

## 4. 調査関連資料

### (1) 地形図

#### (a) 地形図現況

地形図についてはつぎの種類のもが入手可能である。

- 1) 1:500,000 地形図(一般市販)
- 2) 1:125,000 河川図(Dept of Land & Surveyより購入)
- 3) 1:50,000 地形図(同 上)
- 4) 1:25,000 または 1:10,000 航測図(同 上)

上記1)の他は当局の厳重な管理下に置かれているため、国外持出しについては特別申請が必要であり、申請しても入手までに3カ月程度を要するということであった。

3)についてはサラワク全土がカバーされているが、4)については一部分に限られる。

4)のカバー・エリアは図4-1に示すとおりである。

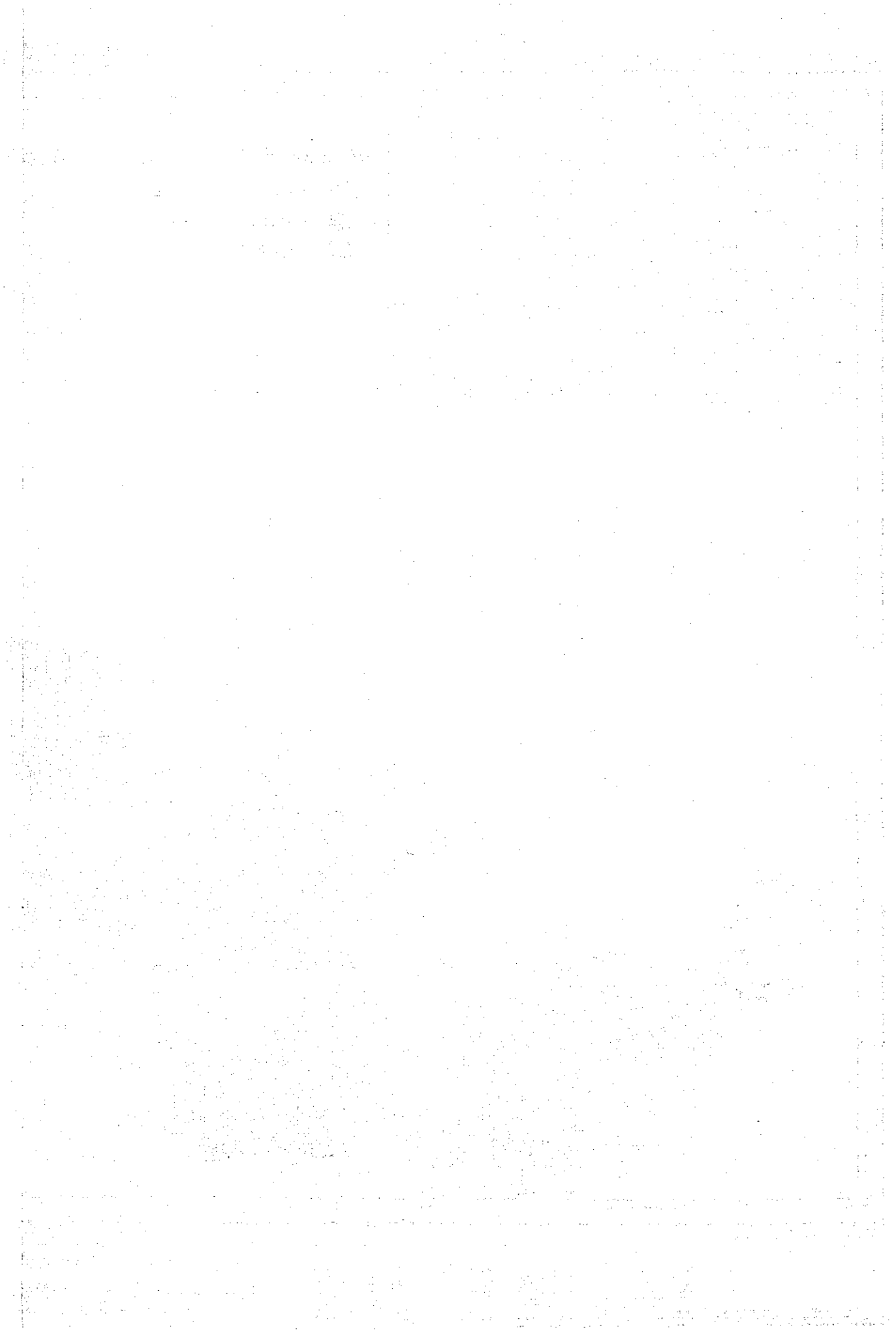
#### (b) F/S実施時の注意事項

事前調査時、上記3)、4)の地図自身の提供を求めたが、得られていない。

航空写真そのものの確認にとどまった。写真はあつたが、まだ図化は済んでいないという印象を受けた。F/S時の航測は協議の結果1/50,000で実施することになったが、上記の写真撮影時に地上測量との整合方法をどうしたかを確認し、既存の写真または航測図が使用に耐えるかどうか判断する必要がある。

また、Steag Iにおいて一番使用頻度が多いと思われる1/50,000 地形図については等高線を鵜呑みにして落差を評価するのは危険であると思われる。等高線間隔は100フィートなので、本プロジェクトのような小水力にとっては落差の評価がプロジェクトの成否に大きく影響するからである。4候補地各々について最有力の1地点だけでも河川縦断測量を実施することが望まれる。





(2) 気象・水文

(a) 気象

サラワクの気象の特徴は、11～1月の北東モンスーンと5～7月の南西モンスーンである。北東モンスーンは南部に大雨をもたらし、しばしば洪水の原因となる。南西モンスーンは内陸部に降雨をもたらす。

気象観測はDept. of Meteorological Services と DID とで実施している。温度、湿度、風、降雨、日照時間、蒸発量が観測されているが、観測所によって観測項目にばらつきがある。

年平均気温は沿岸部で25～27℃であり、通常最高気温は8～9月、最低気温は1～2月に記録されている。主要観測所における月別平均気温は下表のとおりである。

表4 -- 1 MONTHLY MEAN AIR TEMPERATURE

Station Name	Elevation (m)	Month												Mean	Recorded Daily	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Max.	Min.
Kuching	25.6	25.4	25.7	26.2	26.5	26.9	26.7	26.7	26.4	26.3	26.1	25.8	25.7	26.2	36.5	18.9
Sibu	7.5	25.4	25.6	26.0	26.4	26.7	26.6	26.4	26.3	26.2	26.1	26.0	25.7	26.1	36.5	16.5
Miri	16.8	25.8	25.9	26.5	27.0	27.3	27.0	26.8	26.7	26.7	26.6	26.3	26.2	26.6	35.0	17.8

Remarks; Record period 1968 - 1980

温度は年間を通じて高く、月平均で82～89%となっている。

その他詳細については JICA レポート (NATIONAL WATER RESOURCES STUDY MALAYSIA: SECTORAL REPORT VOL. 2, OUT. 1982) が参考になる。

## (b) 水 文

雨量観測所はサラワク全土で 151 カ所あり、DID の管理下にある。151 カ所のうち自記式は 65 カ所で半分に満たない。観測所の位置はクチンなど主要都市周辺に偏っており、流域の上流部ではアクセスの困難と管理者不足から極めて少なくなっている。また、これら地域では観測期間が短かったり、欠測も多くみられる。

サラワク州は稀にみる多雨地帯であり、年平均雨量は半島マレーシアやサバ州で 2,000 mm 台にとどまっているのに比べて 3,836 mm にも達している。流域ごとの月平均雨量は下表に示すとおりである。

表 4 - 2 BASIN MEAN MONTHLY RAINFALL

Basin No.	Basin	Catchment Area (km <sup>2</sup> )	Unit: mm												
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
227	Lawas	1,080	365	195	225	243	300	328	249	327	363	342	430	396	3,762
228	Trusan	2,768	266	174	225	225	258	243	200	240	276	281	316	295	2,999
229	Limbang	3,920	386	260	276	325	331	279	263	286	328	379	381	392	3,884
230	Batam	22,325	336	264	296	303	311	283	256	263	315	401	383	385	3,794
231	Miri	788	396	141	136	170	173	218	238	240	229	295	346	391	2,976
232	Sibuti	935	279	172	143	172	183	218	213	266	203	261	312	323	2,745
233	Niah	1,345	299	195	171	206	195	201	195	203	189	236	269	323	2,681
234	Buai	1,440	348	218	206	229	207	213	207	229	213	248	306	369	2,993
235	Similajau	1,268	400	254	229	237	219	250	208	270	249	300	364	399	3,378
236	Kemena	6,000	455	314	289	295	257	243	271	294	278	351	416	456	3,918
237	Tatau	5,150	465	327	337	299	268	227	265	258	298	340	371	458	3,912
238	Balingian	2,518	538	384	339	257	240	228	212	249	279	337	307	459	3,830
239	Mukah	2,625	546	419	370	269	238	214	207	236	289	330	313	483	3,914
240	Oya	2,005	443	317	297	259	223	192	190	214	259	284	295	397	3,369
241	Rajang	51,053	386	328	357	326	296	269	245	281	327	350	392	433	3,991
242	Kerian	1,675	386	297	276	268	314	219	179	266	262	296	440	434	3,637
243	Saribas	1,900	382	307	271	288	264	218	189	262	279	297	353	436	3,547
244	Lupar	6,813	409	318	289	293	258	213	183	263	278	301	369	439	3,612
245	Sadong	3,645	485	415	326	291	243	204	180	218	252	294	358	451	3,716
246	Sarawak	3,358	646	594	357	289	242	206	184	231	252	340	355	496	4,193
247	Kayau	1,838	792	704	422	346	269	217	202	252	261	351	379	597	4,793

Remark : Record period 1963-1980

流量観測所はサラワク全土で33カ所あり、DIDの管理下にある。33カ所のうち自記式は13カ所で半分に満たない。雨量観測所と同様に沿岸部に偏っており、内陸部は少ない状態である。観測は1964年から実施されており Sarawak Hydrological Year Book として公刊されている。最新のものは79 & 80年版ということであった。

JICAレポート(NATIONAL WATER RESOURCES STUDY, MALAYSIA: SECTORAL REPORT VOL.2, Oct. 1981)では、水位-流量曲線の解析などをもとにして5カ所のキー・ステーションを選定し、それから各流域の流量を推算している。今後実施されるF/Sにおいても、既存のデータの処理および推算に際して同様の作業が要求されるものと思われる。ちなみに解析の際に選出された21カ所の観測所と各々の実測期間は下表のとおりである。

表4-3 INVENTORY OF SELECTED STREAM GAUGING STATIONS

Station Name	Station No.	River	Catchment Area(km <sup>2</sup> )	Recorded Period	Recorded Year
Medamit	4449401	Limbang	2,820	1966-1980	15
Long Terawan	3946411	Tutoh	3,360	1966-1980	15
Lio Matu	3152408	Baram	2,630	1966-1980	15
X Long Pilah (A)	3444409	Baram	9,300	1966-1980	15
Long Jegan	3541410	Tinjor	2,390	1966-1978	13
X Sebiu Bridge	3230412	Sebiu	155	1967-1979	13
Niah	3737415	Niah	725	1969-1980	12
Setapang		Oya	1,000	1969-1972	4
Long Liko		Barui	7,960	1969-1972	4
Nyabong		Linau	9,644	1967-1972	4
Bilong		Rajang	20,793	1966-1975	9
Sg. Gaat		Ga'at	1,478	1966-1975	9
Gassan		Baleh	13,007	1966-1976	11
X Kapit	2029401	Rajang	33,800	1967-1980	14
Katibas		Katibas	2,287	1967-1975	8
Lubok Antu	1018401	Ai	1,300	1966-1980	11
Bedup	1006428	Bedup	36.3	1964-1980	17
X Serian	1105401	Sadong	941	1964-1980	17
Kg. Git	1302428	Sarawak Kiri	425	1970-1980	11
Pedi	1301426	Sarawak Kanan	123	1970-1980	11
X Pk. Buan Bidi	1401427	Sarawak Kanan	217	1970-1980	11

Remark; x indicates 5 key stations

Sources; NATIONAL WATER RESOURCES STUDY, MALAYSIA; SECTORAL REPORT VOL.2, Oct. 1981

(c) F/S実施時の注意事項

雨量、蒸発量、流量の水文量については日単位のデータをD I D発行の隔年報SARA-WAK HYDRDLGICAL YEAR BOOK、DID Kuching で知ることができる。

隔年報の最新版は1979 & 1980年版であり、この版からコンピュータ処理したデータの入手が可能となった。

雨量観測所および流量観測所の位置図は今回入手済み(図4-2および図4-3参照)であるが、雨量については4候補地点各々の近傍に観測所がある反面、流量についてはリンバンおよびスリアマン地点を除いて近傍類似流域の観測所は期待できない。

観測期間については、雨量スリアマンの連続29年間をはじめ比較的長期間であるが、流量はリンバン地点(Medamit 観測所、リンバン川水系)の連続10年間で最高で、他は2~7年の連続観測にとどまっている。(図4-4参照)

いずれにしても高精度の流出解析は望み薄であるので、流域の総雨量および総流出量の観点に立つての検討を主体にするのが賢明であろう。その点で次の資料が参考になる。

一等雨量線図: MASTER PLAN FOR POWER SYSTEM DEVELOPMENT  
VOLUME II, APRIL 1981, SAMA CONSORTIUM(GERMAN)

一雨量と流出高の相関: NATIONAL WATER RESOURCES STUDY SECTORAL  
REPORT VOL. 2, OCTOBER 1982, JICA

また、流量観測所において用いられている水位-流量曲線の信憑性についてもあらかじめチェックしておく必要がある。往々にして河川横断形状が観測所設置時点から急激に変化している場合でも、古いものをそのまま使用しているケースがあるからである。

(3) 地 質

(a) 資料状況

今回のプロジェクト・サイトに直接的に関係する文献またはプロジェクト・レポート類はないが、全般的な解析としてはGeological Survey DepartmentのAnnual Report、Regional Memoir、Bulletin等が参考資料となる。

(b) F/S実施時の注意事項

プロジェクト・サイトが4地点に分散しているため、通常にも増して功率的なスケジュールおよびチーム編成が要求される。現地業者の能力を的確に把握し、工程管理を綿密に行う必要がある。現地業者は州都クチンにも数社あるとの話であったが、場合によっては半島マレーシア(クアラルンプール)の業者を使うことも考慮しておいた方がいいだろう。

# SARAWAK RAINFALL & EVAPORATION

## LEGEND:

RECORDING STATION



PRINCIPAL



SECONDARY

NON RECORDING STATION



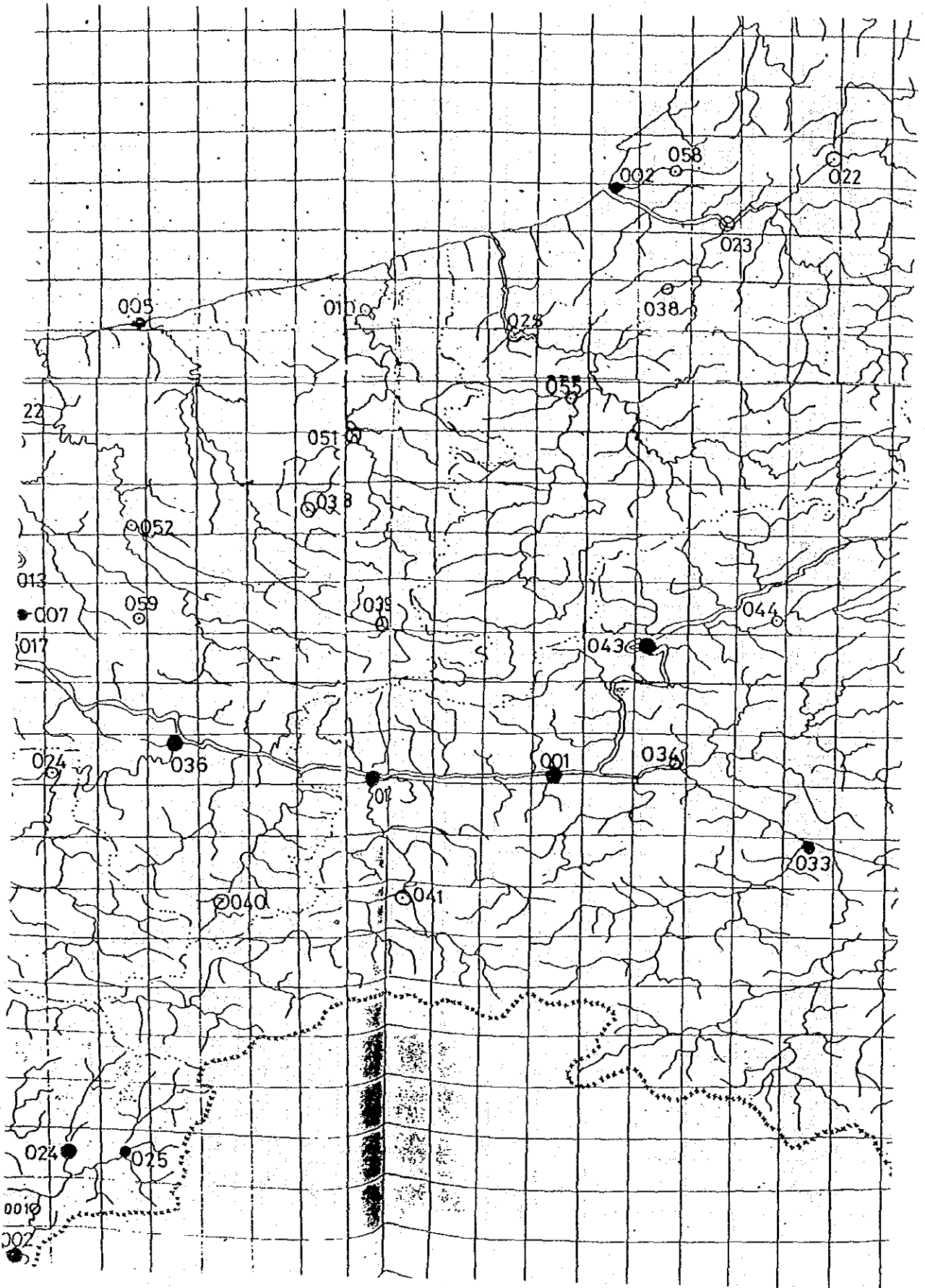
RECORDING + EVAPORATION STATION

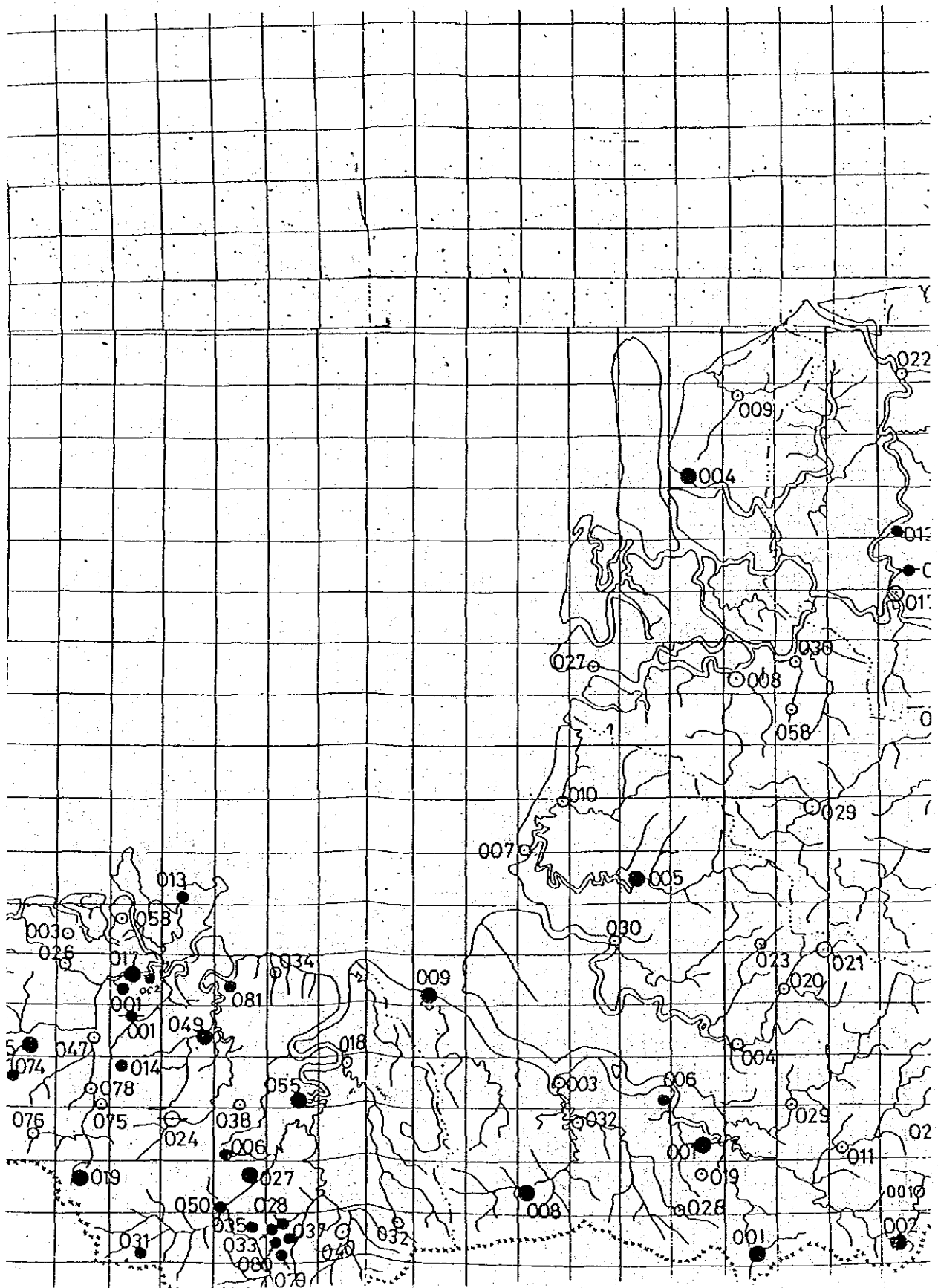


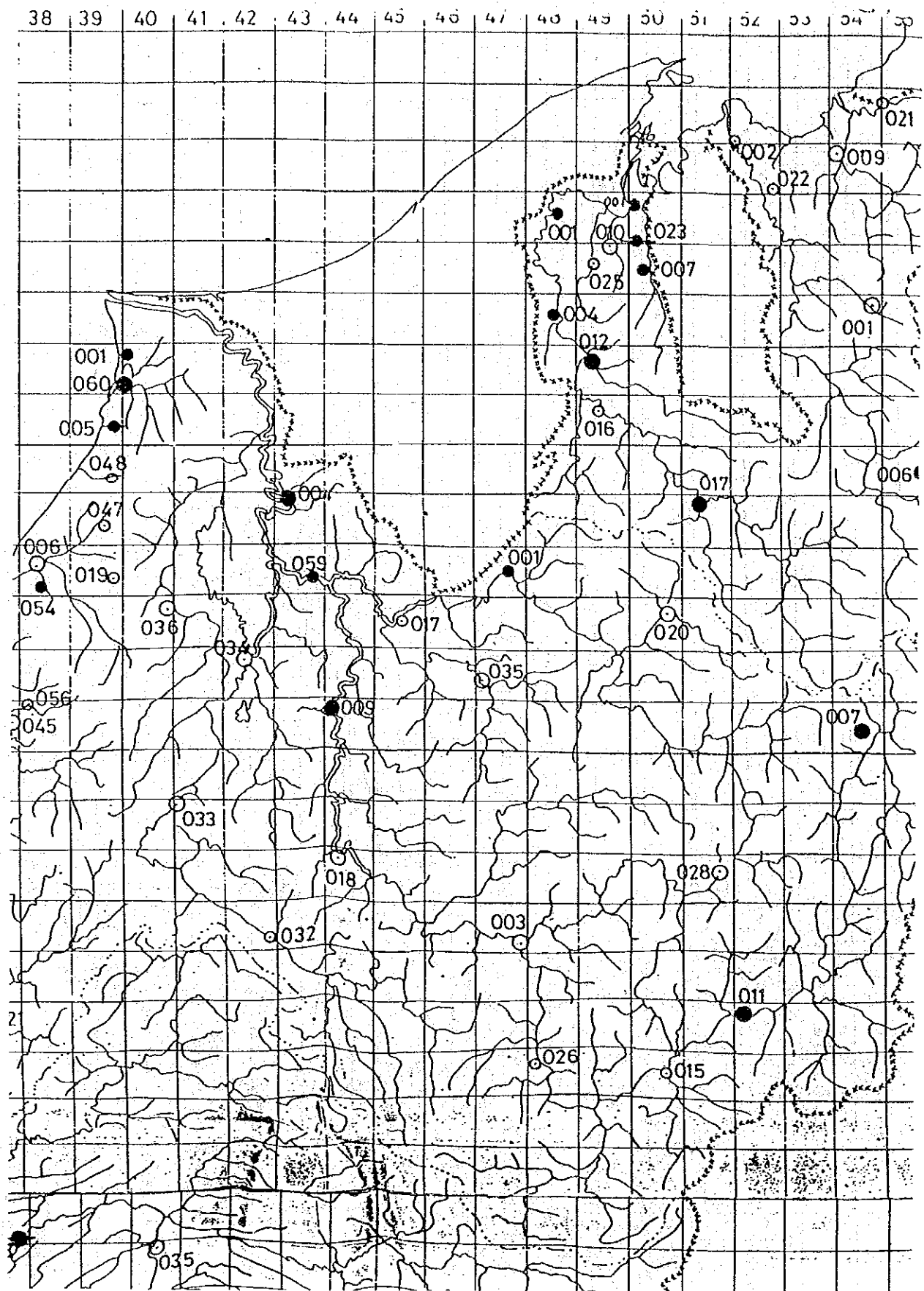
NON-RECORDING + EVAPORATION STATION







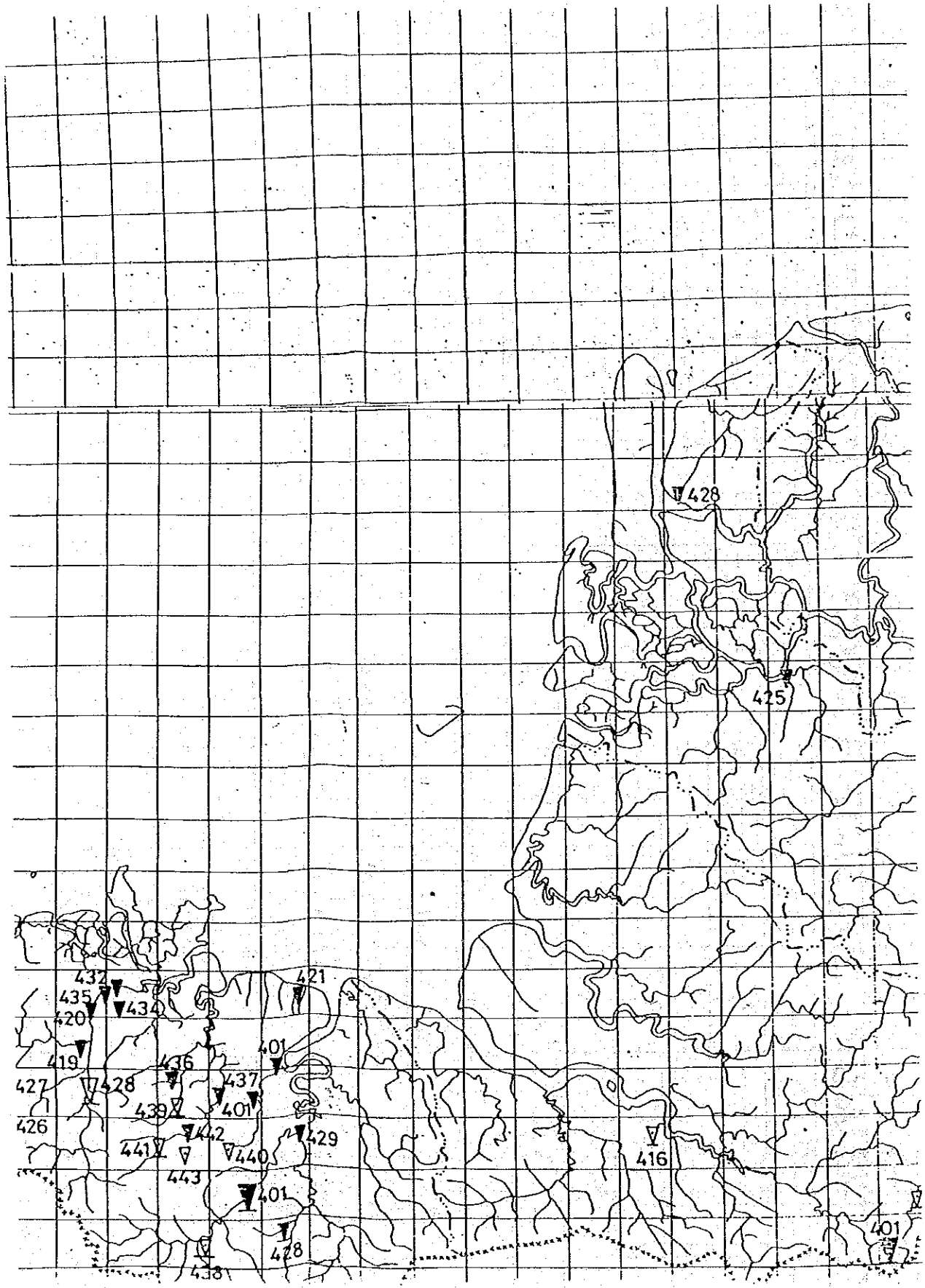


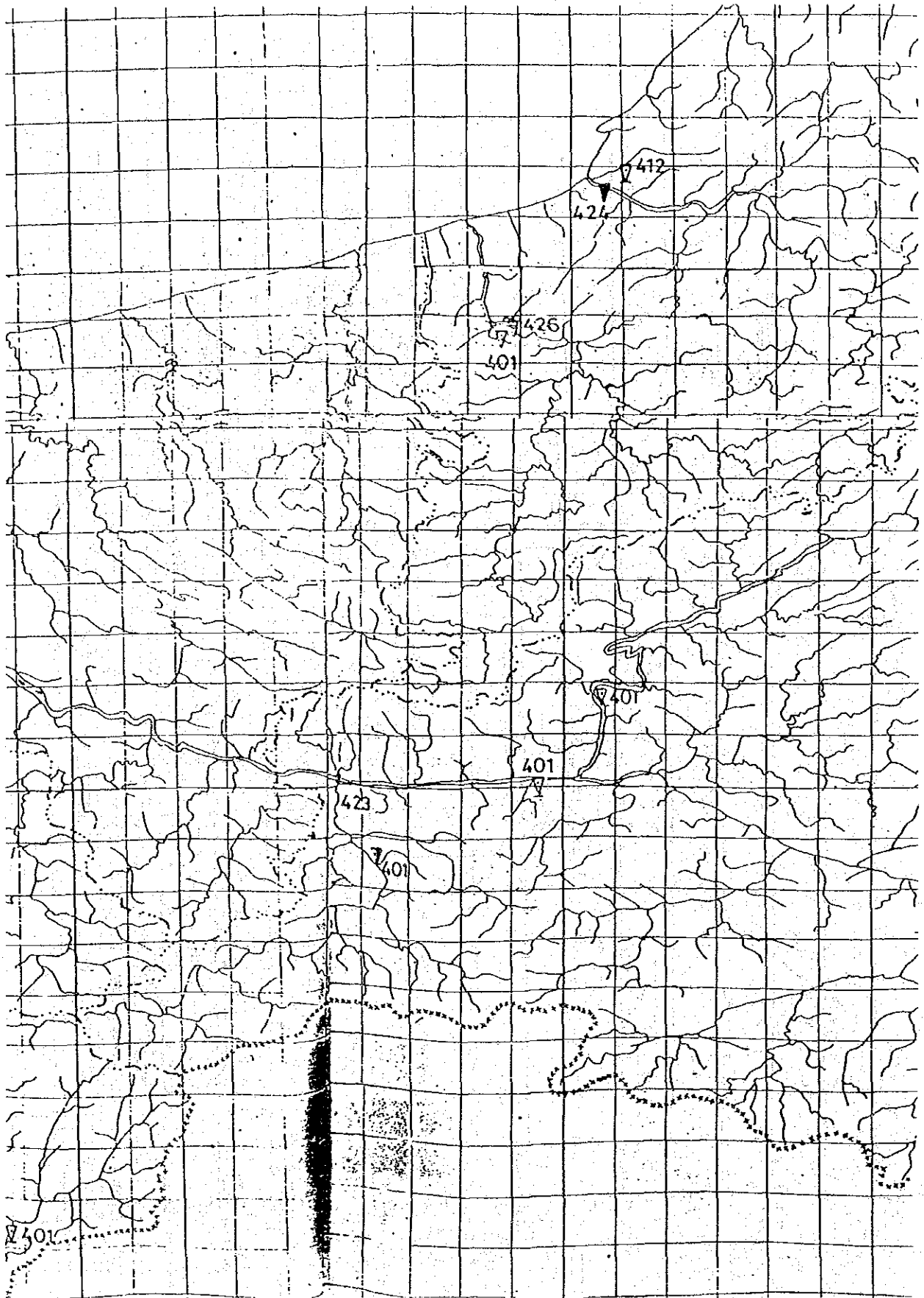


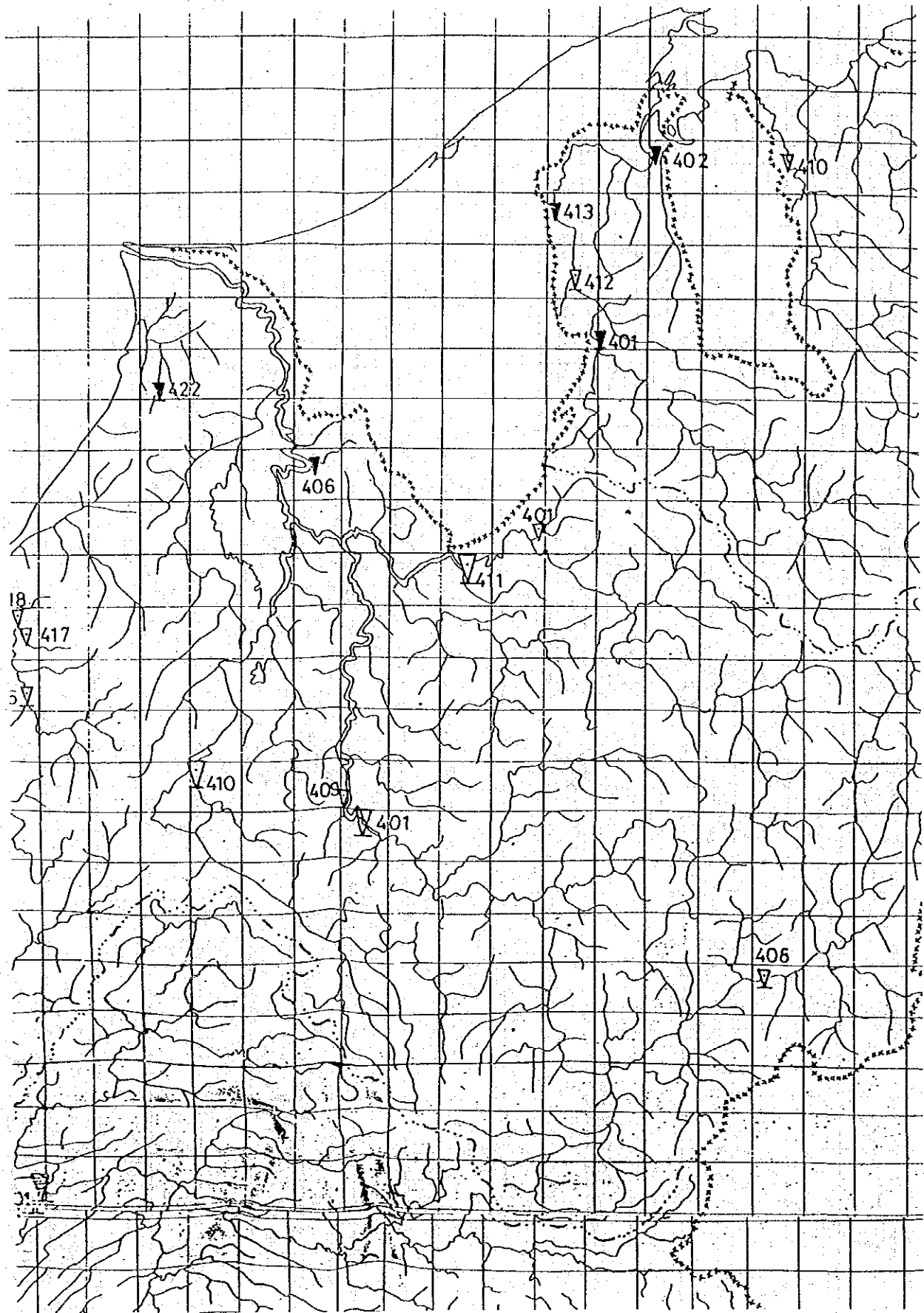
# SARAWAK WATER LEVEL & DISCHARGE STA

## LEGEND

	PRINCIPAL	SECONDARY
STATION WITH AUTOMATIC RECORDER	▼	▽
STATION WITH STICK GAUGE	▽	▽
AUTOMATIC RECORDER CUM DISCHARGE STATION	▼	▽
STICK GAUGE CUM DISCHARGE STATION	▽	▽















#### (4) SESCOでの解析能力

##### (a) 概論

本F/Sにおいては、調査結果の整理、解析、とりまとめなどの作業をほぼ全てマレーシア国内にてSESCOカウンターパートエンジニアとの共同作業により行うこととなる。

これは、SESCOが調査を通じての技術移転を強く希望していることに鑑みたものである。

SESCOは自社所有のコンピューターハード、ソフト、はりつけ可能なエンジニアについて後述のクエッションネアーの中で記している。

ここでは、解析作業において使用することとなるコンピューターについて述べることにする。

##### (b) 設置コンピューターの概要

機種名	DG ECLIPSEシリーズ	S/130
メーカー	米国 Data Gememl社 (日本データゼネラル特)	03-438-3611
C P U	語長	16ビット/語
	メモリ	1メガバイト
	コード系	ASCII (*)
	OS(Operation System)	AOS
言語	FORTRAN、BASIC	
入出力装置	ディスク	50メガバイト×2台
	テープ	1600/800 6pi (*)

科学技術計算用、計測制御用の中規模のミニコンピュータである。

(註)

ASCII : American Standard Code for Information Interchange

bpi : bit per inch (1インチ当りの文字数)

日本における同種の機種の利用者

構造計画研究所にてDG社製使用中

##### (c) 互換性

① コード体系がASCIIであるため、IBM系の計算機(IBM、富士通、日立など)のプログラムやデータは、本機にて、コード変換が必要となる。変換のためのプログラムは、本機に備えられている。

\*DG ECLIPSE S/130

- ② FORTRAN 言語に関しては、計算の部分は問題ないが、データの読み書きの部分については、追加修正が必要になる。

修正情報は、プログラム作成者が指示する必要があると考えられる。

#### 変換の方法例

- (1) プログラム、データを磁気テープに入れて現地に持込む。
  - (2) 本機にて、磁気テープの内容を本機用の形式に変換する。(①による)
  - (3) データの入出力を計っている部分を修正する。(①による)
  - (4) プログラムが正しく動作することを、結果がわかっているデータによってテストする。
  - (5) 本番のデータで実行。
- (d) F/S実施時の注意事項

互換性のところで述べたが、DG製のコンピュータ以外のプログラムやデータを現地に持込む場合には、プログラムの修正、テストといった作業が必要となるため、現地での作業が多大になると思われる。

また、実際に解析作業を行なう時期に、CPUがフル稼動に近かったり、ディスクに空きが十分にならないような場合も考えられる。その場合には、日本国内での解析作業を行うことが必要とある。



## (2) 一般事情

### (a) 言語

クチンでは業務の他ホテル、食堂においても英語で用が足せる。

ただし、プロジェクト・サイト周辺の食堂ではあまり通じないのでマレー語を知っていると便利であろう。

### (b) 宿舎

クチン、スリアマン、サリケイ、リンバン、カピットの各都市ともホテルがある。

クチンにはホリディインなどの高級ホテルも存在する。それ以外の4都市は格がぐっと落ちる宿となるが、それでも冷房・シャワー付の部屋が提供される。

### (c) 両替

クアラルンプール市内には東京銀行をはじめとする銀行が多数ある。一方クチンには東銀はないものの銀行は多数ある。スリアマン他のプロジェクト・サイトの各都市では銀行の数は限られたものとなる。

交換レートはクアラルンプールが最も良く、サラワク州では、レートが5%程度悪くなる。

なお、クチンにおいては、東京銀行のT/Cを受けとらない銀行が多数あり、注意を要する。(調査団の経験では、受けとるのは香港上海銀行であった)。

## 6. 収集資料リスト

### (1) 予備調査

1. Annual Statistical Bulletin Sarawak 1983  
Department of Statistics Malaysia (Sarawak Branch), Dec. 1984
2. 20th Annual Report 1982, SESCO
3. MASTER PLAN FOR POWER SYSTEM DEVELOPMENT, VOLUME II ANNEXES,  
APRIL 1981; GERMAN AGENCY FOR TECHNICAL COOPERATION LTD./ SAMA  
CONSORTIUM
4. -ditto- VOLUME III APPENDICES
5. PREFEASIBILITY STUDY LIMBANG RIVER BASIN, VOLUME 3 ANNEX; CLIMATE,  
BASIN HYDROLOGY AND CIVIL ENGINEERING WORKS; Jan. 1980; M + R  
International Development Project Consultants (Belgium)
6. MINI-HYDRO PROJECT (SABAH and SARAWAK) FINAL REPORT VOLIME-I, May  
1982; EPU with SEB and SESCO / ENEX OF NEW ZEALAND et al.

### その他

1. SARAWAK GUIDE BOOK (Revised Edition December 1982), The Sarawak  
Tourist Association, Tourist Development Corporation, State  
Tourist Development Committee
2. MAJOR POWER STATIONS MONTHLY STATISTIC; October 1984, November  
1984 (A 4 の表 2 枚)
3. 航空写真測量見積りサンプル (A 4 copy 2 枚)
4. LOAD CURVE (Sri Aman, Sarikei, Binatang)
5. BATANG AI HYDROELECTRIC PROJECT A 3 図面 2 枚
6. サラワク 航測図 インデックス・マップ (A 1 青焼S=1/1,000,000)

(2) 既存レポートリスト (SESCO所有)

- MASTER PLAN FOR POWER SYSTEM DEVELOPMENT, APRIL 1981; ○  
GERMAN AGENCY FOR TECHNICAL COOPERATION LTD., SAMA  
CONSORTIUM
- MINI-HYDRO PROJECT (SABAH and SARA AK) FINAL REPORT, ○  
MAY 1982; EPU with SEB and SESCO, ENEX OF NEW ZEALAND  
et al
- PREFEASIBILITY STUDY LIMBANG RIVER BASIN, JAN. 1980; ○  
M + R International Development Project Consultants  
(Belgium)
- RECOMMENDATIONS FOR SARAWAK HYDROPOWER DEVELOPMENT ●  
FEB. 1983; GERMAN AGENCY FOR TECHNICAL COOPERATION LTD.,  
SAMA CONSORTIUM
- Sarawak HYDROLOGICAL YEAR BOOK 1979 & 1980 ●

○ 表紙&volume 構成 copy

● 表紙& 目次 copy



## (2) 事前調査的収集資料リスト

資料の名称	オリジナル or コピー	収集先名称 又は発行機関
1. ZIST ANNUAL REPORT 1983 2. サラワク全土の雨量および流量観測所位置図 3. SESCO リンバン事務所資料一式 1) LOAD CURVE ('84年10月～'85年9月：1年間月別) 2)       "       ('85年10月の金曜～月曜：4日間) 3) Monthly Report ('84年10月～'85年9月：1年間) 4) 単線結線図 4. SESCO カピット事務所資料一式 1) LOAD CURVE ('85年6月25日) 2) 日報 ('85年10月の金曜～月曜：4日間) 3) 配電網図	オリジナル コピー コピー コピー コピー	SESCO DID SESCO,Limbang SESCO,Kapit

## 7. Questionnaire

### (1) 予備調査

回収したQuestionnaireは別紙のとおりである。

これは、Mr. Bernard Suling ( Civil Engineer, SESCO, Kuching )の回答をとりまとめたものである。

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1. Electric Power Situation

Item	Description	Availability	Notes
1. Existing Supply Facilities	<ul style="list-style-type: none"> <li>- Power plants and substations (installed capacities), transmission lines,</li> <li>- Schematic and single line diagram</li> </ul>	<p>Yes</p> <p>n.a.</p>	<p>SESCO 20TH ANNUAL REPORT 1982.</p>
2. Record Demand & Supply	<ul style="list-style-type: none"> <li>- Record of peak kw, kwh from 1972 to 1982 including load curve (annual; monthly, daily).</li> </ul>	<p>Yes</p>	<p>SESCO 20TH ANNUAL REPORT 1982</p> <p>* Daily load curve available in Sri Anan and Sarikei.</p>
3. Power Consumption	<ul style="list-style-type: none"> <li>- Average/Maximum power demand (kw), annual power consumption (kwh):</li> <li>(a) Household</li> <li>(b) Industries</li> <li>(c) Agriculture</li> <li>(d) Commercial</li> <li>(e) Others</li> <li>- Energy loss</li> </ul>	<p>Yes</p>	<p>SESCO 20TH ANNUAL REPORT 1982.</p>

Item	Description	Availability	Notes
4. Demand Forecast	<ul style="list-style-type: none"> <li>- Long term demand (max. kw, kwh) forecast</li> </ul>	Yes	RECOMMENDATIONS FOR SARAWAK HYDROPOWER DEVELOPMENT, Feb. 1983, SAMA CONSORTIUM.
5. Supply Planning	<ul style="list-style-type: none"> <li>- Long term supply (max. kw, kwh) planning</li> <li>- Installed capacity, firm and secondary energy of each planning power plant</li> <li>- Expansion program for transmission and distribution networks</li> <li>- Rural electrification program of neighbouring places</li> </ul>	Yes	<ul style="list-style-type: none"> <li>- MASTER PLAN FOR POWER SYSTEM DEVELOPMENT, April 1981, SAMA CONSORTIUM.</li> <li>- MINI HYDRO PROJECT (SABAH and SARAWAK), May 1982, EPU/SEB/SESCO.</li> </ul>

2. Economic Evaluation

Item	Description	Availability	Notes
1. Evaluation Principle	- Comparison with alternative power plants	Yes	Comparison with Diesel Power Plant.
2. Period of Analysis	- Hydraulic and alternative power plants	Yes	20 years for Mini Hydro Project.
3. Service Life Period of Replacement	- Service life, period of replacement of each item of hydraulic and alternative power plants	Yes	Operating hours - 100,000 hours for diesel plant.
4. Operation & Maintenance	- Annual operation and maintenance fees or ratios such as personnel expenses, repair expenses and other in which lubricating oil, insurance of damage and so on are included for hydraulic and alternative power plants	Yes	MINI HYDRO PROJECT (SABAH and SARAWAK), May 1982, EPU/SEB/SESCO.

Item	Description	Availability	Notes
5. Administration	- Administration fee for hydraulic and alternative power plants	n.a.	
6. Other items of Alternative Plants	- Installed capacities, units, fuel cost and so on	Yes	Fuel cost = 26 cent/kwh.
7. kw and kwh Benefits of Alternative Power Plants	- Including estimated basis	Yes	MINI HYDRO PROJECT (SABAH and SARAWAK), May 1982, EPU/SEB/SESCO.
8. Tariff	- Existing and in future	Yes	32 cent/kwh : Class I for domestic consumer.

Item	Description	Availability	Notes
9. Delivery Cost	- Administration, transmission, substation, distribution, sales, interest, tax, etc.	Yes	MINI HYDRO PROJECT (SABAH and SARAWAK), May 1982, EPU/SEB/SESCO.
10. Tax & Duties	- Taxes and duties levied by the Government of Malaysia		No tax for SESCO



### 3. Geological Data

Item	Description	Availability	Notes
1. Published Map on Rock & Soil classification	- Extensive geological maps, geological structures and their explanation	Yes	Memoir series of "The geology and mineral resources", Geological Survey Department, British Territories in Borneo, 1957 : and other reports.
2. Aerial photograph	- Scale 1:5,000	n.a.	1:10,000 and 1:25,000 mapping available for limited areas.
3. Project Site a) Geological Drawings & Geological Report	- Plans profiles and sections - Geological investigation reports	n.a.	





4 . P l a n n i n g   D a t a

Item	Description	Availability	Notes
1. Rating Curve	- Near downstream of damsite, including location map	Yes	Available from Hydrological Data Book by DID (Drainage & Irrigation Dept.).
2. Power Plant	- Available maximum head and discharge, and so on	n.a.	
3. Transmission Line	- Passing route 1:100,000, 1:50,000, topographical map	Yes	
4. Regulation, Code, Criteria and so forth	- Civil work (dam, penstock, road, etc.) - Building, Machine and Material - Communication	Yes	Normally, Codes based on British Standard (BS).
5. Names of Contractor	- Recommendable contractors (survey, geology, transportation)	Yes	So many

5. Topographical Map

Item	Description	Availability	Notes
1. Topographical Map covering the Rivers	- Adequate Scale 1:500,000 1:250,000 1:100,000 1: 50,000	Yes	
2. Topographical Map near Project Site	- Scale 1:250,000	Yes	1:50,000 maps are available.
3. Topographical Map at Project Site	- Scale 1:2,000, including quarry area and construction facilities	n.a.	Smallest scale in 1:10,000 for limited areas.

Item	Description	Availability	Notes
4. Longitudinal Section of the River	<ul style="list-style-type: none"> <li>- Vertical Scale :</li> <li>- Horizontal Scale :</li> </ul>	n.a.	
5. Cross Section of Dam Site	<ul style="list-style-type: none"> <li>- Scale :</li> </ul>	n.a.	
6. Survey	<ul style="list-style-type: none"> <li>- List and data of triangulation net for Project site</li> <li>- List and data of level net for Project area</li> <li>- List and data of bench-mark near Project area</li> </ul>	n.a.	

6. Hydrological and Meteorological Data

Item	Description	Availability	Notes
1. Run-off	<ul style="list-style-type: none"> <li>- All available data at stream gauging stations including location map(s)</li> <li>- Converted run-off data at the dam site</li> </ul>	Yes	HYDROLOGICAL YEAR BOOK, DID.
2. Flood Flow	<ul style="list-style-type: none"> <li>- By physical method such as probable maximum method</li> <li>- By statistical method</li> <li>- Record maximum flood</li> </ul>	Yes	Available in DID.
3. Sedimentation	<ul style="list-style-type: none"> <li>- Suspended material and bed load material</li> </ul>	n.a.	

Item	Description	Availability	Notes
4. Evaporation	- Monthly average observed or arranged evaporation	Yes	HYDROLOGICAL YEAR BOOK, DID.
5. Precipitation	- All available precipitation data for wet and dry seasons	Yes	HYDROLOGICAL YEAR BOOK, DID.
6. Weather	- Temperature, humidity and thunder (annual number of days per 10km square), location map(s) of stations	Yes	Available in the Department of Meteorological Services and the Department of Statistics.



7. Inland Transportation Data  
(Between Closest Harbour and Project Site)

Item	Description	Availability	Notes
1. Road Condition	<ul style="list-style-type: none"> <li>- Road map of transportation route</li> <li>- Limited loading weight (ton)</li> <li>- Limited loading dimension (meters: height x width x length)</li> </ul>	Yes	<p>Generally gravelled road for non-urban areas.</p> <p>Load limit = 20 tons</p>
2. Harbour Facilities	<ul style="list-style-type: none"> <li>- Maximum harbour crane capacity (ton)</li> <li>- Maximum floating crane capacity (ton)</li> <li>- Area of stockyard and warehouse</li> </ul>	n.a.	<p>Ports of Kuching, Sibul, Miri &amp; Bintulu are available.</p> <p>For Limbang areas, the nearest port is Labuan (Federal Territory)</p>

Item	Description	Availability	Notes
3. Cost of Inland Transportation	<ul style="list-style-type: none"> <li>- Landing and warehouse charge</li> <li>- Cost of inland transportation MS/ton-km, MS/ton, MS/km, or other unit prices</li> <li>- Hire charge of truck, car, barge, etc.</li> </ul>	n.a.	Depend on private sector e.g. RT Cargo.

8. Cost Estimation Data

Item	Description	Availability	Notes
1. Construction Cost for Civil Work	<ul style="list-style-type: none"> <li>- Labour</li> <li>- Materials (cement, steel, oil, etc.)</li> <li>- Unit cost of hydroelectric power plant constructed in recent years (per kw, per kwh)</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Unskilled labour : M\$10-15 per Monday</li> <li>Skilled labour : M\$30 - 40 per Monday</li> <li>Rate for overtime work : 1.5 - 2.0 x rate for normal work</li> <li>Cement : M\$ 12 per 50 kg bag</li> </ul>
2. Construction Cost for Electric Work	<ul style="list-style-type: none"> <li>- Labour</li> <li>- Materials (cement, steel, oil, etc.)</li> <li>- Unit cost of diesel/gas turbine power plant constructed in recent years (per kw, per kwh)</li> <li>- Unit cost of transmission line</li> </ul>	Yes	<ul style="list-style-type: none"> <li>- Refer to STATISTICAL BULLETIN &amp; MASTER PLANT Report</li> <li>- Diesel Plant capital cost                             <ul style="list-style-type: none"> <li>M\$2,500/kW : less than 300 kW</li> <li>M\$1,600/kW : for 1 MW</li> </ul> </li> <li>- Transmission line                             <ul style="list-style-type: none"> <li>M\$125,000/km for 11 kv lines</li> </ul> </li> </ul>

Item	Description	Availability	Notes
3. Operation & Maintenance Yearly Cost	<ul style="list-style-type: none"> <li>- Hydroelectric power station</li> <li>- Thermal power station (including fuel)</li> <li>- Transmission line</li> <li>- Substation</li> </ul>	Yes	Refer to Master Plan Report.
4. Interest Rate		Yes	15% : Commercial
5. Escalation Rate		Yes	7% : Mini Hydro
6. Import duties	- Machinery and material for construction	Yes	No tax for project components.

9. Other Requests

Item	Description	Availability	Notes
1. Organization in Charge of and/or concerned to the Project	<ul style="list-style-type: none"> <li>-Ministrial, Regional, Provincial organization</li> <li>-Responsible agency</li> </ul>	Yes	SESCO 20TH ANNUAL REPORT 1982.
2. Published Statistics	<ul style="list-style-type: none"> <li>-Statistics of economy, industry, trade, etc. in the Project area (Annual Electric Report, Statistical Yearbook, etc.)</li> </ul>	Yes	<ul style="list-style-type: none"> <li>- ANNUAL STATISTICAL BULLETIN, SARAWAK, 1983.</li> <li>- SESCO 20TH ANNUAL REPORT 1982.</li> </ul>
3. Labour	<ul style="list-style-type: none"> <li>-Labour law or regulations and unions (if any)</li> <li>-Public or official holidays</li> <li>-Daily working hour</li> </ul>	n.a.	

Item	Description	Availability	Notes
3. Labour	-Premium payment for holiday and overtime working	Yes	1.5 - 2.0 x normal rate
4. Resettlement	-Number of houses, population, farm, land, etc. necessary to be resettled	n.a.	<ul style="list-style-type: none"> <li>- Depend on particular sites</li> <li>- Farm cost <ul style="list-style-type: none"> <li>• Rubber : M\$18 per tree</li> <li>• Pepper : M\$48 per tree</li> </ul> </li> <li>- Land acquisition cost (price per acre) <ul style="list-style-type: none"> <li>• Mixed zone : M\$0.5 million for Kuching</li> <li>• Native land : M\$7,000 - 15,000</li> <li>• Native country right land : M\$700 - 1,000</li> </ul> </li> <li>• State land : Free</li> </ul>
5. Land, Forest	-Schemes of land use, forest, etc.	Yes (1:50,000 Map)	
6. Game Preserve	-Kinds of wildlives to be re-served (if any) -Area of game preserve	n.a.	

Item	Description	Availability	Notes
7. Facilities and Arrangements for Field Investigation	<ul style="list-style-type: none"> <li>-Temporaly bridges or boats and crafts to cross the river near the dam site</li> <li>-Facilities for climbing at the dam site, if necessary</li> <li>-Labour, cars, radiophones(Hertz)</li> <li>-Arrangement of hotel</li> </ul>	Yes	
8. Water quality record		n.a.	Tests can be done in Kuching.

## (2) 事前調査

前回の予備調査時の補足として今回改めて質問状を作成して SESCO 側に回答を求めた。回答状況は表のとおりであるが、当方で用意した様式に書き切れない分については追加ノートおよび関連資料のコピーが添付されており、前回よりは密度の濃い回答ぶりであった。



Given 25 Oct. '85 by SESCO

QUESTIONNAIRE  
ON SARAWAK SMALL SCALE  
HYDROELECTRIC POWER DEVELOPMENT PROJECT  
IN MALAYSIA

JICA PRELIMINARY STUDY TEAM

OCT. 1985

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I . GENERAL

Item	Description	Availability	Notes
1. Local Office of SPU in Sarawak	- Adress - TEL - TELEX		
2. Local Office of SESCO in KL	- Adress - TEL - TELEX		
3. Organization chart of Sarawak State gov.			
4. Economic Development Plan at/ around Sri Aman, Limbang, Sarikei and Kapit			
5. Directory of SESCO			

**II. IMPORTATION**

Item	Description	Availability	Notes
1. Customs Organization	<ul style="list-style-type: none"> <li>- Customs House</li> <li>- Address</li> </ul>	None	
2. Customs Clearance	<ul style="list-style-type: none"> <li>- Place</li> </ul>	Yes	Refer to Notes attached.
3. Customs Broker		Yes	
4. Procedure	<ul style="list-style-type: none"> <li>- Tariff (Possibility for Exemption)</li> <li>- Procedure, Time</li> <li>- Special Item (Contrabanded Goods and Protected Goods)</li> <li>- Procedure for Return Equipment</li> <li>- Clearance Fee</li> </ul>	Yes	

### III. TRANSPORTATION

Item	Description	Availability	Notes
<p>1. Marine Transportation</p> <p>(1) Location of Harbour</p>	<ul style="list-style-type: none"> <li>- Nearest Available Port from Site</li> <li>- Distance from Site</li> <li>- Seasonal Restriction for unloading</li> </ul>	<p>Yes</p>	<p>Main port is in Kuching, Sibul, Miri, and Bintulu.</p> <p>The location can be obtained from the information handbook enclosed.</p>
<p>(2) Port Facility</p>	<ul style="list-style-type: none"> <li>- Max. Size of Vessel (Length, Breadth, Draft, Dead Weight Gross Tonnage)</li> <li>- Berth Facility and Number (Length, Breadth, Depth of water)</li> <li>- Shore Facility (Type, Capacity, Number)</li> <li>- Condition of Discharging Area (Shed m<sup>3</sup>, Outdoor Storage Space, Railway)</li> </ul>	<p>Yes</p>	<p>See notes &amp; booklet attached.</p>

Item	Description	Availability	Notes
(3) Operation	<ul style="list-style-type: none"> <li>- Name of Port Authority</li> <li>- Port Congestion</li> <li>- Stevedoring Company</li> </ul>		<p>Kuching port authority,  Rajang Port Authority (for SIBU)  Miri Port Authority (for MIRI)  Bintulu Port Authority</p>
(4) Charges	<ul style="list-style-type: none"> <li>- Port Charge</li> <li>- Warfage</li> <li>- Tugging Charge</li> <li>- Pilotage</li> <li>- Stevedoring Charge</li> <li>- Lightering Charge</li> <li>- Landing Charge</li> <li>- Storage</li> <li>- Hire of Equipment</li> </ul>		<p>Refer to the appropriate  Port authorities for information.</p>
2. Inland Transportation from Harbour to Site		Yes	<p>Demanding on the freightforwarding firms.  Small or remote towns might not have firms handling the transportation.  Also refer to yellow pages (undertransport) to procure requirements.</p>
(1) Road Condition	<ul style="list-style-type: none"> <li>- Available Road</li> <li>- Rout and Distance</li> <li>- Width</li> <li>- Condition of Surface (Paved/Unpaved)</li> </ul>		<p>Mostly unpaved/gravelled roads. In the remote sites there are logging roads (unpaved) if logging activities are present near or around the sites, informations or use of logging have to be requested from the logging companies.  Road networks through Sarawak Limited.</p>

Item	Description	Availability	Notes
	<ul style="list-style-type: none"> <li>- Condition of Bridge and Tunnel</li> <li>- Traffic Congestion</li> </ul>		<p>Bridges are normally narrow and short no tunnels in S'wak.</p> <p>Not much congestion outside towns.</p>
(2) Fuel	<ul style="list-style-type: none"> <li>- Situation (Easy/Difficult)</li> <li>- Location of Gas Station</li> <li>- Price</li> </ul>		<p>Gas stations only available in towns.</p>
(3) Limitation	<ul style="list-style-type: none"> <li>- Max. Cargo Weight</li> <li>- Max. Cargo Size (Length, Width, Height)</li> <li>- Time and Procedure of Traffic Restriction for Special Cargo</li> </ul>		<p>To be obtained from Land Transport Department JLN Simpang Tige, Kuching</p>
(4) Temporary Road	<ul style="list-style-type: none"> <li>- Need for Temporary Road (Yes/No)</li> <li>- Specification</li> </ul>	<p>Yes</p>	
(5) Type of Vehicle			



IV. TRAFFIC AND COMMUNICATION

Item	Description	Availability	Notes
<p>1. Domestic Traffic (1) Best Way</p>	<p>Kuching - Sri Aman Kuching - Limbang Kuching - Sarikei Kuching - Kapit</p>	<p>Road Air Road Air/River</p>	
<p>(2) Airplane</p>	<p>Availability for 5 person Kuching - Sri Aman Kuching - Limbang Kuching - Sarikei Kuching - Kapit</p>	<p>Yes</p>	<p>Few times a week, enquire through travel agencies for flight &amp; day's schedules.</p>
<p>(3) Helicopter</p>	<p>Charge, Company Kuching - Sri Aman Kuching - Limbang Kuching - Sarikei Kuching - Kapit</p>	<p>Yes</p>	<p>Hornbill skyways, SON BMO JLN SATOK Kuching Fly all over Sarawak.</p>



Item	Description	Availability	Notes
(4) Boat	Rental Charge, Available Number, Capacity of Passenger (No.) and Equipment ( Kg) - in the vicinities of Sri Aman Limbang Sarikei Kapit	Yes  Yes	Have to be bargain on the spot. Normally small longboats. Seated between 4 - 6 persons. Able to carry light equipments only.
2. Communication	Wireless	Yes	All towns have telephone services. In remote areas wireless can only be available. At Logging camps or S'wak administrative offices (Use have to be requested or negotiated). It is possible to apply for a licence for a wireless set through the Telecoms Dep't, JLN Batu Lintang, Kuching.

V. LABOR CIRCUMSTANCE

Item	Description	Availability	Notes
1. General Labor Condition (1) Labor Law and Regulation	<ul style="list-style-type: none"> <li>- Name</li> <li>- Occupational Safety Regulation</li> <li>- Restriction on Hiring Foreign Labor (Yes/No)</li> <li>- Hiring Condition of Local Labor (Yes/No)</li> </ul>	Yes  Yes  Yes  Yes	1. This can be obtained from the Labour Department. (1) This will be under the Labour Ordinance, Cap 76 Sarawak See sheet attached.
(2) Governmental Authority in charge of Labor	<ul style="list-style-type: none"> <li>- Name</li> <li>- Address</li> <li>- Others</li> </ul>	Yes	(2) The Director Labour Department, EPF Building, Jalan Simpang Tiga Kuching Tel: 082-22261
(3) Social Security System	<ul style="list-style-type: none"> <li>- Workers Accident Compensation Insurance (Yes/No)</li> <li>- Unemployment Insurance (Yes/No)</li> </ul>	Yes  Yes	See sheet attached.

Item	Description	Availability	Notes
(4) Particular Custom of Local Labor  2. Labor Condition	<ul style="list-style-type: none"> <li>- Worship</li> <li>- Bathing</li> <li>- Nap</li> <li>- Others</li> <li>- Working Hour ( /Day, /Week)</li> <li>- Standard Starting Time</li> <li>- Standard Closing Time</li> <li>- Annual Paid Holiday</li> <li>- Month of Fast in 1986, 1987,</li> <li>- Daily Working Time during Fast</li> </ul>	Yes None None None  8 Hrs. 8.00 A.M. 5.00 P.M. 13 days	Times/day, Required hr/time, Influence on Work (Yes/No)  See attached sheet   Details of month of fast cannot be obtained at present normally construction workers will not substain the full fast or not fast at all.
3. Employment Condition	<ul style="list-style-type: none"> <li>- Employment, Dismissal                Procedure Form (Yes/No)</li> <li>- Requirement of Notification                (Yes/No)</li> <li>- Name and Address of Office in                Charge</li> <li>- Dismissal Allowance (Yes/No,                Amount or Rate, if. Yes)</li> <li>- Advance Notice of Dismissal                (Yes/No, Month Advance)</li> <li>- Social Insurance of Employer</li> </ul>	No  Yes  No  Yes  Yes	Labour Department         1 month notice (if no written contract).

Item	Description	Availability	Notes
4. Labor Availability, Wage	<ul style="list-style-type: none"> <li>- Clerk</li> <li>- Typist</li> <li>- Driver</li> <li>- Guardman (including necessity)</li> <li>- Common Laborer</li> <li>- Maid</li> <li>- Cook</li> </ul>	<p>\$395/month  \$335/month  \$315/month  \$335/month  \$285/month  \$200/month</p>	<p>The labour ordinance does not provide the minimum of wages. However the employer must pay rates of wages not less favourable than those established for the trade of industry in the district where the work is carried out.</p> <p>The wages given opposite is based as gov't rates. Private sector might be defferent. Depends on locality where they worked.</p> <p>Unskilled common labourers recruited near logging camps will generally be more higher wages than other areas.</p>

VI. COST ESTIMATION

Item	Description	Availability	Notes
1. Electricity for Construction	<ul style="list-style-type: none"> <li>- Grid Map or Root Map of Transmission Line</li> <li>- Purchase Method of the Electricity for Construction</li> </ul>		Remove areas or sites utilise own generators for electricity supply.
2. Price and Availability of Construction Material and Equipment	<ul style="list-style-type: none"> <li>(1) Construction Material                             <ul style="list-style-type: none"> <li>- Concrete Aggregate</li> <li>- Reinforcement Bar</li> <li>- Steel Materiales</li> </ul> </li> <li>(2) Construction Equipment                             <ul style="list-style-type: none"> <li>- Bulldozer etc.</li> </ul> </li> </ul>	Yes	A number of firms retails heavy machineries.
3. List and Cost Information of Local Contractor for Field Investigation	<ul style="list-style-type: none"> <li>(1) Aerial Survey &amp; Mapping</li> <li>(2) Ground Survey</li> <li>(3) Drilling</li> <li>(4) Seismic Prospecting</li> <li>(5) Laboratory Test</li> <li>(6) Hydrological Survey</li> </ul>	Yes	See sheet attached.

Item	Description	Availability	Notes
4. Compensation for Resettlement	<ul style="list-style-type: none"> <li>- Housing (Unit : Family)</li> <li>- Road (Unit : Meter)</li> </ul>	Yes	
5. Economic Evaluation	<ul style="list-style-type: none"> <li>(1) KW &amp; KWh Value used in the Economic Evaluation at the Feasibility Study Phase of Batang Ai Project</li> <li>(2) Construction Cost per KW &amp; KWh of Batang Ai Project</li> <li>(3) KW &amp; KWh Value used in Mini-Hydro Project (ENEX Report)</li> </ul>	Yes	<p>(1) Refer to economic evaluation notes attached.</p> <p>For further details refer to Batang Ai Offices, SESCO.</p> <p>(2) Same as above.</p> <p>(3) Refer to data attached.</p>

VI. LIVING CONDITION

Item	Description	Availability	Notes
1. Accommodation Lodging. Housing	<p>Hotel - in Kuching</p> <p>- Sri Aman</p> <p>- Limbang</p> <p>- Sarikei</p> <p>- Kapit</p> <p>Rental House/Office</p> <p>- in Kuching</p> <p>- Sri Aman</p> <p>- Limbang</p> <p>- Sarikei</p> <p>- Kapit</p>	<p>Yes</p> <p>"</p> <p>"</p> <p>"</p> <p>"</p> <p>Yes</p> <p>"</p> <p>"</p> <p>"</p> <p>"</p>	<p>Class, Name, Traffic, No. of Room, Room Charge, Address, Tel</p> <p>See sheet attached.</p> <p>Class, No. of Room, Rental Fee, Air Conditioner, Furniture, Contract</p> <p>General information have to be obtained from housing agencies from yellow pages. Contract is normally 1 year. Availability will depend on size of town. Kuching will usually be more expensive than the rest.</p>

Item	Description	Availability	Notes
3. Hygiene (1) Hospital	<ul style="list-style-type: none"> <li>- in Kuching</li> <li>  Sri Aman</li> <li>  Limbang</li> <li>  Sarikei</li> <li>  Kapit</li> </ul>	Yes Yes Yes Yes	Best facilities is only in Kuching. Most towns in S'wak have Gov't Hospitals or clinic. There are also flying doctors to remote villages in the interior. Generally none except for a few cases of denque fever. Enquire through Immigration Dep't or Travel Agencies.
(2) Medicine	<ul style="list-style-type: none"> <li>- Epidemic</li> <li>- Vaccination</li> </ul>		Enquire through Immigration Dep't or Travel Agencies.
(3) Animal and Plant	<ul style="list-style-type: none"> <li>- Poisonous, Harmful, Animal</li> <li>- Poisonous, Harmful, Plant</li> <li>- Others</li> </ul>	Yes	But very few. Enquire through Tourist Information Center, Kuching Tel. 082-56575
4. Outdoor Safety at Night Curfew Time		None	Only security areas under Rascom in the 3rd Division. No curfew.



## II. INPORTATION

### (1) CUSTOMS ORGANISATION

Address: The Director  
Custom & Excise Department  
Jalan Geoung  
Kuching  
Tel: 082-33133

The Custom & Excise Department Hq is in Kuching.

Each division has its own divisional office.

1st & 2nd Division (Sil Aman)

Kuching Tel: 082-33133

3rd & 7th Division (Sarikei & Kupit)

Sibu Tel: 084-33342

5th Division

Limbang Tel: 085-21377

The customs clearances and procedure is the same for all of Sarawak. Information can be obtained from the Kuching office, the address which is given above.

### (2) CUSTOMS CLEARANCE

By Sea - From ports

By Air - Through aircargos

### (3) CUSTOMS BROKER

There are a number of freightforwarding companies around Sarawak. These will assist in Customs declaration & clearance.

Kuching - (i) Burmikargo Agency  
1st Floor  
122, Jln Serama  
Kuching  
Tel: 082-36205

(ii) Zainon Shipping Son  
186, Jln Paoungan  
Kuching  
Tel: 082-483 652

(iii) R. T. Cargo

This company has done SESCO's remove  
to new HQ in Kuching and also for  
Batang Ai project.

The company can handle goods  
worldwide and also local  
transportations.

For entire addresses refer to the yellow pages of the  
Telephone Directory.

(4) PROCEDURE

- |   |   |
|---|---|
| - Tariff (possibility<br>for exemption) | - Exemption of imported goods<br>applied but has to apply<br>through SESCO for obtain<br>exemption. |
| - Procedure, time                       | - Usually between 2 - 3 days<br>but not more than a week.   |

- Special item (contrabanded goods & protected goods)
- List of protected good to obtain from this department.  
Importer have to apply license to import from the  
Ministry of Trade  
Bank Negara  
Kuching.
- Procedure for return equipment
- For goods imported into the country but after completion of projects to be exported will incur no duty but must send a guarantee to the Ministry of Trade.
- Clearance Fee
- Depends on goods same base on tonnages same as number machineries will be based on numbers.

For private companies trying to import goods into the country, it will be under "temporary import". It will be advisable to write to this department mentioning the items to import, the basis of import, with a list (a catalogue) of the items required as the AP (application permit), rate of import duty, sales tax and surtax. Reply will usually be between 2 - 3 weeks. Items to be imported will be under duty tax, surtax, and sales tax. For example, machineries

will incur sales tax or surtax.

## V. LABOUR CIRCUMSTANCE

### (1) LABOUR LAW & REGULATION

- Generally first preference will be given to Malaysian domiciled in Sarawak. Employers required foreign workers will have to apply through the labour dept. with reasons to recruit foreign workers and recommendations from SESCO to support the applications. Unskilled labour may be recruited in Sarawak. The above only applied to foreign skilled labours. For foreign executive posts (i.e. professionals, managers, etc.) approval has to be channelled through Immigration Department, Jalaus Simpang Tiga, Kuching. Recommendations and reasons have to be supplied to hire foreign professionals to obtain the work permit. Malaysians domiciled outside Sarawak has to obtain the appropriate approval from the relevant departments to work in Sarawak.

#### Occupational Safety Regulations

- this can be obtained from

the FACTORY MACHINERY DEPARTMENT,  
YUN PHING  
JLN  
KUCHING  
TEL: 082-23387

Employers are to provide medical facilities are 1st Aid on work sites. Where sites are remote from any clinic or hospital, the employers are to provide medical treatment on set up a clinic.

(3) SOCIAL SECURITY SYSTEM

- Workers Accident Compensation

There is an Act (section Act 1952) that covers the concept of compensation to be paid to the workers injured

- Unemployment Insurance

This is under Section 11, Labour Ordinance.

Due to the employer unable to provide works due to the employer's faults but still retain the labourers for works amount to less than 5 1/2 days works the employer must pay a full week's wages. Negligence to this, the employer will be liable to a fine of M\$1,000/-.

(Note: a lot of local contractors employ labourers on a daily paid basis)

(4) PATICULAR CUSTOM OF LOCAL LABOUR

- Worship

There are a number of religion practiced. However this will bear little difference on site works as most labourers will work everyday of the week except Sunday.

The employer shall in on dealings with labour in his employ will have to observe recognised festivals, days of rest and religious on other customs.

The Chinese will have a few festivals in a year and although this is not a public holidays, they will absence from work to celebrate it. This only applied to site labourers not office workers.

Generally common labourers as constructions sites will work 6 days week, office workers will generally work 5 1/2 days and only observed the public holidays.

The yearly public holidays can be obtained from the S'wak Gov't Announce, common labourers will generally work during these public holidays, common labourers will not normally take holidays.

Note: Employers have to provide transport to these workers if they recruit them in one location but requiring them to work in other regions. Transport have to be provided both ways (to & fro)

VI. COST ESTIMATION

- (1) PENGUASA  
JABATAN TANAH OAN URJR  
BAHAGIAN PERTAMA  
KUCHING - this is a gov't department  
(land & survey department)  
that would have the  
survey & mapping of S'wak.
- (2) PENGUASA  
JABATAN PENYIASATAN  
KAJIBUMI  
P.O. BOX 560  
JAN WAN ABOLRAHMAN  
KUCHING - this is a gov't Geological  
Survey Dep't. Information  
can be obtained from the  
office.  
It also has a library  
TEL: 082-20152
- (3) These are all private firms in Sarawak. For other  
firms outside Sarawak, information & adresses can be  
obtained in the Telephone Directory yellow pages.
- (i) GEOTECHNIQUE EAST MALAYSIA SON BHO - Consultant  
8T, JLN ONG KEE HCL  
KUCHING  
TEL: 082-53468
- (ii) SEA & LAND DRILLING CONTRACTORS - this is a private  
drilling contractors  
(FAR EAST) INC  
SSG MARINE BASE  
MIRI  
TEL: 085-32574
- (4) GEOTECHNIQUE EAST MALAYSIA SON BHO - this firm does  
8T, JLN ONG KEE HUL  
KUCHING prospecting in  
East Malaysia  
TEL: 082-53468

(5) GOVERNMENT ANALYTICAL LABORATORY  
SERAMA ROAD  
KUCHING

JABATAN PARIT & TALIAH - this is the government drainage  
KUCHING & department.

They published the hydrological  
yearly

## VII. LIVING CONDITION

### HOTEL - Kuching

AURORA HOTEL  
MACDAUGAL ROAD  
P.O. BOX 200  
KUCHING  
TEL: 082-20281

In centre of town, with a Japanese restaurant.

Middle class, 86 rooms, air conditioned  
and fully carpeted.

HOLIDAY INN  
JLN TUNRU ABU RAMMAN  
P.O. BOX 2362  
KUCHING  
TEL: 082-23111 & 20277

Centre of town. International class. 325

air-conditioned rooms and suites.

COUNTRY VIEW HOTEL  
JLN TAN SRI DATUR ONG KEE HU  
KUCHING

Middle class. Near town air-conditioned.

Include 1 nightclub.



HOTEL - SRI AMAN

HOOVER HOTEL  
SRI AMAN

ALIBAN HOTEL  
SRI AMAN

Hotels in Sri Aman are in the lower class.

Air-conditioned rooms with showers. Small hotels

- LIMBANG

MUHIBBAH INN  
BANK STREET  
P.O. BOX 37  
LIMBANG  
TEL: 085-22488, 085-22482

Lower class. Only good one in Limbang.

Centre of town. 34 air-conditioned rooms with bathroom  
attached.

- SARIKEI

AMBASSADUR HOTEL  
54 JLN REPUK  
SARIKEI  
TEL: 084-51264

RAJANG HOTEL  
1 JLN MASJIO  
SARIKEI  
TEL: 084-51096

These are lower class hotels and only available  
in Sarikei.

- KAPIT

MELIGAI HOTEL  
JLN AIRPORT  
KAPIT  
TEL: 084-96611

Centre of Kapit. Middle class with air-conditioned  
rooms & bathroom attached. 41 rooms with a pub.

## 8. 現地訪問先

### (a) 予備調査

機 関 名	氏 名	職 位
経済企画庁 (EPU: Economic Planning Unit, K.L.)	Ali Abul Hassan	Director of Infrastructure Department
洲経済企画庁 (SPU: State Planning Unit, Kuching)	Jamil Mukim	Deputy Director of Development
	Chai Sin Onn	Principal Ass. Secretary
サラワク電力供給公社 (SESCO: Sarawak Electricity Supply Corporation, Kuching)	Soon Choon Huie	Chief Engineer (Civil/Hydro)
	Yong Kiong Choon	Senior Civil Engineer
	Ng Yiew Tsiung	Acting Senior Civil Engineer
	Bernard Suling	Civil Engineer
	Sim See Sheng	Civil Engineer
	*: サイト踏査に同行	
	(Sri Aman)	Danice Endawie Ita
(Batang Ai)	Sim Hang Kiang	Acting Senior Electrical Engineer
	Steven Wan	Project Manager
(Sarikei)	Sia Yuk Siew	District Engineer
在マレーシア日本大使館	岡 原 美知夫	一等書記官
JICA K.L. 事務所	中 村 信	所 長
	岩 佐 光 男	副所長
	中 川 泰 二	所 員

MOJV（前田・奥村  
ボタンアイ水力発電  
プロジェクト）事務所

間 宮 達 雄  
佐 藤 博 三  
小野寺 昭 夫  
外 村 欣 二  
竹 上 勝 男

担当重役  
副所長  
第一工事部長  
事務課長  
（奥村組クチン事務所長）

(b) 事前調査

予備調査にて会わず、事前調査にて新たに面会した関係者は以下の通りである。

機関名 EPU	Dr. Mohd Noor HJ Harun	Director of Infrastructure Section
	Miss Leong So Seh	Principal Assistant Director of Infrastructure Section
	Madam Wong Peg Har	Principal Assistant Director of External Assistance Section
連邦、エネルギー 電気通信郵便省 (Ministry of Energy, Telecommunication & Post, KL)	Ahmad Latff Hashim	Principal Assistant Secretary
サラワク、インフラ ストラクチャー開発省 (Ministry of Infra- structure Develop- ment, Sarawak)	HJ Bujang Mohidin Jol	Permanent Secretary
SESCO	Lai	General Manager
	Ling	Deputy General Manager
JICA K.L. 事務所	今井 建一	所員





JICA