B-C							
BERIS **				:		*	
				A i.	250 (0	109 76	160.34
BENEFIT OF JENIANG							19,13
BERIS HADA MAIN_	112						
BERIS KAIN MINOR	3.	41 2.	36 1-70				0.59
BERIS HAIN MINOR	36.	90 24.	32 17-38	12.58			5,51
TAL BENEFIT	1029	92 708.	59 509-60	380.16	292 - 29	230.46	185.57
COST FOR JENIANG	533	.06 444.	86 379.15	328.35	267.98	255.18	228,10
COSY FOR BERIS DAM	43.	21 37	32 32.84	29.28	26 - 34	23.86	21.7
TAL COST	576	.27 482.	18 411-99	357.64	314-32	279.04	249.83
<b>∌</b> -C	453	.65 226.	41 97-61	22.52	~22-03	-48.56	-64.26
BORIS + REMAN **	, <u>, , , , , , , , , , , , , , , , , , </u>						
SPREPRIT OF FEBRUARS & RERIS	1029	.92 708.	59 509-60	380.16	292,29	230.48	185.57
					62-85	48.24	37.69
							1.17
•							224.4
TAL BENEFIT	3113	.13 01.1.	21 421133	400142	331 (01		
				217 44	214 22		249.8
							-
							31.8
TAL COST	. 670	.65 556.	77 472,95	408.68	357.83	316.63	282.54
•							
	TRIBUTARY MINOR D. 4 I ADVERSE LOSS DUE TO TRIBUTARY ADVERSE LOSS DUE TO D 4 I MADA MAIN MAIN KINOR TRIBUTARY MINOR D. 6 I ADVERSE LOSS DUE TO TRIBUTARY ADVERSE LOSS DUE TO TRIBUTARY MAIN MINOR TAL BENEFIT  JENIAMS SISTEM TRIBUTARY MINOR MADA MAIN MAIN MINOR TRIBUTARY HINOR MAIN MINOR TRIBUTARY HINOR MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR TAL BENEFIT  COST FOR JENIAMS COST FOR BERIS DAM TAL COST  \$-C  BERES **  BENEFIT OF JENIAMS COST FOR BERIS DAM TAL COST  COST FOR JENIAMS 6 BERIS COST FOR JENIAMS 6 BERIS COST FOR BEMAN DAM	TRIBUTARY MINOR  D. 4. I  ADVERSE LOSS IME TO TRIBUTARY ADVERSE LOSS DUE TO D. 4. I  ADVERSE LOSS DUE TO D. 4. I  MAIN MINOR  D. 6. I  ADVERSE LOSS DUE TO TRIBUTARY MAIN MINOR  D. 6. I  ADVERSE LOSS DUE TO TRIBUTARY -17. ADVERSE LOSS DUE TO TRIBUTARY -18. ADVERSE LOSS DUE TO TRIBUTARY -19. MAIN MINOR  234. MAIN MINOR  234. MAIN MINOR  234. MAIN MINOR  1.  JENIAMS SISTEM  52. TRIBUTARY MINOR  1.  MAIN MINOR  1.  TRIBUTARY MINOR  1.  TRIBUTARY MINOR  MAIN MINOR  PALL COST  B-C  343.  MERIS MADA MAIN 112. MERIS MADA MAIN 112. MERIS MAIN MINOR  3.  MERIS MAIN MINOR  3.  MAIN MINOR  3.  MERIS MAIN MINOR  3.  MERIS MAIN MINOR  3.  MAIN MINOR  3.  MAIN MINOR  3.  MERIS MAIN MINOR  3.  MAIN MINOR  3.  MERIS MAIN MINOR  3.  MAIN MINOR  4.  MAIN MINOR  7.  MAIN MINOR  94.  MAIN MINOR  95.  MAIN MINOR  96.  MAIN MINOR  97.  MAIN MINOR  96.  MAIN MINOR  97.  MAIN MINOR  98.  MAIN MINOR  99.  MAIN MINOR  99.  MAIN MINOR  91.  MAIN MINOR  91.  MAIN MINOR  91.  MAIN MINOR  92.  MAIN MINOR  94.  MAIN MINOR  94.  MAIN MINOR  94.  MAI	TRIBUTARY MINOR  D. 4. 1  32.63  33.64  -34.49  -22.88  ANDERSE LOSS DUE TO D. 4. 1  33.62  33.17  64.6  39.24  27.33  ANDERSE LOSS DUE TO TRIBUTARY  1.17.74  -12.44  ANDERSE LOSS DUE TO TRIBUTARY  1.11.80  -8.13  ANNERSE LOSS DUE TO TRIBUTARY  1.11.80  -8.14  ANNIN MINOR  224.10  175.48  ANDERSE LOSS DUE TO D. 4. 1  -11.80  -8.13  ANNIN MINOR  224.10  175.48  876.78  603.7  JENIANG SYSTEM  52.61  46.6  TRIBUTARY MINOR  1.33  6.1  MAIN MINOR  2.65  2.1  TRIBUTARY MINOR  3.33.27  358.28  MAIN MINOR  27.70  22.10  8-C  33.06  444.6  8ERIS *A  8ERIS MAIN MINOR  3.41  2.6  BERIS MAIN MINOR  3.41	TELBUTARY MINOR  D. 4 I  32.63  32.22  15.61  ADVERSE LOSS DUE TO TRIBUTARY -50.62  -35.32  -22.78  ADVERSE LOSS DUE TO D. 4 I  34.49  -22.87  -15.89  NADA MAIN  337.22  355.06  244.54  ARIN MINOR  20.41  14.08  10.12  TELBUTARY MINOR  20.41  39.17  64.65  46.93  ANTERSE LOSS DUE TO TRIBUTARY -17.74  -12.40  -9.08  ANTERSE LOSS DUE TO TRIBUTARY -11.180  -8.16  -5.91  NAIN MINOR  234.10  175.44  137.20  ANTERSE LOSS DUE TO D. 4 I  ANTERSE LOSS DUE TO D. 4 I  ANTERSE LOSS DUE TO D. 4 I  ANTERSE LOSS DUE TO TRIBUTARY -11.180  -8.16  -5.91  NAIN MINOR  234.10  175.44  137.20  (A) 26.67  (A) 26.67  (A) 26.70  (A) 26.70  (A) 26.70  (A) 27.70  (A) 28.70  ANTERSE STEIN  52.61  46.60  41.78  TRIBUTARY MINOR  1.33  6.13  5.21  IMAIN MINOR  2.65  2.12  1.74  TRIBUTARY MINOR  1.33  ANTERSE ANTERNOR  ANALY MINOR  2.770  23.18  19.63  TRIBUTARY MINOR  27.70  23.18  19.63  TRIBUTARY MINOR  34.40  ANALY MINOR  27.70  23.18  19.63  TRIBUTARY MINOR  34.82  ERECETT OF JERIANG  358.64  355.67  ERELET HAIN MINOR  3.41  2.36  1.70  ANALY MINOR  4.41  ANALY MINOR	TRIBUTARY MINOR  34.66  33.66  32.63  22.22  35.66  11.75  32.83  22.22  15.81  11.75  30.84  32.83  22.22  15.81  11.75  30.82  30.82  30.83  30.83  30.83  22.22  15.81  11.75  30.80  30.84  30.83  30.83  30.83  30.83  30.83  30.83  30.83  30.83  30.84  14.08  10.12  7.52  TRIBUTARY MINOR  30.44  14.08  10.12  7.52  TRIBUTARY MINOR  93.17  64.65  46.95  35.41  39.42  20.42  14.08  10.12  7.52  TRIBUTARY MINOR  93.17  64.65  46.95  35.41  39.43  20.41  14.08  10.12  7.52  TRIBUTARY MINOR  93.17  64.65  46.95  35.41  30.18  30.18  30.18  17.74  -12.40  -9.08  -6.91  40.81  ADVERSE LOSS DUE TO TRIBUTARY  -11.80  -8.16  -5.91  -4.45  40.82  30.70  40.48  40.80  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48  30.70  40.48	TRIBUTMAY MISOR  34.66  34.66  34.66  32.65  32.62  32.62  32.62  33.66  34.11  32.65  32.62  32.62  35.81  11.75  3.06  ADVERSE LOSS DUE TO TRIBUTARY  50.62  50.64  34.46  22.67  -15.69  -14.51  -15.65  -14.51  -15.65  -15.61  -15.65  -15.61  -15.65  -1	TRIBUTIANY NISOR    34.66   13.66   16.91   12.53   9.57   7.51     32.83   22.22   15.81   11.75   9.06   7.23     AUYERER LOSS DUE TO TRIBUTARY   -50.82   -35.32   -25.78   -19.61   -15.43   -12.22     AUYERER LOSS DUE TO D & 1   34.49   -22.89   -3.58   -19.61   -15.43   -12.22     AUYERER LOSS DUE TO D & 1   34.49   -22.89   -3.58   -19.61   -15.43   -12.22     AUYERER LOSS DUE TO D & 1   34.49   -22.89   -3.58   -19.61   -15.43   -12.22     AUYERER LOSS DUE TO D & 1   34.49   -22.89   -3.58   -19.61   -15.43   -12.22     AUXIAN NATUR   31.72   335.06   244.54   174.32   177.87   96.07     MAIN NINOR   20.41   14.05   10.12   7.52   5.75   4.49     AUXI NINOR   93.17   64.65   64.95   33.41   27.54   11.92   34.03     AUXI NINOR   93.17   64.65   64.95   33.41   27.54   -4.18     AUXI NINOR   17.74   -12.40   -9.08   -6.91   -5.43   -4.18     AUXI NINOR   21.10   775.44   137.20   110.90   91.97   77.63     AUXI NINOR   224.10   775.44   137.20   110.90   91.97   77.63     AUXI NINOR   23.10   775.44   137.20   110.90   91.97   77.63     AUXI NINOR   23.10   775.44   137.20   110.90   91.97   77.63     AUXI NINOR   23.11   250.69   198.75     AUXI NINOR   13.3   64.13   52.61   44.60   44.78   37.76   34.33   31.34     AUXI NINOR   13.3   64.13   52.61   44.50   44.50   37.76   34.33   31.34     AUXI NINOR   13.3   64.13   52.61   44.50   37.76   34.33   31.54     AUXI NINOR   24.65   24.12   1.74   1.45   1.22   1.04     AUXI NINOR   24.65   27.70   23.18   19.63   17.26   15.22   13.77     AUXI NINOR   24.67   27.70   23.18   19.63   17.26   15.22   13.77     AUXI NINOR   34.30   24.42   17.33   13.63   26.79   27.91     AUXI NINOR   34.30   24.42   17.33   13.54   22.52   22.03   23.18     AUXI NINOR   34.30   24.42   17.73   35.70   44.12   31.72   37.72   25.18     AUXI NINOR   34.30   24.42   37.73   37.64   34.32   27.70   27.

Table 25 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 2 (2/8)

					•			
			net	PRESENT VALUE	SJEATERY BTTY	DISCOUNT	RATE	
* DMAINNE *	<b>.</b>	62	81	101	121	142	161	18
Benefit								
KEDAH:	TRIBUTARY HINOR	34.66	23.68	16.91	12,53	9.57	7-51	6.0
	D & I	32-83	22.22	15.81	11.75	9-06	7.23	5.9
	ADVERSE LOSS DUE TO TRIBUTARY	-30.82	-35.32	-25.78	-19.61	-15.45	-12.52	-10.4
	ADVERSE LOSS DUE TO D & I	~34.49	-22.87	-15.89	-11.51	~8.65	-6.71	-5.3
	MADA MAIN	537.22	355.06	244-54	174.32	127.87	96.07	73.6
	HAIN HINOR	20-41	14.08	10-12	7-52	5.75	4.49	3.5
MUDA:	TRIBUTARY HINOR	93,17	64.65	46.95	35-41	27.54	21-98	17.9
	D&I	39.24	27.32	19-95	15.16	11.92	9.63	7.9
	ADVERSE LOSS DUE TO TRIBUTARY	-17.74	-12.60	-9.08	-6.91	-5.43	-4.38	-3.6
	ADVERSE LOSS DUE TO D & I	-11-60	-8.16	-5.91	-4.45	-3.46	-2.77	-2.7
	MAIN MINOR	234.10	175.44	137.20	110-90	91.97	77-83	66.9
ATO	TAL BENEFIT	876.78	603.70	434-82	325.11	250.69	198.36	160.3
COST								
•	JENIANC STRYEN	52.61	45.60	41.78	37.76	34.33	31.34	28.7
KEDAH:	TRIBUTARY MINOR	7.37	6.13	5.21	4.50	3.95	3+50	3.1
	MADA HAIR	433-27	358 28	302.71	260-02	226.30	199-11	176.8
	HAIN HINOR	2,65	2.12	1.74	1.45	1.22	1.04	0.9
HUDA:	TRIBUTARY NINOR	9.46	8.55	7.88	7-37	6.96	6.62	6.2
1	HAIR KINCE	27.70	23-18	19.83	17.26	15.22	13.57	12.2
or*	TAL COST	533.06	444.86	379.15	328.36	287.98	255-18	228-1
TOTAL	B-C	343.72	158.84	55 - 67	-3-25	→37.29	-56.82	-67.7
JENIANG +	BERTS **							
Benefit		•				•		
	BENEFIT OF JENIANG	876.78	603.70	434.82	325.11	250.69	198.36	160.3
KEDAH:	BERIS MADA HAIN	119.05	81.81	58.50	43.20	32.74	25.34	19.9
	BERIS MAIN MINOR	3.60	2.48	1.79	1.32	1-01	0.78	0.6
HUDA:	BERIS MAIN NINOR	32-33	21.78	15-27	11.07	8.25	6.28	4.6
*10	TAL BENEFIT	1031-76	709.77	510.38	380.70	292.69	230.76	185.7
COST								
	COST FOR JENIANG	533.06	444.86	379-15	328.36	287.98	255.18	228-1
	COST FOR BERIS DAM	43-21	37.32	32-84	29.28	26.34	23-86	21.
*10	TAL COST	576.27	482.18	411-99	357.64	314.32	279-04	249.8
TOTAL	в-с	455.49	227.59	98.39	23.06	~21.63	-48.28	-64.0
JENIANG +	SERIS + RZMAN **			· · · · · · · · · · · · · · · · · · ·				
BENEFIT		100						
	BENEFIT OF JEHIANG & BERIS	1031-76	709.77	510-38	380.70	292.69	230.76	185.7
KEDAH:	REMAN MADA MAIN	210-59	144-10	102-64	75-51	57-03	44.00	34.5
1.	REMAN HAIN MIOR	6-35	4.37	3.13	2.31	1.75	1.36	1.0
	TAL BENBYIT	1248.70	858.24	616-15	458.52	351.47	276.12	221.
- TO:	A STATE OF S	4,						
0057		576.27	482.18	411.99	357 - 64	314.32	279.04	249.
	COST FOR JERIANG & BERIS							
	COST FOR JENIANG & BERIS COST FOR REMAN DAM	94.38	74.59	. 60.96	51-04	43.51	37.59	32.
0057			74.59 556.77	60.96 472-95	51-04 408-68	43.51 357.83	37.59 316.63	282-6
0057	COST FOR REMAN DAM	94.38						

BEMARKS. IN 1927 CONSTANT PRICE.

Table 26 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 3 (3/8)

			net	PRESENT VALUE	VITH VARIABLE	PISCOURT	RATE	
		61	81	101	122	147	161	18%
** JENIANG **		٧	· .			:		. + 25
BENEFIT	- A PUTT ANY ACCORD	34.66	23.68	16.91	12.53	9.57	7.51	6.01
KEDAN:	TRIBUTARY NINOR	32.83	22.22	15.81	11-75	9.06	7.23	5.93
	D 6 I	-50.82	-35.32	-25.78	-19-61	~15.45	-12.52	-10.40
	ADVERSE LOSS DUE TO TELEUTARY ADVERSE LOSS DUE TO D 5 1	-34.49	-22.67	-15.89	-11-51	-8.65	-6.31	-5.35
100	MADA MAIN	541-21	357-63	246.26	175.51	128.72	96.69	74.10
	HAIN MINOR	20.53	14.16	10-17	7.56	5-77	4.51	3.58
		93.17	64 - 55	46.95	35-41	27.54	21.98	17.92
ADDA:	TRIBUTARY HINGE D 4 I	39.24	27.32	19-95	15-16	11.92	9.63	7.97
	ADVERSE LOSS DUE TO TRIBUTARY	-17.74	-12-40	-9.08	-6.91	-5.43	-4.38	-3.61
	ADTERSE LOSS DUE TO D & I	-11.80	-8.16	-5.91	-4.45	-3.46	-2.77	-2.27
1 1	HAIS HINGS	234.10	175.44	137.20	110.90	91.97	77+83	66.93
<b>A.</b>	A Company of the Comp	880.89	606 - 35	436.59	326.34	251-56	199.00	160.83
	FAL BENEFIT	345.05						1
æst	and the second	52-61	46.60	41.78	37.76	34.33	31.34	28.77
	JENIANG SYSTEM	7.37	6.13	5.21	4.50	3.95	3.50	3.14
ZEUAH:	TRIBUTARY MINOR	433.27	358 - 28	302.71	260.02	226.30	199.11	176,81
	HADA NAIN	2.65	2.12	1.74	1.45	1.22	1.04	0.90
	HAIN MINOR	9.46	8.55	7.88	7.37	6.96	6-62	6.32
MUDA:	TRIBUTARY HINOR	27.70	23.18	19.83	17.26	15.22	13.57	12-21
	HAIN MINOR	533.06	444.85	379.15	328.35	287.98	255 - 18	228.10
*10	TAL COST	333.00	444,00	3,3,13	320.30	20		
*TOTAL	B+C	347.83	161.49	57.44	-2.02	-36.42	~56.18	-67.29
* JENIANG + 1	22013 84							
BENEFIT	•							
ODNO- 11				110	326.34	251.56	199.00	
	REMERIT OF IPSTANC	880.59	606.35	430.39	J20×34	431+30.		160.81
venan.	BENEFIT OF JENIANG REDIS MADA MAIN	880.59 162.76	606.35 110.72	436.59 78.42	57.39	43-13	33-13	25.90
KEDAR:	BERIS HADA HAIN	162.76	110.72	78-42	57.39	-		i -
	Beris mada main Beris mada mainor	162.76 4.90	110.72 3.35	78.42 2.39	57.39 1.75	43-13 1-32	33-13	25.90
MEDA:	Beris mada main Beris bain ninor Beris main minor	162.76 4.90 0.50	110.72 3.35 0.00	78.42 2.39 0.00	57.39 1.75 0.00	43.13	33-13 1-02	25.90 0.80
mida: *To	Beris mada main Beris mada mainor	162.76 4.90	110.72 3.35	78.42 2.39	57.39 1.75	43.13 1.32 0.00	33-13 1-02 0-00	25.90 0.80 0.90
MEDA:	Beris Mada Main Beris Main Ninor Beris Main Ninor Ini. Benepit	162.76 4.90 0.50 1048.55	110.72 3.35 0.66 720.42	78.42 2.39 0.00 517.40	57.39 1.75 0.00 385.48	43-13 1-32 0-00 296-01	33-13 1-02 0-00 233-15	25.90 0.80 0.90 187.51
mida: *10	Beris Mada Main Beris Main Ninor Beris Main Ninor Inl. Benefit Cost for Jeniang	162.76 4.90 0.90 1048.55	110.72 3.35 0.60 720.42 444.86	78.42 2.39 0.00 517.40	57,39 1,75 0,00 385,48	43-13 1-32 0-00 296-01 287-98	33-13 1-02 0-00 233-15	25.90 0.80 0.90 187.51 228.10
61904: *100	Beris Mada Main Beris Main Ninor Beris Main Ninor Inl. Benepit Cost for Jeniang Cost for Beris Dan	162.76 4.90 0.00 1048.55 533.06 43.21	110.72 3.35 0.60 720.42 444.86 37.32	78.42 2.39 0.00 517.40 379.15 32.84	57,39 1,75 0,00 385,48 328,36 29,28	43-13 1-32 0.00 296-01 287-98 26-34	33-13 1.02 0.00 233-15 255-18 23.66	25.90 0.80 0.90 187-51 228.10 21-73
61904: *100	Beris Mada Main Beris Main Ninor Beris Main Ninor Inl. Benefit Cost for Jeniang	162.76 4.90 0.90 1048.55	110.72 3.35 0.60 720.42 444.86	78.42 2.39 0.00 517.40	57,39 1,75 0,00 385,48	43-13 1-32 0-00 296-01 287-98	33-13 1-02 0-00 233-15	25.90 0.80 0.90 187.51 228.10
eloy:	Beris Mada Main Beris Main Ninor Beris Main Ninor Inl. Benepit Cost for Jeniang Cost for Beris Dan	162.76 4.90 0.00 1048.55 533.06 43.21	110.72 3.35 0.60 720.42 444.86 37.32	78.42 2.39 0.00 517.40 379.15 32.84	57,39 1,75 0,00 385,48 328,36 29,28	43-13 1-32 0.00 296-01 287-98 26-34	33-13 1.02 0.00 233-15 255-18 23.66	25.90 0.80 0.90 187-51 228.10 21-73
MEDA: *TO: COSI *TO: *TO: *TO: *TO: *TO: *TO: *TO: *TO:	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR IAL BENEFIT  COST FOR JENIANG COST FOR BERIS DAM IAL COST	162.76 4.90 0.90 1048.55 533.06 43.21 576.27	110.72 3.35 0.60 720.42 444.86 37.32 482.19	78.42 2.39 0.00 517.40 379.15 32.84 411.99	57,39 1,75 0,00 385,48 328,36 29,28 357,64	43.13 1.32 0.00 296.01 287.98 26.34 314.32	33-13 1.02 0.00 233-15 255-18 23-66 279-04	25.90 0.80 0.90 187.51 228.10 21.73 249.83
MEDA: *TO COST  *TO	BERIS MADA MAIN BERIS MAIN NINOR EERIS MAIN MIMOR IAL BENEFIT  COST FOR JENIANG COST FOR SERIS DAN TAL COST E-C	162.76 4.90 0.90 1048.55 533.06 43.21 576.27	110.72 3.35 0.60 720.42 444.86 37.32 482.18	78.42 2.39 0.00 517.40 379.15 32.84 411.99	57,39 1,75 0,00 385,48 328,36 29,28 357,64	43.13 1.32 0.00 296.01 287.98 26.34 314.32	33-13 1.02 0.00 233-15 255-18 23-66 279-04	25.90 0.80 0.90 187.51 228.10 21.73 249.83
MUDA: *TO COSI  *TO  *TO  *TO  *TO  *TO  *TO  *TO  *T	BERIS MADA MAIN BERIS MAIN NINOR EERIS MAIN MIMOR IAL BENEFIT  COST FOR JENIANG COST FOR SERIS DAN TAL COST E-C	162.76 4.90 0.90 1048.55 533.06 43.21 576.27	110.72 3.35 0.60 720.42 444.86 37.32 482.18	78.42 2.39 0.00 517.40 379.15 32.84 411.99	57,39 1,75 0,00 385,48 328,36 29,28 357,64	43.13 1.32 0.00 296.01 287.98 26.34 314.32	33-13 1.02 0.00 233-15 255-18 23-86 279-04 -45-89	25.90 0.80 0.90 187.51 228.10 21.73 249.83
MIDA:  ATO  COST  ATO  ATO  ATO  ATO  ATO  ATO  ATO	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR INL. BENEFIT  COST FOR JENIANG COST FOR SERIS DAN IAL COST B-C  BERIS + EDMAN **	162.76 4.90 0.50 1048.55 533.96 43.21 576.27 472.28	110.72 3.35 0.60 720.42 444.86 37.32 482.18 238.24	78.42 2.39 0.00 517.40 379.15 32.84 411.99	57,39 1,75 0,00 385,48 328,36 29,28 357,64	43.13 1.32 0.00 296.01 287.98 26.34 314.32	33-13 1-02 0-00 233-15 255-18 23-86 279-04	25.90 0.80 0.00 187.51 228.10 21.73 249.83 -62.32
MUDA:  *TO:  COST  *TO:  *TOTAL  * JENIANG +  SENEFIT	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR IAL BENEFIT  COST FOR JENIANG COST FOR BERIS DAN IAL COST B-C  BERIS + REMAN **  SENEFIT OF JENIANG & BERIS	162.76 4.90 0.90 1048.55 533.06 43.21 576.27 472.28	110.72 3.35 0.60 720.42 444.86 37.32 482.18 238.24	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41	57-39 1-75 0.00 385-48 328-36 29-28 357-64 27-84	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31	33-13 1-02 0-00 233-15 255-18 23-66 279-04 45-89	25.90 0.80 0.90 187.51 228.10 21.73 249.83 -62.32 187.51 33.46
MEDA:  *TO:  COST  *TOTAL  * JENIANG +  BENEFIT  KEDAH:	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR INL. BENEFIT  COST FOR JENIANG COST FOR SERIS DAN INL. COST B-C  BERIS + REMAN #*  SENEFIT OF JENIANG & BERIS REMAN MADA MAIN	162.76 4.90 0.90 1048.55 533.06 43.21 576.27 472.28	110.72 3,35 0.60 720.42 444.86 37.32 482.18 238.24	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41	57-39 1-75 0.00 385-48 328-36 29-28 357-64 27-64	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31	35-13 1.02 0.00 233-15 255-18 23-66 279-04 -45-89	25.90 0.80 0.90 187.51 228.10 21.73 249.83 -62.32 187.51 33.46
MIDA: *TO: COST  *TO: *TOTAL  ** JENIANG + BENEFIT  KEDAH:	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR TAL BENEFIT  COST FOR BERIS DAN TAL COST B-C  BERIS + REMAN **  BENEFIT OF JENIANG & BERIS REMAN MADA MAIN BEMAN MAIN MIOR	162.76 4.90 0.50 1048.55 533.06 43.21 576.27 472.28	110.72 3,35 0,60 720.42 444.86 37.32 452.19 238,24	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41	57-39 1-75 0.00 385-48 328-36 29-28 357-64 27-84 385-48 73-67 2-25	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31	35-13 1.02 0.00 233-15 255-18 23-66 279-04 -45-89	25.90 0.80 0.90 187.51 228.10 21.73 249.83 -62.32 187.51 33.46
MIDA:  *TO:  COST  *TOTAL  ** JENIANG +  SENERIT  KEDAM:	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR TAL BENEFIT  COST FOR BERIS DAN TAL COST B-C  BERIS + REMAN **  BENEFIT OF JENIANG & BERIS REMAN MADA MAIN BEMAN MAIN MIOR	162.76 4.90 0.50 1048.55 533.06 43.21 576.27 472.28	110.72 3,35 0,60 720.42 444.86 37.32 452.19 238,24	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41	57-39 1-75 0.00 385-48 328-36 29-28 357-64 27-84 385-48 73-67 2-25	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31	33-13 1.02 0.00 233-15 255-18 23-66 279-04 -45-89	25.90 0.80 0.00 187.51 228.10 21.73 249.83 -62.32 187.51 33.46 1.04 222.01
MUDA: *TO COST  *TO TAL  * JENIANG + BENEFIT  KEDAM: *TO	BERIS MADA MAIN BERIS MAIN NINOR EERIS MAIN MINOR TAL BENEFIT  COST FOR JENIANG COST FOR BERIS DAN TAL COST B-C  BERIS + REMAN **  BENEFIT OF JENIANG & BERIS REMAN MADA MAIN BEMAN MAIN MIOR TAL BENEFIT	162.76 4.90 0.50 1048.55 533.06 43.21 576.27 472.28 1048.55 207.34 6.25 1252.14	110.72 3,35 0,60 720.42 444.86 37.32 482.18 238,24 720.42 141.43 4.29 866.14	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41 517.40 100.42 3.06 620.88	57.39 1.75 0.00 335.48 328.36 29.28 357.64 27.84 385.48 73.67 2.25	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31 296.01 55.49 1.71	33-13 1.02 0.00 233-15 255-18 23.66 279.04 -45.89 233-15 42-71 1.32 277-18	25.90 0.80 0.90 187.51 228.10 21.73 249.83 -62.32 187.51 33.46 1.04 222.01
MIDA:  *TO:  ODSI  *TO  *TOTAL  ** JENIANG +  BENEFIT  KEDAH:  *TO  COST	BERIS MADA MAIN BERIS MAIN MINOR BERIS MAIN MINOR BERIS MAIN MINOR IAL BENEFIT  COST FOR SERIS DAN IAL COST B-C  BERIS + REMAN **  BENEFIT OF JENIANG & BERIS REMAN MADA MAIN BENAN MAIN MIOR TAL BEREFIT  COST FOR JENIANG & BERIS	162.76 4.90 0.90 1048.55 533.06 43.21 576.27 472.28 1048.55 207.34 6.25 1262.14	110.72 3,35 0,60 720.42 444.86 37.32 482.18 238.24 720.42 141.43 4.29 866.14	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41 517.40 100.42 3.06 620.88	57-39 1-75 0.00 335-48 328-36 29-28 357-64 27.84 385-48 73-67 2-25 461-40 357-64	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31 296.01 55.49 1.71 353.21	33-13 1.02 0.00 233-15 255-18 23-86 279-04 -45-89 233-15 42-71 1.32 277-18	25.90 0.80 0.00 187.51 228.10 21.73 249.83 -62.32 187.51 33.46 1.04 222.01
MIDA:  *TO:  COST  *TOTAL  ** JENIANG +  BENEFIT  KEDAH:  *TO  COST	BERIS MADA MAIN  BERIS MAIN MINOR  BERIS MAIN MINOR  BERIS MAIN MINOR  COST FOR JENIANG  COST FOR BERIS DAN  TAL COST  B-C  BERIS + EEMAN **  SENEFIT OF JENIANG & BERIS  REMAN MADA MAIN  BEMAN MAIN MIOR  TAL BENEFIT  COST FOR JENIANG & BERIS  COST FOR BEMAN DAN  COST FOR BEMAN DAN	162.76 4.90 0.90 1048.55 533.06 43.21 576.27 472.28 1048.55 207.34 6.25 1252.14 576.21 94.38	110.72 3,35 0,60 720.42 444.86 37,32 482.18 238,24 720.42 141.43 4.29 866.14	78.42 2.39 0.00 517.40 379.15 32.84 411.99 105.41 517.40 100.42 3.06 620.88 411.99 60.96	57.39 1.75 0.00 385.48 328.36 29.28 357.64 27.84 27.84 385.48 73.67 2.25 461.40	43.13 1.32 0.00 296.01 287.98 26.34 314.32 -18.31 296.01 55.49 1.71 353.21	33-13 1.02 0.00 233-15 255-18 23-86 279-04 -45-89 233-15 42-71 1.32 277.18 279-04 37.59	25.90 0.80 0.00 187.51 228.10 21.73 249.83 -62.32 187.51 33.46 1.04 222.01 249.83 32.81

Table 27 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 1 (4/8)

e JENIANG			NET	PRESENT VALUE	VITE VARIABLE	DISCOUNT	RATE	
	•	61	82	101	121	142	162	182
BEHEFIT	·							
KEDAH:	TRIBUTARY MINOR	34.66	23.68	16.91	12.53	9.57	7.51	6.01
	D & I	32.83	22.22	15.81	11.75	9.06	7.23	5.93
	ADVERSE LOSS DUE TO TRIBUTARY	-50.82	-35.32	-25.78	-19-61	-15.45	-12-52	-10.40
	ADVERSE LOSS DUE TO D & I	-34.49	-22-87	-15.89	-11-51	-8.65	-6.71	-5.35
	MADA MAIN	537.72	355.06	244.54	174 - 32	127.87	96.07	73.64
100	MAIN MINOR	20.41	14.08	10.12	7.52	5,75	4.49	3.57
MUDA:	TRIBUTARY MINOR	93.17	64.65	46.95	35.41	27.54	21.98	17.92
	D&I	39.24	27.32	19-95	15.16	11.92	9-63	7.97
	ADVERSE LOSS DUE TO TRIBUTARY	-17.74	-12.40	-9.08	-6.91	-5.43	-4.38	-3.61
Taraka da	ADVERSE LOSS DUE TO D & I	-11-80	-8.16	-5.91	-4.45	-3.46	-2.77	-2.27
	MAIN MINOR	234.10	175.44	137.20	110.90	91.97	77.83	66.93
*10	STAL BENEFIT	876.78	603.70	434.82	325.11	250.69	198.36	160.34
COST								
Tarana a	JEHLANG SYSTEM	52-61	46.60	41.78	37.76	34.33	31 - 34	28.72
KEDAR:	TRIBUTARY MINOR	7.37	6.13	5-21	4.50	3.95	3-50	3.14
	MADA MAIN	433.27	358.28	302-71	260.02	226.30	199.11	176-81
1.5	HAIR MINOR	2.65	2.12	1.74	1.45	1.22	1.04	0.90
KUDA:	TRIBUTARY MIROR	9.46	8.55	7.88	7.37	6.96	6.62	6-32
	HAIN HINOR	27.70	23.18	19.83	17 . 26	15.22	13.57	12.21
<b>*T</b> C	TAL COST	533.06	444.86	379.15	328.36	287.98	255.18	228.10
**TOTAL	<b>3-</b> C	343.72	158.84	55.67	-3.25	~37+29	-56.82	-67.76
** JENIANG +	DERIS **							<del>-</del>
BENEFIT								
	DENEFIT OF JENIANG	876.78	603.70	434.82	325-11	250.69	198.36	
eedan:	SERIS MADA MAIN	112-83	77.71	55.70	41.21	31-29	24 - 26	19-13
	eeris mana main Beris mana minor	112.63 3.41	77.71 2.36	55.70 1.70	41 · 21 1 · 26	31-29 0-96	24 - 26 0 - 75	19•13 G-59
nida:	EZELS MANA MAIN BERIS MAIN MINOR ÈZBIS MAIN MINOR	112-83 3-41 36-90	77 - 71 2 - 36 24 - 82	55.70 1-70 17-38	41.21 1.26 12.58	31-29 0.96 9-35	24-26 0-75 7-11	19-13 0-59 5-51
BUDA:	eeris mana main Beris mana minor	112.63 3.41	77.71 2.36	55.70 1.70	41 · 21 1 · 26	31-29 0-96	24 - 26 0 - 75	0.59 5.51
nida:	SERIS MANA MAIN BERIS MAIN MINOR BERIS MAIN MINOR OTAL BENEFIT	112.83 3.41 36.90 1029.92	77.71 2.36 24.82 708.59	55.70 1.70 17.38 509.60	41.21 1.26 12.58 380.16	31-29 0-96 9-35 292-29	24-26 0-75 7-11 230-48	19-13 0-59 5-51 185-57
BUDA:	EZELS MATA MAIN EERIS MAIN MINOR ÉERIS MAIN MINOR OTAL BENEFIT COST FOR JENIANG	3.41 36.90 1029.92 533.06	77.71 2.36 24.82 708.59	55.70 1.70 17.38 509.60	41.21 1.26 12.58 380.16	31-29 0.96 9-35 292-29 287-98	24-26 0.75 7.11 230-48 255-18	19-13 0-59 5-51 185-57 228-10
NUDA:	EZELS MANA MAIN EERIS MAIN MINOR ÉERIS MAIN MINOR VIAL BENEFIT  COST FOR JENIANG COST FOR BERIS DAM	112.83 3.41 36.90 1029.92 533.06 43.21	77.71 2.36 24.82 708.59 444.86 37.32	55.70 1.70 17.38 509.60 379.15 32.84	41.21 1.26 12.58 380.16 328.36 29.28	31-29 0.96 9-35 292-29 287-98 26-34	24-26 0.75 7.11 230-48 255-18 23-36	19.13 0.59 5.51 185.57 228.10 21.73
NUDA:	EZELS MATA MAIN EERIS MAIN MINOR ÉERIS MAIN MINOR OTAL BENEFIT COST FOR JENIANG	3.41 36.90 1029.92 533.06	77.71 2.36 24.82 708.59	55.70 1.70 17.38 509.60	41.21 1.26 12.58 380.16	31-29 0.96 9-35 292-29 287-98	24-26 0.75 7.11 230-48 255-18	19.13 0.59 5.51 185.57 228.10 21.73
BUDA: ATC COST *TC	EZEIS MADA MAIN BERIS MAIN MINOR ÈZBIS MAIN MINOR TALL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM TALL COST	112.83 3.41 36.90 1029.92 533.05 43.21 576.27	77.71 2.36 24.82 708.59 444.86 37.32 482.18	55-70 1-70 17-38 509-60 379-15 32-84 411-99	41.21 1.26 12.58 380.16 328.36 29.28 357.64	31.29 0.96 9.35 292.29 287.98 26.34 314.32	24.26 0.75 7.11 230.48 255.18 23.36 279.04	19.13 0.59 5.51 185.57 228.10 21.73 249.83
NUDA:	EZELS MANA MAIN EERIS MAIN MINOR ÉERIS MAIN MINOR VIAL BENEFIT  COST FOR JENIANG COST FOR BERIS DAM	112.83 3.41 36.90 1029.92 533.06 43.21	77.71 2.36 24.82 708.59 444.86 37.32	55.70 1.70 17.38 509.60 379.15 32.84	41.21 1.26 12.58 380.16 328.36 29.28	31-29 0.96 9-35 292-29 287-98 26-34	24-26 0.75 7.11 230-48 255-18 23-36	19.13 0.59 5.51 185.57 228.10 21.73 249.83
NUDA:  ATC COST  ATC COST  ATC ATC ATC ATC ATC ATC ATC ATC ATC A	EZEIS MADA MAIN BERIS MAIN MINOR ÈZBIS MAIN MINOR TALL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM TALL COST	112.83 3.41 36.90 1029.92 533.05 43.21 576.27	77.71 2.36 24.82 708.59 444.86 37.32 482.18	55-70 1-70 17-38 509-60 379-15 32-84 411-99	41.21 1.26 12.58 380.16 328.36 29.28 357.64	31.29 0.96 9.35 292.29 287.98 26.34 314.32	24.26 0.75 7.11 230.48 255.18 23.36 279.04	19.13 0.59 5.51 185.57 228.10 21.73 249.83
NUDA:  ATC COST  ATC COST  ATC ATC ATC ATC ATC ATC ATC ATC ATC A	EZEIS MANA MAIN BERIS MAIN MINOR ÈZBIS MAIN MINOR OTAL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM OTAL COST B-C	112-83 3-41 36-90 1029-92 533-06 43-21 576-27 453-65	77.71 2.36 24.82 708.59 444.86 37.32 482.18	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61	41.21 1.26 12.58 380.16 328.36 29.28 357.64	31-29 0.96 9-35 292-29 287-98 26-34 314-32	24.26 0.75 7.11 230.48 255.18 23.36 279.04	19-13 0-59 5-51 185-57 228-10 21-73 249-83
NUDA:  *TC  **IOTAL.  ** JENIANG +	EZEIS MANA MAIN BERIS MAIN MINOR ÈZBIS MAIN MINOR OTAL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM OTAL COST B-C	112-83 3.41 36.90 1029.92 533.06 43-21 576-27 453.65	77-71 2-36 24-82 708-59 444-86 37-32 482-18 226-41	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52	31.29 0.96 9.35 292.29 287.98 26.34 314.32 -22.03	24.26 0.75 7.11 230.48 255.18 23.86 279.04 -48.56	19.13 0.59 5.51 185.57 228.10 21.73 249.83
**IOTAL  ** JENIANG +  BENEFIT	EZEIS MADA MAIN BERIS MAIN MINOR  ÉEBIS MAIN MINOR  TALL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM  TALL COST  B-C  BERIS + T.HUDA **  BEREFIT OF JEMIANG & ZERIS T.HUDA MADA MAIN	112-83 3.41 36.90 1029.92 533.06 43-21 576-27 453.65	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52	31.29 0.96 9.35 292.29 287.98 26.34 314.32 -22.03	24.26 0.75 7.11 230.48 255.18 23.36 279.04 -48.56	19.13 0.59 5.55 185.57 228.10 21.73 249.83 -64.26
AUDA:  COST  *TO  **IOTAL  ** JENIANG +  BENEFIT	EZEIS MANA MAIN BERIS MAIN MINOR BERIS MAIN MINOR MAL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM MAL COST  B-C  BERIS + T. MUDA **  BENEFIT OF JEMIANG & BERIS	112-83 3-41 36-90 1029-92 533-06 43-21 576-27 453-65	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41 708.59 37.40 1.13	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52	31.29 0.96 9.35 292.29 287.98 26.34 314.32 -22.03	24.26 0.75 7.11 230.48 255.18 23.36 279.04 ~48.56 230.48 10.98 0.34	19.13 0.59 5.51 185.57 228.10 21.73 249.83 -64.26
PAUDA:  *TO COST  *TO COST  *TO STOTAL  ** JENIANG + BENEFIT  KEDAB:	EZEIS MADA MAIN BERIS MAIN MINOR  ÉEBIS MAIN MINOR  TALL BENEFIT  COST FOR JEMIANG COST FOR BERIS DAM  TALL COST  B-C  BERIS + T.HUDA **  BEREFIT OF JEMIANG & ZERIS T.HUDA MADA MAIN	112-83 3.41 36.90 1029.92 533.06 43-21 576-27 453.65	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52	31.29 0.96 9.35 292.29 287.98 26.34 314.32 -22.03	24.26 0.75 7.11 230.48 255.18 23.36 279.04 -48.56	19.13 0.59 5.51 185.57 228.10 21.73 249.83 -64.26
MUDA:  COST  *TO  *TO  *TO  TAL  ** JENIANG +  BENEFIT  KEDAH:	EZEIS MADA MAIN BERIS MAIN MINOR BEBIS MAIN NINOR STALL BENEFIT  COST FOR JENIANG COST FOR BERIS DAM STALL COST B-C  BERIS + T.MUDA **  BENEFIT OF JENIANG & BERIS T.MUDA MADA MAIN T.MUDA MAIN MINOR STALL BENEFIT	112-83 3.41 36.90 1029-92 533.06 43.21 576.27 453.65	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41 708.59 37.40 1.13 747.12	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61 509-60 26-35 0.80 536-75	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52	31.29 0.96 9-35 292.29 287.98 26.34 314.32 -22.03	24.26 0.75 7.11 230.48 255.18 23.36 279.04 -48.56 230.48 10.98 0.34 241.80	19.13 0.59 5.51 185.57 228.10 21.73 249.83 -64.26 185.57 8.55 0.26
PUDA:  *TO  COST  *TO  **YOTAL.  ** JENIANG +  BENEFIT  KEDAB:	EZEIS MANA MAIN BERIS MAIN MINOR  ÉZEIS MAIN MINOR  TALL BENEFIT  COST FOR JENIANG COST FOR BERIS DAM  TALL COST  B-C  BERIS + T.HUDA **  BENEFIT OF JENIANG & BERIS T.HUDA MADA MAIN T.HUDA MAIN MINOR  TALL BENEFIT  COST FOR JENIANG & BERIS  COST FOR JENIANG & BERIS	112-83 3.41 36.90 1029-92 533.06 43.21 576.27 453.65	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41 708.59 37.40 1.13 747.12	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61 509-60 26-35 0.80 536-75	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52 380.16 19.19 0.59 399.94	31.29 0.96 9-35 292.29 287.98 26.34 314.32 -22.03 292.29 14.36 0.44 307.09	24.26 0.75 7.11 230.48 255.18 23.36 279.04 -48.56 230.48 10.98 0.34 241.80	19.13 0.59 5.51 185.57 228.10 21.73 249.83 -64.26 185.57 8.55 0.26 194.38
**YOTAL.  **JEHIANG + BEREFIT  KEDAB:  *TO COST	EZEIS MANA MAIN  BERIS MAIN MINOR  ZERIS MAIN MINOR  ZERIS MAIN MINOR  ZERIS MAIN MINOR  ZERIS MAIN MINOR  COST FOR JEMIANG  COST FOR JEMIANG  COST FOR JEMIANG  BERRIS + T.HUDA **  BERREYT OF JEMIANG & ZERIS  T.HUDA MADA MAIN  T.HUDA MAIN MINOR  TAL BENEFIT  COST FOR JEMIANG & BERIS  COST FOR JEMIANG & BERIS  COST FOR T.HUDA DAM	112-83 3-41 36-90 1029-92 533-06 43-21 576-27 453-65 1029-92 55-27 1-66 1086-85 576-27 68-07	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41 708.59 37.40 1.13 747.12 482.18 59.87	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61 509-60 26-35 0-80 536-75 411-99 53-33	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52 380.16 19.19 0.59 399.94 357.64 47.93	31.29 0.96 9.35 292.29 287.98 26.34 314.32 -22.03 292.29 14.36 0.44 307.09 314.32 43.35	24.26 0.75 7.11 230.48 255.18 23.26 279.04 -48.56 230.48 10.98 0.34 241.80 279.04 39.40	19.13 0.59 5.51 185.57 228.10 21.73 249.83 -64.26 185.57 8.55 0.26 194.38 249.83 35.95
**IOTAL.  ** JENIANG + BENEFIT  KEDAB:  **OOST	EZEIS MANA MAIN BERIS MAIN MINOR  ÉZEIS MAIN MINOR  TALL BENEFIT  COST FOR JENIANG COST FOR BERIS DAM  TALL COST  B-C  BERIS + T.HUDA **  BENEFIT OF JENIANG & BERIS T.HUDA MADA MAIN T.HUDA MAIN MINOR  TALL BENEFIT  COST FOR JENIANG & BERIS  COST FOR JENIANG & BERIS	112-83 3.41 36.90 1029-92 533.06 43.21 576.27 453.65	77.71 2.36 24.82 708.59 444.86 37.32 482.18 226.41 708.59 37.40 1.13 747.12	55-70 1-70 17-38 509-60 379-15 32-84 411-99 97-61 509-60 26-35 0.80 536-75	41.21 1.26 12.58 380.16 328.36 29.28 357.64 22.52 380.16 19.19 0.59 399.94	31.29 0.96 9-35 292.29 287.98 26.34 314.32 -22.03 292.29 14.36 0.44 307.09	24.26 0.75 7.11 230.48 255.18 23.36 279.04 -48.56 230.48 10.98 0.34 241.80	19.13 0.59 5.51 185.57 228.10 21.73 249.83 -64.26 185.57 8.55 0.26 194.38

Table 28 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT
PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 3 (5/8)

					. :			
			NET	PRESENT VALUE	WITH VARIABLE	DISCOUNT		
** JENIANC **	•	6%	87	10%	127	14%	167	16
BENEFIT				* - 4 4				
	TRIBUTARY MINOR	34.66	23.6B	16-91	12.53	9.57	7.51	6.0
	D & I	32.83	22-22	15.81	11-75	9.06	7.23	5.9
	ADVERSE LOSS DUE TO TRIBUTARY	~50.B2	-35.32	-25.78	-19-61	-15.45	-12.52	-10-
	ADVERSE LOSS DUE TO D & I	-34.49	-22.87	-15.89	-11-51	-8.65	-6.71	-5.:
	HADA MATS	541-21	357.63	246.26	175.51	128.72	96.69	74.
	HAIR MENOR	20.53	14.16	10.17	7.56	5.77	4.51	3.
	TRIBUTARY MINOR	93.17	64.65	46.95	35-41	27.54	21.98	17.
1,	DII	39.24	27.32	19.95	15.16	11.92	9.63	7.
	ADVERSE MOSS DUE TO TRIBUTARY	-17.74	-12.40	-9.08	-6.91	-5.43	-4.38	-3.
	ADVERSE LOSS DUE TO D & I	-11.80	-8.16	-5-91	-4.45	-3.46	-2.77	-2-
	MAIN HINOR	234-10	175-44	137.20	110.90	91.97	77.83	66.
· To	TAL BENEFLT	880.89	606.35	436.59	326.34	251.56	199.00	160.
COST							2.45	17.0
	JERIANG STSTER	52.61	46.60	41.78	37.76	34.33	31 - 34	28.
	TRIBUTARY MINOR	7.37	6-13	5-21	4.50	3.95	3.50	3.
	HADA MAIN	433.27	358.28	302.71	260-02	226.30	199-11	176.
	MAIN MENOR	2.65	2.12	1.74	1.45	1.22	1.04	0.
M.m.A.;	TRIBUTARY MINOR	9.46	8.55	7.88	7.37	5.90	6-62	6.
	MAIN MINOR	27-70	23.18	19.83	17.26	15.22	13,57	12.
	TAL COST	533.06	444.86	379.15	328-36	287 -98	255.18	228.
LOIVE	<b>s-c</b>	347.83	161-49	57.44	-2.0z	-36.42	-56.18	-67
* JENIANG + 1	FERIS RE							
BENEFIT					÷			14 To 15
	RENEFIT OF JENIANG	880.89	606.35	436.59	326.34	251.56	199.00	1\$0.
KEDAH:	BERIS HADA MAIN	162-76	110+72	78.42	57.39	43.13	33.13	25
	BERIS HAIN MINOR	4.90	3.35	2.39	1.75	1.32	1.02	0.
HIDA:	BERIS HAIR HINOR	0.00	0.00	0.00	0.00	0.00	0.00	0.
	TAL BENEFIT	1048-55	720,42	517.40	385.48	296.01	233.15	187
COST							100	:
	COST FOR JENIANG	533.06	444.86	379.15	328.36	287.98	255.18	228
	COST FOR BERIS DAM	43-21	37.32	32.84	29.28	26.34	23.85	21
*70	TAL COST	576.27	482.18	411.99	357-64	314.32	279.04	249
*TOTAL	в-с	477.28	238 - 24	105.41	27 - 84	-18.31	-45.89	-62
* JENIANG + 1	BERIS + T.HUDA **						14.	
BENEFIT								1
	BENEFIT OF JENIANG & BERIS	1048-55	720-42	517.40	395.48	296.91	233.15	187
KEDAS:	T.HUDA HADA HAIN	46.49	31.56	22.31	16.30	12.23	9.38	7.
	T. HUDA HAIN HINGE	1-40	0.96	0.68	0.50	0.38	0.29	o.
*10	TAL BENEFIT	1096.44	752.94	540.39	402.28	308.62	242.82	195
COST								
	COST FOR JENIANG & BERIS	576-27	482.18	411.99	357.64	314.32	279.04	249
	COST FOR T.NUDA DAM	68-07	59.87	53.33	47.93	43,35	39.40	35
	TAL COST	644.34	542.05	465.32	405-57	357.67	318.44	285
*10								

Table 29 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 1 (6/8)

				1.14.				
AN JENIANG AS	•	61	NET 81	PRESENT VALUE	WITH VARIABLE			
BENEFIT	·	VI	. 04	102	124	14%	161	18
KEDAH:	TRIBUTARY HINOR	34.66	23.68	16.91	12.53	9.57	7,51	6.0
	DII	32.83	22.22	15-81	11.75	9,06	7,23	5.9
	ADVERSE LOSS DUE TO TRIBUTARY	-50+82	-35.32	~25.78	-19.61	~15.45	-12.52	-10.4
	ADVERSE LOSS DOE TO D & T	-34.49	-22.87	-15.89	-11.51	-8.65	-6.71	-5.3
1	HADA HAIN	537.22	355.06	244.54	174-32	127.87	96.07	73.6
	MAIN MINOR	20.41	14.08	10-12	7.52	5.75	4.49	3.5
HUDA;	TRIBUTARY MINOR	93.17	64.65	46.95	35.41	27.54	21.98	17.9
	D 4 I	39.24	27.32	19.95	15-16	11.92	9.63	7.9
	ADVERSE LOSS DUE TO TRIBUTARY	-17.74	-12-40	-9.08	-6.91	-5.43	-4.38	-3.6
	ADVERSE LOSS DUE TO D 6 1	-11.80	-8.16	-5.91	-4.45	-3.46	-2.77	-2.2
	MAIN HINOR	234 - 10	175.44	137.20	110.90	91.97	77-83	66.9
*101	FAL BENEFIT	876.78	603.70	434.82	325.11	250.69	198.36	160
COST						230145		
	JENIANG SYSTEM	52.61	46.60	41.78	37.76	34.33	31.34	28.7
KEDAH:	TRIBUTARY MINOR	7.37	6.13	5.21	4-50	3.95	3.50	3.1
	HIAM ADAH	433.27	358 - 28	302.71	260.02	226.30	199-11	175.8
	HAIN HIROR	2.65	2.12	1.74	1-45	1.22	1.04	0.9
HIDA:	TRIBUTARY MINOR	9.46	8-55	7.88	7-37	6.96	6.62	6.
	MAIN MINOR	27.70	23.18	19.83	17.26	15.22	13.57	12.
*101	AL COST	533.06	444.86	379 15	328.36	287.98	255.18	228.
						201111		
*TOTAL	<b>B-C</b>	343.72	158.84	55.67	-3.25	-37 .29	-56.82	-67.7
* JENIANG + B	Eris **	:						
BENEPIT		*						
4 4	RENEFIT OF JENIANG	876.78	603-70	434.82	325.11	250 69	198-36	160.3
	BERIS HADA NAIN	112.83	77.71	55.70	41 - 21	31 - 29	24.26	19.
	RERIS MAIR MINOR	3.41	2.35	1.70	1.26	0.96	0.75	0.
	RERIS HAIN MINOR	36-90	24.82	17.38	12.58	9.35	7.11	5.
	AL BENEFIT	1029.92	708.59	309.60	380.16	292.29	230.48	185.
COST			,,,,,	203100	3007.2	******	2307-0	
	COST FOR JENTANG	533.06	444.86	379.15	328.36	287.98	255-18	228.
	COST FOR BERIS DAM	43.21	37.32	32.84	29.28	26.34	23.86	21.
	AL COST	576.27	482-18	411.99	357-64	314.32	279.04	249.
			402710	11.13,	227.00	2121	273.01	
			226.41	97.61	22.52	-22.03	-48.56	64
*TOTAL	B-C	453.65	220.41					
	BRIS + K.THEPBA **	433.63						
		433.63		<u> </u>				
* JENIANG + B		1029.92	708.59	509.60	380.16	292.29	230-48	185.
JENIANG + B	BRIS + K.THEPHA **					292-29 28.77	230-48 22-15	
JENIANG + B BENEFIT REDAH: 1	Eris + K.Thepea ** Benefit of Jenlang & Beris	1029-92	708-59	509,60	380.16			17.
JENIANG + B BENEPIT KEDAH: 1	BRIS + K.THEPEA ** BENEFIT OF JENIANG & BERIS K.THEPBA MADA HAIN	1029.92 107.49	708-59 73-32	509,60 52.07	380.16 38.20	28.77	22.15	17. 0.
* JENIANG + B SENEFIT KEDAH: 1	eris + K.Thepea ** Benepit op Jeniang & Beris K.Thepba Mada Hain K.Thepua Main Hinor	1029 . 92 107 . 49 3 . 24	708-59 73-32 2-22	509.60 52.07 1.59	380.16 38.20 1.17	28.77 0.88	22 - 15 0 - 68	17. 0.
* JENIANG + B BENEFIT KEDAH: 1	eris + K.Thepea ** Benepit op Jeniang & Beris K.Thepba Mada Hain K.Thepua Hain Hinor Al Benepit	1029.92 107.49 3.24 1140.65	708-59 73-32 2-22 784-13	509.60 52.07 1.59 563.26	380.16 38.20 1.47 419.53	28.77 0.88 321.94	22.15 0.68 253.31	17. 0. 203.
* JENIANG + B BENEFIT KEDAB: 1	RENE + K.THEPHA **  RENEPIT OF JENIANG & BERIS  K.THEPHA MADA HAIN  K.THEPHA MAIN MINOR  AL BENEPIT  COST FOR JENIANG & BERIS	1029-92 107-49 3-24 1140-65	708-59 73-32 2-22 784-13	509.60 52.07 1.59 563.26	380.16 38.20 1.17 419.53	28.77 0.88 321.94	22.15 0.68 253.31 279.04	17. 0.( 203.) 249.
* JENIANG + B BENEFIT REDAB: ) *107.	RRIS + K.THEPHA **  BENEFIT OF JENIANG & BERIS  K.THEPHA MADA MAIN  K.THEPHA MAIN MINOR  AL BENEFIT  COST FOR JENIANG & BERIS  COST FOR K.THEPHA DAM	1029.92 107.49 3.24 1140.65 576.27 66.32	708.59 73.32 2.22 784.13 482.18 56.80	509.60 52.07 1.59 563.26 411.99 49.53	380.16 38.20 1.17 419.53 357.64 43.72	28.77 0.88 321.94 314.32 38.93	22.15 0.68 253.31 279.04 34.89	17.; 0.0 203.0 249.i
* JENIANG + BEREFIT  EEDAB: 1  * TOT.  COST	RENE + K.THEPHA **  RENEPIT OF JENIANG & BERIS  K.THEPHA MADA HAIN  K.THEPHA MAIN MINOR  AL BENEPIT  COST FOR JENIANG & BERIS	1029-92 107-49 3-24 1140-65	708-59 73-32 2-22 784-13	509.60 52.07 1.59 563.26	380.16 38.20 1.17 419.53	28.77 0.88 321.94	22.15 0.68 253.31 279.04	185.: 17.: 0.6 203.( 249.8 31.,

Table 30 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 3 (7/8)

			net	PRESENT VALUE	VITH VARIABLE	DISCOUNT	BATE	
** JENIANG **		61.	81,	101	121	34%	161	187
BENEFIT	·							
	TRIBUTARY HINCE	34.66	23.68	16.91	12.53	9.57	7.51	6.01
FEG.	D 5 1	32.83	22.22	15.61	11.75	9.06	7.23	5.93
	ADVERSE LOSS DUE TO TELEUTARY	-50.82	-35.32	-25-78	-19.61	-15.45	-12.52	-10.40
	ADVERSE LOSS DUE TO D & I	-34.49	-22.87	-15-89	-11.51	-8.65	-6.71	-5.35
	MADA MAIN	541.21	357.63	246.26	175.51	128.72	96.69	74.10
	MAIN HIND	20.53	14.16	10-17	7.56	5.77	4.51	3.58
	IRIBUTARY HINOR	93.17	64.65	46.95	35.41	27.54	21.98	17.92
ELCA,	D & I	39.24	27.32	19.95	15.16	11.92	9.63	7-97
	ADVERSE LOSS DUE TO TRIBUTARY	~17.74	~12.40	~9.08	-6.91	~5.43	-4.38	-3.61
	ADVERSE LOSS DUE TO D & I	-11.89	-8.16	-5.91	-4.45	-3.46	-2.77	-2.27
	MAIN MINOE	234.10	175.44	137.20	110.90	91.97	77.83	66×93
	TAL BENEFIT	880.89	606.35	436.59	326 - 34	251.56	199.00	160+81
COST :								2.5
	JENIANG SYSTEM	52.61	45.60	41.78	37.76	34.33	31.34	28.72
	TRIBUTARY MINOR	7.37	6.13	5.21	4.50	3.95	3.50	3-14
	HADA HAIN	433-27	358.28	302.71	260.02	226+30	199-11	176+81
	· ·	2.65	2.12	1.74	1.45	1.22	1.04	0.90
	MAIN HINOR	9.46	8.55	7.88	7.37	6.96	6.62	6-32
HEDA:	TRIBUTARY MINOR	27.70	23.18	19.83	17.26	15.22	13.57	12.21
	MAIN MINOR	533-06	444.86	379.15	328.36	287-98	255.16	228-10
*101	YAL COST	333400					100	
** TOTAL	B-C	347.83	161-49	57.44	-2.02	-36-42	-56.18	-67.19
** JENIANG + 1	BERIS #A	\$					100	
SENEFIT	•						4.3	100
16	BENEFIT OF JENIANG	880 -89	606 - 35	435.59	326.34	251.56	199.00	160.81
	BERIS MADA MAIN	167-76	110.72	78.42	57.39	43-13	33.13	25.90
	BERIS MAIN NINOR	4-90	3,35	2.39	1.75	1-32	1.02	0.80
Buba:	BERIS HAIN MINOR	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TAL SENSPIT	1048-55	720.42	517.40	365.48	296.01	233.15	187,-51
COST								
5551	COST FOR JENIANG	533.08	444.86	3/9-15	328.35	287.98	255.18	228.10
	COST FOR BERIS DAM	43.21	37-32	32.84	29.28	26.34	23.86	21.73
490	TAL COST	576.27	482.18	411.99	357.64	314,32	279.04	249.63
- 10.	int was	370127	402-10	411-37			2.7.07	
* TUTAL	B-E	472.28	238-24	105.41	27.84	-18.31	-45.89	-62.32
ar jeniang + 1	BERTS + K.THEPHA **							
BENEFIT							<i>2</i> -	
*:	BENEFIT OF JESIANC & BERIS	1048.55	720-42	517-40	385.48	296.01	233.15	187.51
KEDAH:	K. THEPEA RADA MAIN	93.52	64.33	45.04	34.03	25,81	19.99	15.75
	ronin man angaht.	2.82	1.95	1.41	1.04	0.79	0.62	0.08
*.10.	TAL BENEFIT	1144.89	786.70	564.85	420.55	322.61	253.76	203.3
cost								
	COST FOR JENIANG & BERLS	576.27	482-18	411.99	357.64	314.32	279.04	249-8
	COST FOR K.THEPHA DAM	66.32	55.80	49-53	43.72	38.93	34.89	31.4
870	TAL COST	642.59	538-98	461.52	401.35	353.25	313.93	281.2
	•	******	,					
		502.30	247.72					

Table 31 PRESENT VALUE OF B-C OF OVERALL SOURCE DEVELOPMENT PLAN ASSUMING JENIANG OPERATION OF ALTERNATIVE 3 (8/8)

				NET	PRESENT VALUE	WITH VARIABLE	DISCHURT	0177	
** JENIANG **	•		61	82	101	12\$	142	163	181
BENEFIT				: 1					
redan;	TRIBUTARY MINOR		34.66	23.68	16.91	12-53	9.57	7.51	6.01
	D & I		32.83	22-22	15.81	11.75	9.06	7.23	5.9
	ADVERSE LOSS DUE TO TRIBUTARY	44.5	-50.82	-35.32	-25.78	~19.61	-15.45	~12.52	-10.46
	ADVERSE LOSS DUE TO D & I	: '-	~34.49	-22.87	~15.89	-11.51	-8.65	-6.7 t	-5.35
	HADA HAIN		541.21	357-63	246.26	175.51	128.72	96.69	74.10
	MAIN HINOR		20.53	14-16	10.17	7.56	5.77	4-51	3.58
MUDA;	TRIBUTARY MINOR		93.17	64.65	46.95	35.41	27.54	21.98	17.92
	D 4 1		39.24	27.32	19.95	15,-16	11.92	9.63	7.97
. :	ADVERSE LOSS DUE TO TRIBUTARY		-17.74	-12-40	~9.08	-6.91	-5.43	-4.38	-3.61
	ADVERSE LOSS DUR TO D & I		-11.80	-8-16	-5.91	-4.45	-3.46	-2.77	-2.27
	HAIN MINOR		234 10	275-44	137.20	110.90	91.97	77.83	66.93
*TOT	AL BENEFIT		880.89	606.35	436.59	326.34	251.56	199.00	160.8
COST									
	JEHIANG STRIEN		52-61	46.60	41.78	37.76	34 - 33	31.34	28.72
E EDAR :	TRIBUTARY MINOR		7.37	6-13	5.21	4.50	3.95	3.50	3,14
	HIAH AGAH		433.27	358.28	302.71	260-02	226.30	199-11	176.81
	MAIN HINOR		2.65	2.12	1.74	1.45	1.22	1-04	0.90
HUDA:	TRIBUTARY HINOR		9.46	8.55	7.88	7.37	6.96	6.62	6.32
	HAIN NINOR		27.70	23,18	19.83	17.26	15.22	13.57	12.21
*TOT	AL COST		533.06	444.86	379.15	328.36	287.98	255.18	228.10
		•						.*	
** TOTAL	<b>B-C</b>		347.83	161.49	57.44	-2.02	-36.42	-56.18	-67.25
** JENIANG + B	PRIC 24				·	-			
HENEFIT	5410								
	SPANNET OF THATANA		000 00			206.06	251.46		
	BENEFIT OF JENIANG		880 89	606.35	436.59	326.34	251.56	199.00	160.81
	BERIS HADA MAIR		162.76	110.72	78.42	57.39	43.13	33.13	25.90
	BERIS MAIN MINOR BERIS MAIN MINOR	- 01	4.90	3.35	2.39	1.75	1.32	1.02	0.80
			0.00	0.00	0.00	0.00	0.00	0.00	0.00
_	AL BENEFIT		1048.55	720.42	517.40	385.48	296.01	233+15	187.51
COST	<u>er e di </u>				1.2				
	COST FOR JENIANG		533.06	444.86	379.15	328.36	287.98	255.18	226.10
	COST FOR BERIS DAN		43.21	3732	32.84	29.28	26.34	23.86	21.73
-101	AL COST		576.27	482.18	411.99	357.64	314.32	279.04	249.83
**TOTAL	<del>B</del> -C		472.28	238.24	105.41	27.84	-18.31	-45.89	-62.32
····			<del></del>	<del></del>	· · · · · · · · · · · · · · · · · · ·	···			
	eris + Reman **			•					
BENEFIT					•				
1	BENEFIT OF JENIANC & BERIS		1048 - 55	720.42	517.40	385.48	296.01	233-15	187.51
	REMAN MADA MAIN		207.34	141.43	100.42	73-67	55.49	42-31	33.46
	REMAN HAIN MIOR		6-25	4.29	3.05	2.25	1.71	1.37	1.04
	AL BENEFIT		1262-14	866.14	620.8B	461.40	353-21	277-18	222.01
COST									
	COST FOR JEHIANG & BERIS		576.27	482.18	411.99	357.64	314.37	279.04	249.83
	COST FOR REMAN DAM		94.38	74.59	60.96	51-04	43.51	37.59	32.81
* POT	AL COST		670.65	556.77	472.95	408.68	357.83	316-63	282.64
**TOTAL	B-C		591.49	309.37	147.93	52.72	-4.62	-39-45	-60.63
renkrit	ERIS + REMAN + MERBOX **								
	BENEFIT OF JENIANG , BERIS & REMAN		1262-14	866.14	620.88	461.40	353.21	277 - 16	222.01
The second second	ERBOR MAIN NINGE		36.90	24.82	17.38	12.58	9.35	7.11	3.51
	U. BENEFIT		1299.04	890.96	638.26	473.98	362 56	284-29	227.52
C051	The state of the s		1277104		7,0120				,
	DOST FOR JENIANG . BERIS & MEMAN		670-65	556.77	472.95	408.68	357.83	316-63	282.64
and the second second	JUST FOR HERBOK	1	69.06	59.78	52.50	46.57	41.61	37-38	33.73
	U. COST		739.71	616.55	525.45	455 .25	399,44	354.01	316.37
-1017	u wy		133111	010177	343.43	400.60	222142	234101	210-3/
**TOTAL ;	3C	."	559.33	274.41	112.81	18.73	-36.88	-69.72	-88.85
*******	* <del>*</del>					·			

Table 32 INCREMENTAL NET PRODUCTION VALUE

		KEDAH	MUDA	A	
YEAR	MADA	MAIN	TRIBU-	MAIN	TRIBU-
	MAIN	MINOR	TARY	MINOR	TARY
	· ·		MINOR		MINOR
1984	0.00	0.00	0.00	0.00	0.00
1985	0.00	0.00	0.12	7.05	0.82
1986	0.00	0.00	0.44	11.13	1.64
1987	0.00	0.00	0.49	13.77	1.81
1988	0.00	0.00	0.54	16.42	1.99
1989	0.00	0.00	0.75	16.51	3.24
1990	42.06	2.78	1.01	16.26	4-63
1991	61.23	2.84	1.81	20.20	4.92
1992	66.62	2.89	1.92	20.27	5.19
1993	71.41	2.93	2.02	20.31	5.33
1994	76.80	2.93	2.35	20.32	5.88
1995	82.19	3.03	2.54	20.38	6-46
1996	87.14	3.23	2.82	20.48	7.24
1997	92.69	3-27	2.90	20.50	7.44
1998	98.58	3.36	2.95	20.52	7.57
1999	107.65	3-46	3.14	20.65	8.6
2000	114.31	3.61	3.61	20.83	9.11
2001	118.15	3.65	3.67	20.97	9.32
2002	120.45	3.70	3.73	21.01	9.52
2003	121.22	3.71	3.77	21.03	9.62
2010	121.22	3.71	3.77	21.03	9.62
2011	121.22	3.71	3.77	21.03	9.62
2032	121.22	3.71	3.77	21.03	9.62
2033	121.22	3.71	3-77	21.03	9.62
NPV( 6%)	1074.08	36.67	34.66	272-30	93.17
VPV( 8%)	722.87	25.29	23.68	201.40	64.65
IPV(10%)	507.15	18.18	16.91	155.58	46.95
IPV(12%)	368.24	13.51	12.53	124.36	35.41
IPV(14%)	275.03	10.32	9.57	102-10	27.54
TPV(16%)	210-26	8.05	7.51	85.63	21.98
(18%)	163.88	6.40	6.01	73.05	17.92

Table 33 D&I WATER SUPPLY BENEFIT

DAT.	BENEFIT	١

-		-
	KEDAH	MUDA-
YEAR	RIVER	PERAI
	SYSTEM	RIVER
		SYSTEM
-	(a)	(b)
1984	1.03	0.66
1985	0.86	0.75
1986	0.69	0.83
1987	0.51	0.91
1988	0.34	0.99
1989	0-17	1.08
1990	0.00	1.16
1991	0.38	1.45
1992	0.77	1.74
1993	1.15	2.03
1994	1.54	2.32
1995	1.92	2.61
1996	2.30	2.90
1997	2.69	3.19
1998	3.07	3.48
1999	3.46	3.77
2000	3.84	4.06
2001	3.84	4.06
2002	3.84	4.06
2003	3.84	4.06
2010	3.84	4.06
2011	3.84	4.06
2032	3.84	4-06
2033	3.84	4.06
NPV( 6%)	32.83	39.24
NPV(6%)	22.22	27.32
NPV(10%)	15.81	19.95
NPV(12%)	11.75	15.16
NPV(14%)	9.06	11.92
NPV(16%)	7.23	9.63
NPV(18%)	5.93	7.97
MEALTOWY	7.73	1431

Table 34 BENEFIT CASH FLOW AND PRESENT WORTH OF IRRIGATION IN KEDAH RIVER FOR OVERALL PLAN, ALTERNATIVE 1 (1/6)

	Pi	ROPORTION	OF N.W.O	TO DIVIL	AND	. :	Ж	ADA HAIR	* *		•		MIN HING		
year ·	JERIANG	SERIS	REMAN	T.RUDA	K. THEPHA	JEN LANG	BERIS	REHAR	T.MUDA	к тикриа	JENIANG	BER15	BEHAN		к.тнери
	SYSTEM	ĐAH	DAH	DAM	DAH	SYSTEM	DAH	DAH	DAM	DAN	System	HAC	DAH	DAN	
	(X) (a)	(1) (b)	(X) (c)	(X) (d)	(1) (e)	(H\$10 <sup>6</sup> ) (£)	(H\$10 <sup>6</sup> ) (g)	(H\$10 <sup>6</sup> )	(1) (1)	(H\$10 <sup>6</sup> )	(и\$10 <sup>6</sup> ) (k)	(H\$10 <sup>6</sup> )	(m) (m)	(n)	(o) (3310 <sub>6</sub> )
1984	100.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1985	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.0
1986	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1987	100,00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1988	00.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1989	100,00	0.00	0.00	0.00	0.00	0.00	0.00	0:00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1990	85.46	0.00	0.00	0.00	0.00	7.89	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.0
1991	86.13	4.01	6.93	1.50	3.32	23.56	10.89	18.82	4.06	9.01	1.61	0.36	0.61	0.13	0.2
1992	85.80	3,94	7.01	1 - 53		27 29	10.92	19.43	4-24	9.21	1.62	· 0.35	0.62	0.14	0.3
1993	85.47	3.87	7.09	1.57	4	30-46	10.91	19.97	4.41	9.39	1.63	0.35	0.63	0.14	0.3
1994	85.14	3.80	7,17	1.60		34.12	10.92	20.58	4.59	9.60	1.60	0.34	0.64	0.14	0.3
1995	84.81	3.74	7.25	1.64			10.93	21.19	4.38	9.80	1.65	0.34	0.66	0.15	0.3
1996	84.47	3.67	7.32	1 - 67		40.95	10.91	21.79	4.97	9.99	1.79	0.34	0.68	0.15	0.
1997.	84.14	3-60	7.40	1.71		44.64	10.90	22.43	5.17	10-20	1.80	0.33	0.69	0.16	0.
1998	83.81	3.53	7.48	1.74		48.57	10.90	23.11	5.38	10.42	1.84	0.33	0.70	0.16	0.3
999	83.48	3.46	7.56	1.78		55.12	11.00	24.04	5-64	10.75	1.89	0.33	0.72	0.17	0
2000	83115	3.39	7:64	1,81		59.61	11.01	24.80	5.88	11.01	1.99	0.33	0.74	0.17	0.3
1001	83.15	3.39	7.64	1.81		62.80	11.14	25.18	5.95	11.14	2.01	0,33	0.74	0.18	0.
2002	83.15	3.39	7.64	1.81		64.71	11.21	25.27	5.99	11-21	2.06	0.33	0.74	0.18	0.
2003	83.15	3.39	7.64	18.1		65.35	11.24	.25 - 33	6.00	11-24	2.07	0.33	0.74	0.18	0.3
2010	83.15	3.19	7.64	1.81	3.39	65.35	11.24	25.33	6.00	11-24	2.07	0.33	0.74	0.18	0.0
2011	83.15	3.39	7.64	1.81	3.39	65.35	11.24	25.33	6.00	11.24	2,07	0.33	0.34	0.16	0.1
2032	83.15	3.39	7.64	1.81	3.39	65.35	11.24	25-33	6.00	11.24	2.07	0.33	0.34	6.18	8
2033	83.15	3.39	7.64	1.81	3.39	65.35	11.24	25.33	6.00	11.24	2.07	0.33	0.74	0 18	0.
					NPV( 62)	537 . 22	112.83	238.04	55,27	107.49	20.41	3.41	7.17	1.66	3.
					NPV( 8%)	355.06	77.73	161.78	37.40		14.08	2.36	4.90		100
					NPV(10X)	244.54	55.70	114.47	26,35	. 11 /	10.12	1.70			
	•				NPV(121)	174.32	41.21	83.70	19.19		7.52	1.26	2 - 56		
					NPV(14X)	127.07	31.29	62.85	14.36	1 1 2 1 1	5.75	0.96	1.93		
					MPV(16X)	96.07	24.26	48.24	10.98	· .	4,49	8-75	1.49		
							~				.,			~	

Table 35 BENEFIT CASH FLOW AND PRESENT WORTH OF IRRIGATION IN MUDA RIVER FOR OVERALL PLAN, ALTERNATIVE 1 (2/6)

	PROPORTION	٠.	MAIN	MINOR
	N.W.O. TO	DEMAND	·	
YEAR				
* ;	JENTANG	BERIS	JENIANG	BERIS
	System	DAM	SYSTEM	DAM
	(%) (p)	(%) (q)	(M\$10 <sup>6</sup> ) (r)	(M\$10 <sup>6</sup> )
1984	100.00	0.00	0.00	0.00
1985	100.00	0.00	7.05	0.00
1986	100.00	0.00	11.13	0.00
1987	100.00	0.00	13.77	0.00
1988	100.00	0.00	16.42	0.00
1989	100.00	0.00	16.51	0.00
1990	95.74	0.00	14.31	0.00
1991	95.35	4.65	17.89	2.31
1992	94.97	5.03	17.76	2.51
1993	94.58	5.42	17.61	2.70
1994	94.19	5.81	17.42	2.90
1995	93.81	6.20	17.29	3.09
1996	93.42	6.58	17.19	3.29
1997	93.03	6.97	17.01	3.49
1998	92.64	7.36	16.84	3.68
1999	92.26	7.74	16.76	3.89
2000	91.87	8.13	16.73	4.10
2001	91.87	8.13	16.86	4.11
2002	91.87	8.13	16.90	4.11
2003	91.87	8.13	16.92	4.11
	120			1 .
2010	91.87	8 13	16.92	4.11
2011	91.87	8.13	16.92	4.11
2032	91.87	8.13	16.92	4.11
2033	91.87	8.13	16.92	4.11
NPV( 6%)			234.10	36.90
NPV( 8%)			175.44	24.82
NPV(10%)			137.20	17.38
NPV(12%)	14, 1		110.90	12.58
NPV(14%)		1.	91.97	9.35
NPV(16%)		4.	77.83	7.11
NPV(18%)	•		66.93	5.51
	1.9	11		7.73

Table 36 BENEFIT CASH FLOW AND PRESENT WORTH
OF IRRIGATION IN KEDAH RIVER FOR
OVERALL PLAN, ALTERNATIVE 2 (3/6)

P	ROPORTION	OF N.W.O	to deman	D М	ADA MAIN		M	AIN MINOR	·
	JENIANG SYSTEM (%)	BERIS DAM (%)	DAM			DAM	JENIANG SYSTEM (M\$10 <sup>6</sup> )	DAM	DA
1984	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1985	100.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.0
1986	100.00	0.00	0.00	0.00	0.00	0.00	1.	. "	ta ta ta a
1987	100.00	0.00	0.00		0.00	0.00	1000	0.00	0.0
	100.00	0.00	0.00	and the second		0.00	0.00	0.00	0.0
1989	100.00	0.00	0.00	0.00	0.00	0.00			
1990	86,46	0.00	0.00	7.89	0.00		25	and the parties of	
1991		4.10	6 82	23.56		100	4.0	0.36	0.6
1992	85.80	4.04	6.79	The second second		**			0.6
1993	85.47	3.99	6.76	30.46				and the second of	0.6
1994	85.14	3.94	6.73	34.12	11.31			0.35	0.6
1995	100	3.89	6.70	37.74	11.36			0.35	Account to the
1996		3.83	6.66	40.95	4 4		1.0		
1997	84.14	3.78	6.63	and the second second	11.45	the second second			
1998	83.81		6.60			4 (F)	1.84	0.35	0.6
1999	83.48	3.67	6.57	55.12		11.	and the second	4	and the second
2000	83.15	•	6.54	100	11.75	1 ++1		0.35	0.6
2001	83.15	3.62	6.54		11.89			1	
2002	83.15	3.62	6.54		11.97				0.6
2003	83.15	3.62	6.54			4.5	12		0.0
2010	83.15	3.62	6.54	65.35	12.00	21.68	2.07	0.35	0.0
2011	83.15	3.62	6.54	65.35	12.00	21.68	2.07	0+35	0.0
2032	83.15	3.62	6.54	65.35	12.00	21.68	2.07	0.35	0.0
2033	83.15	3.62	6.54	65.35	12.00	21.68	2.07	0.35	0.0
,	**************************************	NP	v( 6%)	537.22	119.05	210.59	20.41	3.60	6
	•		V( 8%)	355.06	81.81		14.08		
			V(10%)	244.54	58 - 50		the second second		
			V(12%)	174.32	43.20	and the second second	4.0	100	
			V(14%)	127.87	32.74			14 (14 A)	l.
		٠.	V(16%)	96.07	25.34	100			1.
			V(18%)	73.64	19.95				

Table 37 BENEFIT CASH FLOW AND PRESENT WORTH
OF IRRIGATION IN MUDA RIVER FOR
OVERALL PLAN, ALTERNATIVE 2 (4/6)

	PROPORTIO	n of	MAIN MINOR				
1002 6 VA	N.W.O. TO	DEMAND					
YEAR	JENIANG	BERIS	JENIANG	BERIS			
	System	DAM	System	DAM			
	<b>(%)</b>	(X)	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )			
1984	100.00	0.00	0.00	0.00			
1985	100.00	0.00	7.05	0.00			
1986	100.00	0.00	11.13	0.00			
1987	100.00	0.00	13.77	0.00			
1988	100.00	0.00	16.42	0.00			
1989	100.00	0.00	16.51	0.00			
1990	.95.74	0.00	14.31	0.00			
1991	95.35	4.22	17.89	2.10			
1992	94.97	4.53	17.76	2.26			
1993	94.58	4.85	17.61	2.42			
1994	94.19	5.17	17.42	2.58			
1995	93.81	5.49	17.29	2.74			
1996	93.42	5,80	17 - 19	2.90			
1997	93.03	6.12	17.01	3.06			
1998	92.64	6.44	16.84	3.22			
1999	92.26	6.75	16.76	3.39			
2000	91.87	7.07	16.73	3.56			
2001	91.87	7.07	16.86	3.57			
2002	91.87	7.07	16.90	3.57			
2003	91.87	7.07	16.92	3.58			
2010	91.87	7.07	16.92	3.58			
2011	91.87	7:07	16.92	3.58			
2032	91.87	7.07	16.92	3.5			
2033	91.87	7.07	16.92	3.58			
NPV( 6%)			234.10	32.3			
NPV( 8%)			175.44	21.7			
NPV(10%)	ì		137.20	15.2			
NPV(12%)	•		110.90	11.0			
NPV(14%)			91.97	8-2			
NPV(16%)			77.83	6.2			
NPV(18Z)	•		66.93	4.8			

Table 38 BENEFIT CASH FLOW AND PRESENT WORTH OF IRRIGATION IN KEDAH RIVER FOR OVERALL PLAN, ALTERNATIVE 3 (5/6)

		PROFORMION OF N.W.O. TO DEMAND			HADA HAIN					NAIN MINOR					
YEAR -	JEHIANG	SERIS DAY	REHAN DAH	T.HUDA DAM	AH99HT.X	JENIANC SYSTEM	BERIS	REMAN Dan	T.NUDA DAH	K.THEPHA Dam	Jeniang System	BERIS DAM	REMAN DAN	T.HUDA DAM	K.THEPHA Dan
(X)								(H\$)U <sup>6</sup> )	(H\$J0e)		(H\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )	(H\$10 <sup>6</sup> )	(N\$10 <sub>6</sub> )	(H\$10 <sup>6</sup> 1
1984	90.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	- 11 a 1 a 1
1985	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1986	100,00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1987	100.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0+00	0.00	0.00	0.00	0.00	1.
1988	00.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1989	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1990	86-46	0.00	0.00	0.00	0.00	7.89	0.00	0.00	0.00	0.00	1.59	0.00	0,00	0.00	
1991	86.15	4-61	5,40	1.33	3.25	21.60	13.07	17 37	3.61	8.86	1.61	0.43	0.57	0.12	0.29
1992	85.83	4.86	6.41	1.35	3.21	27 - 37	13.45	17.76	3.73	8.90	1.63	0.43	0.57	0.12	0.29
1993	85.52	4.90	6.43	1.37	3.17	30-60	13.80	. 18-11	3.85	8.92	1.63	0.44	0.58	9.12	0.28
1994	85-20	4.94	6.44	L 39	3.12	34.30	14.19	18+50	3.98	8.95	1.61	0.44	0.58	0.12	0.28
1995	84-89	4.99	6.46	1.41	3.07	37-97	14-58	18.90	4.11	8.98	1.66	0.45	0.58	0,13	0.28
1996	84.57	5.03	6.48	1.42	3.02	41.24	14.96	19-26	4 . 24	8.99	1.60	0.47	0.60	0.13	0.28
1997	84-26	5.07	6.49	1.44	2.97	44.98	15.37	19.67	4.37	9.01	1.81	0.47	0.60	0.13	0.28
1998	83.94	5-11	6.51	1.46	2.93	48.97	15.80	20.10	4.52	9.04	1.05	0.48	0.61	0.14	0.2
1999	83.63	5.16	6.52	1.48	2.88	55-56	16-40	20.75	4.71	9.15	1.91	0.49	0.62	0.14	0.2
2000	83.31	5-20	6.54	1 50	2.83	60-13	16.88	21,23	4.87		2.00	0.50	0.63	0.14	0.2
2001	83-31	5-20	6-54	1.50		63.33	17.08	21.48	4,93	9.30	2.04	0.50	0.63	0.15	0.2
2002	83.31	5-20	6.54	1.50	2.83	65.24	17.20	21.63				100	0.64	0.15	
2003	83-31	5-20	6.54	1 50	2.83	65.88	17,24	21.68	4.97		2.09		0.64	0.15	
2010	83.31	5 - 20	6.54	1.50	2.83	65.88	17.24	21.68	4.97	9.38	2.09	0.51	0.64	0.15	0.28
2011	83.31	5.20	6.54	1.50	2.83	65.88	17.24	21.68			2.09	0.51	0.64	0.15	0.2
2032	83.31	5.20	6.54	1.50	2.83	65,88	17.24	21.68	4.97	9.38	2.09	0.51	0.64	0.15	0.2
2033	83.31	5.20	6.34	1.50	2.83	65.88	17.24	21.68	4.97	9.18	2.09	0.51	0.64	0.15	
	*******				NPV( 61)	541.21	162.76	207.34	46.45	93.52	20.53	4,90	6-25	1.40	2.8
					NPV( 81)	357.63	310.72	141.43	7.15				4.29	0.98	
					NPV(10X)	246.26	78.42	1 1	100	4 1 1 1			3.06	1.	1.0
					HPV(12%)	175.51	57.39	73.67						100	
		•			NPV(142)	128.72	A3.13							1.50	
1,1					HPV(16%)	96.69	33.13	42.71				1.7	1.32		
						30.03	22113	41.//1	- 30	12:33	4+31	1101	.1.34	0.29	0.0

Table 39 BENEFIT CASH FLOW AND PRESENT WORTH
OF IRRIGATION IN MUDA RIVER FOR
OVERALL PLAN, ALTERNATIVE 3 (6/6)

a. N	PROPORTIC	N OF	MAIN I	IINOR
	N.W.O. TO	DEMAND		
YEAR				<del></del> -
	JENIANG	MERBOK	JENIANG	MERBOK
	System	:	System	
	(X)	(%)	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )
1984	100.00	0.00	0.00	0.00
1985	100.00	0.00	7.05	0.00
1986	100.00	0.00	11-13	0.00
1987	100.00	0.00	13.77	0.00
1988	100.00	0.00	16.42	0.00
1989	100.00	0.00	16.51	0.00
1990	95.74	0.00	14.31	0.00
1991	95.35	4.65	17.89	2.31
1992	94.97	5.03	17.76	2.51
1993	94.58	5-42	17.61	2.70
1994	94.19	5.81	17.42	2.90
1995	93.81	6.20	17.29	3.09
1996	93.42	6.58	17.19	3.29
1997	93.03	6.97	17.01	3.49
1998	92.64	7.36	16.84	3.68
1999	92.26	7.74	16.76	3.89
2000	91.87	8 13	16.73	4.10
2001	91.87	8.13	16.86	4.11
2002	91.87	8.13	16.90	4.11
2003	91.87	8.13	16.92	4.11
2010	91.87	8.13	16.92	4.11
2011	91.87	8.13	16.92	4.11
2032	91.87	8.13	16.92	4.11
2033	91.87	8.13	16.92	4.1
NPV( 6%)			234.10	36.9
NPV( 8%)	. *	i i i i i i i i i i i i i i i i i i i	175.44	24.8
NPV(10%)		· Ag	137.20	17.30
NPV(12%)	*.		110.90	12.5
NPV(14%)	•		91.97	9.3
NPV(16%)			77.83	7.1
NPV(18%)			66.93	

Table 40 ESTIMATE OF NET IRRIGATION BENEFIT

Unit: M\$10<sup>6</sup>

1	NCREMENTAL	, net proi	DUCTION VA	LUE		IRRIG	ATION DI	RECT FACIL	ITY COST	T	
		KEDAH		1aud/	· · · · · · · · · · · · · · · · · · ·		KEDAH		MUD	A	
YEAR	MADA MAIN	HAIN MINOR	TRIBU- TARY MINOR	MAIN MINOR	TRIBU- TARY HINOR	MADA MAIN	MAIN MINOR	TRIBU- TARY MINOR	MAIN HINOR	TRIBU- TARY MINOR	
1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002	0.00 0.00 0.00 0.00 0.00 0.00 42.06 61.23 66.62 71.41 76.80 82.19 87.14 92.59 87.14 92.58 107.65 114.31 118.15	2.84 2.89 2.93 2.93	1.81 1.92 2.02 2.35 2.54 2.82 2.90 2.95	0.00 7.05 11.77 16.42 16.51 16.52 20.20 20.27 20.31 20.38 20.48 20.50 20.52 20.65 20.97 21.01	0.00 0.82 1.64 1.99 3.63 4.99 5.33 5.846 7.24 7.57 8.61 9.32 9.62	20.88 21.17 24.82 39.16 42.65 43.24 43.83 44.42 47.47 51.01 57.67 50.03 17.95 9.94 9.94	0.00 0.00 0.25 0.34 0.25 0.01 0.01 0.15 0.46 0.529 0.44 0.72 0.64 0.06 0.06 0.06	0.81 0.30 0.30 0.76 0.79 0.41 0.05 0.44 0.95 0.54 1.27 0.95 0.41 1.10 0.72 0.15 0.15	2.45 1.14 1.58 3.56 4.09 20.27 1.22 2.66 3.01 1.54 1.92 3.93 2.01 0.58 0.58	0.00	
2010 2011	121.22	3.71 3.71	3.77 3.77	21.03 21.03	9.62 9.62	9.94 9.94	0.06 0.06	0.15	0.58 0.58	0.19 0.19	
2032 2033	121.22	3.71 3.71	3.77 3.77	21.03 21.03	9.62 9.62	9.94 9.94	0.06 0.06		0.58 0.58	0.19 0.19	
NPV(6%) NPV(8%) NPV(10%) NPV(12%) NPV(14%) NPV(16%) NPV(18%)	1074.08 722.87 507.15 368.24 275.03 210.26 163.88	36-67 25-29 18-18 13-51 10-32 8-05 6-40	34.66 23.68 16.91 12.53 9.57 7.51 6.01	272.30 201.40 155.58 124.36 102.10 85.63 73.05	64.65 46.95 35.41 27.54	433.27 358.28 302.71 260.02 226.30 199.11 176.81	2.65 2.12 1.74 1.45 1.22 1.04 0.90	7.37 6.13 5.21 4.50 3.95 3.50 3.14	27.70 23.18 19.83 17.26 15.22 13.57 12.21	9.46 8.55 7.88 7.37 6.96 6.62 6.32	

	NE	T IRRIGAT	TION BENEI	/IT	
*****		KEDAH		MUDA	1
YEAR	MADA MAIN	MAIN MINOR	TRIBU- TARY MINOR	MAIN HINOR	TRIBU- TARY MINOR
1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1995 1996 1996 1996 1996 1996 1996 1998 1990 2001 2001 2002	-20.88 -21.17 -24.45 -31.82 -39.16 -42.65 -1.18 17.20 23.94 25.765 29.466 64.59 89.70 64.57 108.21 110.51	0.00 0.00 -0.25 -0.25 -0.21 -2.77 2.874 2.772 2.743 2.744 2.755 2.72 3.555 3.665	-0.81 -0.18 -0.127 -0.254 0.96 1.376 0.75 1.400 1.75 2.446 3.528 3.528 3.62	-2.45 -5.91 -5.91 -9.83 -12.33 -15.99 -18.62 -17.34 -17.34 -17.34 -18.56 -18.62	-3.94 -1.328 1.285 1.334 4.454 5.155 5.28 7.001 7.124 8.992 9.133 9.43
2010 2011 2032 2033	111.28 111.28 111.28 111.28	3.65 3.65 3.65 3.65	3.62 3.62 3.62 3.62	20.45 20.45 20.45 20.45	9.43 9.43 9.43 9.43
NPV( 67) NPV( 82) NPV( 102) NPV( 102) NPV( 142) NPV( 142) NPV( 162) NPV( 182)	640.81 364.59 204.44 108.23 48.73 11.15 -12.93	34.02 23.17 16.44 12.06 9.09 7.01 5.50	27.28 17.55 11.70 8.03 5.63 4.00 2.87	244.60 178.21 135.75 107.10 86.88 72.06 60.84	83.70 56.10 39.07 28.04 20.59 15.37 11.60

Table 41 BENEFIT CASH FLOW AND NET PRESENT WORTH OF BERIS DAM, ALTERNATIVE 1, CASE A (1/6)

					KEDAH SYST	E3H				·,	
		ET WATER	GUTPUT B	CAUSE		IRRI	GATION B	ENEFIT IN	APPECTED	AREA	KEDAN
YEAR	HADA HAIN	. HINOR	TRIBUTA- RY MINOR		HAINTE~ NANCE FLOW	MADA	MAIN HINOR	TRIBUTA- RY HINOR	De I	HAINTS- NANCE FLOW	BENEFI
	(106 m <sub>3</sub> )				(10 <sup>6</sup> m <sup>3</sup> )		(HS106)	{H\$10 <sup>6</sup> }	(M\$10 <sup>6</sup> )	(M\$106)	
	(a)	(b)	(c)	(9)	(e)	(£)	(g)	(h)	(i)	())	(k)
1984	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	. 0.0
1985 1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.0
1988		0.00	0.00	0.00	0.00	0.03	0.00	0.00 0.00 0.00	0.00	0.00	ก็เกิ
1989	0.00 0.00 42.65 40.20 37.75 35.30 32.85 30.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
1991	42.65	0.62	8.30	0.00	0.00	0.00	0.00	0.45	0.00	0.00	2.0
1992	40.20	0.87 0.84	9.60	0.20	0.16	2.77	40.06	0.64	0.01	0.01	2.9
1993 1994	37 • 75	0.81 0.78	10.90	0.10 0.20 0.30 0.40	0.24	0.00 2.40 2.77 2.74 2.70 2.62	0.06	0.64 0.76 0.90	0.02	0.02	3.5
1225	33.30	0.78	12.20	0.40	0.32	3.72	9.06	0.90	0.03	0.02	3.7
1993 1996	30.40	0.75	13.50	0.50 0.60 0.70	0.40	2.10	0.06 0.06 0.08 0.11	1.06	0.06 0.05 0.08 0.13	0.03	3.6
1997		0.69	16.10	0.70	Ŏ.56	3.34	0.08	1,85	ŏ.ŏs	0.06	ş.,
1998	25-50	0.66	17.40	0.80	0.64	3.34 4.47 5.49 5.57 5.77	0.11	2.96	0.13	0.11	.7.3
2000	23.03	0.63	20.00	1.00	0.72	2.53	8:15	2.5	0.31	0.17	10. 11.
2001	20.60	0.60	20.00	1.00	0.80	3:35	0.17	3.86	0.58	0.72	12.0
2002	25.50 23.05 20.60 20.60 20.60	0.60	20,00	1.00	0.89	5.89 5.93	0.17 0.17 0.17	5.72	0.27 0.28 0.29 0.29	0.22 0.23 0.23	12 . 12 . 12 .
2003	20.60	0.60	20.00	1.00	0.80	5.93	0.17	1.85 2.95 4.37 5.60 5.72 5.76	0.29	0.23	12 - 3
2010 2011	20.60	0.60	20.00 20.00	1.00	0.80	5.93 5.93	0.17	3:76	0.29	0.23	12.3 12.3
2032 2033	20.60	0.60	20.00 20.90	1.00	0.80	5.93 5.93	8:17	5.76 5.76	0.29	0.23	12
			20190							·	
V( 63)						47.52 31.21	1.29 0.84	38.81 24.35	1.87		90.9 58.4
V(10X)						21.36	0.56	15.87	0.25	ብ.ለስ	39.1
V(123)						15.13	0.39	10.69	0.30 0.34	0.40	27 . 19
V(141)						11.03	0.28	7.41	0.34	9.27	19
¥{181						8.24 6.28	0.21	5.26 3.81	0.24	0.19	10

				1	DDA-PERAI	SYSTEM					
-		HET WATER	OUTPUT B	CAUSE		1 P.R	ICATION BE	NEFIT IN	AFFECTED	AREA	HUDA-
		KEDAR STA	T.E.	P.PINA	G STATE		KEDAH STATE			G STATE	PERA1 TOTAL
YEAR		TRIBUTA- RY MINOR		HAIN HINOR	1941		TRIBUTA- RY MINOR		HAIN	D4 1	BENEFIT
	$(10^6 \text{ m}^3)$	$(10^6 a^3)$	$\{10^5 \text{ m}^3\}$	(10 <sup>6</sup> m <sup>3</sup> )	(10 <sup>6</sup> m <sup>3</sup> )	(HS10 <sup>6</sup> )	(H\$10 <sup>6</sup> )	(#\$10 <sup>6</sup> )	(8\$16 <sup>6</sup> )		
	(1)	(12)	(n)	(0)	(p)	(q)	(r)	(s)	(t)	{u}	(v)
1984 1985 1986 1987	0.00 0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00		0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00 0.00 0.00	0.00	0.00 0.00 0.00	0.00 0.00 0.00
1988	0.00	0.00	0.00		6.00 0.00 0.00 0.00		0.00	0.00	0.00	0.00	0.00
1989 1990 1991	0.00 0.00 3.00 3.00 3.00	0.00	0.00	0.00 0.00 0.00 3.00 3.00 3.00	0.00 0.00 0.50 1.00 1.50 2.00 2.50	0.00	0.00 0.00 0.00 0.00 0.79 0.84 1.29 1.34 1.43 1.60	0.00 0.00 0.00 0.00 0.34 0.33 0.34 0.34	0.00	0.00 0.00 0.00 0.09 0.17	0.00 0.00 0.00 2.25
1991 1992 1993	3.00	4.60 5.20	2.00	3.00	1.00	0.50	0.87	0.33	0.51 0.50 0.49	0.17	2.57
1993	3.00	5.80 2.80	2.00	3.00	1,50 2,00 2,50 3,00 3,50	0.49	0.94	0.33	0.49	0.24	2.37 2.49 2.72 2.99
1995	3.00 3.00 3.00 3.00 3.00	7.00	2.00	3.60 3.60	2.50	0.51	įžě	0.34	0.50 0.51 0.51 0.49 0.49	0.33 0.43	2.99 3.16
1996 1997	3.00 3.00	7:60 8:20	2.00 2.00 2.00	3.00 3.00 3.00 3.00	1.56	0.51 0.49 0.49 0.51 0.53	1:34	0.33	0.49	0.51 0.57 0.65 0.77	3.21
1997 1998	3.00	8.20 8.80	2.00	3.00	4.00 4.50 5.00	0.43	1-43	0.33	0.49	0.65	3.39 3.73
1999	3.00	9.40 10.00	2.00 2.00 2.00	3.00 3.00	5.00	0.53	1.76	0.35	0.51 0.53	98.0	4.05
2000 2001	3.60	10.00	2.00	3.00	5.00 5.00	0.53	1.76	0.35	0.53	0.88	4 06
2002 2003	3.00	10.00	2.60 2.00	3.00 3.00	5.00	0.53	1.76 1.76 1.76	0.35 0.35 0.35	0.53	88.0 88.0	4.06
2010 2011	3.00 3.00	10.00 10.00	2.00 2.00	3.00 3.00	5.00 5.00	0.53 0.53	1:76	0.35	0.53	0.58 0.88	4.06 4.06
2032 2033	3.00 3.00	10.00 10.00	2.00 2.00	3.00 3.00	5.00 5.00	0.53 0.53	1.76 1.76	0.35 0.35	0.53	0.88	4.06
NPV(61) HPV(81) NPV(101) NPV(121) HPV(141) NPV(161) NPV(181)						5.26 3.62 2.59 1.91 1.45 1.12 0.89	2.77		5.26 3.62 2.59 1.91 1.45 1.12 0.89	6.75 4-36 2.93 2.03 1.45 1.06 0.79	35.89 24.66 16.80 12.13 9.00 6.83 5.28

	Benefit	Cost	B-C	
NPV (8%)	82.54	37.32	45.22	
NPV (10%)	55.94	32.84	23.10	e e
NPV (12%)	39.24	29.28	9.96	
NPV (14%)	28.33	26.34	1.99	
NPV (16%)	20.96	23.86	-2.90	EIRR = 14.8

Table 42 BENEFIT CASH FLOW AND NET PRESENT WORTH OF BERIS DAM, ALTERNATIVE 2, CASE A (2/6)

بدعد مع		OF ULTER	ovient b		KEDAR SYSYI		GATION BE	NEFIT IN	APPECTED	AREA	KEDAP
YEAR			TO 1 91074	DE I	HAIRTE- RANCE PLOW (10 <sup>6</sup> m <sup>3</sup> )	KADA HATN (M910 <sup>6</sup> )	HAIN HINOR (MS10 <sup>6</sup> )	TRIBUTA- RY HINOR (MS106)	D\$ I (M\$10 <sup>6</sup> )	HAINTE- NANCE FLOW (H\$10 <sup>6</sup> )	BENEFI (H\$10 <sup>6</sup>
1984 1985 1986 1987 1988	0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00	0.00	00000
1939 1930 1991 1992 1993	0.00 0.00 43.82 41.54 39.26	0.00 0.00 0.87 0.84 0.78	0.00 8.30 9.60	0.00 0.00 0.11 0.22 0.33 0.44	0.00 0.00 0.10	0.00 0.00 2.46 2.86 2.84	0.00 0.05 0.05	0.46 0.46	0.00 0.01 0.01	0.00 0.01 0.01	3.
1994 1995 1996 1997 1998 1999	36.98 34.70 32.42 30.14 27.86	0.78 0.75 0.12 0.69 0.66	13.50 14.60 15.10 17.40	0.55	0.50	2.84 2.84 2.79 3.60 4.86 6.08 6.30	0.06 0.06 0.08 0.11 0.15	1.85	0.04 0.05 0.09 0.15 0.23 0.30	0.04 0.05 0.08 0.13	4. 5. 8.
2000 2001 2002 2003	23.30 23.30 23.30 23.30	0.60 0.60 0.60	20.00 20.00	1.10	1.00	8.97 8.71	0.16 0.17 0.17 0.17	5.60 5.72 5.76	0.31 0.32 0.32	0.28 0.29 0.29	12: 13: 13:
2010 2011	23.30 23.30	0.60 0.60	20.00 20.00	1.10 1.10			0.17		0.32 0.32		
2032 2033	23.30 23.30	0.60	20-00 20-00	1.10	1.00	6.71	0.17		0.32 0.32		13. 13.
V( 61) V( 82) V(101) V(121) V(141) V(161) V(181)			4.7			52.80 34.52 23.52 16.39 12.04 8.96 6.80	1.29 0.84 0.56 0.39 0.28 0.21 0.16	38.81 24.35 15.87 10.69 7.41 5.26 3.81	2.09 1.30 0.83 0.35 0.38 0.26 0.19	1.87 1.16 0.75 0.50 0.34 0.24 0.17	96. 62. 41. 28. 10.
					NIDA-PERAL						

	1	NET WATER	OUTPUT E	CAUSE		ISR	IGATION BE	NEFIT IN	AFFECTED	AREA	HUE
: 1		KEDAS STAT	E	P.PINA	G STATE	. 1	KEDAH STAT	E	P.PINA	C STATE	FEF TOT
YEAR	M1408	TRIBUTA- RY NINOR		MAIN NINCE (106 m <sup>3</sup> )	D&I (108 =3)	KAIN HINOR (HS10 <sup>5</sup> )	TRIBUTA- BY NINOR (M\$10 <sup>6</sup> )	D&1 (8510 <sup>6</sup> )	MINOR	A 100 PM 200	BENE
1984 1985 1986 1987	0.00 0.00 0.00	0.00	0.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.00	9.00 9.00 9.00 9.00	0.00 0.00 0.00 0.00	0.00 0.00 0.00	000
1988 1989 1990 1991 1992	0.00 0.00 2.40 2.30	0.00 0.50 4.60 5.20	0.00 0.00 2.00 2.00	0.00 0.00 0.00 2.40 2.30	0.00 0.00 0.50 1.00 1.50 2.50 3.60 3.50 4.50	0.00 0.00 0.41 0.39	0.00 0.00 0.79 0.87	0.00 0.00 0.34 0.33	0.00 0.00 0.41 0.39	0.00 0.00 0.09	000000000000000000000000000000000000000
1993 1994 1995 1996 1997 1998	2.20 2.10 2.00	5.60 6.40 7.00 7.60 8.20	2.00 2.00 2.00 2.00 2.00	2.20 2.10 2.00 1.90 1.80	2.00 2.50 3.00 3.50	0.35 0.35 0.32 0.29	1.06 1.20 1.29	0.33 0.34 0.34 0.33	0.35 0.34 0.32 0.29	0.33 0.43 0.51 0.57	
1998 1999 2000 2001 2002 2003	1.60 1.50 1.50 1.50	10.00	2,00 2,00 2,00 2,00 2,00 2,00 2,00	1.70 1.60 1.50 1.50 1.50	5.00 5.00 5.00	0,28 0,27 0,26 0,26 0,26 0,26	0.00 0.00 0.00 0.00 0.00 0.00 0.87 0.87	0.33 0.34 0.35 0.35 0.35	0.28 0.27 9.26 0.26 0.26 0.16	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	The second second
2010 2011	1.50	10.00	2.00		5.00 3.00	0.26	1.76 1.75	0.35 0.35		9.88 0.88	
2032 2033	1.50 3.50	19.00 10.00	2.00 2.00	1.50	5.00 5.00	0.26	1.76	0.35 0.35	0.26	0+88	
V( 61) V( 62) V( 102) V( 142) V( 142) V( 162)			`: .			3.55 2.15 1.58 1.19 0.92 0.73 0.58	10.04 6.96 4.99 3.67 2.77	3.53 2.42 1.73 1.28 0.75 0.75	1.58 1.19 0.97	6.75 4.36 2.93 2.03 1.45 1.06 0.79	16

		Benefit	Cost	B-C	
NPV	(8%)	83.29	37.32	45.97	
	10%)	56.32	32.84	23.48	
NPV (	12%)	39.41	29,28	10.13	, ,
NPV (	14%)	28.39	26.34	2.05	
NPV (	16%)	20.96	23.86	-2.90	EIRR = 14.8

Table 43 BENEFIT CASH FLOW AND NET PRESENT WORTH OF BERIS DAM, ALTERNATIVE 3, CASE A (3/6)

CYCTEM

	*******				CONTRACTOR			محرحت بديد سجوت	رسيده فتجددف		
		ET WATER	OUTPUT BY	CAUSE	-	IRRI	GATION B	ENEFIT IN	AFFECTED	AREA	KEDAH TOTAL
YEAR	MADA MAIN	MAIN	TRIBUTA- RY MINOR	D&I	MAINTE- NANCE FLOW	ADAM MAIN	MAIN	TRIBUTA- RY MINOR	D& I	MAINTE- NANCE FLOW	RENEFIT
	(106 m <sup>3</sup> )	$(10^6 \text{ m}^3)$	$(10^6 \text{ m}^3)$	$(10^6 \text{ m}^3)$	$(10^6 \text{ m}^3)$	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )
1984 1985	0.00	0.00	0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.19 0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1986			0.00	0.00	0.00 0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00
1987 1988	0.00	0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
1989 1990 1991 1992	0.00	0.00	0.00 0.00 0.00 0.00 0.00	0.00	0.00 0.00 0.17 0.34 0.51	0.00	0.00	0.00	0.00 0.00	0.00	0.00 0.00 0.00 0.00 3.49
1991	52.64	0.00 1.10	8.30	0.19	0.17	0.00 2.95	0.06	0.46	0.01	0.01	3.49
1992 1993	51.38 50.12	1.10	9,60	0.38	0.34	3.52 3.60 3.72	0.08 0.08	0.64 0.76	0.02	0.02	4.28 4.52
1994	48.86	1.10	12.20	0.57 0.76		3.72	Ŏ.ŏĕ	0.90	0.0	0.05	4.80 5.15
1995 1996	46.34	1.10	14.80	1.14	1.02	3.72 3.86 3.95 5.32	0.09	1.06 1.22 1.85	0.09	0.08	5.44
1996 1997 1998	45.08	1.10	16.10 17.40	1.33	1.19	5.32 7.60	0.09 0.13 0.19	1.85 2.96	0.26	0.14	7.59
1999	0.00 0.00 0.00 0.00 52.64 51.12 48.86 47.60 45.38 43.82 42.30 41.30	1.10 1.10 1.10	18.70	0.95 1.14 1.33 1.52 1.71	1.53	10.06	0.26	4.37	.0.40	ŏ.36	11.24 15.46 17.86 18.50
2000 2001	41.30 41.30	i.iŏ	. 20.00	1.90 1.90 1.90	1.70	10.06 11.17 11.57	0.30 0.31	5.41 5.60	0.52 0.54	0.46	18.50
2002		i.io 1.10	20.00	1.90	1.19 1.36 1.53 1.70 1.70 1.70	11.81	0.32 0.32	5.41 5.60 5.72 5.76	0.55 0.55	0.49 0.49	18.89 19.02
2003			:								
2010 2011	41.30 41.30	1.10	20.00 20.00	1.90 1.90	1.70 1.70	11.90 11.90	0.32 0.32	5.76 5.76	0.55 0.55	0.49 0.49	19.02 19.02
2032	41.30 41.30	1.10	20.00 20.00			11.90 11.90	0.32 0.32	5.76 5.76		0.49 0.49	19.02 19.02
2033		1.10	20.00	1.30	1.70					~~~~~~	
NPV(6%)		. 154				88.03 56.68	2.31 1.48	38.81 24.35 15.87	3.58 2.22	1.99	135.94 86.72
NPV(102)						38 00 26 37	0.98	15.87	1.43 0.95	1.28	57.57 39.54
NPV(12%) NPV(14%)						18.84	0.48	7.41	0.65	0.58	27.96
NPV(16%) NPV(18%)			•			13.80	0.35 0.26	5.26 3.81	0.45	0.41	20.26 15.01
(100)	•										

	Benefit	Cost	В-С	•
NPV (8%)	86.72	37.32	49.40	-
NPV (10%)	57.57	32.84	24.73	
NPV (12%)	39.54	29.28	10.26	
NPV (14%)	27.96	26.34	1.62	•
NPV (16%)	20.26	23.86	-3.60	EIRR = 14.6

Table 44 BENEFIT CASH FLOW AND NET PRESENT WORTH OF BERIS DAM, ALTERNATIVE 1, CASE B (4/6)

	•				KEDAH SYST					خبيد حيرتدي	
,, ,,	h	ET WATER	OUTPUT BY	CAUSE				ENEFLT IN			KEDAR TOTAL BENEVIT
YEAR	KADA HATR (10 <sup>6</sup> m <sup>3</sup> )	MAIN NINOR (10 <sup>6</sup> m <sup>3</sup> )	TRIBUTA- RY HINOR (10 <sup>5</sup> E <sup>3</sup> )	(10 <sup>6</sup> m <sup>3</sup> )	HAINTE- HANCE FLOW (10 <sup>6</sup> m <sup>3</sup> )	HADA HAIN (H\$106)	HAIN HINOR (HS106)	(HS106)	(H\$10 <sup>6</sup> )	WANCE FLOR	(H\$10 <sup>6</sup> )
1984 1985 1986 1987 1988 1990 1992 1993 1993 1995 1995 1995 2000 2001 2010 2011 2032	0.00 0.00 0.00 0.00 0.00 0.00 0.00 49.24 48.48 47.72 46.20 41.16 42.40 42.40 42.40 42.40 42.40	0.00 0.00 0.00 0.00 0.00 0.00 0.99 0.91 0.95 0.91 0.92 0.93 0.93 0.93 0.93	0.00 0.00 0.00 0.00 0.00 0.00 7.00 7.00	0,00 6,00 6,00 6,00 6,00 6,00 6,00 6,00	0.000 0.000	0.00 0.00 0.00 0.00 0.00 0.00 0.00 2.79 3.64 3.82 5.45 10.55 11.34 12.69	0.00 0.00 0.00 0.00 0.00 0.00 0.07 0.07	0000 0000 0000 0000 0000 0000 0000 0000 0000	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0.000 0.000 0.000 0.000 0.001 0.000 0.001 0.003	0.000 0.000
2033 NFV( 61) NFV( 81) NFV( 101) NFV( 121) NFV( 141) NFV( 162) NFV( 181)	42.40	0.90	7.60	2.00	1.70	92.51 59.33 39.62 27.37 19.47 14.20 10.58		15.00 9.58 6.37 4.38		3.29 2.04 1.31 0.87 0.59	15.60 74.59 49.56 34.72 24.27 17.55 13.11

					uda-perai					·	
	]	ET VATER	CUTPUT BY	CAUSE		IRR	IGATION BE	KEFIT IN	APPECTED .	A REA	MIIDA-
-		CEDAR STAT	ΓĒ	P.PINA	G STATE		TATE HACK	E	F PINAN	STATE :	PERAT
YZA9	MATN	TRIBUTA-	143	HAIN	DEX .	MAIN	TRIBUTA-	D& 1	MAIN	DoL	ZENEPIT
	1106 a3i	1105 mg/	(266 g3)	(10 <sup>6</sup> m <sup>3</sup> )	(106 53)	(H\$10 <sup>6</sup> )	(M\$10 <sup>6</sup> )	(H\$10 <sup>6</sup> )	(HS106)	(M\$10 <sup>5</sup> )	(H\$10 <sup>6</sup> )
1984	0.00	9.00	0.00	0.00	0.00	0.00	0.00	0.00	(#\$10°) 0.00 0.00 0.00 0.00 0.00 0.00 0.57 0.58 0.59 0.57 0.58 0.59	0.00	0.00
1985	9.00	0.00	C-00	0.00	0.00	0.00	0.00	0.00	8.80	0.00	0.00
1986 1987 1988 1939	0.00	6-00	0.00	0.00	.0.00	6.66	6.66	0.00	0.00	0.00	0.00
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1939	0.00	0.00	å*80	6.00	0.00	0.00	0.00	6.66	0.00	0.00	0.00
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	7.25	9.00	0.40
1007	1.00	1:76	2.00	3.00	1.00	6.19	0.19	5.39	0.58	0.19	1,35
1990 1991 1992 1993 1994 1995	1,00	1,00	2.60	3,60	1.50	ŏ. 19	0.19	0.38	0.57	0.28	1.60
1994	1.00	1.00	2.00	3.00	2.00	0.19	0,19	0.38	0-58	0.39	1.73
1995	1.00	1.00	2.50	. 3.60	3 00	0.20	0.20	0.10	7.50	0.70	1.07
1335	1.00	1.00	2.00	1.00	3.50	0.14	0.13	0.18	6.37	0.66	1.60
133? 1998	1.00	1.00	2.00	3.00	4.00	ŏ. 19	0.19	0.38	0.57	0.76	2,08
1999	1.00	1.00	2.00	3.00	4 50	0.20	0.20	0.40	0.59	0.89	2.25
2000 2001	1.00	1.00	5-00	3.00	5.00	0.20	0.16	0.43	7.01	1.03	7-95
2001	1.00	1,00	2.00	1.00	2.00	0.20	6 20	0.41	0.61	1.03	2.46
2002 2003	1.66	1.00	2.00	3.00	5.00	0.20	0.20	Ď. i	0.61	1.05	2,46
2010 2011	1.00	1.00		3.00	5.00 5.00	0.20	0.20	0.41	0.61	1.03	2.46 2.46
2032 2033	1.00	1.00	2.00	3.00 3.60	5.00 5.00	0.20	0.20	0.41	0.61		
1074 63 NPV 82	. :					2.04	2.04	4.07	6.11 4.20 3.00 2.22	7.85 5.07 3.41 2.37	22.10 14.87
NPV( . 8 2 )						1.40	1.40	2 80	4-20	\$.07	14.87
NPV(102)						0.74	1.40 1.00 0.74	1.48	3.27	3:31	10.27
SPYC 1425						0.56	0.56	1-12	1.68	1.69	5.62
NPV(162)						0.43	0.13	0.87	3.00 2.22 1.68 1.30 1.03	1.23	10.42 7.55 5.62 4.28 3.32
NPV(18%)						0.34	0.34	0.68	1.03	0.92	3.32

	Benefit	Cost	<u>B-C</u>	2.5
NPV (8%)	89.46	37.32	52.14	
NPV (10%)	60.08	32.84	27.24	
NPV (12%)	41,77	29.28	12.49	
NPV (14%)	29.89	26.34	3.55	
NPV (16%)	21.93	23.86	-1.93	EIRR = 15.3

Table 45 BENEFIT CASH FLOW AND NET PRESENT WORTH OF BERIS DAM, ALTERNATIVE 2, CASE B (5/6)

					KEDAR STST	eh .	gr <sup>ee</sup> i	en de la	10.5	4,000	
			OUTPUT BY				IGATION E	ENEFIT IN	APPECTED	APEA	KEDAH
YEAR	HADA HAIR (106 m3)	(106 m3)	TRIBUTA- RY HINOR (106 m3)	D&1 (105 m3)	MAINTE- NANCE FLOW (106 m3)	HADA HAIN (MS10 <sup>6</sup> )	HAIN HINOS (MS10 <sup>G</sup> )	ruc inti	(HE: DE)	HAINTE- RANCE FLOW (HS10 <sup>6</sup> )	REMERIT
1984 1986 1986 1988 1988 1991 1991 1992 1994 1994 1995 1997 1999 2000 2002 2002	0.00 0.00 0.00 0.00 0.00 0.00 50.41 49.82 49.23	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.99 0.97 0.96 0.93 0.91 0.91 0.90 0.90		0.00 0.00 0.00 0.00 0.00 0.21 0.42 0.63 0.84		0.00 0.00 0.00 0.00 0.00 0.00 0.00 3,46 3,49 3,77 3,91 5,62 11,16 12,67 13,13	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.54 0 0.54 0 0.54 0 0.54 0 0.54 1 0.54 1 0.54 1 0.54	0.600 0.6000 0.6000 0.6000 0.6000 0.600 0.	0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 3.34 4.26 4.26 4.26 10.23 13.96 16.58 16.93
2010 2011	45.10 45.10	0.90	7.00	2.10 2.10	1.90	13,49	0.26		0.63		17.0
2032 2033	45.10 45.10	0.90	7.00 7.00	2.10 2.10	1.90 1.90	13.49			0.63		17.04
NPY( 61) NPY( 81) NPY( 101) NPY( 1021) NPY( 141) NPY( 161) NPY( 161)						97.94 62.75 41.84 28.8) 20.51 14.94	1.92 1.23 0.82 0.56 0.40 0.29	15.00 9.58 6.38 3.10 2.25 1.67	4.11 2.55 1.64 1.09 0.74 0.52 0.37	0.97	172.63 76.37 52.13 33.66 25.42 18.46

<del></del>	<del></del>				HJDA-PERAT				. ronninan		
		KEDAH STAT			NG STATE					G STATE	MUDA- PERAT
TEAR	MAIN	TRIBUTA-	DéI	MAIN	Dé I	RAIN	TRIBUTA-	141	HAIN	Dá I	TOTAL BENEFIT
	(10 <sup>6</sup> m <sup>3</sup> )	(166 m3)	(10 <sup>6</sup> ± <sup>3</sup> )	(10 <sup>6</sup> ± <sup>3</sup> )	$(10^6 \text{ m}^3)$	(M\$10 <sup>6</sup> )	(H\$106)	(H\$100)	(M\$106)	(MS106)	(M\$106)
1984	0.00	0.00	0.00	9.00 6.00 9.00 9.00 9.00 9.00 2.06 1.78 1.78	0.00 0.00 0.00 0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00
1985 1986	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	0.00
1987 1988	: 0.00	0.00	0.00 0.00 0.00	0.00	0.00 0.00 0.00 0.00 0.50 1.00 2.60	6.00	0.00		0.60	0.00	0.00
1988	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00 0.00 0.40 0.39 0.38 0.38 0.38 0.38 0.40	0.00	0.00	0.00
1989	0.00 0.00 0.74	0.00 0.00 1.00	. 0.00	9.00	0.00	0.00	0.00 0.00 0.20 0.19	0.00	0.00 0.00 0.41 0.334 0.334 0.339 0.233 0.19	0.00	0.00
1991	0.74	1.00	0.00 2.00	2.66	0.50	6.15	0.20	ñ.40	0.41	0.10	1.26
1992	0.68	1.00	2.00	1.92	ĭ.cŏ	0.15	0,19	0.39	ŏ.37	0.19	1.28
1993	0.62	1.00	2.00	1.78	1.50	0.12	0.19 0.19 0.20 0.20 0.19	0.38	0.34	0.28	1.30
1994	0.56	1.00	2.00	1.64	2.00	0.11	0.19	0.35	0.32	0.39	1.39
1995 1996	0.50	1.00	2.00	1.50	2.50 3.00 3.50 4.00 4.50	0.10	0.20	n-19	0.37	0.50	1.54
1997	0.38	1.00	2.00	1.22	3.50	0.07	0.15	ŏ.38	0.23	0.66	1.54
1998	0.32	1.00 1.00 1.00 1.00	2.00 2.00 2.00 2.00 2.00 2.00	1.22 1.08 0.94	4.00	0.06 0.05 0.04 0.04	0.19	0.38	0.21	0.76	1.59
1999	0.26	1.00	2.00	0.94	4.50	0.05	0.20 0.20 0.20	0.40	0.19	0.89	1.12
2000 2001	, N.30	1.70	2:00	0.80 0.80	5.00 5.00	0.04	0.20	0.41	8:16	1.03	1.84
2002	ň. 20	1.00	2.00	0.80	5.00	D. 04	ŏ. 2ŏ	0.4i	0.16	1.03	1.85
2002 2003	0.20 0.20 0.20 0.20	1.00	2.00 2.00	0.80 0.89	5.00 5.00	0.04	0.20 0.20	0.41 0.41	0.16	1.03	1.85
2010	0.20	1.00	2.00	0.60	5.00	0.04	0.20	0.41	0.16	1.03	
2011	0.20	1.00	2.00	0.60	5.00	0.04	ŏ. 2ŏ	0-41	0.16	1.03	1.83
2032 2033	0.20 0.20	1.00 1.00	2.00 2.00	0.80 0.80	5.00 5.00	0.04	0.20 0.20		0.16	1.03	1.85
NEVI 61)			<del></del>			0.69	2.04	4.07	2.31	7.85	16.95
NPV( 61)	1					0.51	1.40	2.80	1.68	3.41 2.37 1.69	11.46
MPY(101)	0.5					0.39	1.00	2.00	1.26	3.41	8.07 5.87 4.39
NPV(12%) NPV(14%)						0.31 0.25	0.74	1.48	0.95	7.36	5.87
NPY(162)						0.20	0.43	0.87	0.62	1.23	3.36
(PV (18%)						0.20	0.43	0.87 0.68	0.62	0.92	3.36

	Benefit	Cost	В-С	
NPV (8%)	89.83	37.32	52.51	
NPV (10%)	60.20	32.84	27.36	
NPV (12%)	41.75	29.28	12.47	
NPV (14%)	29.81	26.34	3.47	
NPV (16%)	21.82	23,86	-2.04	EIRR = 15.3

Table 46 BENEFIT CASH FLOW AND NET PRESENT WORTH OF BERIS DAM, ALTERNATIVE 3, CASE B (6/6)

		the second	KEDAH SYSTE			و دونا	
		TER OUTPUT BY C	CAUSE	IRRIGATION	BKNBFIT IN A	PFECTED AREA	KEDAH TOTAL
YEAR	MADA MA MAIN MI (106 m3) (106	$m^3$ ) (106 $m^3$ ) (1	DSI MAINTE- NANCE FLOW 106 m <sup>3</sup> ) (106 m <sup>3</sup> )	MADA MAIN MAIN MINO (M\$10 <sup>6</sup> ) (M\$10 <sup>6</sup> )	TRIBUTA- R RY MINOR (M\$10 <sup>6</sup> )	D&I MAINTE- NANCE FLOW (M\$10 <sup>6</sup> ) (M\$10 <sup>6</sup> )	BENEFIT
1984 1985 1986 1987 1989 1990 1991 1992 1993 1994 1996 1996 1997 1998 2001 2002	0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 53.83 1 53.76 1 53.69 1 53.69 1 53.69 1 53.48 1 53.44 1 53.34 1 53.34 1 53.32 1	.00 0,00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 3.05 0.0 3.73 0.0 3.73 0.0 4.14 0.0 4.65 0.1 6.45 0.1 9.51 0.2 13.00 0.2	0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.40 8 0.49 8 0.51 9 0.58 0 0.61 1.25 1.75 1.96 2 2.03	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.01 0.01 0.03 0.03 0.05 0.05 0.07 0.06 0.13 0.11 0.21 0.18 0.35 0.31 0.21 0.18 0.35 0.31 0.70 0.62 0.73 0.64	0.00 0.00 0.00 0.00 0.00 0.00 0.00 3.54 4.60 4.91 5.59 7.81 11.61 16.00 18.54 19.21
2010 2011	53.20 1 53.20 1	.10 7.00 10 7.00	2.50 2.20 2.50 2.20	15.92 0.3 15.92 0.3	3 2.09 3 2.09	0.75 0.66 0.75 0.66	19.74
2032 2033		.10 7.00 .10 7.00	2.50 2.20	15.92 0.3 15.92 0.3	3 2.09 3 2.09	0.75 0.66 0.75 0.66	19.74 19.74
NPV(6%) NPV(8%) NPV(10%) NPV(10%) NPV(12%) NPV(14%) NPV(16%) NPV(18%)		~~~ ~~~~~~ ,***		114.29 2.3 73.00 1.5 48.52 1.0 33.37 0.7 23.63 0.4 17.15 0.3 12.72 0.2	2 9.58 1 6.37 0 4.38 9 3.10 6 2.25	1.29 1.13 0.88 0.77 0.61 0.54	89.75 59.54 40.86 28.87 20.91

	Benefit	Cost	<u>B-C</u>	
NPV (8%)	89.75	37.32	52.43	
NPV (10%)	59.54	32.84	26.70	
NPV (12%)	40.86	29.28	11.58	
NPV (14%)	28.87	26.34	2.53	
NPV (16%)	20.91	23.86	-2.95	EIRR = 14.9

Table 47 SENSITIVITY ANALYSIS

		Change in	Alt	EIRR (%) ernati	ve	In	sitivi dicato ernati	r
		(%)	1	<del></del>	3	1	2	3
Case A		T K Michael Bergelan (dan serina di Bera sejama (arangga palaga Para ala-ala-ala					-	
	Base Case	-	14.8	14.8	14.6	_		.75
(1)	Investment costs and 0 & M costs	+10	13.8	13.9	13.8	0.68	0.61	0.55
(2)	Benefits	-25	12.1	12.1	12.1	0.73	0.73	0.68
(3)	Delay in commis- sioning project	one year	14.1	14.1	14.2	<u>.</u>	<u></u>	
(4)	Combination of (1), (2) and (3)		11.0	11.0	11.2	18		- 1. 1
Case B								
4.4	Base Case		15.3	15.3	14.9	-		•
(1)	Investment costs and O&M costs	+10	14.4	14.3	14.0	0.59	0.65	0.60
(2)	Benefits	-25	12.7	12.7	12.5	0.68	0.68	0.64
(3)	Delay in commis- sioning project	one year	14.7	14.7	14.5	•••	<b>-</b> .*	Anath
(4)	Combination of (1), (2) and (3)		11.5	11.5	11.5	_	<del></del> .	

Table 48 SUMMARY OF CONSTRUCTION COST

Unit: M\$10<sup>3</sup>

			OHICE	11310
-	Items	Foreign Component	Local Component	Total
1.	River Diversion Works	790	1,360	2,150
2.	Main Dam	1,800	8,200	10,000
3.	Stilling Basin	90	620	710
4.	River Outlet	1,200	200	1,400
5.	Saddle Dam	1,100	3,270	4,370
6.	Relocation Road	1,520	5,710	7,230
7.	Preparatory Works	1,000	3,040	4,040
8.	Compensation	<u>-</u>	25,700	25,700
9.	Engineering Services and Government Administration (Design and Supervision)	5,900	2,500	8,400
	Supervision)			4
10.	Contingencies			
	Physical contingencies	2,680	10,120	12,800
	Price escalation	4,370	15,420	19,790
	Sub-total	7,050	25,540	32,590
	Total	20,450	76,140	96,590

Remark; At 1983 price level

Table 49 ESTIMATED LAND ACQUISITION COST FOR THE PROPOSED BERIS RESERVOIR AREA

		Maxim	num Water L	evel (El.	m)
	Land Use	79.7	85.7	87.7	90.7
Α.	Land				
	1. Rubber	4.77	8.59	9.84	11.87
÷	2. Paddy	1.73	3.12	3.57	4.31
	3. Residential and Mixed Cultivation Land	3.08	5.60	6.53	7.62
	4. Alienated Forest	0.80	1.22	1.40	1.68
	Sub-total	10.38	18.53	21.34	25.48
3.	Houses		·		
	1. Batu Seketul Village	0.12	0.47	0.61	0.62
	2. Sg. Batang Village	0.99	2.12	2.52	2.7
	3. Terenas Village	0.42	0.52	0.54	0.59
	Sub-total	1.53	3.11	3.67	3.92
•	Public Facilities				
	1. Mosque	0.12	0.12	0.12	0.1
	2. School	0.29	0.29	0.29	0.2
	3. Place of Worship	0.06	0.06	0.06	0.0
	4. Storehouse	0.80	0.80	0.80	0.8
	5. Public House	0.40	0.40	0.40	0:4
	6. RISDA Hospital	0.40	0.40	0.40	0.4
	7. Small Public House	0.01	0.01	0.01	0.0
	8. Cemetery	0.05	0.05	0.05	0.0
	Sub-total	0.69	0.69	0.69	0.6
	Total: A to C	12.60	22.33	25.70	30.0

DISBURSEMENT SCHEDULE OF BERIS DAM PROJECT Table 50

Unit: M\$10<sup>3</sup>

· ·			•			D:	nic: H\$10 <sup>3</sup>
		otal count	lst year (1985)	2nd year (1986)	3rd year (1987)	4th year (1988)	5th year (1989)
المان الم المان المان ال							1
1. River Diversion Works	P.C.	790			290	330	170
1. Kivet bivataten korks	L.C.	1,360			490	570	300
	Suo-total	2,150			780	900	470
				•.		950	850
2. Nain Dam	P.C. L.C.	1,900 8,200	-			4,300	3.900
	Sub-total					5,250	4,750
*			,		3		
3. Stilling Basin	P.C.	90				90 520	1.2
The state of the s	L.C.	620				710	
	Sub-total	170					45
4. River Cutler	F.C.	1,200			120	960	130
	L.C.	300	•				200
	Sub-total	1,400			120	960	320
		1 100				340	760
5. Saddle Dan	F.C.	1,100 3,270				1.030	2,240
	Sub-total	4,370				1,370	3,000
						4.	
6. Relocation Road	F.C.	1.520				450	1,070
	P.C.	5,710				1,690 2,140	5,090
	Sub-total	7,230				2,240	
7. Preparatory Works	F.C.	1,000			820	90	90 :
	L.C.	3,040			2,480	290	280
	Sub-total	4,040			3,300	370	370
G Advance Barmont	F.C.				5,000	-2,000	~3,000
8. Advance Payment	L.C.	-			3,333	*****	
	Sub-total	-					
9. Compensation	r.c.				25,700		
* * * * * * * * * * * * * * * * * * * *	L.C. Sub-total	25,700			25,700	•	
The state of the s	oup court	401.00					
lo. Engineering Services and						•	
Government Administration	P.C.	5,900	700	1,200	700	1,400	1,900
(Design and Supervision)	L.C. Sub-total		1,000	500 1,700	1,000	600 2,000	800 2,700
	200-0001	6,400	2,000	1,100	21000	2,000	2,110
11. Contingencies	:				14.	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	100
Physical Contingencies		2,680	140	240	390	920	990
		10.120	60	100	5,790	1.020	2,350
•	Sub-cotal	T\$'800	200	340	6,180	2,740	3,340
Price Escalation	. <b>7</b>	4,370	90	230.	500	1,530	2.020
		15,420	30	90	7,490	3,020	4,790
	Sub-total		120	120	7,990	4,550	6.810
			····				
Total		20,450	930	1,670 690	7,820	5,060	4,970
	r.c.	76,140	390	030	42,250	13,930	18,880

<sup>(1)</sup> At 1983 price level (2) P.C.: Foreign currency portion (3) L.C.: Local currency portion

Table 51 INVESTMENT COST DISBURSEMENT SCHEDULE OF WATER DEMAND AND SUPPLY BALANCE PLAN

Unit: M\$10<sup>6</sup>

* 1	2.6 m 2m 2m		ation	D&I		
i	MADA	MADA	Tributary	Water Supply	Source Development	÷
Year	Main	Minor	Minor Schemes	Public	Jeniang System	Total
1984	20,7	4.92	4.07	45.7	0.00	75.39
1985	12.2	2.67	1.72	166.6	2.25	185.44
1986	7.8	0.79	1.99	166.6	25.78	202.96
1987	13.7	1.57	5.22	166.6	26.36	213.45
1988	23.2	1.48	5.42	166.6	19.54	216.24
1989	49.5	0.52	2.58	166.6	. 0	219.20
1990	52.8	0	0	192.5	0	245.30
1991	60.6	0	1.68	192.5	0	254.78
1992	68.4	0.27	3.91	192.5	0	265.08
1993	76.2	0.87	5.76	192.5	0	275.33
1994	70.5	0.93	4.14	192.5	0.	268.07
1995	64.7	0.50	1.86	77.5	0	144.56
1996	63.0	0.74	2.10	77.5	0	143.34
1997	28.9	1.60	5.07	77.5	0	113.07
1998	17.3	1.56	5.13	77.5	0	101.49
1999	5.7	0.62	2.27	77.5	0	86.09
2000	0	0	0 :	· O.	0	0
Total	635.2	19.04	52.92	2,228.7	73.93	3,009.79

Remark; In 1983 constant price.

Table 52 JOINT COST ALLOCATION OF BERIS DAM, ALTERNATIVE 1, CASE A (1/6)

•			KEOAN	RIVER SYS	TEN	MDA-PRRAI SYSTEM								
ILEN	NADA			MADA HAIN	HAIN HINOR	TRIBUTARY HINOR	D & 1	BIVER HAINTE-	HAIN	HINOR	TRIBUTARY HINOR -	D &	I	
	HALS	BANGA	ninua		NANCE FLOW	Kedah	P.PINANG		KEDAR P	PINANG				
1.1 PROJECT COST														
TO BE ALLOCATED										4 +				
CONSTRUCTION					*						67.76			
OSM.											1.2			
TOTAL											68.9			
4														
1.2 BENEFIT	31.21	0.84	24.35	1,16	0.93	3.62	3.62	10.04	2.42	4.36	82.5			
1.3 ALTERNATIVE COST				•										
Construction	39.28	28.06	38.86	28.27		29.39			28.90	30.52	314.0			
ANNUAL OSM	1434	-1378		.1,379		.1385			-1383	.4139	1.3947			
06M	1.09	1.05	1.09	1.05		1.06			1.05	1.06	10.63			
SUB TOTAL	40.37	29.11	39.95	29.32	29.12	30.45	30.45	34.39	29.95	31.58	324.69			
•											00.5			
1.4 JUSTIYIABLE	31,21	0.84	24.35	1.16	0.93	3.62	3.62	10.04	2.42	4.36	87.5			
expenditure	-							•						
1.5 SEPARABLE COST				•					0.03		52.2			
CONSTRUCTION	14.59	0.77		1.05		2.87			2.03	4.62				
ANNUAL OGN	-0165	.0005		.0006		.0019			-0014	.003	.040			
K20	0.13	0.00		0.00		0.01			0.01	0.02	0.3			
SUB TOTAL	14.72	Q.77	14.24	1.05	0-91	2.88	2.58	8.38	2.04	4.64	52.5			
1.6 REMAINING JUSTI-	16.49	0.07	10.11	0.11	0.02	0.74	0.74	1.65	0.38	0.00	30.3			
FIABLE EXPENDITURE														
1.7 PERCENTAGE DIS-	54.43	0.22	33.37	0.35	0.05	2,43	2 - 43	5.48	1.25	0.00	100.0			
TRIBUTION OF 1.6														
*** TOTAL REMAINING			100	•							15.5			
JOINT COST (CON)			1.0		100									
TOTAL REMAINING											0.9			
JOINT COST (OAN)											_			
1.8 REMAINING JOINT														
7200														
CONSTRUCTION	8.46	0.03	5.13	0.05	0.01	0.38	0.38	0.85	0.19	0.00	15.5			
OSN	0.50	0.00	0.30	0.00	0.00	0.02	0.02	0.05	0.01	0.00	0.9			
SUB TOTAL	8.95	0.04	5.49	0.06	. 0.01	0.40	0.40	0.90	0.21	0.00	16-4			
			·	·~-			,		· · · · · · · · · · · · · · · · · · ·					
1.9 TOTAL ALLOCATED COS														
CONSTRUCTION	23.05	0.80		1.10		3.25			2.22	4.62	67,•7			
OFH	0.62	0.01	0.37	0.01	0.00	0.04	0.04		0.02	0.02	1.2			
TOTAL	23.67	0.81		1.11	0.92	3.26		9.28	2.25	4.64	68.9			
PERCENTAGE OF DIS-	34.31	1.17	28.60	1.61	1.34	4.76	5 4.76	13.46	3.26	6.73	100-0			
TRIBUTION										-				
2.1 ANNUAL COST										. 1				
CONSTRUCTION	3.02	0.11		0.14		0.43			0.29	0.61	8.8			
M&0	-082	.001	-049	-001	.001	-00	5 .005	.012	.003	.003	.16			

Table 53 JOINT COST ALLOCATION OF BERIS DAM, ALTERNATIVE 2, CASE A (2/6)

		KEDAH RIVER SYSTEM				HUDA-PERAT SYSTEM					
ITEM	HADA HAIN	MAIN T	RIBUTARY MINOR		RIVER HAINTE	MAIN HINOR		TRIBUTARY HINOR -		5 1	
				1	NANCE PLOW		P.PINANG			P.PINANG	
1.1 PROJECT COST		•					_	٠.			
TO BE ALLOCATED			•								
CONSTRUCTION											67.76
O&YI											68.98
TOTAL											00.30
1.2 BENEFIT	34.52	0.84	24.35	1.30	1.16	2 15	2.15	10.04	2.42	4.36	83 29
1.3 ALTERNATIVE COST	34132			1430				:			
CONSTRUCTION	40.69	28.06	38.86	28.41	28.27	28.48	28.48	33.32	28.90	30.52	313.99
ANNUAL OGN	.144	.1378	.1431	.138	.1379	.138			.1383		1.3945
OFM	1.10	1.05	1.09	1.05	1.05	1.05			1.05	1.06	10.63
SUB TOTAL	41.79	29-11	39.95	29.46	29.32	29.53			29.95	31.58	324 - 62
				*							
1.4 JUSTIPLABLE	34.52	0.84	24.35	1.30	1.16	2.15	2.15	10.04	2.42	4.36	83.29
EXPENDITURE					•						
1.5 SEPARABLE COST		* • .									
CONSTRUCTION	16.13	0.77	14.17	1.12	1.05	1.47	1,47	8.34	2.03	4.62	51.17
ANNUAL OAH	•01	.0005	-0089	•0007	•0006	-001	.001	•0053	-0014	.003	.0324
04H	0.08	0.00	: 0.07	0.01	0.00	0.01	0.01	0.94	0.01	0.02	0.25
SUB TOTAL	16.21	0.77	14.24	1.13	1.05	1 48	1.48	8.38	2.04	4.64	51.42
1.6 REMAINING JUSTI-	18.31	0.07	10.11	0.17	0.11	0.67	0.67	1.66	0.38	0.00	32.16
PIABLE EXPENDITURE											
1.7 PERCENTAGE DIS-	56.95	0.21	31-45	0.54	0.33	2.09	2.09	5-16	1.18	0.00	100.00
TRIBUTION OF 1.6											
*** TOTAL REMAINING											16.59
JOINT COST (CON)					•						
TOTAL REMAINING											0.97
JOINT COST (O&M)											
1.8 REMAINING JOINT		:			•						
COST										2 **	
CONSTRUCTION	9.45	0.03	5.22	0.09	0.05	0.35			0.20		16.59
08M	0.55	0.00	0.31	0.01	0.00	0.02			0.01		17.5
SUB TOTAL	10.00	0.04	5.52	0.10	0.06	0.37	0.37	0.91	0.21	0.00	17.7
I A SORIA 43145455	- <del></del>		<del></del>								
1.9 TOTAL ALLOCATED COS		0.80	19.39	1.21	1.10	1.87	1.82	9.20	2.23	4.62	67.76
CONSTRUCTION	25.58 0.63	0.01	0.37	0.01	0.01	0.03			0.02		1.2
06H	26.21	0.81	19.76	1.22	1.11	1.84			2.25		68.98
TOTAL	37.99	1.17	28.65	1.77	1.61	2.67			3.26		100.00
PERCENTAGE OF DIS-	31.99	; • 1 <i>f</i>	20.00					,			
TRIBUTION											
2.1 ANNUAL COST	3.35	0.11	2.54	0.16	0.14	0.24	0.24	1.21	0.29	0.61	8.8
CONSTRUCTION OGH	083	1001	.049	-001	.001	·004			-003		.16
ven	1000	1001	.047	•001							

Table 54 JOINT COST ALLOCATION OF BERIS DAM, ALTERNATIVE 3, CASE A (3/6)

			KEDAH	RIVER SYS	KSY	Huda-Yerai System					
ITEN	HADA HAIN	HAIN HINOR	TRIBUTARY HINOR	D & 1	RIVER HAINTE-	HAZH HINOR		TRIBUTARY	D&I		
	na.ia	RENUE	III		rance flow	Krdah	P.PINANC		KEDAH P	PINANG	
1.1 PROJECT COST						,					
TO BE ALLOCATED											
CONSTRUCTION											67.78
OS N								•			1.2
TOTAL											48.9
1								•			
1.2 BENSKIT	56.68	1.48	24.35	2.22	1.99	0.00	0.00	0.00	0.00	0.00	86.7
1.) ALTERNATIVE COST											
CONSTRUCTION	50.86	28.41	38.86	28.83	28.76	0.00	0.00	0.00	0.00	0.00	175.7
ANNUAL OSM	.1496	.138	.1431	.1382	.1381	O	. 0	0	0	G	.70
05H	1.14	1.05	1.09	1.05	1.05	0.00	0.00	03.0	0.00	0.00	5.39
SUB TOTAL	52-00	29.46	39.95	29.88	29.81	0.00	0.00	0.00	0.00	0.00	181-1
											1.0
1.4 JUSTIPIABLE	52.00	1,48	24.35	2.22	1.99	0.00	0.00	0.00	0.00	0.00	86.73
expenditure											
-5 SEPARABLE COST											
CONSTRUCTION	26.37	1-12	14.17	1.82	1.75	0.00	0.00	0.00	0.00	0.00	45.2
NUAL OSH	0155	<b>,0007</b>	.0089	.0012	.0011	. 0		9 0	0	. 0	.027
6H	0.12	0.01	0.07	0.01	0.01	0.00	0.00	0.00	0,00	0.00	8.2
UB TOTAL	26.49	1.13	14.24	1.83	1.76	0.00	0.00	0.00	0.00	0.00	45.4
22 201112											
.6 REMAINING JUSTI-	25.51	0.35	10.11	0.39	0.23	0.00	0.00	0.00	0.00	0.00	36.6
FLABLE EXPENDITURE						•					
.7 PERCENTAGE DIS-	69.70	0.91	27.63	1.07	0.63	0.00	0.00	0.00	0.00	0.00	100.0
TRIBUTION OF 1.6								17.4			
** TOTAL REMAINING											22.5
JOINT COST (CON)					•						
TOTAL REMAINING	•					-				•	1-0
JOINT COST (OSM)											
.8 REMAINING JOINT											
COST			:								
ORSTRUCTION	15.70	0.22	6.22	0.24	0.14	0.00	0.00	0.00	0,00	0.00	22.5
		0.22	0.22	0.01	0.01	0.00			: 0.00		1.0
EN TOTAL	0.70	0.01	6.50		0.15	0.00		100	0.00	0.00	
SUS TOTAL	16.41	0.23	D+3V	. 9.23	0.13	0.00		0.00	2.00	0,00	2,7•3
.9 TOTAL ALLOCATED COST	<del></del>		شان هم سنده هر پاهند ها پارستون دان سو					<del></del>	· · · · · · · · · · · · · · · · · · ·		
ONSTRUCTION	42.07	1.34	20.39	2.06	1.89	0.00	0.00	0.00	0.00	0.00	67.7
nustroction	0.82	0.02	0.35		0.01	0.00			0.00	0.00	1.2
or Oral	42.90	1.35	20.74	2,08	1.91	0.00			0.00	0.00	68.9
•	62.19	1.96	30.07	3.02	2.77	0.00			0.00	0.00	100.0
PERCENTAGE OF DIS-	0%+13	1.90	30.07	3.194	2.411	0.00	0.00	0.00	V•00	0.00	100*1
TRIBUTION COST											
.1 ANNUAL COST				0.27					a ba	p ee	
ONSTRUCTION	5.52	0-18	2.67		0.25	0.00	and the second second		0.00	0.00	8.8
88	.108	•002	.046	•003	002	. 6	0	0	. 0	0	- 416

Table 55 JOINT COST ALLOCATION OF BERIS DAM, ALTERNATIVE 1, CASE B (4/6)

		KEDAH RIVER SYSTEM				•	YOTAL				
ITEM	MADA MAIN	Main Minor	TRIBUTART MINOR	D & 1	RBVIR STHIAH		HAIN HINOR		D 6 I		
					NANCE FLOW	KEDAH	P.PINANG	·	KEDAH P	.PINANG	
1.1 PROJECT COST TO BE ALLOCATED											
CONSTRUCTION											67.76
DAM											1.22
OTAL					;	:					68.98
* · · · · · · · · · · · · · · · · · · ·					1						89.46
.2 BENEFIT	59.33	1.23	9.58	2.41	2.04	1.40	4.20	1.40	2.80	5.07	02-40
.3 ALTERNATIVE COST						20.27		50.07	20.00	20.62	314.20
CONSTRUCTION	51 - 35	28.20		28.90		28.27			28.90	30.52	1.3949
ANNUAL OSM	.1499	+1375		•1383		1.05			+1383 1+05	.139 1.06	10.64
OSH	1.14	1.05		1.05		29.32			29.95	31.58	324.84
SUB TOTAL	52.49	29.25	32.70	29.95	29.81	29.32	30.43	27.32	22.23	31.00	327.64
.4 Justifiable Expenditure	52.49	1-23	9.58	2.41	2.04	1.40	4.20	1.40	2.80	5.07	89.46
5 SEPARABLE COST											
CONSTRUCTION	26.79	0.98	6.17	2.03	1.75	1.05	2.87	1.05	2.03	4.62	49.34
AHNUAL OAH	.0158	0005		.0014		•0006		0006	6014	.003	•0303
OSN .	0.12	0.00		0.01	0.01	0.00	0.01	0.00	0.01	0.02	0.23
SUB TOTAL	26.91	0.98	6.20	2.04	1.76	1.05	2,88	1.05	2.04	4.64	49.57
.6 REMAINING JUSTI-	25.58	0.25	3.38	0.37	0.28	0.35	1.32	0.35	0.76	0.43	33.05
FIABLE EXPENDITURE				4.			3.00		2.30		100.00
1.7 PERCENTAGE DIS-	77.40	0.74	10.22	1-12	0.85	1.05	3.98	1.05	2.30	1.29	100.00
TRIBUTION OF 1.6											18.43
*** TOTAL REMAINING											10.40
JOINT COST (CON) TOTAL REHAINING											6.99
JOINT COST (06H)											
COST								•			
COST	14.26	0.14	1.68	0.21	0.16	0.19	0.73	0.19	0.42	0.24	18.42
OSH CONTRACTION	0.77	0.01	0.10	0.01		0.01			0.02	0.01	0.99
SUB TOTAL	15.02	0.14		0.22		0.20			0.45	0.25	19.41
SOR IOIAL		V-14	1.70						<del>, , , , , , , , , , , , , , , , , , , </del>	·	
.9 TOTAL ALLOCATED COS								1.24	2.45	4.86	67.7
CONSTRUCTION	41.05	1.12		2.24		0.01			0.03	0.04	1.2
D&H	0.89	0.01		0.02		1.26			2.49	4.89	68.9
TOTAL,	41.93	1.13		2.26		1.82			3.60	7.09	100.0
PERCENTAGE OF DIS-	60.79	1.64	11,87	3.27	2119	1.02	. ,,,,	, ,,,,,,	3.00	,	
RIBUTION											
2.1 ANNUAL COST	F 26		1.06	0.29	0.25	0.16	0.43	7 0.16	0.32	0.64	8.8
CONSTRUCTION	5.38			.003		.007			•004	-005	-15
DAM	-116	.001	.017	•00.	002		- 50.			-	

Table 56 JOINT COST ALLOCATION OF BERIS DAM, ALTERNATIVE 2, CASE B (5/6)

•			KEDAH I	KIVER SYSTEM			Mida-Perat System					
REFF	HADA	HAIN MINOR	TRIBUTARY MINOR	D&I	RBVIR STHIAH	KAIH KINOR		TRIBUTARY HINOR -	D & 1			
	ACIN	ninoa	ALLON.		RANCE PLOW	REDAH	P.PINANG	-	KEDAH I	PINANG		
i.i project cost										:		
TO BE ALLOCATED												
CONSTRUCTION					*						67.7	
OSM											1.2	
TOTAL									*.		68.9	
1.2 BENEFIT	62.75	1.23	9.58	2.55	2.27	0.51	1.68	1.40	2.80	5.07	89.8	
1.3 ALTERNATIVE COST							4.		e de la composition della comp			
CONSTRUCTION	53.17	28.20	31.64	28.94	28.83	28.06	28.07	28 27	28.90	30-52	314.60	
ANNUAL OSH	-151	.1375	.1395	.1383	.1382	.1377	.1378	.1379	.1383	.139	1.395	
K90	1.15	1.05	1.06	1.05	1.05	1.05	1.05	1.05	1.05	3.06	10-64	
SUB TOTAL	54.32	29.25	32.70	29.99	29.88	29.11	29-12	29.32	29.95	31.58	325.20	
1.4 JUSTIFIABLE	54.32	1.23	9.58	2.55	2.27	0.51	1.68	1.40	2.80	5.07	89.84	
EXPENDITURS											100	
1.5 SEPARABLE COST												
CONSTRUCTION	28.41	0.98	6-17	2.10	1.82	0.14	0.91	1.05	2.03	4-62	48 - 2	
ANNUAL OSM	.0166	.0005	.004	.0014	.0012	.0001	.0005	.0006	-0014	-003	.029	
CSX	0.13	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.2	
SUB TOTAL	25 54	0.98	5.20	2-11	1.83	0.14	0-91	1.05	2.04	4.64	48.4	
1.6 REMAINING RUSTI-	25.78	 Q.25	3.38	0.44	0.44	0.37	0.77	0.35	0.76	0.43	32.9	
PLABLE EXPENDITURE								1				
1.7 PERCENTAGE DIS- TRIBUTION OF 1.6	78.24	0.75	10.25	1.33	1.34	1.12	2.32	1.05	2.30	1.30	100.0	
*** TOTAL REMAINING											19,5	
JOINT COST (CON)											1272	
TOTAL REMAINING					:						1.0	
JOINT COST (OCH)								,				
1.8 WEMAINING JOINT										100		
COST				1.								
CONSTRUCTION	15.28	0-15	2.00	0.26	0.26	0.22	0.45	0.20	0.45	0.25	19.5	
CSH	0.78	0.01	0.10	0.01	0.01	0.01			0.02	0.01	1.0	
SUS TOTAL	16.06	0.15	2.10	0.27	0.27	0.23			0.47	0.27	20.5	
V22 10112		****										
1.9 TOTAL ALLOCATED COS	ır	<del></del>		·							- <del></del>	
CONSTRUCTION	43.69	1.13	3,17	2.36	2.08	0.36	1.36	1.25	2.48	4.87	67.7	
OSM	0.91	0.01	0.13	0.02	0.02	0.01	0.03	0.02	0.03	0.04	1.2	
TOTAL.	44.60	1.14	8.31	2.38	2.10	0.37			2.51	4.91	68.9	
PERCENTAGE OF DIS-	64.65	1.65	12.04	3.46	3.05	0.54			3.64	7.12	100.0	
TRIBUTION 2.1 ANNUAL COST					•			•				
CONSTRUCTION	5.73	0.15	1 67	0.31	0.27	0.05	0-18	0.15	0.33	0.64	4.0	
QSH QSH	119	100.	1.07	.003	0.27	•003			.004	0.54	8.8	
von.	*313	*001	*011	*1/33	.003	1903		-002	+4/14	*003	-1	