

Fig.I.39

Storage and Area Curve at Lemanak

GOVERNMENT OF MALAYSIA  
**FEASIBILITY STUDY**  
 SMALL SCALE HYDROELECTRIC POWER PROJECT IN SARAWAK

JAPAN INTERNATIONAL COOPERATION AGENCY



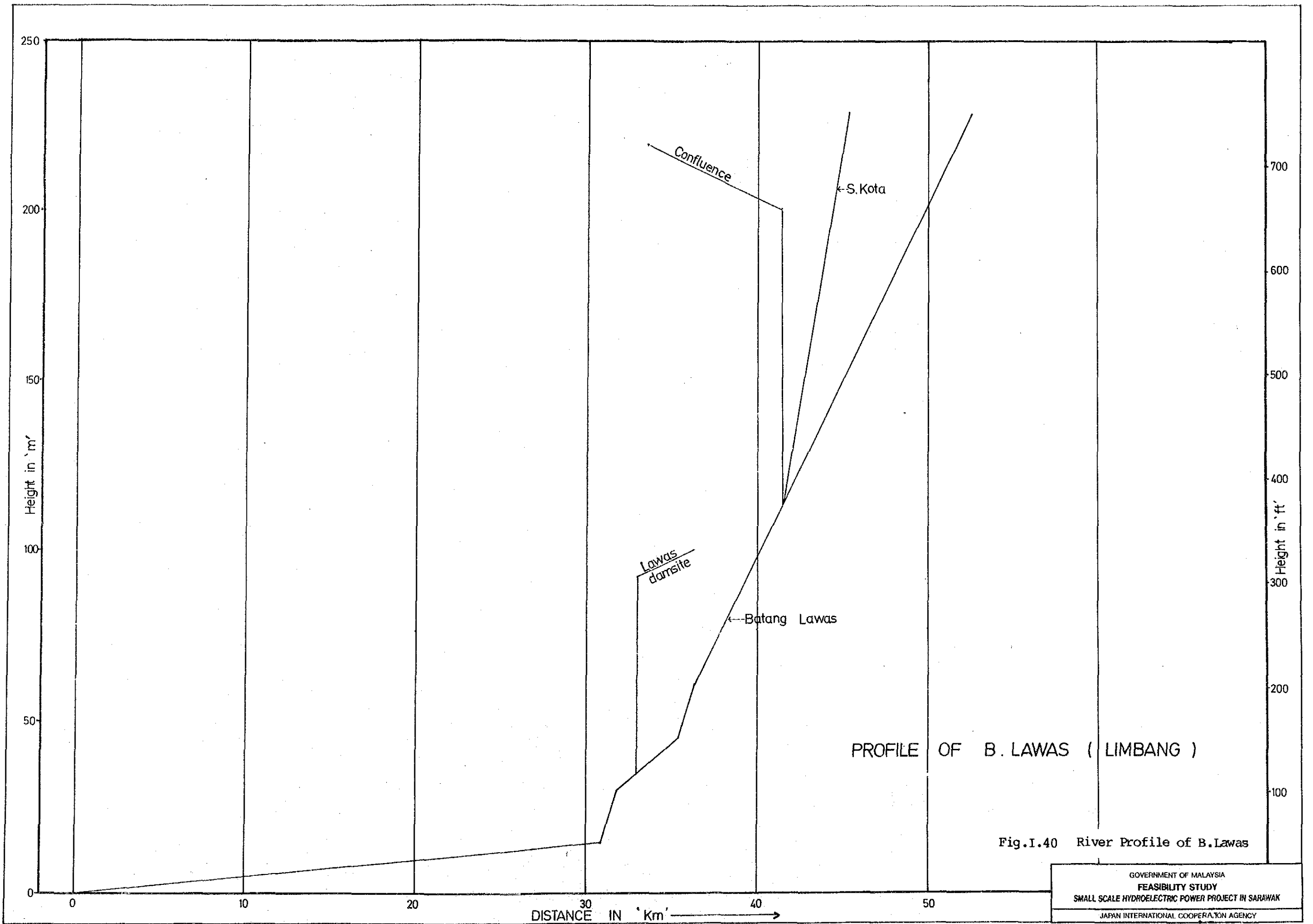
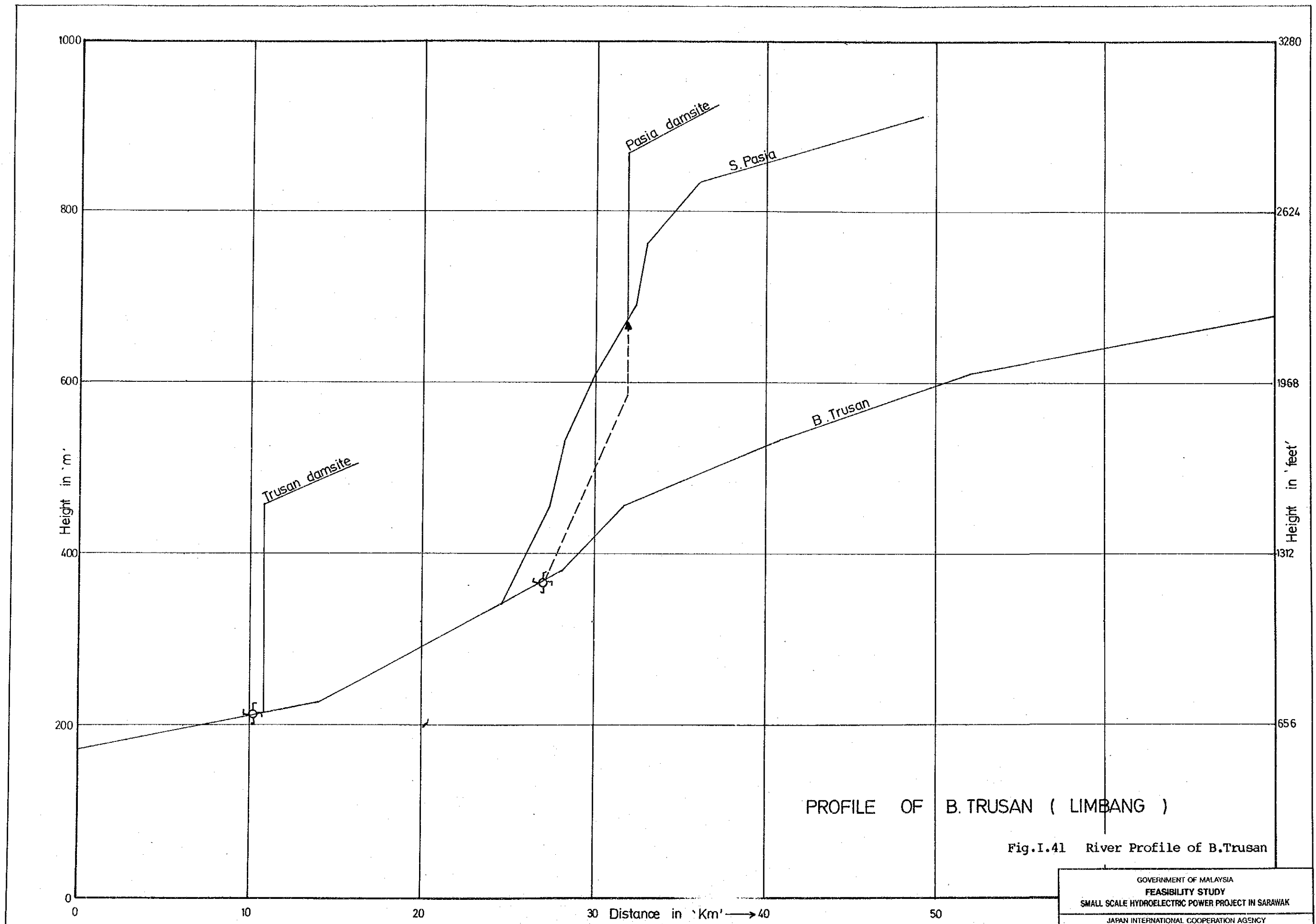


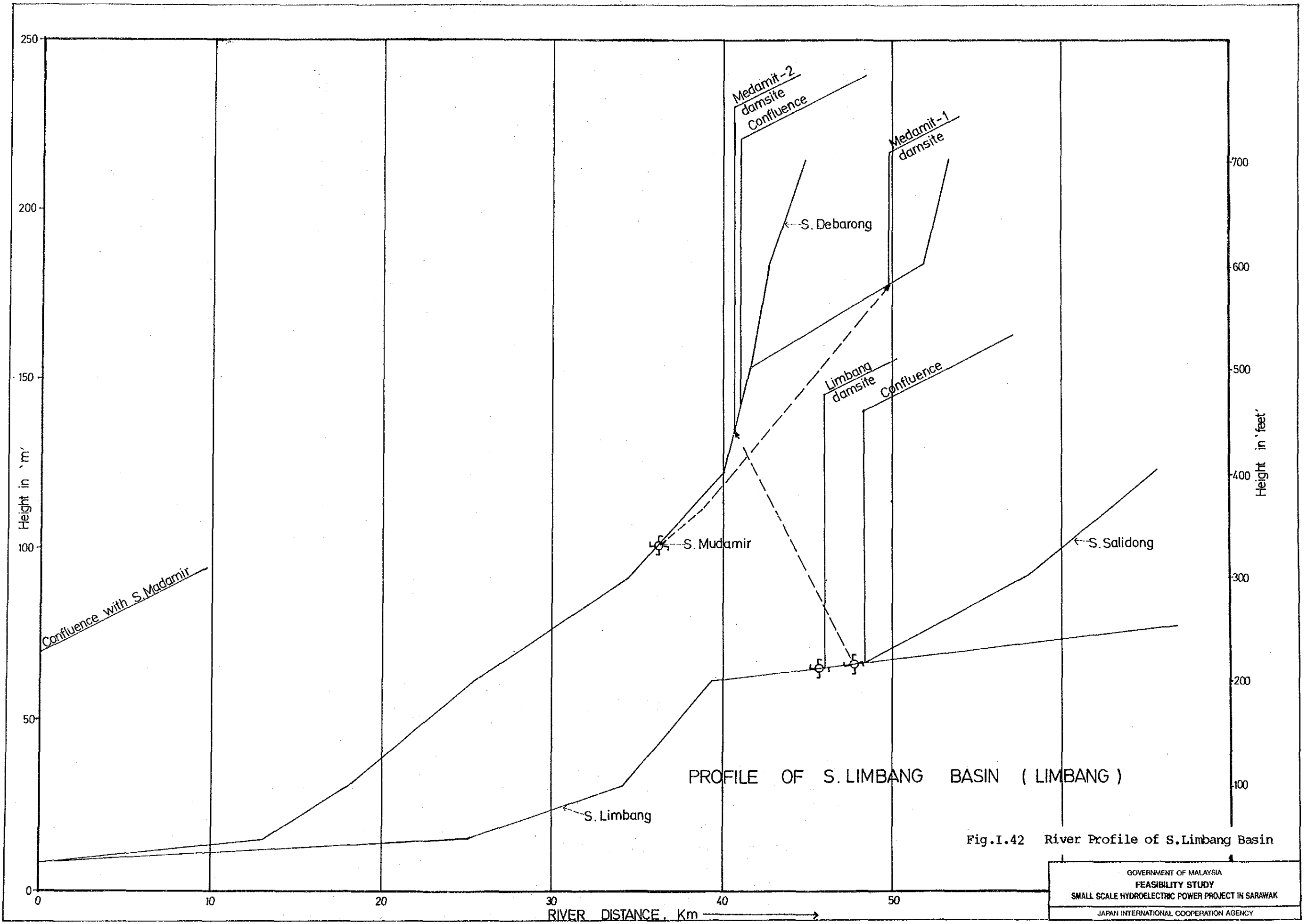
Fig.I.40 River Profile of B.Lawas



PROFILE OF B. TRUSAN ( LIMBANG )

Fig.I.41 River Profile of B.Trusan

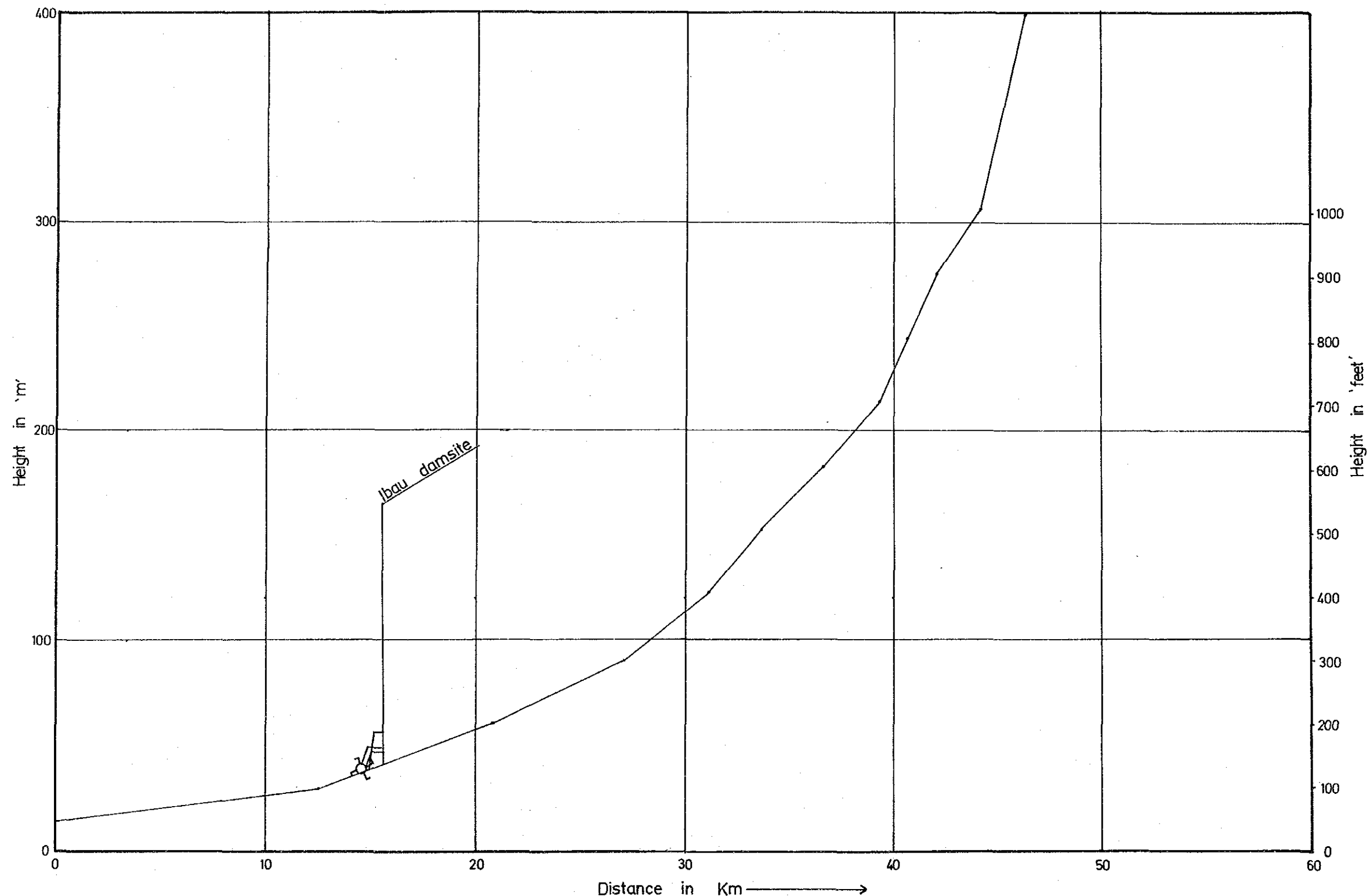
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PROFILE OF S. LIMBANG BASIN ( LIMBANG )

Fig.I.42 River Profile of S.Limbang Basin

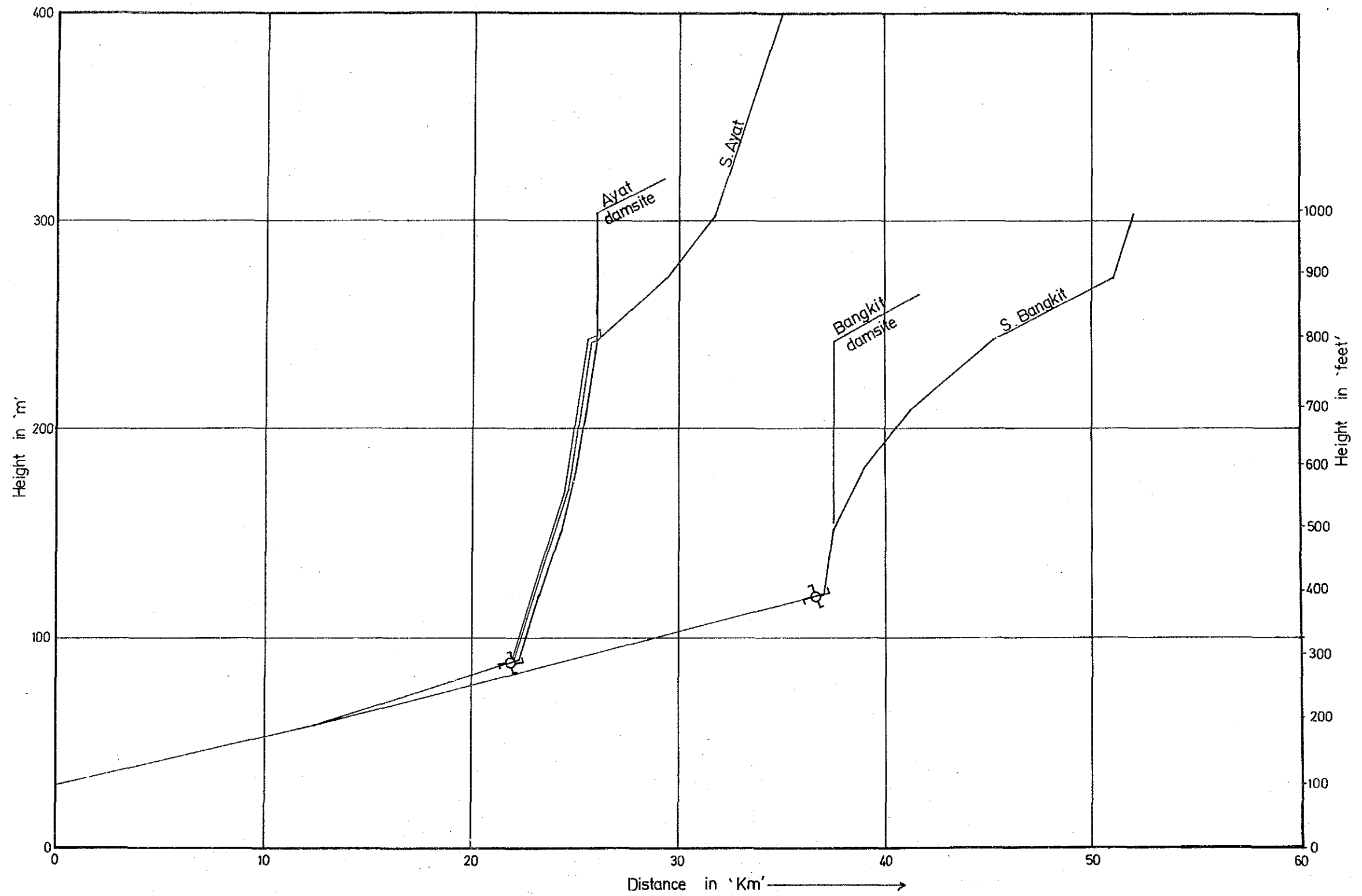
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PROFILE OF S. IBAU ( KAPIT )

Fig.I.43 River Profile of S.Ibau

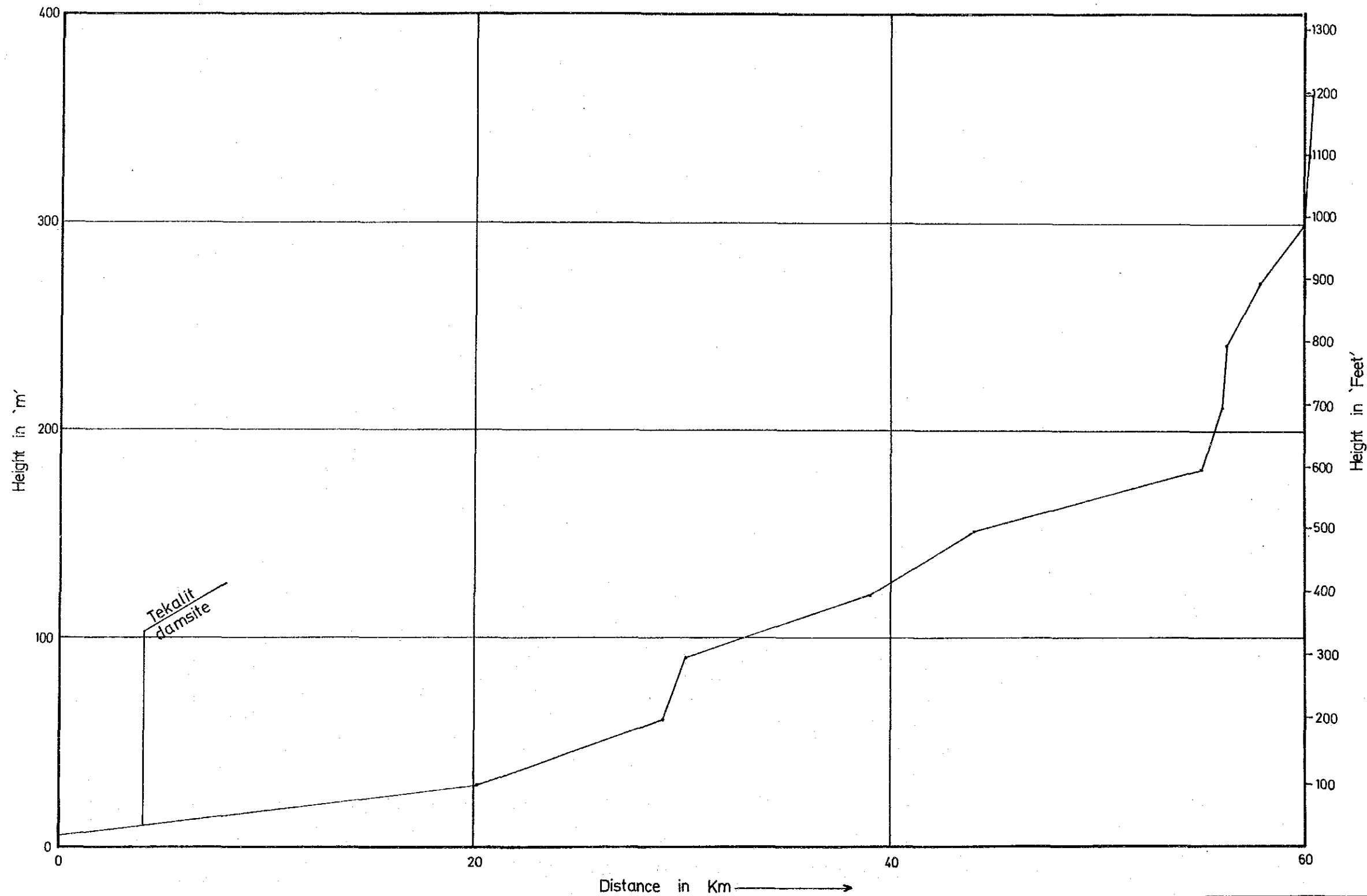
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PROFILE OF S. BANGKIT ( KAPIT )

Fig.I.44 River Profile of S.Bangkit

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 SMALL SCALE HYDROELECTRIC POWER PROJECT IN SARAWAK  
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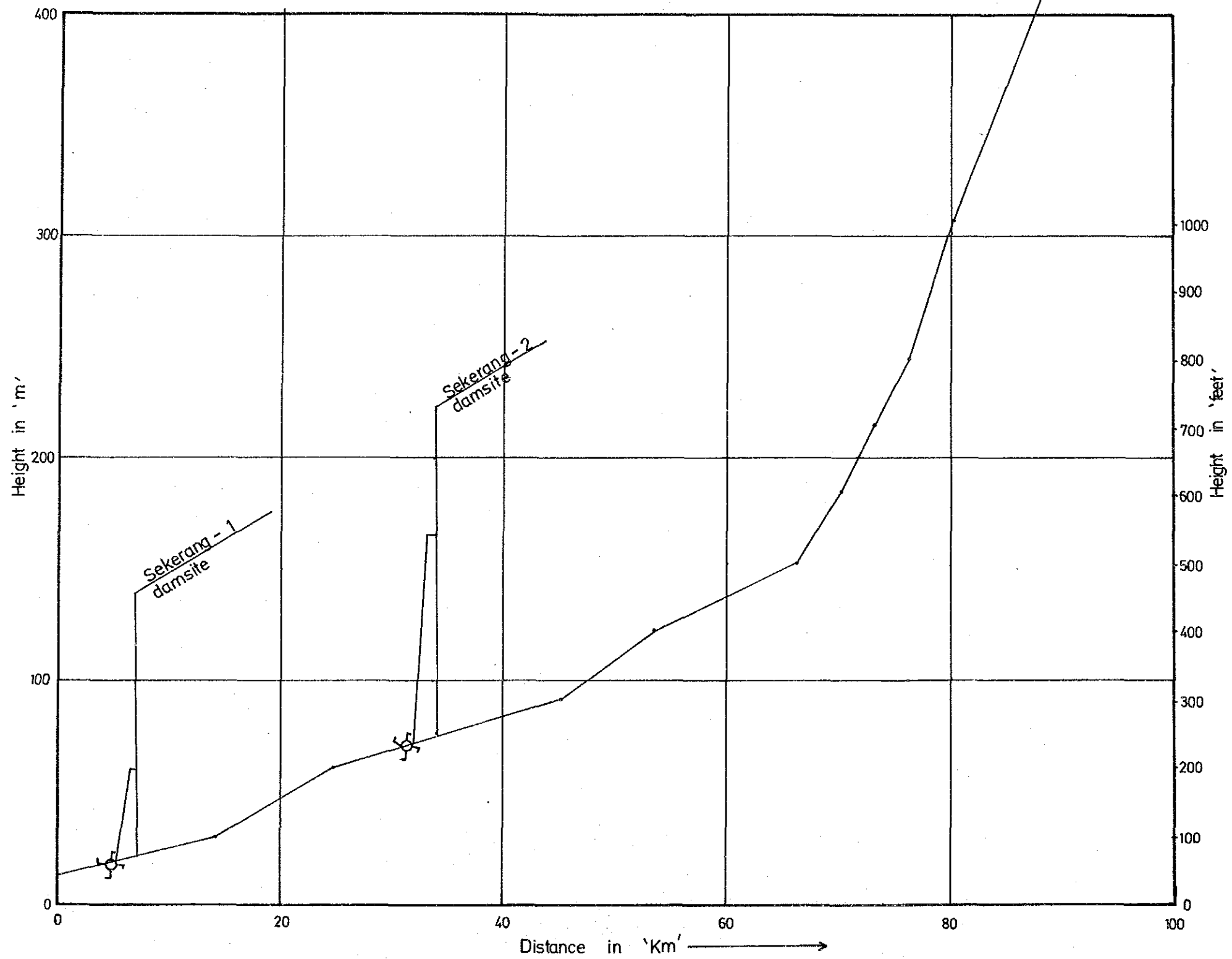


PROFILE OF S. TEKALIT ( KAPIT )

Fig.I.45 River Profile of S. Tekalit

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 FEASIBILITY STUDY  
 SMALL SCALE HYDROELECTRIC POWER PROJECT IN SARAWAK  
 JAPAN INTERNATIONAL COOPERATION AGENCY

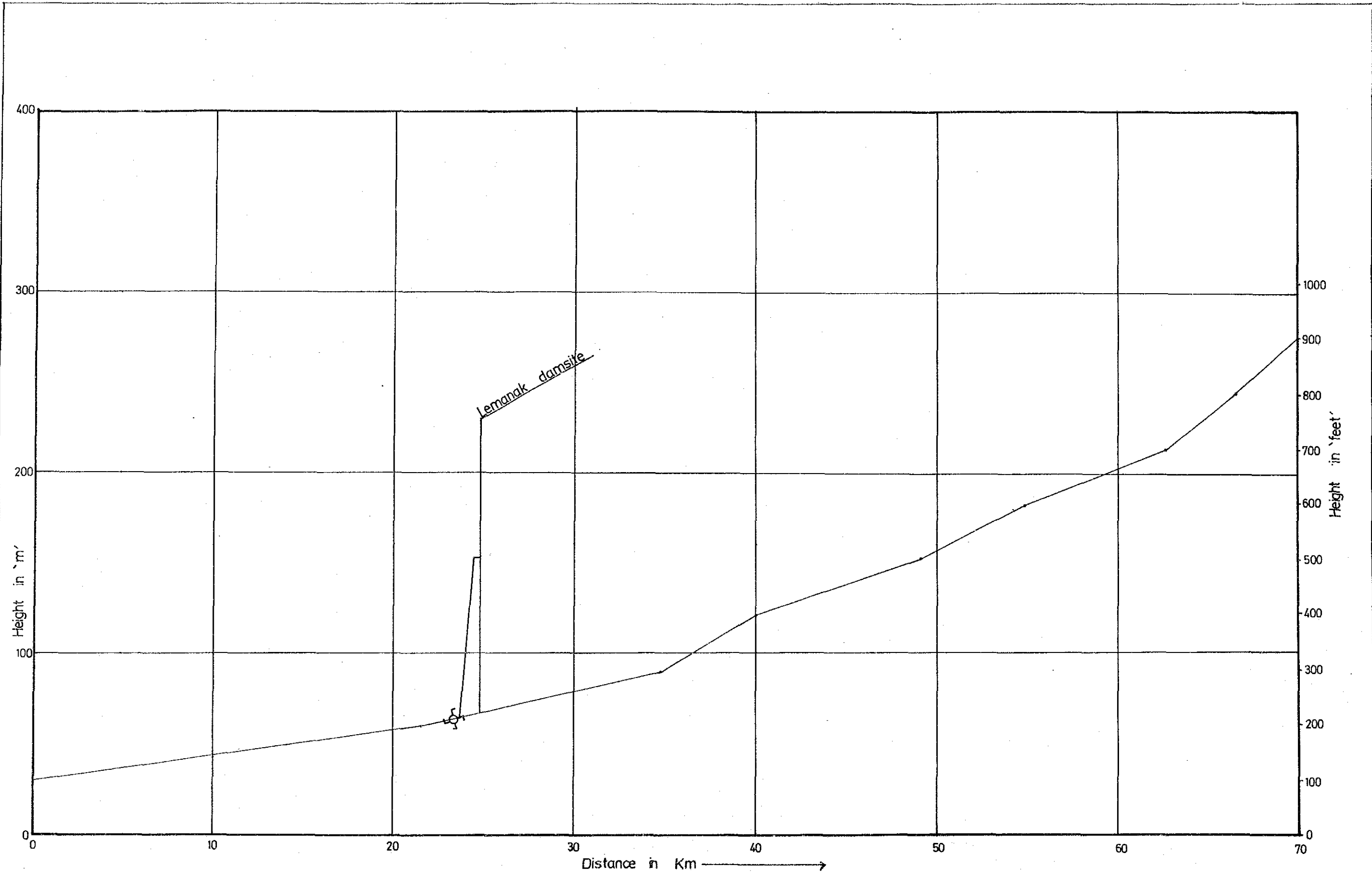




PROFILE OF BATANG SEKERANG ( SRI AMAN )

Fig.I.46 River Profile of B.Sekerang

GOVERNMENT OF MALAYSIA  
 FEASIBILITY STUDY  
 SMALL SCALE HYDROELECTRIC POWER PROJECT IN SARAWAK  
 JAPAN INTERNATIONAL COOPERATION AGENCY



PROFILE OF B. LEMANAK ( SRI AMAN )

Fig.I.47 River Profile of B.Lemanak

GOVERNMENT OF MALAYSIA  
 FEASIBILITY STUDY  
 SMALL SCALE HYDROELECTRIC POWER PROJECT IN SARAWAK  
 JAPAN INTERNATIONAL COOPERATION AGENCY



**APPENDIX II**

**INVENTORY OF POTENTIAL  
SITE FOR  
THE FIRST SCREENING**



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 00 INVENTORY OF POTENTIAL SITES FOR THE FIRST CYCLE OF  
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1. LOAD CENTER : LIMBANG  
 2. POTENTIAL SITE : LAMAS (S-LAMAS)  
 3. IDENTIFICATION NO.: 11  
 4. LOCATION :  
 LATITUDE : 4 19 00 N LONGITUDE : 111 37 00 E  
 NOTE : ABOUT 1.0 KM UPSTREAM FROM THE  
 CONFLUENCE OF THE S-MALASAK

5. DISTANCE FROM LOAD CENTER : 51.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ. KM) : 719.0  
 MAX. TOPOGRAHICAL ELEVATION (EL: M) : 153.6  
 MAX. WIDTH OF DAM GEEZ (M) : 498.0  
 RIVERBED ELEVATION AT DAM SITE (EL: M) : 35.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4251.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1473.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 61.0  
 MAJORACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 200.0  
 PLANT FACTOR : 0.5  
 DENUDATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (%)		0.536	0.436	0.336	0.536	0.436	0.336	0.536	0.436	0.336
FIRM DISCHARGE (CMS)		32.7	27.4	21.1	33.7	27.4	21.1	33.7	27.4	21.1
PEAK DISCHARGE (CMS)		67.5	54.9	42.3	67.5	54.9	42.3	67.5	54.9	42.3
FULL SUPPLY LEVEL (EL: M)		152.4	152.4	152.4	151.5	142.2	134.1	150.5	132.1	115.9
RATED WATER LEVEL (EL: M)		131.5	143.1	147.8	129.9	130.2	126.7	128.2	115.9	105.1
MIN. OPERATION LEVEL (EL: M)		89.7	124.5	138.7	76.5	106.1	111.8	83.5	83.5	83.5
TAIL WATER LEVEL (EL: M)		37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
GROSS STORAGE (MCM)		290.9	290.9	290.9	289.3	231.2	189.5	279.8	181.3	121.9
ACTIVE STORAGE (MCM)		238.3	139.8	80.4	238.3	139.8	80.4	238.3	139.8	80.4
SEDIMENT VOLUME (MCM)		35.9	35.9	35.9	35.9	15.9	35.9	35.9	35.9	35.9
POWER GENERATION EFFICIENCY (%)		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		94.5	105.1	110.8	92.9	93.2	89.7	91.2	78.9	68.1
NET HEAD (M)		85.1	95.5	99.8	83.6	83.9	80.7	82.1	71.0	61.3
INSTALLED CAPACITY (MW)		46.1	42.1	33.9	45.3	37.0	27.4	44.5	31.3	20.8

9. REMARKS :



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 INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : LIMBANG  
 2. POTENTIAL SITE : TENGOA (S-TENGOA)  
 3. IDENTIFICATION NO. : 12  
 4. LOCATION : LATITUDE 4 37 0 N LONGITUDE 115 23 0 E  
 NOTE : ABOUT 4-5 KM UPSTREAM FROM THE  
 CONFLUENCE OF THE S-SUBU  
 5. DISTANCE FROM LOAD CENTER : 46.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 221.9  
 MAX. TOPOGRAPHICAL ELEVATION (EL:M) : 304.8  
 MAX. WIDTH OF DAM CREST (M) : 600.0  
 RIVERBED ELEVATION AT DAMSITE (EL:M) : 121.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4000.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1415.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 13.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 150.0  
 PLANT FACTOR : 0.5  
 DEMONIGATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (%)	0.851	0.796	0.665	0.851	0.735	0.665	0.851	0.785	0.665
FIRM DISCHARGE (CMS)	15.3	14.1	12.0	16.3	14.1	12.0	15.3	14.1	12.0
PEAK DISCHARGE (CMS)	30.6	28.3	23.9	30.5	28.3	23.9	30.6	28.3	23.9
FULL SUPPLY LEVEL (EL:M)	304.8	304.8	304.8	282.6	276.9	269.8	280.8	276.9	269.8
RATED WATER LEVEL (EL:M)	299.0	297.5	299.9	281.9	265.3	252.4	290.0	222.4	222.4
MIN. OPERATION LEVEL (EL:M)	275.5	283.0	290.2	241.8	245.1	247.7	169.0	169.0	169.0
TAIL WATER LEVEL (EL:M)	131.0	131.0	131.0	131.0	131.0	131.0	131.0	131.0	131.0
GROSS STORAGE (MCM)	550.1	550.1	550.1	377.0	332.5	289.3	241.0	182.6	126.1
ACTIVE STORAGE (MCM)	170.1	170.1	113.6	229.5	170.1	113.6	228.5	170.1	113.6
SEDIMENT VOLUME (MCM)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
POWER GENERATION EFFICIENCY (%)	2.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)	164.0	166.5	158.7	137.9	135.3	131.4	99.0	91.4	82.0
NET HEAD (M)	147.6	149.9	152.0	124.2	121.8	118.3	89.1	82.2	73.8
INSTALLED CAPACITY (MW)	36.3	34.1	29.2	30.5	27.7	22.7	21.9	18.7	14.2

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.

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 \*\* INVENTORY OF DAMS AND WEIR SITES FOR THE FIRST SCREENING \*\*  
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- 1. LOAD CENTER : LIXIANG
- 2. POTENTIAL SITE : TRUSAN (G. PRUSAN)
- 3. IDENTIFICATION NO.: 13
- 4. LOCATION : LATITUDE : 24 34 30"N LONGITUDE: 115 21 0"E  
 NOTE: POINT IS 100 M DOWNSTREAM FROM THE  
 CONFLUENCE OF THE SUBEPTAN
- 5. DISTANCE FROM LOAD CENTER : 51.3 KM
- 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ KM) : 2177.0  
 MAX. TOPOGRAPHICAL ELEVATION (ELEV) : 391.0  
 MAX. WIDTH OF DAM CREST (M) : 590.0  
 RIVERBED ELEVATION AT DAM SITE (ELEV) : 311.0  
 AVERAGE ANNUAL RAINFALL (MM) : 2000.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1713.0  
 AVERAGE ANNUAL RUNOFF (MM) : 117.0  
 HEADRACE TUNNEL LENGTH (M) : 30.0  
 PENSTOCK TUNNEL LENGTH (M) : 100.0  
 PLANT FACTOR (%) : 100  
 DECAUDATION FACTOR (%) : 100

8. PRELIMINARY POWER OUTPUT (KWH/DAY)

DESCRIPTION	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (M)	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
FIRM DISCHARGE (CMS)	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5
PEAK DISCHARGE (CMS)	119.5	119.5	119.5	119.5	119.5	119.5	119.5	119.5	119.5
FULL SUPPLY LEVEL (ELEV)	381.0	381.0	381.0	381.0	381.0	381.0	381.0	381.0	381.0
GRADED WATER LEVEL (ELEV)	373.4	373.4	373.4	373.4	373.4	373.4	373.4	373.4	373.4
MIN. OPERATION LEVEL (ELEV)	370.0	370.0	370.0	370.0	370.0	370.0	370.0	370.0	370.0
TAIL WATER LEVEL (ELEV)	370.0	370.0	370.0	370.0	370.0	370.0	370.0	370.0	370.0
GROSS STORAGE (CMS)	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0
ACTIVE STORAGE (CMS)	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0
SEDIMENT VOLUME (CMS)	181.0	181.0	181.0	181.0	181.0	181.0	181.0	181.0	181.0
PUMP GENERATION EFFICIENCY (%)	82	82	82	82	82	82	82	82	82
GROSS HEAD (M)	106.6	106.6	106.6	106.6	106.6	106.6	106.6	106.6	106.6
NET HEAD (M)	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3	101.3
INSTALLED CAPACITY (MW)	102.4	102.4	102.4	102.4	102.4	102.4	102.4	102.4	102.4

9. REMARKS :

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : LIMRANG  
 2. POTENTIAL SITE : MEDAMIT-1 (S-MEDAMIT)  
 3. IDENTIFICATION NO.: 14  
 4. LOCATION : LATITUDE : 4 21 0 N LONGITUDE 115 6 0 E  
 NOTE : ABOUT 5.0 KM UPSTREAM FROM THE CONFLUENCE OF THE S-DEBARONG  
 5. DISTANCE FROM LOAD CENTER : 45.5 KM  
 6. TYPE OF DEVELOPMENT : RUN-OF-RIVER

7. PROJECT FEATURES

CAUCHMENT AREA (SQ-KM) : 145.0  
 RIVERBED ELEVATION AT DAMSITE (EL;M) : 177.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4000.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1390.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 12.0  
 HEADRACE TUNNEL LENGTH (M) : 4550.0  
 PENSTOCK TUNNEL LENGTH (M) : 500.0  
 PLANT FACTOR : 0.5

o. PRELIMINARY POWER OUTPUT CALCULATION

MIN DISCHARGE (CMS) : 3.4  
 DEPENDABLE PEAK DISCHARGE (CMS) : 5.7  
 AVAILABLE FIRMING DISCHARGE (CMS) : 22.4  
 FULL SUPPLY LEVEL (EL;M) : 180.0  
 TAIL WATER LEVEL (EL;M) : 100.0  
 POWER GENERATION EFFICIENCY (%) : 0.82  
 GROSS HEAD (M) : 80.0  
 NET HEAD (M) : 72.0  
 FIRM OUTPUT (MW) : 11.7  
 DEPENDABLE PEAK OUTPUT (MW) : 11.7  
 INSTALLED CAPACITY (MW) : 11.7

7. REMARKS :

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 INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : LIMBANG  
 2. POTENTIAL SITE : MEDANIT-2 (S-MEDANIT)  
 3. IDENTIFICATION NO.: 15  
 4. LOCATION : LATITUDE 4 21 0 N LONGITUDE 115 4 0 E  
 NOTE : ABOUT 300 M DOWNSTREAM FROM THE CONFLUENCE OF THE S-DEJAKONG  
 5. DISTANCE FROM LOAD CENTER : 44.5 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 186.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL.M) : 243.6  
 MAX. WIDTH OF DAM CREST (M) : 100.0  
 RIVERBED ELEVATION AT DAMSITE (EL.M) : 134.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3750.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1410.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 14.0  
 HEADRACE TUNNEL LENGTH (M) : 4400.0  
 PENSTOCK TUNNEL LENGTH (M) : 350.0  
 PLANT FACTOR : 0.5  
 DEBURGATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (2)	(CMS)	0.851	0.745	0.665	0.851	0.785	0.665	0.851	0.785	0.665
PIKM DISCHARGE (CMS)	(CMS)	11.9	11.0	9.3	11.9	11.0	9.3	11.9	11.0	9.3
PEAK DISCHARGE (CMS)	(CMS)	23.8	22.0	18.6	23.8	22.0	18.6	23.8	22.0	18.6
FULL SURFACE WATER LEVEL (EL.M)	(EL.M)	243.6	243.6	243.6	239.0	235.0	230.1	234.5	226.4	216.5
RATED WATER LEVEL (EL.M)	(EL.M)	230.9	235.4	233.7	276.3	224.5	223.1	214.2	208.8	202.2
MIN. OPERATION LEVEL (EL.M)	(EL.M)	205.5	213.0	209.7	195.0	203.4	209.0	173.5	173.5	173.5
TAIL WATER LEVEL (EL.M)	(EL.M)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
GROSS STORAGE (MCM)	(MCM)	242.4	252.4	242.4	215.0	191.4	162.2	189.2	142.8	98.9
ACTIVE STORAGE (MCM)	(MCM)	177.7	132.3	89.4	177.7	132.3	89.4	132.3	89.4	89.4
SEDIMENT VOLUME (MCM)	(MCM)	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
POWER GENERATION EFFICIENCY (%)	(%)	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82	0.82
GROSS HEAD (M)	(M)	160.0	163.8	163.9	164.0	154.5	153.1	144.2	138.8	132.2
NET HEAD (M)	(M)	144.8	142.9	141.2	142.9	139.0	137.8	129.8	124.9	119.0
INSTALLED CAPACITY (MW)	(MW)	27.7	26.3	22.7	20.6	24.6	20.6	24.8	22.1	17.8

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.  
 THIS SITE PROGRESSED TO THE SECOND SCREENING.

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 INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING  
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1. LOAD CENTER : LIMBANG  
 2. POTENTIAL SITE : MEDAMIT-2 (S-MEDAMIT)  
 3. IDENTIFICATION NO.: 15  
 4. LOCATION : LATITUDE 4 21 9 N LONGITUDE 115 4 0 E  
 NOTE : ABOUT 300 M DOWNSTREAM FROM THE CONFLUENCE OF THE S-DEBARONG  
 5. DISTANCE FROM LOAD CENTER : 46.5 KM  
 6. TYPE OF DEVELOPMENT : SUN-DE-RIVER

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 184.0  
 RIVERBED ELEVATION AT DAMSITE (EULN) : 134.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3750.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1410.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 14.0  
 HEADRACE TUNNEL LENGTH (M) : 4400.0  
 PENSTOCK TUNNEL LENGTH (M) : 3500.0  
 PLANT FACTOR : 0.5

8. PRELIMINARY POWER OUTPUT CALCULATION

FIRM DISCHARGE (CMS) : 1.0  
 DEPENDABLE PEAK DISCHARGE (CMS) : 7.8  
 TAILWATER TUNNEL DISCHARGE (CMS) : 2.1  
 FULL SUPPLY LEVEL (EULN) : 137.0  
 TAIL WATER LEVEL (EULN) : 70.0  
 POWER GENERATION EFFICIENCY : 0.82  
 GROSS HEAD (M) : 57.0  
 NET HEAD (M) : 50.3  
 FIRM OUTPUT (MW) : 1.9  
 DEPENDABLE PEAK OUTPUT (MW) : 3.8  
 INSTALLED CAPACITY (MW) : 12.6

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.  
 THIS SITE WAS RECHECKED IN THE SECOND SCREENING.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : LIMBANG  
 2. POTENTIAL SITE : LIMBANG (S.LIMBANG)  
 3. IDENTIFICATION NO.: 16  
 4. LOCATION : LATITUDE 4 19 0 N LONGITUDE 115 2 0 E  
 NOTE : ABOUT 500 M DOWNSTREAM FROM THE CONFLUENCE OF THE S-SEMAP  
 5. DISTANCE FROM LOAD CENTER : 40.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 1860.0  
 MAX. TOPOGRAPHICAL ELEVATION (ELM) : 152.4  
 MAX. WIDTH OF DAM CREST (M) : 550.0  
 RIVERBED ELEVATION AT DAMSITE (ELM) : 55.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4250.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1440.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 166.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PERSTOCK TUNNEL LENGTH (M) : 109.0  
 PLANT FACTOR : 0.5  
 DEVELOCATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

SUBROUTINE	UNIT	CASE								
		CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (C)	2.000	0.503	0.403	0.403	0.603	0.503	0.403	0.603	0.503	0.403
FIRM DISCHARGE (CMS)	109.1	33.5	66.9	100.1	83.5	66.9	100.1	83.5	66.9	100.1
PEAK DISCHARGE (CMS)	206.1	154.9	133.7	200.1	166.9	133.7	200.1	166.9	133.7	200.1
FULL SUPPLY LEVEL (ELM)	152.4	152.4	152.4	151.9	147.2	142.8	151.3	142.1	133.2	133.2
HATED WATER LEVEL (ELM)	140.0	140.0	139.4	139.6	138.5	138.8	138.9	132.8	126.8	126.8
MIN. OPERATION LEVEL (ELM)	115.1	135.1	143.4	119.0	121.2	130.9	114.1	114.1	114.1	114.1
FALL WATER LEVEL (ELM)	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0	67.0
GROSS STORAGE (MCM)	354.3	97.3	79.3	946.5	792.3	655.8	929.7	633.8	391.6	391.6
ACTIVE STORAGE (MCM)	319.4	531.5	239.3	225.4	531.5	289.3	826.4	531.5	289.3	289.3
REQUIREMENT VOLUME (MCM)	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0
POWER GENERATION EFFICIENCY (%)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)	78.0	77.6	76.4	72.6	71.5	71.8	71.9	65.8	59.8	59.8
NET HEAD (M)	65.7	71.7	76.2	65.4	64.4	64.7	64.7	59.2	53.9	53.9
INSTALLED CAPACITY (MW)	104.5	95.1	79.7	105.1	86.4	69.5	104.1	79.4	57.9	57.9

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.

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 INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : LIMBANG  
 2. POTENTIAL SITE : PASIA 15.PASIA1  
 3. IDENTIFICATION NO.: 17  
 4. LOCATION : LATITUDE : 4 21 0 N LONGITUDE : 115 24 0 E  
 NOTE : ABOUT 8.2 KM UPSTREAM FROM THE CONFLUENCE OF THE B. TRUSAN  
 5. DISTANCE FROM LOAD CENTER : 41.0 KM  
 6. TYPE OF DEVELOPMENT : RUN-OF-RIVER

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 177.0  
 RIVERBED ELEVATION AT DAMSITE (EL.M) : 676.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3500.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1150.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 13.0  
 HEADRACE TUNNEL LENGTH (M) : 6000.0  
 PENSTOCK TUNNEL LENGTH (M) : 550.0  
 PLANT FACTOR : 0.5

8. PRELIMINARY POWER OUTPUT CALCULATION

FIRM DISCHARGE (CMS) : 3.9  
 DEPENDABLE PEAK DISCHARGE (CMS) : 7.2  
 MAXIMUM TURBINE DISCHARGE (CMS) : 24.2  
 FULL SUPPLY LEVEL (EL.M) : 677.0  
 TAIL WATER LEVEL (EL.M) : 301.0  
 POWER GENERATION EFFICIENCY : 0.82  
 GROSS HEAD (M) : 376.0  
 NET HEAD (M) : 279.9  
 FIRM OUTPUT (MW) : 3.2  
 DEPENDABLE PEAK OUTPUT (MW) : 14.4  
 INSTALLED CAPACITY (MW) : 54.5

9. REMARKS : THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : KAPIT  
 2. POTENTIAL SITE : YAPII-U (S. MENDUAN)  
 3. IDENTIFICATION NO.: 21  
 4. LOCATION : LATITUDE : 2 5 0 N LONGITUDE : 115 54 0 E  
 NOTE : ABOUT 1.5 KM DOWNSTREAM FROM THE CONFLUENCE OF THE S. ENCKATAN  
 5. DISTANCE FROM LOAD CENTER : 2.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ. KM) : 1101.0  
 MAX. TOPOGRAPHICAL ELEVATION (M) : 61.0  
 MAX. WIDTH OF DAM CREST (M) : 200.0  
 RIVERBED ELEVATION AT DAMSITE (RLM) : 30.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4000.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1470.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 3.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 40.0  
 PLANT FACTOR (%) : 0.5  
 DEMANDATION RATE (M<sup>3</sup>/YR) : 1.0

8. PRELIMINARY DAM & OUTPOST CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (CMS)	(CMS)	0.427	0.427	0.327	0.527	0.427	0.327	0.527	0.427	0.327
PIKA DISCHARGE	(CMS)	4.2	3.4	2.6	4.2	3.4	2.6	4.2	3.4	2.6
PEAK DISCHARGE	(CMS)	4.4	5.8	5.2	8.4	8.4	5.2	8.4	6.8	5.2
FULL SUPPLY LEVEL (RLM)	(RLM)	61.0	61.0	61.0	60.4	60.4	60.4	60.4	57.1	54.3
RATED WATER LEVEL (RLM)	(RLM)	34.5	59.3	60.1	56.2	56.2	56.4	55.7	53.4	51.5
MIN. OPERATION LEVEL (RLM)	(RLM)	47.3	55.0	53.2	46.9	52.3	53.9	45.9	45.9	45.9
TAIL WATER LEVEL (RLM)	(RLM)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
GROSS STORAGE (MCM)	(MCM)	37.2	37.2	37.2	36.5	30.4	25.3	35.8	23.5	16.5
ACTIVE STORAGE (MCM)	(MCM)	29.0	10.8	9.8	26.0	26.0	9.8	29.0	16.8	9.8
SEDIMENT VOLUME (MCM)	(MCM)	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
PUMP GENERATION EFFICIENCY (%)	(%)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)	(M)	26.0	29.3	30.1	26.2	26.9	26.4	25.7	23.4	21.5
NET HEAD (M)	(M)	23.9	26.4	27.1	23.6	24.2	23.8	23.1	21.0	19.4
INSTALLED CAPACITY (MW)	(MW)	1.6	1.4	1.1	1.6	1.3	1.0	1.6	1.1	0.8

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.  
 THIS SITE PROCURED TO THE SECOND SCREENING.



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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : KAPIT  
 2. POTENTIAL SITE : KAPIT-2' (S.BENUANG)  
 3. IDENTIFICATION NO.: 22  
 4. LOCATION : LATITUDE 1 49 0 N LONGITUDE 115 47 0 E  
 NOTE : ABOUT 1.5 KM UPSTREAM FROM THE CONFLUENCE OF THE S.MUKOH

5. DISTANCE FROM LOAD CENTER : 27.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR  
 7. PROJECT FEATURES

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
ORFT RATE	(%)	0.662	0.562	0.662	0.662	0.562	0.462	0.662	0.562	0.462
FIRM DISCHARGE	(CMS)	12.6	10.7	8.8	12.6	10.7	8.8	12.6	10.7	8.8
PEAK DISCHARGE	(CMS)	25.1	21.3	17.5	25.1	21.3	17.5	25.1	21.3	17.5
FULL SUPPLY LEVEL	(EL:M)	182.4	182.4	182.4	182.4	177.5	172.9	181.9	172.1	162.9
RATED WATER LEVEL	(EL:M)	167.9	167.9	167.9	167.9	168.9	167.7	167.0	160.5	154.3
MIN. OPERATION LEVEL	(EL:M)	140.8	140.3	170.1	139.0	151.6	157.4	137.2	137.2	137.2
TAIL WATER LEVEL	(EL:M)	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0	105.0
GROSS STORAGE	(MCM)	136.9	136.9	136.9	134.9	115.6	97.8	132.8	94.8	63.6
ACTIVE STORAGE	(MCM)	11.0	11.0	49.3	118.6	80.6	49.3	118.6	80.6	49.3
SEDIMENT VOLUME	(MCM)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
POWER GENERATION EFFICIENCY	(%)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD	(M)	63.9	70.4	73.6	62.9	53.9	62.7	62.0	55.5	49.3
NET HEAD	(M)	57.5	63.3	66.3	56.7	47.5	56.5	55.8	49.9	44.4
INSTALLED CAPACITY	(MW)	11.6	10.8	9.3	11.4	9.6	7.9	11.3	8.5	6.2

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.  
 THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : KAPIT  
 2. POTENTIAL SITE : IBAU (S.IBAU)  
 3. IDENTIFICATION NO. : Z3  
 4. LOCATION : LATITUDE 2 4 0 N LONGITUDE 112 43 0 E  
 NOTE : ABOUT 800 M. UPSTREAM FROM THE  
 CONFLUENCE OF THE S.SANYABU  
 5. DISTANCE FROM LOAD CENTER : 25.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 169.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL:M) : 121.9  
 MAX. FLOTH OF DAM CREST (M) : 300.0  
 RIVERBED ELEVATION AT DAMSITE (EL:M) : 42.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3500.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1455.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 11.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 150.0  
 PLANT FACTOR : 2.5  
 DENUDATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (L)		0.851	0.745	0.655	0.851	0.785	0.665	0.851	0.785	0.665
FIRM DISCHARGE (CMS)		9.4	9.6	7.3	9.4	8.6	7.3	9.4	8.6	7.3
PERMISSIBLE FLOW (CMS)		18.7	17.3	14.6	18.7	17.3	14.6	18.7	17.3	14.6
MAX. WATER LEVEL (EL:M)		121.9	121.9	121.9	108.1	105.9	102.9	96.3	89.9	83.8
MIN. WATER LEVEL (EL:M)		115.3	117.7	119.1	102.9	102.1	100.4	82.0	79.1	75.0
MIN. OPERATION LEVEL (EL:M)		105.0	109.3	113.5	92.6	94.5	95.4	57.4	57.4	57.4
TAIL-WATER LEVEL (EL:M)		42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
GROSS STORAGE (MCM)		389.1	389.1	389.1	274.1	255.7	229.4	150.3	114.6	80.1
NET STORAGE (MCM)		139.6	103.9	69.4	139.6	103.9	49.4	139.6	103.9	59.4
SEDIMENT VOLUME (MCH)		8.1	9.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
POWER GENERATION EFFICIENCY		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		14.3	75.7	77.1	60.9	60.1	58.4	40.0	37.1	33.0
NET HEAD (M)		56.8	63.1	59.4	54.8	54.1	52.6	36.0	33.4	29.7
INSTALLED CAPACITY (MW)		10.0	9.5	8.1	8.2	7.5	6.2	5.4	4.6	3.5

9. REMARKS : THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : KAPIT
2. POTENTIAL SITE : BANGKIT (S-SANGKIT)
3. IDENTIFICATION NO.: 24
4. LOCATION : LATITUDE 1 39 0 N LONGITUDE 112 48 0 E  
 NOTE : ABOUT 200 M UPSTREAM FROM THE  
 CONFLUENCE OF THE S.RIRANG
5. DISTANCE FROM LOAD CENTER : 43.0 KM
6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ. KM) : 167.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL: M) : 274.3  
 MAX. WIDTH OF DAY CREST (M) : 750.0  
 RIVERBED ELEVATION AT DAM SITE (EL: M) : 162.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4100.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 2395.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 14.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 700.0  
 PLANT FACTOR : 0.5  
 DEMONATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (R)	0.825	0.725	0.625	0.825	0.725	0.625	0.825	0.725	0.625
FIRM DISCHARGE (CMS)	11.5	10.1	8.7	11.5	10.1	8.7	11.5	10.1	8.7
PEAK DISCHARGE (CMS)	23.1	20.3	17.5	23.1	20.3	17.5	23.1	20.3	17.5
FULL SUPPLY LEVEL (EL: M)	274.3	274.3	274.3	270.5	246.1	234.5	266.7	218.0	194.8
RATED WATER LEVEL (EL: M)	241.5	246.2	248.8	238.5	225.2	219.1	235.5	203.0	187.6
MIN. OPERATION LEVEL (EL: M)	174.9	177.9	177.7	174.5	133.2	188.2	173.1	173.1	173.1
TAIL WATER LEVEL (EL: M)	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0
GROSS STORAGE (MCM)	176.1	176.1	176.1	172.3	148.1	136.6	168.5	120.2	87.8
ACTIVE STORAGE (MCM)	157.0	157.0	157.0	157.0	143.6	76.3	108.6	108.6	76.3
SEDIMENT VOLUME (MCM)	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
POWER GENERATION EFFICIENCY	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)	119.5	124.2	126.3	116.5	103.2	97.1	113.5	91.0	65.6
NET HEAD (M)	107.6	111.8	114.1	104.9	92.8	87.4	102.2	72.9	59.0
INSTALLED CAPACITY (MW)	20.0	18.2	16.0	19.5	15.1	12.3	19.0	11.9	8.3

9. REMARKS : THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : KAPIT  
 2. POTENTIAL SITE : TEKALIT (S.YEKALIT)  
 3. IDENTIFICATION NO.: 25  
 4. LOCATION : LATITUDE : 1 54 0 N LONGITUDE : 112 36 0 E  
 NOTE : ABOUT 3-5 KM UPSTREAM FROM THE CONFLUENCE OF THE S.KATIBAS  
 5. DISTANCE FROM LOAD CENTER : 37.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 518.0  
 MAX. TOPOGRAPHICAL ELEVATION (ELTM) : 61.0  
 MAX. WIDTH OF DAM CREST (M) : 350.0  
 RIVERBED ELEVATION AT DAMSITE (ELTM) : 10.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3250.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1490.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 29.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 60.0  
 PLANT FACTOR : 0.5  
 DEGENERATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	INIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (CMS)	0.851	0.795	0.665	0.851	0.795	0.665	0.851	0.785	0.665	
FIRM DISCHARGE (CMS)	24.7	22.6	19.3	24.7	22.8	19.3	24.7	22.8	19.3	
PEAK DISCHARGE (CMS)	49.4	45.5	38.6	49.4	45.5	38.6	49.4	45.5	38.6	
FULL SUPPLY LEVEL (ELTM)	61.0	61.0	61.0	58.7	56.7	54.2	56.7	56.6	52.4	
RATED WATER LEVEL (ELTM)	55.0	57.1	58.6	51.8	51.6	50.7	51.6	46.9	44.2	
MIN. OPERATION LEVEL (ELTM)	43.0	49.3	53.9	37.9	41.4	43.8	41.4	27.8	27.8	
TAIL WATER LEVEL (ELTM)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
GROSS STORAGE (MCM)	527.5	527.5	527.5	465.8	413.5	352.1	404.0	309.9	218.9	
ACTIVE STORAGE (MCM)	363.2	274.0	332.1	368.2	274.0	183.1	368.2	274.0	183.1	
SEDIMENT VOLUME (MCM)	23.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	
PUMP GENERATION EFFICIENCY (%)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	
GROSS HEAD (M)	43.0	45.1	45.0	39.8	39.6	38.7	39.6	34.9	32.2	
NET HEAD (M)	33.7	40.6	42.0	35.8	35.6	34.9	35.6	31.4	29.0	
INSTALLED CAPACITY (MW)	15.4	14.8	13.0	14.2	13.0	10.8	12.5	10.6	8.1	

9. REMARKS :

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : KAPIT  
 2. POTENTIAL SITE : AYAT (S.AYAT)  
 3. IDENTIFICATION NO.: 26  
 4. LOCATION : LATITUDE 1 38 0 N LONGITUDE 112 43 0 E  
 NOTE : ABOUT 100 M DOWNSTREAM FROM THE  
 CONFLUENCE OF THE S-SUNGKABANG

5. DISTANCE FROM LOAD CENTER : 43.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ+KM) : 50.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL:M) : 304.8  
 MAX. WIDTH OF DAM CREST (M) : 350.0  
 RIVERBED ELEVATION AT DAM SITE (EL:M) : 244.0  
 AVERAGE ANNUAL RAINFALL (MM) : 4000.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1355.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 5.0  
 HEADRAGE TUNNEL LENGTH (M) : 1100.0  
 PENSTUCK TUNNEL LENGTH (M) : 300.0  
 PLANT FACTOR (%) : 0.5  
 DENUDATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (R)	(CMS)	7.75	3.9	3.3	0.851	0.795	0.665	0.851	0.785	0.665
FIRM DISCHARGE (CMS)	(CMS)	3.9	7.7	6.7	4.3	3.9	3.3	3.3	3.9	3.3
PEAK DISCHARGE (CMS)	(CMS)	7.7	7.7	6.7	8.5	7.9	6.7	7.9	7.9	6.7
FULL SUPPLY LEVEL (EL:PM)	(EL:PM)	304.8	304.8	304.8	304.4	302.3	299.3	302.3	302.3	299.3
RATED WATER LEVEL (EL:PM)	(EL:PM)	292.5	292.9	301.9	291.0	293.4	293.6	293.4	293.4	293.6
MIN. OPERATION LEVEL (EL:PM)	(EL:PM)	288.0	287.0	296.0	264.2	275.6	282.2	275.6	275.6	282.2
TAIL WATER LEVEL (EL:PM)	(EL:PM)	134.0	134.0	134.0	134.0	134.0	134.0	134.0	134.0	134.0
GROSS STORAGE (MCM)	(MCM)	71.6	71.6	71.6	69.6	59.8	50.1	67.6	51.4	35.7
ACTIVE STORAGE (MCM)	(MCM)	51.5	54.3	31.6	53.5	47.3	31.6	47.3	47.3	31.6
SEDIMENT VOLUME (MCM)	(MCM)	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
POWER GENERATION EFFICIENCY (%)	(%)	7.82	7.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)	(M)	164.7	164.7	167.9	157.0	159.4	159.6	159.4	152.1	148.2
NET HEAD (M)	(M)	142.7	141.4	151.1	141.3	143.5	143.6	139.4	136.9	133.4
INSTALLED CAPACITY (MW)	(MW)	4.7	4.4	3.1	9.7	9.1	7.7	9.5	8.1	7.2

9. REMARKS : THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 AN INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING OF  
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1. LOAD CENTER : KAPIT  
 2. POTENTIAL SITE : AYAT (SAYAT)  
 3. IDENTIFICATION NO. : 26  
 4. LOCATION : LATITUDE : 1 36 0 N LONGITUDE : 112 43 0 E  
 NOTE : ABOUT 100 M DOWNSTREAM FROM THE  
 CONFLUENCE OF THE S-SONGKRABANG  
 5. DISTANCE FROM LOAD CENTER : 48.0 KM  
 6. TYPE OF DEVELOPMENT : RUN-OF-RIVER

7. PROJECT FEATURES

CATCHMENT AREA (SQ. KM) : 59.0  
 RIVERBED ELEVATION AT DAMSITE (EL. M) : 244.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3000.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1355.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 5.0  
 HEADRACE TUNNEL LENGTH (M) : 1100.0  
 PENSTOCK TUNNEL LENGTH (M) : 300.0  
 PLANT FACTOR : 0.5

8. PRELIMINARY POWER OUTPUT CALCULATION

FIRM DISCHARGE (CMS) : 1.4  
 DEPENDABLE PEAK DISCHARGE (CMS) : 2.6  
 MAXIMUM TURBINE DISCHARGE (CMS) : 9.3  
 FULL SUPPLY LEVEL (EL. M) : 247.0  
 TAIL WATER LEVEL (EL. M) : 134.0  
 POWER GENERATION EFFICIENCY : 8-82  
 GROSS HEAD (M) : 113.0  
 NET HEAD (M) : 101.7

FIRM OUTPUT  
 DEPENDABLE PEAK OUTPUT  
 INSTALLED CAPACITY

9. REMARKS : THIS SITE IS NOT RECOMMENDED FOR DEVELOPMENT

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : SARIKET
2. POTENTIAL SITE : KANOHIT (S-KANOHIT)
3. IDENTIFICATION NO.: 31
4. LOCATION : LATITUDE : 1 49 0 N LONGITUDE : 111 56 0 E  
 NOTE : ABOUT 3.0 KM DOWNSTREAM FROM THE CONFLUENCE OF THE S-ENTABAI
5. DISTANCE FROM LOAD CENTER : 47.0 KM
6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 1331.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL: M) : 51.0  
 MAX. WIDTH OF DAM CREST (M) : 500.0  
 RIVERBED ELEVATION AT DAMSITE (EL: M) : 20.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3400.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1480.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 90.0  
 HEADRACE TUNNEL LENGTH (M) : 400.0  
 PENSTOCK TUNNEL LENGTH (M) : 100.0  
 PLANT FACTOR : 0.5  
 DEMODATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE	(CMS)	6.712	6.612	6.512	6.712	6.512	6.512	6.712	6.612	6.512
FIRM DISCHARGE	(CMS)	66.0	55.0	46.0	64.0	55.0	46.0	64.0	55.0	46.0
PEAK DISCHARGE	(CMS)	128.1	110.1	92.1	128.1	110.1	92.1	128.1	110.1	92.1
TOPI. WATER LEVEL (EL: M)		61.0	61.0	61.0	60.4	55.4	51.3	59.7	49.7	41.5
BEFORE WATER LEVEL (EL: M)		60.9	59.2	55.9	49.3	47.6	46.2	48.6	41.9	36.5
MIN. OPERATION LEVEL (EL: M)		27.0	27.7	45.8	27.0	32.0	36.1	26.4	26.4	26.4
TAIL WATER LEVEL (EL: M)		22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
GROSS STORAGE (MCM)		315.9	316.9	316.9	404.3	704.3	622.9	791.6	591.8	428.9
NETIVE STORAGE (MCM)		254.8	255.8	252.1	666.9	455.0	302.1	656.9	465.0	302.1
SEDIMENT VOLUME (MCM)		60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
POWER GENERATION EFFICIENCY (%)		77.7	76.0	76.0	77.3	76.2	76.2	76.2	76.2	76.2
GROSS HEAD (M)		34.1	34.2	34.9	33.4	25.6	24.2	32.6	19.9	14.5
NET HEAD (M)		25.1	28.1	30.5	24.6	23.0	21.8	23.9	17.9	13.0
INSTALLED CAPACITY (MW)		25.7	74.9	22.6	35.3	20.4	16.1	24.7	15.9	9.6

9. REMARKS : THIS SITE CONSIDERED TO BE A GOOD SCREENING.

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 INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING OF  
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1. LOAD CENTER : SARIKEI  
 2. POTENTIAL SITE : SARI-1 (S-JULAU)  
 3. IDENTIFICATION NO. : 32  
 4. LOCATION : LATITUDE 1 52 0 N LONGITUDE 111 40 0 E  
 NOTE : ABOUT 200 M DOWNSTREAM FROM THE CONFLUENCE OF THE S.LIUM  
 5. DISTANCE FROM LOAD CENTER : 17.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 160.0  
 MAX. TOPOGRAPHICAL ELEVATION (ELFM) : 61.0  
 MAX. WIDTH OF DAM CREST (M) : 750.0  
 RIVERBED ELEVATION AT DAMSITE (ELFM) : 30.5  
 AVERAGE ANNUAL RAINFALL (MM) : 3400.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1480.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 9.0  
 HEADRACE TUNNEL LENGTH (M) : 20.0  
 PLANT FACTOR : 0.5  
 DENUDATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (%)		0.851	0.785	0.665	0.851	0.785	0.665	0.851	0.785	0.665
FIRM DISCHARGE (CMS)		7.7	7.1	6.0	7.7	7.1	6.0	7.7	7.1	6.0
PEAK DISCHARGE (CMS)		15.5	14.1	12.0	15.5	14.1	12.0	15.5	14.1	12.0
FULL SUPPLY LEVEL (ELFM)		61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0
RATED WATER LEVEL (ELFM)		59.1	58.6	50.1	52.1	51.6	51.1	44.2	42.8	41.3
MIN. OPERATION LEVEL (ELFM)		55.2	55.8	58.2	47.5	48.3	48.8	37.1	37.1	37.1
TAIL WATER LEVEL (ELFM)		31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
GROSS STORAGE (HCM)		378.2	378.2	378.2	248.7	229.1	209.0	137.3	108.0	79.8
ACTIVE STORAGE (HCM)		114.2	85.1	56.8	114.2	85.1	56.8	114.2	85.1	56.8
SEDIMENT VOLUM (MCM)		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
POWER GENERATION EFFICIENCY (%)		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		28.1	28.6	29.1	21.1	20.6	20.1	13.2	11.8	10.3
NET HEAD (M)		25.3	25.7	26.2	19.0	18.6	18.1	11.9	10.6	9.2
INSTALLED CAPACITY (MW)		3.1	2.9	2.5	2.3	2.1	1.7	1.5	1.2	0.9

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.



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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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- 1. LOAD CENTER : SARIKEI
- 2. POTENTIAL SITE : SARI-2 (S-SARIKEI)
- 3. IDENTIFICATION NO.: 33
- 4. LOCATION : LATITUDE 1 59 0 N LONGITUDE 111 32 0 E  
 NOTE : ABOUT 600 M DOWNSTREAM FROM THE CONFLUENCE OF THE S-GERUGU
- 5. DISTANCE FROM LOAD CENTER : 32.0 KM
- 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 20.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL:M) : 30.5  
 MAX. WIDTH OF DAM CREST (M) : 250.0  
 RIVERBED ELEVATION AT DAMSITE (EL:M) : 15.2  
 AVERAGE ANNUAL RAINFALL (MM) : 3300.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1480.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 2.0  
 HEADRAGE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 40.0  
 PLANT FACTOR : 0.5  
 DENUDATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE	(L)	0.351	0.735	0.665	0.851	0.785	0.665	0.851	0.785	0.665
FIRM DISCHARGE	(CMS)	1.7	1.6	1.3	1.7	1.6	1.3	1.7	1.6	1.3
PEAK DISCHARGE	(CMS)	3.4	3.1	2.7	3.4	3.1	2.7	3.4	3.1	2.7
FULL SUPPLY LEVEL	(EL:M)	30.5	30.5	30.5	27.8	29.1	28.3	29.0	27.7	28.3
RATED WATER LEVEL	(EL:M)	28.5	29.2	29.7	27.6	27.4	27.1	26.3	25.4	25.4
MIN. OPERATION LEVEL	(EL:M)	24.6	26.6	28.2	23.1	24.1	24.8	20.9	20.9	20.9
TAIL WATER LEVEL	(EL:M)	15.0	14.0	15.0	16.0	16.0	15.0	16.0	16.0	16.0
GROSS STORAGE	(MCM)	37.5	37.5	37.5	33.3	29.4	25.3	29.2	22.8	16.5
ACTIVE STORAGE	(MCM)	25.4	18.0	12.6	25.4	18.9	12.6	25.4	18.9	12.6
SEDIMENT VOLUME	(MCM)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
POWER GENERATION EFFICIENCY		0.42	0.82	0.92	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD	(M)	12.5	13.2	13.7	11.6	11.4	11.1	10.3	9.4	8.3
NET HEAD	(M)	11.3	11.9	12.4	10.4	10.3	10.0	9.3	8.5	7.5
INSTALLED CAPACITY	(MW)	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.2

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.

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 # INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING #  
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1. LOAD CENTER : SRI AMAN  
 2. POTENTIAL SITE : SRIA-1 (B-LUPAR)  
 3. IDENTIFICATION NO. : 41  
 4. LOCATION : LATITUDE : 1 5 0 N LONGITUDE : 111 43 0 E  
 NOTE : ABOUT 1.5 KM DOWNSTREAM FROM THE CONFLUENCE OF THE S-AP  
 5. DISTANCE FROM LOAD CENTER : 32.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 65.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL.M) : 91.4  
 MAX. WIDTH OF DAM CREST (M) : 600.0  
 REVERSED ELEVATION AT DAMSITE (EL.M) : 27.4  
 AVERAGE ANNUAL RAINFALL (MM) : 3300.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1480.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 4.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PLANT FACTOR (M) : 80.0  
 DENUDATION RATE (MM/YR) : 3.5  
 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (M)		0.795	0.795	0.565	0.851	0.785	0.665	0.851	0.785	0.665
FIRM DISCHARGE (CMS)		3.4	3.1	2.7	3.4	3.1	2.7	3.4	3.1	2.7
PEAK DISCHARGE (CMS)		6.8	6.3	5.3	6.8	6.3	5.3	6.8	6.3	5.3
FULL SUPPLY LEVEL (EL.M)		91.4	91.4	91.4	85.2	87.1	85.2	87.1	87.1	85.2
RATED WATER LEVEL (EL.M)		90.7	90.9	91.1	87.0	86.3	87.0	86.3	86.3	87.0
MIN. OPERATION LEVEL (EL.M)		89.4	89.9	90.4	84.7	84.6	84.0	84.7	84.6	84.0
TAIL WATER LEVEL (EL.M)		21.0	29.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
GROSS STORAGE (MCU)		774.4	774.4	774.4	316.5	301.5	280.6	316.5	301.5	280.6
ACTIVE STORAGE (MCM)		50.8	37.8	25.3	50.8	37.8	25.3	50.8	37.8	25.3
SEDIMENT VOLUME (MCM)		3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
POWER GENERATION EFFICIENCY (%)		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		52.7	62.9	63.1	39.0	38.3	37.1	39.0	38.3	37.1
NET HEAD (M)		56.5	56.6	56.8	35.1	34.4	33.4	35.1	34.4	33.4
INSTALLED CAPACITY (MW)		3.1	2.9	2.4	1.9	1.7	1.4	1.9	1.7	1.4

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY STUDY TEAM.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : SRI AMAN  
 2. POTENTIAL SITE : SRIA-2 (B.UNDUP)  
 3. IDENTIFICATION NO.: 42  
 4. LOCATION : LATITUDE : 1 1 0 N LONGITUDE : 111 33 0 E  
 NOTE : ABOUT 100 M DOWNSTREAM FROM THE  
 CONFLUENCE OF THE S-SENTAR  
 5. DISTANCE FROM LOAD CENTER : 24.0 KM  
 6. TYPE OF DEVELOPMENT : SUN-OF-RIVER

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 98.0  
 RIVERBED ELEVATION AT DAMSITE (EL:M) : 45.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3500.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1470.0  
 AVERAGE ANNUAL RUNOFF (MM) : 6.0  
 HEADRACE TUNNEL LENGTH (M) : 30.0  
 PENSTOCK TUNNEL LENGTH (M) : 20.0  
 PLANT FACTOR : 0.5

8. PRELIMINARY POWER OUTPUT CALCULATION

FIRM DISCHARGE (CMS) : 1.7  
 DEPENDABLE PEAK DISCHARGE (CMS) : 3.4  
 MAXIMUM TURBINE DISCHARGE (CMS) : 11.2  
 FULL SUPPLY LEVEL (EL:M) : 48.0  
 TAIL WATER LEVEL (EL:M) : 45.0  
 POWER GENERATION EFFICIENCY (%) : 0.82  
 GROSS HEAD (M) : 3.0  
 NET HEAD (M) : 2.7  
 FIRM OUTPUT (MW) : 0.0  
 DEPENDABLE PEAK OUTPUT (MW) : 0.3  
 INSTALLED CAPACITY (MW) : 0.3

9. REMARKS : THIS SITE IS IDENTIFIED BY JICA PRELIMINARY

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : SRI AMAN  
 2. POTENTIAL SITE : SEKRANG-I (D. SERRANG)  
 3. IDENTIFICATION NO. : 43  
 4. LOCATION : LATITUDE 1 21 0 N LONGITUDE 111 43 0 E  
 NOTE : ABOUT 2.0 KM UPSTREAM FROM THE CONFLUENCE OF THE S-TEBAT  
 5. DISTANCE FROM LOAD CENTER : 30.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES  
 CATCHMENT AREA (SQ. KM) = 508.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL. M) = 81.0  
 MAX. WIDTH OF DAM CREST (M) = 240.0  
 REVERSED ELEVATION AT DAM SITE (EL. M) = 22.0  
 AVERAGE ANNUAL RAINFALL (MM) = 3400.0  
 AVERAGE ANNUAL EVAPORATION (MM) = 1480.0  
 AVERAGE ANNUAL RUNOFF (CMS) = 31.0  
 HEADRAGE TUNNEL LENGTH (M) = 0.0  
 PENSTOCK TUNNEL LENGTH (M) = 80.0  
 PLANT FACTOR (%) = 0.5  
 DEBURDENMENT RATE (MM/YR) = 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (L/S)		0.793	0.693	0.593	0.793	0.693	0.593	0.793	0.693	0.593
FIRM DISCHARGE (CMS)		23.7	18.9	18.9	24.6	21.5	18.4	24.6	21.5	18.4
PEAK DISCHARGE (CMS)		36.0	36.0	36.0	49.2	43.0	36.8	49.2	43.0	36.8
FULL SUPPLY LEVEL (EL. M)		59.8	59.8	59.8	60.8	59.7	58.4	60.7	58.3	57.9
RATED WATER LEVEL (EL. M)		59.8	59.8	59.8	59.8	55.5	55.5	59.3	51.7	50.1
MIN. OPERATION LEVEL (EL. M)		21.8	21.8	21.8	40.0	47.0	49.6	38.6	38.6	38.6
TAIL WATER LEVEL (EL. M)		24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
GROSS STORAGE (MCM)		349.9	349.9	349.9	344.2	301.4	256.4	338.5	252.9	187.2
ACTIVE STORAGE (MCM)		256.4	256.4	256.4	300.2	214.5	148.9	300.2	214.5	148.9
SEDIMENT VOLUME (MCM)		256.4	256.4	256.4	25.4	25.4	25.4	25.4	25.4	25.4
POWER GENERATION EFFICIENCY (%)		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		30.5	33.9	35.6	29.9	31.5	31.5	29.3	27.7	26.1
NET HEAD (M)		27.4	30.5	32.1	26.9	28.3	28.3	26.4	25.0	23.5
INSTALLED CAPACITY (MW)		10.6	10.6	9.5	10.6	9.8	8.4	10.4	8.6	7.0

9. REMARKS : THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : SRT AMAN  
 2. POTENTIAL SITE : SEKURANG-2 (B-SEKRANG)  
 3. IDENTIFICATION NO. : 4A  
 4. LOCATION : LATITUDE : 1 27 0 N LONGITUDE : 111 46 0 E  
 NOTE : ABOUT 100 M DOWNSTREAM FROM THE CONFLUENCE OF THE S-SEMAN  
 5. DISTANCE FROM LOAD CENTER : 45.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES  
 CATCHMENT AREA (SQ. KM) : 360.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL. M) : 182.9  
 MAX. WIDTH OF DAM CREST (M) : 550.0  
 RIVERBED ELEVATION AT DAMSITE (EL. M) : 70.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3400.0  
 AVERAGE ANNUAL EVAPORATION (MM) : 1450.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 22.0  
 HEADRACE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 110.0  
 PLANT FACTOR : 0.5  
 DENUDATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
INLET RATE (L)		0.851	0.785	0.665	0.851	0.785	0.665	0.851	0.785	0.665
INLET DISCHARGE (CMS)		18.7	17.3	14.6	18.7	17.3	14.6	18.7	17.3	14.6
INLET WATER LEVEL (EL. M)		179.7	182.9	182.9	179.7	182.9	182.9	179.7	182.9	182.9
OPERATION LEVEL (EL. M)		173.2	175.7	178.1	173.2	175.7	178.1	173.2	175.7	178.1
WATER LEVEL (EL. M)		72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0
DAM'S STORAGE (MCM)		1290.0	1290.0	1290.0	702.4	625.1	549.1	303.3	231.9	162.9
RESERVOIR STORAGE (MCM)		279.3	207.9	178.9	279.3	207.9	178.9	279.3	207.9	178.9
SEDIMENT VOLUME (MCM)		18.0	18.0	1.0	18.0	18.0	18.0	18.0	18.0	18.0
POWER GENERATION EFFICIENCY (%)		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		107.7	108.5	109.3	83.6	81.1	78.7	52.3	47.7	43.1
NET HEAD (M)		96.9	97.7	98.4	75.2	73.0	70.8	47.1	42.9	38.8
INSTALLED CAPACITY (MW)		29.1	27.1	23.2	22.6	20.2	16.7	14.2	11.9	9.1

9. REMARKS : THIS SITE PROCEEDED TO THE SECOND SCREENING.

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 \*\* INVENTORY OF POTENTIAL SITE FOR THE FIRST SCREENING \*\*  
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1. LOAD CENTER : SRI AMAN  
 2. POTENTIAL SITE : LEMANAK (B-LEMANAK)  
 3. IDENTIFICATION NO. : 45  
 4. LOCATION : LATITUDE 1 19 0 N LONGITUDE ERY 49 0 E  
 NOTE : ABOUT 300 M UPSTREAM FROM THE  
 CONFLUENCE OF THE S-UCHONG  
 5. DISTANCE FROM LOAD CENTER : 41.0 KM  
 6. TYPE OF DEVELOPMENT : RESERVOIR

7. PROJECT FEATURES

CATCHMENT AREA (SQ.KM) : 184.0  
 MAX. TOPOGRAPHICAL ELEVATION (EL:M) : 152.4  
 MAX. WIDTH OF DAM CREST (M) : 380.0  
 RIVERBED ELEVATION AT DAMSITE (EL:M) : 70.0  
 AVERAGE ANNUAL RAINFALL (MM) : 3400.0  
 AVERAGE ANNUAL SWAPGRATION (MM) : 1450.0  
 AVERAGE ANNUAL RUNOFF (CMS) : 11.0  
 HEADRAGE TUNNEL LENGTH (M) : 0.0  
 PENSTOCK TUNNEL LENGTH (M) : 80.0  
 PLANT FACTOR : 0.5  
 DEREGULATION RATE (MM/YR) : 1.0

8. PRELIMINARY POWER OUTPUT CALCULATION

DESCRIPTION	UNIT	CASE-1	CASE-2	CASE-3	CASE-4	CASE-5	CASE-6	CASE-7	CASE-8	CASE-9
DRAFT RATE (Z)		0.851	0.785	0.665	0.851	0.785	0.665	0.851	0.785	0.665
FIRM DISCHARGE (CMS)		9.4	8.6	7.3	9.4	8.6	7.3	9.4	8.6	7.3
PEAK DISCHARGE (CMS)		18.7	17.3	14.6	18.7	17.3	14.6	18.7	17.3	14.6
FULL SUPPLY LEVEL (EL:M)		152.4	152.4	152.4	152.4	152.4	152.4	152.4	152.4	152.4
RATED WATER LEVEL (EL:M)		150.1	150.8	151.3	150.8	153.8	151.2	150.8	153.8	151.2
MIN. OPERATION LEVEL (EL:M)		145.6	147.5	149.1	145.6	125.0	124.7	145.6	125.0	124.7
TAIL WATER LEVEL (EL:M)		71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0	71.0
GROSS STORAGE (MCM)		454.3	454.3	454.3	454.3	228.9	192.7	454.3	228.9	192.7
ACTIVE STORAGE (MCM)		139.6	103.9	59.4	139.6	102.9	40.4	139.6	102.9	40.4
SEDIMENT VOLUME (MCM)		9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
POWER GENERATION EFFICIENCY (%)		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
GROSS HEAD (M)		79.1	79.8	80.3	64.4	62.8	60.2	48.3	44.6	39.7
NET HEAD (M)		71.2	71.8	72.3	58.0	56.5	54.2	43.5	40.1	35.8
INSTALLED CAPACITY (MW)		10.7	10.0	8.5	8.7	7.9	6.4	6.5	5.6	4.2

9. REMARKS :

