

TABLES

Table 1 LOCATION OF VILLAGE INTERVIEWED^{/1}

Code of Location	Villages Interviewed	Tributary/River	Grid
SI	Poring/Ranau	Mamut/Sugut	116°43'/6°03'
SII	Singaran Baru	Meroli/Sugut	116°48'/6°03'
SIII	Merungin 1	Sugut	116°53'/6°08'
LI	Kirakot/Ranau	Kirakot/Melent	116°30'/5°49'
LII	Nabutan/Ranau	Liwagu/Labuk	116°49'/5°52'
LIII	Telupit	Liwagu/Labuk	117°10'/5°37'
PI	Tuarittot/Keningau	Pegalan/Padas	116°10'/5°16'
PII	Senagang/Keningau	Musolog/Pegalan	115°59'/5°19'
PIII	Bunuk/Tenom	Pegalan/Padas	115°58'/5°08'
PIV	Mentaniur Besar	Padas	115°48'/5°20'
PV	Gadong	Padas	115°36'/5°21'
MI	Moyog	Moyog/Puputan	116°14'/5°53'
MII	Pagonog	Moyog/Puputan	116°11'/5°53'
BI	Long Melinau	Tutoh	114°50'/4°00'
BII	Long Lama	Baram	114°30'/3°45'
RI	Belaga	Rajang	113°45'/2°45'
RII	Kapit	Rajang	112°55'/2°01'
RIII	Kanowit	Rajang	112°09'/2°06'
SaI	Serikin	Serikin/Sr. Kanan	111°00'/1°20'
SaII	Batu Kitang	Sarawak	110°16'/1°27'
KI	Biawak	Biawak/Ulu Kyang	109°41'/1°37'
KII	Stungkor	Kayang	109°57'/1°30'
KIII	Stunggeng	Kayang	109°52'/1°39'

Remark: ^{/1} Informations of BI, BII and RI are referred from the results of field surveys (Refs. 3 and 5).

Table 2 DISTANCE OF VILLAGES INTERVIEWED
FROM RIVER MOUTHS

Distance (km)	Code of Location
0 - 20	MII
21 - 40	PV, MI ^{/1} , KIII
41 - 60	SaII, PIV
61 - 80	KI ^{/1}
81 - 100	KII
101 - 120	SaI ^{/1} , PIII
121 - 140	RIII, LIII, PII ^{/1}
141 - 160	SIII
161 - 180	PI, SII
181 - 200	SI ^{/1}
201 - 220	LII, RII
221 - 240	BII
241 - 260	LI ^{/1} , BI ^{/1}
261 - 280	RI, BI ^{/2}
281 - 300	RI ^{/2} , BI ^{/2}
301 - 400	RI ^{/2}
401 - 500	RI ^{/2}

Remark: /1 Located in the middle-upper zones as shown in Table 3.

/2 The field survey areas of these locations covered those ranges.

Table 3 ZONING OF RIVERS INTERVIEWED^{/1}

Code of Location	Mean Gradient ^{/2}	Zone
SI	5.1	Upper Zone
SII	2.4	Lower Zone
SIII	< 2.2	Lower Zone
LI	1.8 - 3.3	Lower - Middle Zone
LII	< 2.2	Lower Zone
LIII	< 2.2	Lower Zone
PI	< 2.2	Lower Zone
PII	1.7 - 2.8	Lower - Middle Zone
PIII	< 2.2	Lower Zone
PIV	< 2.2	Lower Zone
PV	< 2.2	Lower Zone
MI	2.4 - 4.9	Middle - Upper Zone
MII	< 2.2	Lower Zone
BI	< 2.2 ~ 2.3 - 4.5	Lower, Middle Zone
BII	< 2.2	Lower Zone
RI	< 2.2	Lower Zone
RII	< 2.2	Lower Zone
RIII	< 2.2	Lower Zone
SaI	0.9 - 3.2	Lower - Middle Zone
SaII	< 2.2	Lower Zone
KI	2.4 - 4.8	Middle - Upper Zone
KII	< 2.2	Lower Zone
KIII	< 2.2	Lower Zone

Remarks; ^{/1}: Zonation of the river is taken the classification method based on mean gradient (SL10).

^{/2}: The river is zoned by the following range of mean gradient: elevation/distance = m/km

Upper tributaries	78%	≤	M.G.
Upper Zone	4.7	≤	M.G. < 78
Middle Zone	2.2	≤	M.G. < 4.7
Lower Zone			M.G. < 2.2

Table 4 FISHES LISTED BY INTERVIEW SURVEY (1/9)

Code	Scientific Name	Local Name
Engraulidae		
A1	<i>Septipinna melanochir</i> (Bleeker)	Nyual ⁺ , Luyan ⁺ , Luangtutung ⁺ , Empirang ⁺ , Pupu ⁺ , Puput ⁺ , Belantok ⁺
Mastacombelidae		
B1	<i>Macragnathus aculeatus</i> Valenciennes	Gonjong ⁺
B2	<i>Mastacombelus armatus</i> (Lacépède)	Salan [*] , Sungkok [*] , Purosok [*] , Gelosok [*] , Tilan ⁺ , Bajek ⁺
B3	<i>M. crythnotaenis</i>	Telan
B4	<i>M. maculatus</i> Valenciennes	Tilan ⁺ , Telan ⁺ , Helan ⁺ , Solong ⁺
B5	<i>M. unicolor</i>	Tilan ⁺
Anguillidae		
C1	<i>Anguilla</i> sp. (3 types including <i>A. bicolor pacifica</i> , <i>A. borneensis</i> and <i>A. marmorata</i>)	Rolou [*] , Sinsilok [*] , Kacili [*] , Kacilik [*] , Basusong [*] , Bedong ⁺ , Berdong, Pengorak boroh
Synbranchidae		
D1	<i>Fluta alba</i> (Ziew)	Lindung [*] , Lindong [*] , Bedong
Notopteridae		
E1	<i>Notopterus</i> sp (2 types including <i>N. chitala</i> and <i>N. notopterus</i>)	Belida ^{*+} , Belidak ^{*+} , Belid ⁺
Cyprinidae		
F1	<i>Chela oxygastroides</i> (Bleeker)	Lipis ⁺
F2	<i>Macrochirichthys macrochyrus</i> (C.&V.)	Tamus [*] , Parang ⁺
F3	<i>Nematabramis everetti</i> Boulenger	Lumpis [*] , ? ⁺
F4	<i>Oxygaster</i> sp. (4 types including <i>O. anomalura</i> , <i>O. oxygastroides</i> , <i>O. pointoni</i> and <i>O. sp</i>)	Lalang ^{*+} , Kalalang [*] , Taya ⁺ ,
F5	<i>Esomus goddardi</i> Ahl	Bilis payou ⁺
F6	<i>Luciosoma bleekeri</i> Steindachner	Lompahagon [*] , Randak [*] , Seluang ⁺
F7	<i>L. pellegrini</i> Popta	Magau [*]
F8	<i>L. setigerum</i> (C&V)	Selnang ⁺

Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 5 FISHES LISTED BY INTERVIEW SURVEY (2/9)

Code	Scientific Name	Local Name
F9	Rasbora sp. (8 types including R. argyrotaenia, R. dusionensis, R. einthoveni, R. elegans, R. myersi, R. sumatrana, R. volzi and R. sp.)	Lontoi*, Lantaian*, Galais*, Seluang ⁺ , Panjut ⁺ , Enjual ⁺ , Doyai ⁺
F10	Filirasbora rubripinna Fowler	Makalou*
F11	Cirrhinus lineatus Smith	Remaik*
F12	Cyclocheilichthys apogon (Valenciennes)	Putain*, Popolzan*, Boeng ⁺ , Boant ⁺ , Baeng ⁺ , Turing ⁺ , Paat
F13	C. repasson (Bleeker)	Megas*, Matulang*?, Biran*
F14	C. mekongensis Fowler	Boeng ⁺
F15	Epalzeorhynchus kalliurus Smith	Batduan*, Betuan*
F16	E. kallopterus	Salasak*, Seliwang*, ? ⁺
F17	E. sp	Binkaratan*
F18	Garra borneensis (Vaillant)	Batduan Kecil*, Mekalou*, Batovan ⁺ , Sedakot ⁺ , ? ⁺
F19	Hampala dispar	Babankan*, Lakang*
F20	H. macrolepidota van Hasselt	Barop*, Barob*, Garap*, Palian*, Bankan, Bandai
F21	H. macrolepidata sabana	?*, Adong ⁺ , Dungan ⁺ , Juluh ⁺
F22	H. macrolepidata bimaculata Popta	?*, ? ⁺
F23	Labes pleurotaenia	?*
F24	Labocheilus bo (Popta)	Sarawi*, Selauyee*, Bugudan*, Kolong ⁺ , Batu ⁺
F25	Leptobarbus hosii (Regan)	Sada*, Kulong ⁺
F26	L. melanotaenia Boulenger	Bakoloi*, Kulong ⁺
F27	Morulius chrysophekadion (Bleeker)	Sayan ⁺
F28	Mystacoleucus sp	Rangan*
F29	Osteochilus hasselti (C&V)	Kudinghang*, Bantak ⁺ , Engareh ⁺ , Umayang ⁺
F30	O. kahajanensis	Bantah ⁺
F31	O. melanopleura (Bleeker)	Mata Merah ⁺
F32	O. microcephalus (Valenciennes)	Bantah ⁺ , Engarek ⁺
F33	O. prosemion Fowler	Metulang*, Basalayan*, Busulayan*, Vavutang*, Purut*
F34	O. spilurus (Bleeker)	Bantak,
F35	O. vittatus (Valenciennes)	Lamik*, Lumalabus*, Buntal*, Palau ⁺ , Ikan piet ⁺ , Bantak ⁺

Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 6 FISHES LISTED BY INTERVIEW SURVEY (3/9)

Code	Scientific Name	Local Name
F36	<i>O. sp</i>	Mulid
F37	<i>Paracrossochilus sp</i>	?+
F38	<i>Probarbusjullieni</i> Sauvage	Belabau ⁺
F39	<i>Puntioplites protozystron</i> (Bleeker)	Tawaan [*] , Kuras [*] , Jalawa, Pausk
F40	<i>Puntius altus</i> (Günther)	?+
F41	<i>P. binotatus</i> (Valenciennes)	Lembugou [*] , Paparakan [*] , Puteh ⁺ , Banggah ⁺ , Bautok ⁺ , Tevering ⁺
F42	<i>P. Bramoides</i> (Valenciennes)	Lontong [*] , Salap [*] , Kachong ⁺
F43	<i>P. bulu</i> (Bleeker)	Mu [*] , Mengalan ⁺ , Teven-alan ⁺
F44	<i>P. collingwoodi</i> (Günther)	Babauah ⁺
F45	<i>P. douronensis</i>	?+
F46	<i>P. gonionotus</i> (Bleeker)	Botang ⁺ , Lampan Siam ⁺
F47	<i>P. javanicus</i>	Patian [*] , Lampan Jawa ^{*+}
F48	<i>P. orphoides</i> (Valencinnes)	Rongoi [*] , Pipi Merah ⁺
F49	<i>P. schwanefeldi</i> (Bleeker)	Tepiat ⁺ , Kapiat ⁺ , Tengadek ⁺ , Tengadak ⁺ , Halap ⁺
F50	<i>P. sealei</i> (Herre)	Turongou [*] , Urongou [*] , Tongou- Ongou [*]
F51	<i>P. stigmatosomus</i>	Tokogangan ⁺
F52	<i>P. tambroides</i>	?+
F53	<i>P. sp</i>	Tigas [*]
F54	<i>Tor douronensis</i> (Valenciennes)	Belian [*] , Empurau ⁺ , Semah puteh ⁺ , Tangos ⁺ , Tevala ⁺
F55	<i>T. tamboides</i> (Bleeker)	Semah ⁺ , Nyaran ⁺
Chinese Carps		
G1	<i>Cyprinus carpio</i> (Linn)	Lee Koh ⁺
G2	<i>Arychthys nobilis</i> (Richardson)	Kap. Kepala besar
G3	<i>Ctenopharyaodon idellus</i> (C&V)	Kap. Rumput
Gastromyzontidal		
H1	<i>Gastromyzon borneensis</i> Günther	Rokot [*] , Dokot [*] , Dekat [*] , helekap ⁺
H2	<i>G. nieuwenhuisi</i>	?+
H3	<i>G. sp</i>	?+

Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 7 FISHES LISTED BY INTERVIEW SURVEY (4/9)

Code	Scientific Name	Local Name
H4	<i>Parhomaloptera microstoma</i> (Boulenger)	Kerekap ⁺
H5	<i>Protomyzon aphelocheilus</i>	? ⁺ (Rokot)
	Hamalopteridae	
I1	<i>Homaloptera orthogoniata</i>	? ⁺
I2	<i>H. weberi</i> Hora	Silong wair [*] , Parat [*] , Beladus [*] , Lempakang [*] , ? ⁺
I3	<i>H. sp</i>	? ⁺
	Cobitidae	
J1	<i>Acanthopthalmus sp</i>	Burgai ruing ⁺ , Tangga Keling ⁺
J2	<i>Botia hymenophysa</i> (Bleeker)	Tontowadok [*]
J3	<i>Botia sp.</i>	Empalasi ⁺ , Masehtuseng ⁺
J4	<i>B. sp</i>	Gangarak ⁺
J5	<i>Nemachilus faciatus</i>	? ⁺
J6	<i>N. olivaceus</i> Boulenger	Bulugut [*] , Tangkilaus [*]
J7	<i>N. selangoricus</i> Duncker	Binkaran [*] , I.Patarmulong ⁺
	Siluridae	
K1	<i>Memisilurus scleronema</i>	Silua ⁺
K2	<i>Kryptopterus apogon</i> (Bleeker)	Korumbatang [*] , Kalipata [*] , Lais ⁺ , Amaes ⁺
K3	<i>K. bleekeri</i> Günther	Kalipata [*] , Lais [*]
K4	<i>K. Cryptopterus</i> (Bleeker)	Lais [*] , Seluah ⁺
K5	<i>K. limpok</i>	Luyang ⁺ , Lipid ⁺
K6	<i>K. parvanalis</i> Inger and Chin	Lais [*] , Lajong ⁺ , Keluwah ⁺
K7	<i>K. sp₁</i>	Lair [*]
K8	<i>K. sp₂</i>	Empilut ⁺ , Kawit usang ⁺
K9	<i>K. sp₃</i>	Belanang ⁺ , Rottan ⁺ , Subong Jagui ⁺
K10	<i>Ompok fimaculatus</i>	Yaloah ⁺
K11	<i>O. Sabanas</i> Inger and Chin	Lais [*]
K12	<i>Wallago sp</i> (3 types)	Tawi [*] , Tapah ⁺ , Batutak [*] , Lalarat [*] , Kolinpatat [*] , Tapaha ⁺

Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 8 FISHES LISTED BY INTERVIEW SURVEY (5/9)

Code	Scientific Name	Local Name
Clariidae		
L1	<i>Clarias batrachus</i> (Linnaeus)	Puntot*, Kali*, Gemutan*, Bokuk+, Keli+, Berlagan+
L2	<i>C. macrocephalus</i> Günther	Bokuh+, Keli+
L3	<i>C. striatus</i>	Gemutan*, Gamutan*, Kali*
L4	<i>C. teysmanni</i> Bleeker	Gemboi*, Putot+
Bagridae		
M1	<i>Bagroides macracanthus</i> Bleeker	Kemidan+, Sakan+
M2	<i>Heterobagrus bocourti</i> Bleeker	Ikan Tiang Layan+
M3	<i>Leiocassis micropogon</i> (Bleeker)	Tungkarin*, Konkoling*
M4	<i>L. robustus</i> Inger and Chin	Fifin*
M5	<i>L. siamensis</i> Regan	Bondek+, Asarburak+?
M6	<i>L. sp</i>	Ikan Tikus+
M7	<i>Mystus baramensis</i> (Regan)	Kuyugor*, Baung*+
M8	<i>M. cavasius</i> (H-B)	Sepong*, Baung*+, Karoang+
M9	<i>M. numerus</i> (Valenciennes)	Sepong*, Bubong*, Bugudan*, Luat*, Baung*+, Baung puteh* Klamu+
M10	<i>M. planiceps</i> (Valenciennes)	Tugat*, Tikon*, Baungkunig*
M11	<i>M. rhegma</i> Fowler	Baeng+, ?+
M12	<i>M. sabanus</i> Inger and Chin	Sepong*, Baung*+, Teken+
M13	<i>M. wychii</i> (Bleeker)	Tebee+, Buluk+
M14	<i>M. sp</i>	Bangkok*
Sisoridae		
N1	<i>Glyptothorax major</i> (Boulenger)	Kuyuntong*, Payuntong*, Potik+
N2	<i>G. trilineatus</i> Blyth	Bunbugut*, Potik+, Ikan Buta
N3	<i>G. sp</i>	Ikan lalang
Pangasiidae		
O1	<i>Pangasius dezwanii</i>	?+
O2	<i>P. larnaudii</i> Bocourt	Kapal*, Liwak*, Patin+, Tikan+
O3	<i>P. macronema</i> Bleeker	Tebungoh*?, Lawang*, Kapan*, Lawik*, ?+

Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 9 FISHES LISTED BY INTERVIEW SURVEY (6/9)

Code	Scientific Name	Local Name
04	<i>P. nieuwenhuisi</i> (Popta)	Lawang*, Labang ⁺ , Selarang ⁺
05	<i>P. pangasius</i> (H-B)	Gegagok*, Dalak*, Patin*
06	<i>P. siamensis</i> Steindachner	Buris ⁺ , Buhi ⁺
07	<i>P. tubbi</i> Inger and Chin	Kapal*, Patian*, Lawek ⁺
08	<i>P. sp</i>	Lajong ⁺
Ariidae		
P1	<i>Arius maculatus</i> (Thunberg)	Belukang ⁺ , Badukang ⁺
P2	<i>A. microcephalus</i> Bleeker	Belukang ⁺
P3	<i>Batrachocephalus mino</i> (Hamilton)	Lundu ⁺
Hemiramphidae		
Q1	<i>Dermogenys pusillus</i> van Hasselt	Penjulong ⁺
Q2	<i>Hemirhamphodon pogonognatus</i>	Suroi*, ? ⁺
Q3	<i>Hemirhamphus xenetodon</i>	Kenyulong ⁺ , Usung Aru ⁺ , Stokok ⁺
Ophicephalidae		
R1	<i>Channa gucha</i> (H-B)	Sakak*, Banggal*, Ketayak ⁺
R2	<i>Channa striatus</i> Bloch	Paung*, Badus*, Haruan*, Blau ⁺ , Aruan ⁺ , Dodoek ⁺ , Tiong ⁺
R3	<i>Ophicephalus melanosoma</i> Bleeker	Pangal*, Udun ⁺ , Bdun ⁺ , Ikan Bah ⁺ , Toman ⁺ , Levut ⁺ , Dayo ⁺
Syngnathidae		
S1	<i>Dorichthys deokhatoides</i>	? ⁺
Anabantidae		
T1	<i>Anabas testudinus</i> (Bloch)	Karoh*, Tarok*, Puyu ⁺ , Batok ⁺ , Betok ⁺ , Tevaring ⁺
T2	<i>Helostoma temmincki</i>	Biawak*, Tamaing*, Biawang ⁺
T3	<i>Osphronemus goramy</i> Lacépède	Baatik*, Kalui* ⁺ , Kaloh ⁺
T4	<i>Trichogaster pectoralis</i> (Regan)	Bakalou*, Sepat Siam* ⁺ , Appat Pali
T5	<i>T. trichopterus</i> (Pallas)	Sepat* ⁺ , Sepat padi ⁺ , Loyan ⁺
T6	<i>Trichopsis vittatus</i> (C&V)	Tankek ⁺

Remarks; * : Local names in Sabah,
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Table 10 FISHES LISTED BY INTERVIEW SURVEY (7/9)

Code	Scientific Name	Local Name
	Nandidae	
U1	<i>Nandus nebulosus</i> (Gray)	Rigoh ⁺ , Kitang ⁺ , Tukuduk ⁺ , Amorkok ⁺ , Lingo ⁺
	Contropomidal	
V1	<i>Chanda siamensis</i> Fowler	Keridin ⁺
V2	<i>C. wolfii</i>	Ikan Antu ⁺
	Toxotidae	
W1	<i>Toxotes chatareus</i> (Hamilton)	Sumpit ⁺ , Pejawan ⁺
	Belonidae	
X1	<i>Xenentodon cancila</i>	Banau*, Setokuh ⁺
X2	<i>X. cancelloides</i>	Kenyulong ⁺ , Sejulong ⁺ , Nyulongayas ⁺ , Nyulong ⁺
	Lutianidae	
Y1	<i>Lutianus argentimaculatus</i> (Forskol)	Merah ⁺
	Pristolepidae	
Z1	<i>Pristolipis fasciatus</i> (Bleeker)	Empelekong ⁺ , Engkerinsang ⁺ , Patong ⁺
	Eleotridae	
ZA1	<i>Oxyeleotris marmoratus</i> (Bleeker)	Karupan*, Bakut*, Bintutuk*, Perati*, Betutu ⁺ , Bertutu ⁺ , Dayau
	Gobiidae	
ZB1	<i>Ctenogobins ocellatus</i> (Fowler)	Tuytuy gandung*
ZB2	<i>C. mekongianus</i> (P&F)	Bongoi ⁺
ZB3	<i>C. sp</i>	Bukuh*, Bakut*, Bukuk*, Puchong*
ZB4	<i>Periophthalmodon tredecemradiatus</i> <i>borneensis</i> (Bleeker)	Labi labi*
ZB5	<i>Cynoglossus sp</i>	Ikan Daun ⁺ , Lidah ⁺ , Daun buluh ⁺
ZB6	<i>Glossogobius giuris</i> (Hamilton)	Bekut ⁺

Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 11 FISHES LISTED BY INTERVIEW SURVEY (8/9)

Code	Scientific Name	Local Name
	Tetraodontidae	
ZC1	Tetraodon sp (3 types including T. leiurus, T. fluviatilis, T. cutcutia)	Bunanak*, Buntal ⁺ , Boangajan ⁺ , Bontai ⁺
	Soleidae	
ZD1	Synaptura sp	Pait*
	Mugilidae	
ZE1	Mugil sp	Belanah* ⁺ , Lomik*, Beluan Kumura ⁺
	Megalopidal	
ZF1	Megalops cyprinoides (Brouss)	Bulan, Bulan ²
	Cichlidae	
ZG1	Tilapia sp	Karapia*

Following local names are not identified by scientific names.
Some of them are considered to overlap to other names.

Lawis Suluh*, Tumotobun*, Balasayan*, Buntol*, Garasikap*, Telin*, Emus*, Solonsong*, Batuk*, Talian*, Bubohan*, Hihinsok*, Panjut⁺, Entebuloh⁺, Luang tutung⁺, Luang Pid⁺, Ensuluai⁺, Nyaren⁺, Julini layah⁺, Hanyen⁺, Musai⁺, Tepasan⁺, Ikan padi⁺, Buki⁺, Lanong⁺, Kepirah⁺, Selum⁺, Belaoh⁺, Puteh (Putie)⁺, Sakam (Baong)⁺, Hand⁺, Pekalong⁺, Lejo hugie⁺, Kedoboh⁺, Lekat (Masih brto)⁺, Pangkong⁺, Along , Along⁺, Lelepai⁺, Ikan Bulu-bulu⁺, Buabilut⁺, (Guppy)⁺, Ternepony⁺, Silua⁺, Urang⁺, Goliang⁺, Pukut Parim⁺, Jeluang⁺, Ikam Tebuing⁺, Ikan Amporgong⁺, Ikan work⁺, Katah porma⁺, Tuerkuduk⁺, Elong (mugil)⁺, Serok⁺

Followings are shells, crabs, shrimps an other animals which can be caught by riverine fishing.

ZH1	Freshwater prawns (Macrobrachium sp)	Gipan*, Pasik*, Udanggalah ⁺
	Shrimps (2 types)	Gipan*, Udang kecil ⁺ , Udang Inang
	Snails	Tuntul*, Turguang ⁺
	Crabs	Ketan*, Puah*, Kuyaoh ⁺
	Turtles (2 types)	?*, Buduh ⁺
	Tortise (3 types)	Daoh, Tekura

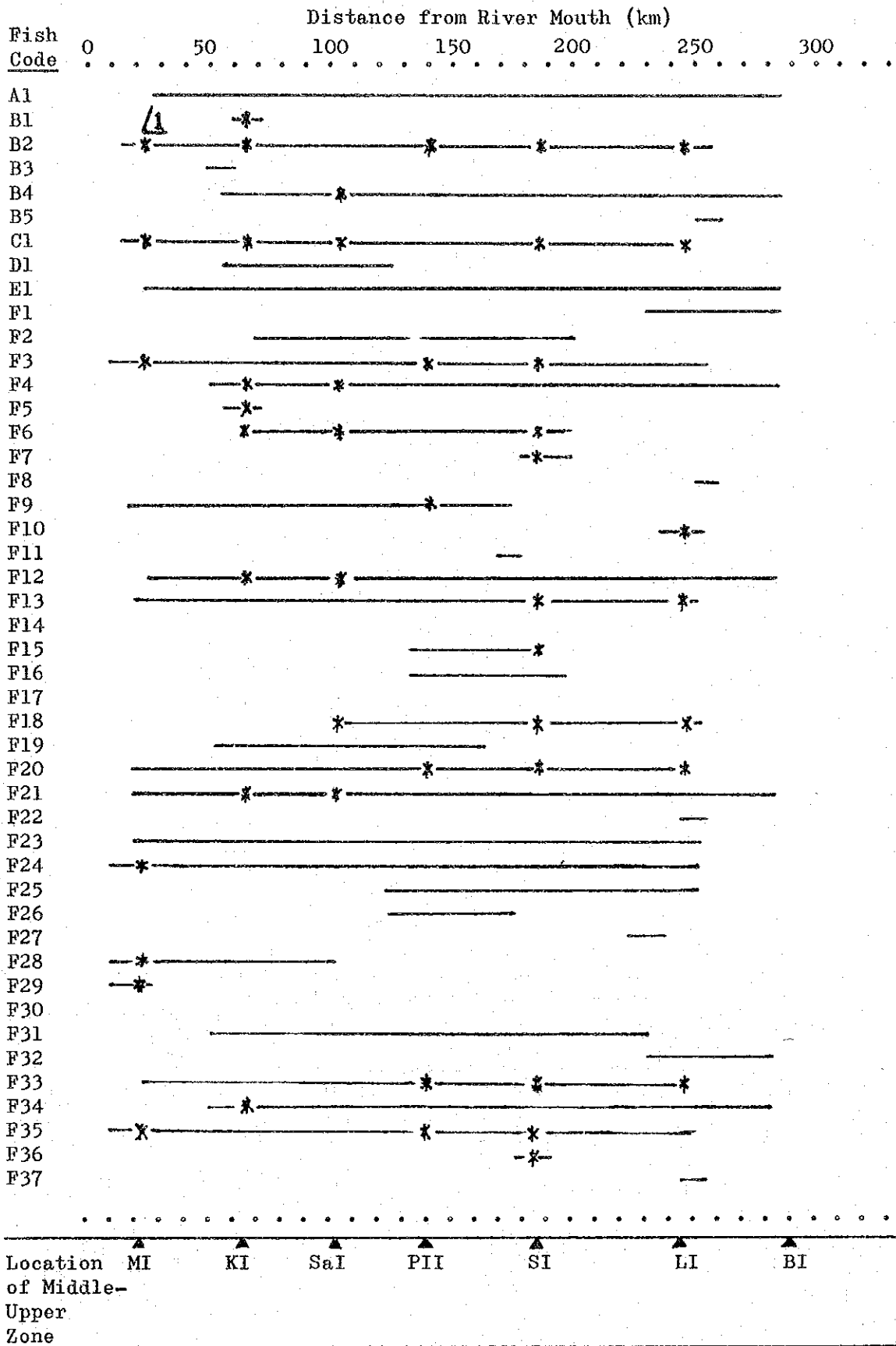
Remarks; * : Local names in Sabah,
+ : in Sarawak

Table 12 FISHES LISTED BY INTERVIEW SURVEY (9/9)

Code	Scientific Name	Local Name
Followings are marine or brackish water fishes which can be caught by riverine fishing.		
Perangu*, Duai ⁺ , Manchong ⁺ , Senaging ⁺ , Yu ⁺ , Parir ⁺ ,		
Tinggriri ⁺ , Karapu ⁺ , Trusan ⁺ , Palan ⁺ , Panjan ⁺ , Bilis ⁺ , Mera ⁺ , Siar ⁺ , Sembiran ⁺ , Belanak sembawa (milk fish) ⁺		

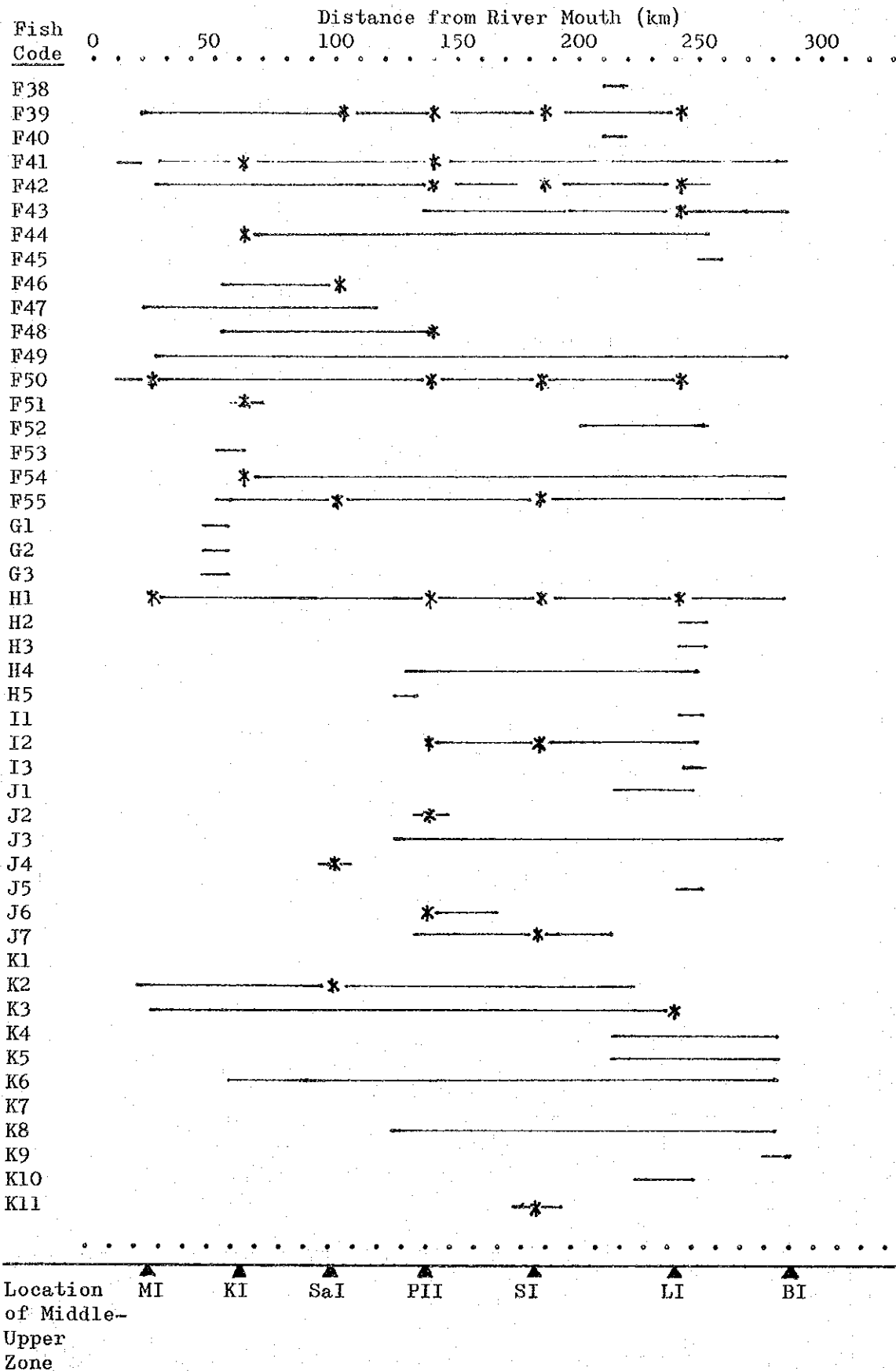
Remarks; * : Local names in Sabah,
 + : in Sarawak

Table 13 LONGITUDINAL DISTRIBUTION OF FISHES LISTED (1/4)



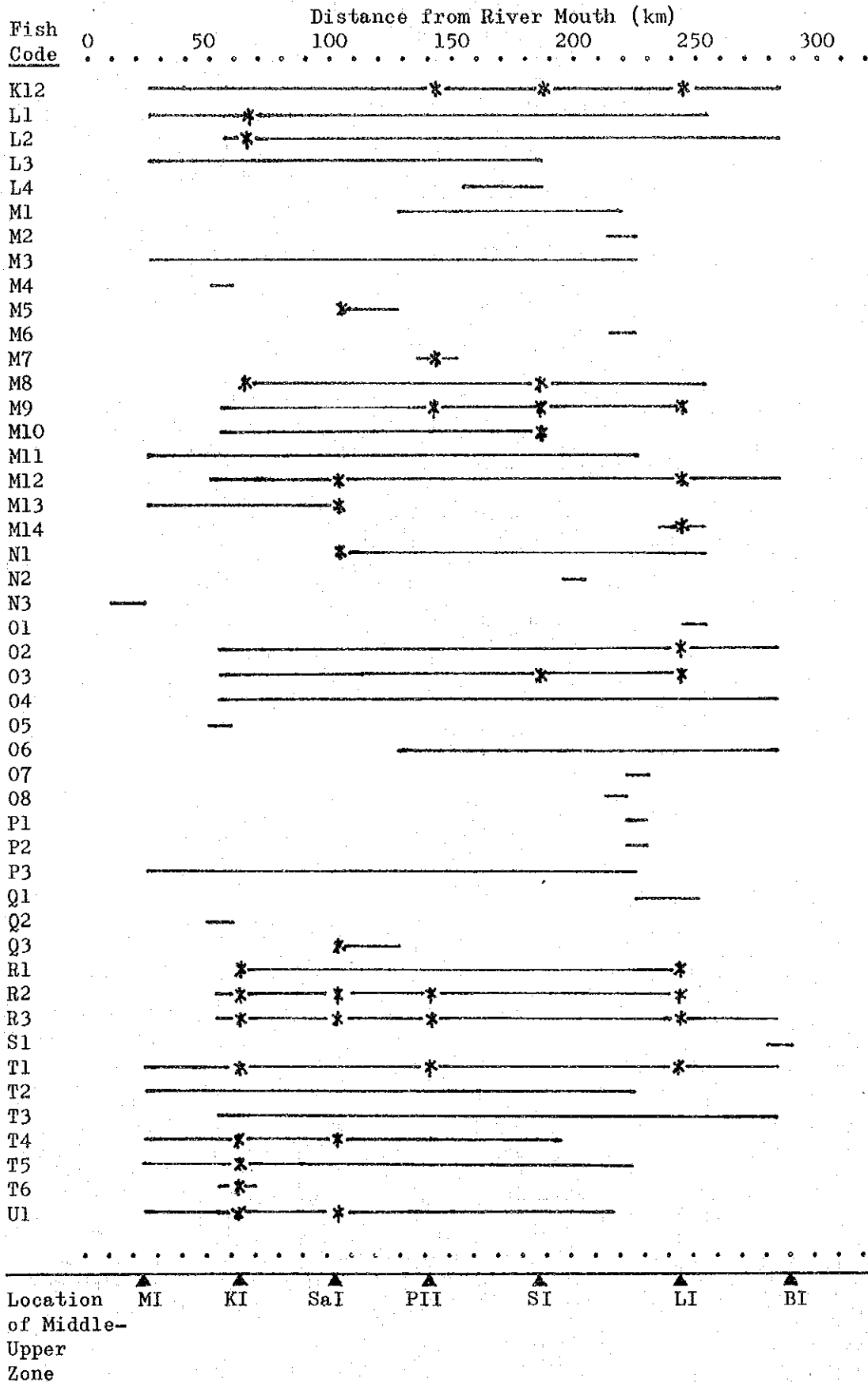
Remarks; Δ: Middle~Upper zone in each river where fishes exist.

Table 14 LONGITUDINAL DISTRIBUTION OF FISHES LISTED (2/4)



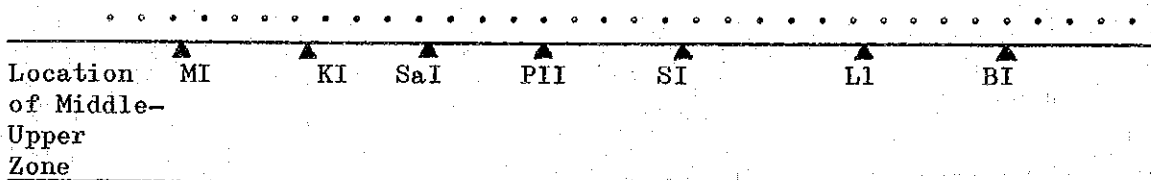
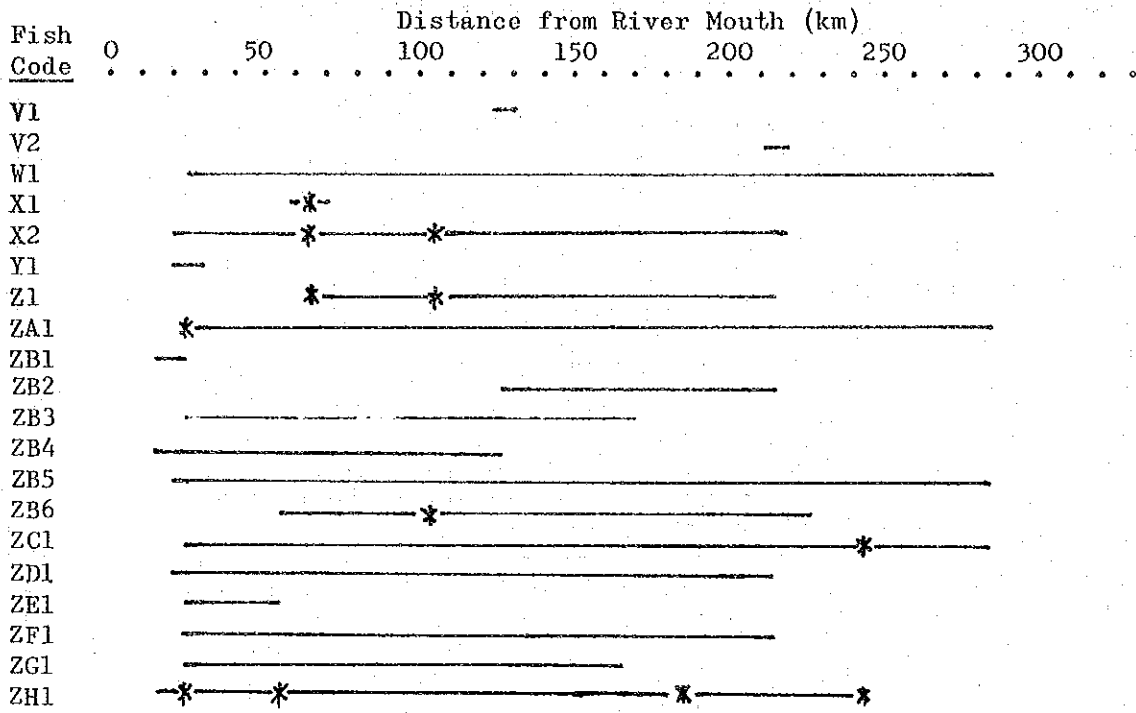
Remark /1: Middle~Upper locations in each river where fishes exist.

Table 15 LONGITUDINAL DISTRIBUTION OF FISHES LISTED (3/4)



Remarks /1: Middle~Upper locations in each river where fishes exist.

Table 16 LONGITUDINAL DISTRIBUTION OF FISHES LISTED (4/4)



Remark 1: Middle~Upper locations in each river where fishes exist.

Table 17 FISH FAUNA OF EACH RIVER BASIN IN SABAH

River	Code of Fish ^{/1}	No. of Species ^{/2}
Sugut	B2, C1, F3, F4, F6, F7, F9, F11, F13, F15, F18, F20, F25, F26, F33, F35, F36, F39, F42, F43, F48, F50, H1, I2, J6, K7, K11, K12, L1, L4, M8, M9, M10, M12, N1, O3, ZB3, ZH1	38 (39)
Labuk	B2, C1, F2, F3, F6, F10, F13, F15, F16, F17, F18, F20, F24, F33, F35, F39, F42, F43, F50, F52, H1, I2, J2, J7, K2, K3, K12, L3, M9, M12, M14, N1, N2, O2, O3, R1, R2, R3, T1, T2, ZA1, ZB4, ZC1, ZH1	44 (47)
Padas	B2, C1, D1, E1, F3, F4, F9, F12, F13, F19, F20, F21, F23, F33, F35, F39, F41, F42, F47, F50, F53, H1, I2, J6, K2, K3, K6, K12, L1, L3, M3, M4, M7, M9, M10, M12, N3, O2, O3, O4, O5, Q2, R1, R2, R3, T1, T4, T5, X2, ZA1, ZB1, ZB3, ZB4, ZD1, ZE1, ZF1, ZG1, ZH1	58 (63)
Moyog	B2, C1, F3, F12, F20, F23, F28, F29, F35, F41, F42, F50, L1, L3, T1, T2, T5, ZB4, ZE1, ZH1	20 (23)

Remark; ^{/1} : Excluding unidentified fish types.

^{/2} : Figures in parenthesis including the number of unidentified fish types, but excluding those of other animals.

Table 18 FISH FAUNA OF EACH RIVER BASIN IN SARAWAK

River	Code of Fish ^{/1}	No. of Species ^{/2}
Baram ^{/3}	A1, B2, B4, B5, E1, F1, F3, F4, F8, F12, F13, F18, F22, F23, F24, F25, F27, F30, F31, F32, F35, F37, F41, F42, F43, F44, F45, F52, F54, F55, H1, H2, H3, I1, I2, I3, I4, J1, J3, J5, K2, K5, K6, K9, K12, L1, L2, M3, M8, M9, M11, M12, N1, O1, O7, P1, P2, P3, Q1, Q2, R2, R3, T1, T2, T3, T5, ZA1, ZB6, ZH1	69 (72)
Rajan ^{/3}	A1, B4, C1, D1, E1, F1, F4, F12, F14, F21, F25, F26, F31, F32, F34, F35, F38, F39, F40, F41, F43, F49, F54, F55, H1, H4, H5, J1, J3, J7, K2, K4, K5, K6, K8, K9, K12, L2, M1, M2, M5, M6, M11, M12, O2, O4, O6, O8, P3, Q3, R2, R3, T1, T2, T3, T4, T5, U1, V1, V2, W1, X1, X2, Z1, ZA1, ZB2, ZB5, ZB6, ZC1, ZD1, ZF1, ZH1	72 (92)
Sarawak	B3, B4, C1, E1, F4, F6, F12, F18, F21, F31, F34, F39, F41, F46, F47, F48, F49, F55, G1, G2, G3, K2, L2, M5, M12, M13, N1, Q3, R2, R3, T3, T4, U1, W1, X2, Z1, ZA1, ZB4, ZB6, ZC1, ZF1, ZH1	42 (45)
Kayan	A1, B1, B2, B4, C1, E1, F2, F4, F5, F6, F12, F21, F34, F41, F44, F48, F51, F54, K3, L1, L2, L4, M8, M11, M12, M13, P3, R1, R2, R3, T1, T4, T5, T6, U1, W1, X1, X2, Z1, ZA1, ZB5, ZC1, ZH1	43 (49)

Remarks; ^{/1} : Excluding unidentified fish types.

^{/2} : Figures in parenthesis including the number of unidentified fish types, but excluding those of other animals and sea fishes.

^{/3} : Referred to field survey results (Refs. SL 3 & SL 4)

Table 19 TROPHIC POSITION OF FISHES LISTED

Feeding Category	Code of Fish ^{/1}
<u>Herbivores</u>	F15-F18, F23-F27, F54, F55, G3, H1-H3, P3
<u>Omnivores</u>	
1. Herbivore dominant	F29-F37, F39, F43, F46-F48, F50-F53, H4, H5, T2, T3, ZE1, ZF1, AG1
2. Predator dominant	F9-F14, F28, F38, F41, F42, F44, F45, F49 G1, G2, J1, ZB1-ZB3, ZC1, ZG1, ZH1 ^{/2}
<u>Carnivores</u>	
1. Exogenous arthropods, Endogenous invertebrales	B1-B5, D1, F1-F8, I1-I3, J2-J7, K10, K11, L1-L4, M1-M8, M10-M14, N1-N3, P1, P2, Q1-Q3, (S1), T1, T4-T6, U1, V1, V2, W1, X1, X2, Z1, AB4, ZB5, ZD1
2. Crustacea, Fish, etc.	A1, C1, E1, F19-F22, K1-K9, K12, M9, O1-O8, R1-R3, Y1, ZA1, ZB6

Source; Refs. SL 1, SL 8 & SL 10

Remarks; ^{/1} : Unidentified freshwater fishes and sea-fishes are not included.

^{/2} : Freshwater prawn is included here for the convenience of the study discussion.

Table 20 FISHES CLASSIFIED BY BASIC FAUNA

Basic Fauna	Code of Fish Types
1. Cypriniformes	F1-F55, G1-G3, H1-H5, I1-I3, J1-J7
2. Siluriformes	K1-K12, L-L4, M1-M14, N1-N3, O1-O8, P1-P3
3. Non-Ostaryophsi	A1, B1-B5, C1, D1, E1, Q1-Q3, R1-R3, S1, T1-T6, U1, V1, V2, W1, X1, X2, Y1, Z1, ZA1, ZB1-ZB6, ZC1, ZD1, ZE1, ZF1, ZG1, (ZH1) ^{/1}

Remark; ^{/1} : ZH1 show Freshwater Prawn.

Table 21 FISH FAUNA BY FOOD HABIT IN THE
SUGUT RIVER AND THE LABUK RIVER (1/2)

Food Habit	Fish Fauna	Sugut			Labuk		
		SI ^{/1}	SII ^{/1}	SIII	LI	LII	LIII
H	F15	o	o	o	o	.	.
	F16	.	.	.	o	o	.
	F17	.	.	.	o	.	.
	F18	o	.	o	.	.	o
	F24	o	.	o	D	o	.
	F25	.	.	.	D	.	.
	F26	.	o	.	.	.	.
	H 1	o	o	o	o	o	o
OH	F33	.	.	o	o	o	o
	F35	.	.	o	.	o	.
	F36	.	.	o	.	.	.
	F39	.	o	D	.	X	o
	F43	.	.	o	.	.	o
	F48	.	.	o	.	.	.
	F50	o	o	o	o	o	o
	F52	.	.	.	.	o	.
	T 2	.	.	.	.	o	.
OC	F 9	.	o	.	.	.	.
	F10	.	.	.	.	.	o
	F11	.	o	.	.	.	.
	F13	.	.	o	.	.	o
	F42	.	o	o	.	o	o
	ZC1	.	.	.	.	o	o
	ZG1	.	.	A	.	.	.
	ZH1	.	X	o	.	o	o

Remarks; o : Existing species
D : Recently decreased
X : Recently disappeared
I : Recently increased
A : Recently appeared

/1 : Since 1975, fishing has not been done, suggested the danger of the Mamutu Copper Mining discharge by the Government.

Table 22 FISH FAUNA BY FOOD HABIT IN THE
SUGUT RIVER AND THE LABUK RIVER (2/2)

Food Habit	Fish Fauna	Sugut			Labuk		
		SI	SII	SIII	LI	LII	LIII
C	B 2	o	o	o	.	o	o
	F 2	.	.	.	.	D	.
	F 3	o	o	o	o	o	o
	F 4	.	.	.	.	.	.
	F 6	.	.	o	.	o	.
	F 7	.	.	o	.	.	.
	I 2	.	.	o	o	o	.
	J 2	.	.	.	o	.	.
	J 6	o	o	.	.	.	.
	J 7	.	.	.	o	.	.
	K11	.	.	o	.	.	.
	L 1	.	.	o	.	.	.
	L 4	o	.	o	.	.	.
	M 8	.	.	o	.	.	.
	M10	.	.	D	.	.	.
	M12	.	o	.	.	.	o
	M14	.	.	.	.	.	o
	N 1	o	.	.	o	.	.
	N 2	.	.	.	.	o	.
	T 1	.	.	A	.	.	o
ZB4	.	.	.	.	.	o	
CP	C 1	o	o	o	o	o	o
	F20	.	o	D	X	o	o
	K 2	.	.	.	D	.	.
	K 3	.	.	.	.	.	o
	K 7	.	.	o	.	.	.
	K12	.	.	D	.	.	o
	M 9	o	o	o	o	o	o
	O 2	.	.	.	.	.	o
	O 3	.	o	o	.	.	o
	R 1	.	.	.	.	.	o
	R 2	.	.	.	.	.	o
	R 3	.	.	.	.	.	o
	ZA1	.	.	.	.	o	.

Remarks; See remarks in Table 21.

Table 23 FISH FAUNA BY FOOD HABIT IN THE
PADAS RIVER AND THE MOYOG RIVER (1/2)

Food Habit	Fish Fauna	Padas					Moyog	
		PI	PII	PIII	PIV	PV	MI	MII
H	F23	.	.	.	.	o	.	.
	F24	.	.	.	.	.	D	o
	H 1	o	o	.	.	.	o	.
OH	F29	.	.	.	.	.	o	.
	F33	.	o	.	o	o	.	.
	F35	.	o	I	o	o	o	.
	F39	.	.	o	o	o	.	.
	F47	.	.	o	.	o	.	.
	F50	o	o	.	.	.	o	o
	F53	.	.	.	D	.	.	.
	T 2	.	.	.	.	.	.	o
	ZE1	.	.	I	o	o	.	o
	ZF1	.	.	.	o	o	.	.
	ZG1	o	A	o	.	o	.	.
OC	F 9	.	o	.	o	o	.	.
	F12	.	.	.	o	.	.	o
	F13	.	.	.	o	o	.	.
	F28	.	.	.	.	.	o	.
	F41	o	o	.	.	o	o	.
	F42	.	o	o	o	.	.	o
	ZB1	.	.	.	.	o	.	.
	ZB3	.	.	.	o	o	.	.
	ZH1	.	o	.	o	o	o	o
C	B 2	o	o	D	o	o	o	o
	D 1	.	.	o	o	.	.	.
	F 3	o	o	.	.	.	o	o
	F 4	o	.	o	o	.	.	.
	I 2	.	o	.	.	.	.	.
	J 6	.	.	.	o	.	.	.
	L 1	.	.	.	o	o	.	.
	L 3	o	o	.	o	o	.	o
M 3	.	.	.	o	o	.	.	

Remarks; See remarks in Table 21.

Table 24 FISH FAUNA BY FOOD HABIT IN THE
PADAS RIVER AND THE MOYOG RIVER (2/2)

Food Habit	Fish Fauna	Padas					Moyog	
		PI	PII	PIII	PIV	PV	MI	MII
C	M 4	.	.	.	o	.	.	.
	M 7	.	o	.	.	.	.	.
	M10	o	.	o	o	.	.	.
	M12	.	.	.	o	.	.	.
	N 3	.	.	.	.	o	.	.
	Q 2	.	.	.	.	o	.	.
	T 1	o	o	o	.	.	.	.
	T 4	o	.	o	.	o	.	.
	T 5	o	.	o	o	.	.	o
	X 2	.	.	.	.	o	.	.
	ZB4	.	.	.	.	o	o	o
	ZD1	.	.	.	.	o	o	.
	CP	C 1	.	.	o	o	o	o
E 1		.	.	.	o	o	.	.
F19		o	.	o	o	.	.	.
F20		o	D	D	o	o	.	o
F21		.	.	.	.	o	.	.
K 2		.	.	.	o	o	.	.
K 3		.	.	o	.	.	.	.
K 6		.	.	.	o	.	.	.
K12		.	o	.	o	o	.	.
M 9		o	o	o	o	.	.	.
D 2		.	.	.	.	o	.	.
D 3		.	.	.	.	o	.	.
D 4		.	.	.	.	o	.	.
D 5		.	.	.	.	I	.	.
R 1		o	.	.	.	.	.	.
R 2		o	A	o	o	D	.	.
R 3		o	o	o	o	.	.	.
ZA1	.	.	o	D	o	o	.	

Remarks; See remarks in Table 21.

Table 25 FISH FAUNA BY FOOD HABIT IN THE
BARAM RIVER AND THE RAJANG RIVER (1/3)

Food Habit	Fish Fauna	Baram		Rajang		
		BI	BII	RI	RII	RIII
H	F18	0	.	.	.	.
	F23	0	.	.	.	.
	F24	0	0	.	.	.
	F25	0	.	.	.	0
	F26	.	.	.	.	0
	F27	.	0	.	.	.
	F54	0	.	0	0	.
	F55	.	0	0	0	.
	H 1	0	.	0	0	.
	H 2	0	.	.	.	.
	H 3	0	.	.	.	.
	P 3	.	0	.	.	0
OH	F30	0	.	.	.	.
	F31	.	0	.	0	0
	F32	0	0	0	.	.
	F34	.	.	0	0	0
	F35	0	0	.	.	0
	F37	0	.	.	.	.
	F39	.	.	.	.	0
	F43	0	0	0	0	0
	F52	0	.	.	.	.
	H 4	0	.	.	.	0
	H 5	.	.	.	.	0
	T 2	.	0	.	0	0
	T 3	0	0	0	D	0
	ZF1	.	.	.	.	0
OC	F12	0	0	0	0	0
	F13	0	.	.	.	.
	F14	.	.	.	D	.
	F38	.	.	.	0	.
	F41	0	0	0	0	0
	F42	0	0	.	.	.
	F44	0	.	.	.	.
	F45	0	.	.	.	.
	F49	.	.	0	0	D
	J 1	0	.	.	0	.
	ZB2	.	.	.	0	0
	ZB3	.	.	0	0	0

Remarks; See remarks in Table 21.

Table 26 FISH FAUNA BY FOOD HABIT IN THE
BARAM RIVER AND THE RAJANG RIVER (2/3)

Food Habit	Fish Fauna	Baram		Rajang		
		BI	BII	RI	RII	RIII
OC	ZC1	.	.	o	o	o
	ZH1	.	o	.	o	o
C	B 2	o	.	.	.	.
	B 4	o	o	o	o	o
	B 5	o	.	.	.	.
	D 1	.	.	.	o	.
	F 1	.	o	o	.	.
	F 3	o	.	.	.	.
	F 4	o	o	o	o	o
	F 8	o	.	.	.	.
	F40	.	.	.	o	.
	I 1	o	.	.	.	.
	I 2	o	.	.	.	.
	I 3	o	.	.	.	.
	J 3	o	.	o	o	o
	J 5	o	.	.	.	.
	J 7	.	.	.	o	.
	L 1	o	.	.	.	.
	L 2	o	o	o	o	o
	M 1	.	.	.	o	o
	M 2	.	.	.	o	.
	M 3	.	o	.	.	.
	M 5	.	.	.	.	o
	M 6	.	.	.	o	.
	M 8	o	o	.	.	.
	M11	.	o	.	o	.
	M12	.	o	o	o	o
	N 1	o	.	.	.	.
	P 1	.	o	.	.	.
	P 2	.	o	.	.	.
	Q 1	.	o	.	.	.
	Q 2	o	.	.	.	.
Q 3	.	.	.	.	o	
T 1	.	o	o	o	o	
T 4	.	.	.	.	o	
T 5	.	o	.	o	o	
U 1	.	.	.	o	o	
V 1	.	.	.	o	.	
V 2	.	.	.	.	o	

Remarks; See remarks in Table 21.

Table 27 FISH FAUNA BY FOOD HABIT IN THE
BARAM RIVER AND THE RAJANG RIVER (3/3)

Food Habit	Fish Fauna	Baram		Rajang		
		BI	BII	RI	RII	RIII
C	W 1	.	.	o	o	o
	X 1	.	.	.	o	.
	X 2	.	.	.	o	.
	Z 1	.	.	.	o	o
	ZD1	.	.	.	o	o
CP	A 1	.	o	o	o	.
	C 1	.	.	.	.	o
	E 1	.	o	o	o	o
	F21	.	.	o	o	o
	F22	o	.	.	.	.
	K 2	.	o	.	o	o
	K 4	.	.	o	o	.
	K 5	.	o	o	o	.
	K 6	.	o	o	o	.
	K 8	.	.	o	o	o
	K 9	o	o	o	.	.
	K12	.	o	o	o	o
	M 9	.	o	.	.	.
	O 1	o	.	.	.	.
	O 2	.	.	o	.	D
	O 4	.	.	o	o	D
	O 6	.	.	o	.	D
	O 7	.	o	.	.	.
	O 8	.	.	.	o	.
	R 2	.	o	.	.	o
	R 3	o	o	o	o	o
	ZA1	.	o	o	o	o
ZB6	.	o	.	o	o	

Remarks; See remarks in Table 21.

Table 28 FISH FAUNA BY FOOD HABIT IN THE
SARAWAK RIVER AND KAYAN RIVER (1/2)

Food Habit	Fish Fauna	Sarawak		Kayan		
		SaI	SaII	KI	KII	KIII
H	F18	o	.	.	.	.
	F54	.	.	o	.	.
	F55	o	o	.	.	.
	G 3	.	D	.	.	.
	P 3	.	.	.	.	o
OH	F31	.	o	.	.	.
	F34	.	o	o	o	.
	F39	o	.	.	.	.
	F46	o	o	.	.	.
	F47	.	D	.	.	.
	F48	.	o	.	.	o
	F51	.	.	o	.	.
	T 3	.	o	.	.	.
ZF1	.	o	.	.	.	
OC	F12	o	o	o	o	.
	F41	.	o	o	o	.
	F44	.	.	o	.	.
	F49	.	o	.	.	.
	G 1	.	D	.	.	.
	G 2	.	D	.	.	.
	ZB3	.	.	.	o	o
	ZC1	.	o	.	.	o
ZH1	X	o	o	o	o	
C	B 1	.	.	o	.	.
	B 2	.	.	o	.	.
	B 3	.	o	.	.	.
	B 4	o	o	.	o	.
	F 2	.	.	.	o	.
	F 4	o	o	o	o	.
	F 5	.	.	o	.	.
F 6	o	.	o	.	.	

Remarks; See remarks in Table 21.

Table 29 FISH FAUNA BY FOOD HABIT IN THE SARAWAK RIVER AND THE KAYAN RIVER (2/2)

Food Habit	Fish Fauna	Sarawak		Kayan		
		SaI	SaII	KI	KII	KIII
C	L 1	.	.	0	.	0
	L 2	.	0	0	0	.
	L 4	.	.	.	.	0
	M 5	0	.	.	.	.
	M 8	.	.	0	.	.
	M11	.	.	.	.	0
	M12	0	0	.	0	.
	M13	0	.	.	.	0
	N 1	0	.	.	.	.
	Q 3	0	.	.	.	.
	T 1	.	.	0	.	0
	T 4	0	0	0	.	.
	T 5	.	.	0	.	0
	T 6	.	.	0	.	.
	U 1	0	0	0	.	0
	W 1	.	0	.	.	0
	X 1	.	.	0	.	.
	X 2	0	0	0	.	.
	Z 1	0	.	0	0	.
	ZB4	.	0	.	.	.
ZB5	.	.	.	0	0	
CP	A 1	.	.	.	.	0
	C 1	0	.	0	.	.
	E 1	.	0	.	0	0
	F21	0	0	0	0	.
	K 2	0	.	.	.	.
	K 3	.	.	.	.	0
	R 1	.	.	0	.	.
	R 2	0	0	0	0	.
	R 3	0	0	0	.	.
	Y 1	.	.	.	.	0
	ZA1	.	0	.	.	0
	ZB6	0	0	.	.	.

Remarks; See remarks in Table 21.

Table 30 ECOLOGICAL CONDITION OF FISH FAUNA

Location	F	Fh	Of (%)	Oh (%)	Nh (12)	Food Habit not Existing
Sugut R.	37	18	-	-	-	-
S I	12	5	32	28	7	Cyp.: OC, CP, Sil.: H, N-O.: OH, OC
S II	17	9	46	50	9	Sil.: H, N-O.: OH, OC
S III	32	15	86	83	10	Sil.: H, N-O.: OH
Labuk R.	42	19	-	-	-	-
L I	17	8	40	50	7	Cyp.: OC, Sil.: H, N-O.: OH, OC, C
L II	22	12	52	63	11	Sil.: H
L III	26	11	62	58	10	Sil.: H, N-O.: OH
Padas R.	55	19	-	-	-	-
P I	17	4	31	21	10	Sil.: H, N-O.: OC
P II	19	9	35	47	11	Sil.: H
P III	21	6	38	32	9	Cyp.: H, Sil.: H, N-O.: OC
P IV	33	12	60	63	10	Cyp.: H, Sil.: H
P V	33	14	60	74	10	Cyp.: C, Sil.: H
Moyog R.	18	12	-	-	-	-
M I	12	8	67	67	7	Cyp.: CP, Sil.: H, C, CP, N-O.: OH
M II	12	7	67	58	8	Sil.: H, CP, N-O.: CP
Baram R.	69	29	-	-	-	-
B I	43	23	67	79	10	Sil.: H, N-O.: OC
B II	40	14	58	48	11	Cyp.: CP
Rajang R.	71	27	-	-	-	-
R I	34	12	48	44	11	Sil.: H
R II	52	18	73	67	11	Sil.: H
R III	48	20	68	74	12	-
Sarawak R.	41	18	-	-	-	-
Sa I	24	6	59	33	10	Sil.: H, N-O.: OH
Sa II	31	16	76	89	10	Sil.: H, CP
Kayan R.	43	11	-	-	-	-
K I	28	7	65	64	9	Sil.: H, CP, N-O.: OH
K II	14	5	33	45	8	Cyp.: H, Sil.: H, CP, N-O.: OH
K III	18	5	42	45	8	Cyp.: OC, C, CP, N-O.: OH

Remarks; F : No. of fish types
 Fh: No. of herbivores and omnivores
 Of: Occupation rate of fish types at a location in a river
 Oh: Occupation rate of herbivores and omnivores at a location out of those totals in a river
 Nh: No. of types of food habit

Table 31 RECENT CHANGE OF RIVER FLOW PATTERN

Code of Location	Pattern ^{/1}	River Bed	Flood	Probable Cause
S I	N, FS	Nd, S,G,Sa,St/S,G.	Nf	Silt escape from the Mamut Mining
S II	N, FS	Sd, Sa,St/S,G	I	Silt escape from the Mamut Mining
S III	N, FS	Sd, Nb=S,G	Nf	
L I	N, FS	Nd, Nb=S,G	Nf	
L II	N, FS	Sd, St,Sa/S,G	Nf	
L III	N, FS	Nd, Nb=G,Sa	Nf	
P I	N, FS	Nd, Nb=G	Nf	
P II	N, FS	Nd, Nb=S	Nf	
P III	FS/SS	Sd, Nb=G	I ^{/2}	
P IV	N, FS	Nd, Nb=S	I	
P V	N, FS	Nd, Nb=Sa,St	I	(Frequency is same but water level increase because of embankment upstream)
M I	N, FS	Nd, Nb=S	Nf	
M II	N, FS	Nd, Sa,St/S	Nf	
B I	-	-	-	-
B II	-	-	-	-
R I	-	-	-	-
R II	? SS	Sd, Sa	Nf	Logging upstream
R III	N, SS	Nd, Nb=Sa,St	Nf	Querring of sand
Sa I	N, FS	Sd, Sa,St/S,G	If	Sifting cultivation
Sa II	N, SS	D, Nb=S,Sa,St	Nf	Querring of sand
K I	N, SS	Sd, G.Sa/S,G,Sa	Nf	
K II	N, FS	Sd, Sd,St/S,G,Sa	I ?	
K III	N, N1	D, Nb=Sa,St	Nf ?	

Remarks; /1: Recent river flow patterns are symbolized as follows;
 N : No change of the pattern of water level fluctuation
 FS : Water level rise fast and down slowly after the rain
 SS : Water level rise and down slowly after the rain
 a/b: Conditions has changed from b to a
 N1 : No change of water level after the rain
 Nd : No change of river depth
 Sd : River is getting shallower
 D : River is getting deeper
 Nb : No change of river bed material
 S : Sones, G=Gravels, Sa=Sand, St=Silt
 Nf : No change of flood frequency
 I : Increase of frequency
 D : Decrease of frequency

/2: Decrease of drainage capacity causes to the increase of frequency of flood upstream.

Table 32 RECENT DECREASE OF FISH CATCH ^{/1}

Unit: kg/d

Code of Location	Fish Catch		Probable Cause ^{/2} of Fish Decrease
	10-20 Years Before	At Present	
S I	Much more, 1-2 in 1975	No more fishing	?
S II	Very easy to catch fish, 4-5 in 1973	No more fishing	S
S III	50-60	1-2	S
L I	6-7	1-2	P
L II	Very easy to catch fish	3-4	S
L III	Much more	3-4	P
P I	2-3	2-3	-
P II	13-19	> 1	P
P III	Very easy to catch fish	4-5	S, P
P IV	30	3-7	S
P V	30-50	5-7	?
M I	12-13	1-4	S, P
M II	6-7	No more fishing	S
B I	* ^{/3}	*	-
B II	* ^{/3}	*	-
R I	* ^{/3}	*	-
R II	Fish catch decreased half		O, S
R III	18-90	9-36	?
Sa I	1-2	No more fishing	S
Sa II	1-9	1-9	-
K I	3-4	1	S
K II	6-12	1-3	S
K III	30-36	12-18	?

Remarks; ^{/1} : Results of interviews on fish catch to the village people who have been living along the rivers for a long time and usually going fishing.

^{/2} : S=Siltation, P=Population increase, O=Overfishing

^{/3} : Interview was not done.

Table 33 DEVELOPMENT ACTIVITIES ALONG THE RIVERS

Code of Location	Development Activities Along the Rivers ^{/1}					
	Irr.	Min.	Fac.	Logg.	Est.	Shift.
S I	-	U(C,1973)	-	-	-	-
S II	-	U(C,1973)	-	-	-	U, D
S III	U(1978)	U(C,1973)	-	U,D(1979)	-	U, D
L I	-	-	-	-	-	-
L II	-	-	-	-	-	U, D
L III	-	-	-	U(1970)	-	U, D
P I	U(?)	-	-	-	?	U
P II	-	-	-	-	-	-
P III	-	-	D(R,1981)	U(?)	D	-
P IV	-	-	U(R,1978)	?	U(1977)	-
P V	-	-	-	-	D(1965)	-
M I	-	-	?	-	-	U, D
M II	-	-	-	-	-	-
B I ^{/2}	*	*	*	*	*	*
B II	*	*	*	*	*	*
R I	-	-	-	U, D	-	U, D
R II	-	-	-	U, D	-	U, D
R III	-	-	-	U, D	-	U, D
Sa I	-	-	-	-	-	U, D
Sa II	-	-	D	-	U	-
K I	-	-	-	-	-	U, D
K II	-	-	-	U,D(1977)	U,D(R)	U, D
K III	U,D(1973)	-	-	U(1975)	U(R),D(C)	U

Remarks; ^{/1}: Items of development activities along the rivers are shown by the following symbols together with the initial years of activities, U-Upstream, D=Downstream.

Irr.: Effluent from irrigated paddy field
 Min.: Mining activity; C=Copper
 Fac.: Factory, R=Rubber
 Logg: Logging
 Est.: Estate; R=Rubber, C=Coconut
 Shift: Shifting cultivation

^{/2}: Information was not obtained.

Table 34 COMPLAINTS ABOUT PRESENT RIVER CONDITION

Code of Location	Complaint	Counter Action
S I	Mining (No more use of river for drinking, cropping, fishing)	Complaint made
S II	Mining (No more fish from the river)	Complaint made
S III	Mining (24 Kalabaos dead in 1978, people get stomachache even now after drinking river water)	Complaint made
L I	None	None
L II	None	-
L III	None	-
P I	None	-
P II	Water quality (No good for drinking during rainy season)	None
P III	Flood	Complaint made
P IV	Fish decrease	None
P V	Flood (Easily affected by flood after embankment of upstream)	Complaint made
M I	None	-
M II	No more fish in the river	None
B I	*	-
B II	*	-
R I	*	-
R II	Logging and sawing (River water easily get turbid)	Complaint made
R III	Speed boat (River bank is eroded by its wave)	Complaint made
Sa I	None	-
Sa II	Explosive fishing by soldier	None, afraid of revenge
K I	None	-
K II	None	-
K III	None	-

Table 35 RELATION BETWEEN DEVELOPMENT ACTIVITIES AND FISH FAUNA (1/2)

Index ^{/1}	Sugut			Labuk			Padas					Moyog	
	SI	SII	SIII	LI	LII	LIII	PI	PII	PIII	PIV	PV	MI	MII
(1) Condition of Fish Fauna ^{/2}													
Of (%)	32	46	86	40	52	62	31	35	38	60	60	67	67
Oh (%)	28	50	83	50	63	58	21	47	32	63	74	67	58
Nh(No. 12)	7	9	10	7	11	10	10	11	9	10	10	7	8
(2) Development Activities													
	M M,S	M,I, L,S	-	S	L,S	I,S	-	L	F,E	-	S	-	
(3) Information Obtained by Interview Survey													
a. River flow													
(Pt)	N	N	N	N	N	N	N	N	F/S	N	N	N	N
(Rb)	St	Sd,St	N	N	Sd,St	N	N	N	Sd	N	N	N	St
(FF)	N	I	N	N	N	N	N	N	I	I	I	N	N
(PC)	M	M	-	-	St	-	-	-	-	?	R	-	St
b. Fish catch decrease & probable cause													
	MSt	MSt	MSt	P	St	P	-	P	P,St	St	?	P,St	St
c. Complaints about fish catch decrease & water use													
	M	M	M	-	-	-	-	(St)	-	(St)	R	-	(St)

Remarks; ^{/1}: Indexes are coded by the following symbols:

M(Mining), S(Shifting cultivation), I(Irrigation effluent), L(Logging), F(Factory effluent), E(Big-scale estate), Pt(Pattern of water level fluctuation), Rb(River bottom depth and material), FF(Flood frequency), PC(Probable cause of recent change), N(No recent change), F/S (Rise fast, drop slow), St(Silted: including the meaning that the previous river bed material was covered by the smaller size materials), Sd(River depth getting shallower), Dd(Getting deeper), I(Increase of flood frequency), R(River bank improvement upstream), MSt(St by Mining), LSt(St by Logging), SSt(St by Shifting cultivation), P(Population increase or over fishing), Er(River bank erosion), Exc.(Excavation to get sand), Exp.(Explosive fishing), SBt(Wave of Speed boat)

^{/2}: see Remarks in Table 30

^{/3}: Complaints in the parenthesis were not taken any counter actions to the Government.

Table 36 RELATION BETWEEN DEVELOPMENT ACTIVITIES
AND FISH FAUNA (2/2)

Index	Baram		Rajang			Sarawak		Kayan		
	BI	BII	RI	RII	RIII	SaI	SaII	KI	KII	KIII
(1) Condition of Fish Fauna										
Of (%)	67	58	48	73	68	59	76	65	64	9
Oh (%)	79	48	44	67	74	33	89	33	45	8
Nh(No. 12)	10	11	11	11	12	10	10	42	45	8
(2) Development Activities										
	S	S	L,S	L,S	L,S	S	E	S	L,E, S	I,L, E,S
(3) Information Obtained from Interview Survey										
a. River flow (Pt)	*	*	*	N	N	N	N	N	N	N
(Rb)	*	*	*	Sd,St	N	Sd,St	Dd	Sd,St	Sd,St	Dd
(FF)	*	*	*	N	N	I	N	N	I	N
(PC)	*	*	*	L	-	S	Exc	St	L	?
b. Fish catch decrease & probable cause										
	(P)	(P)	*	P,LSt	Er	SSt	-	St	LSt	?
c. Complaints about fish catch decrease & water use										
	*	*	*	L	Sbt	-	(Exp)	-	-	-

Remarks; See remarks in Table 33.

FIGURES

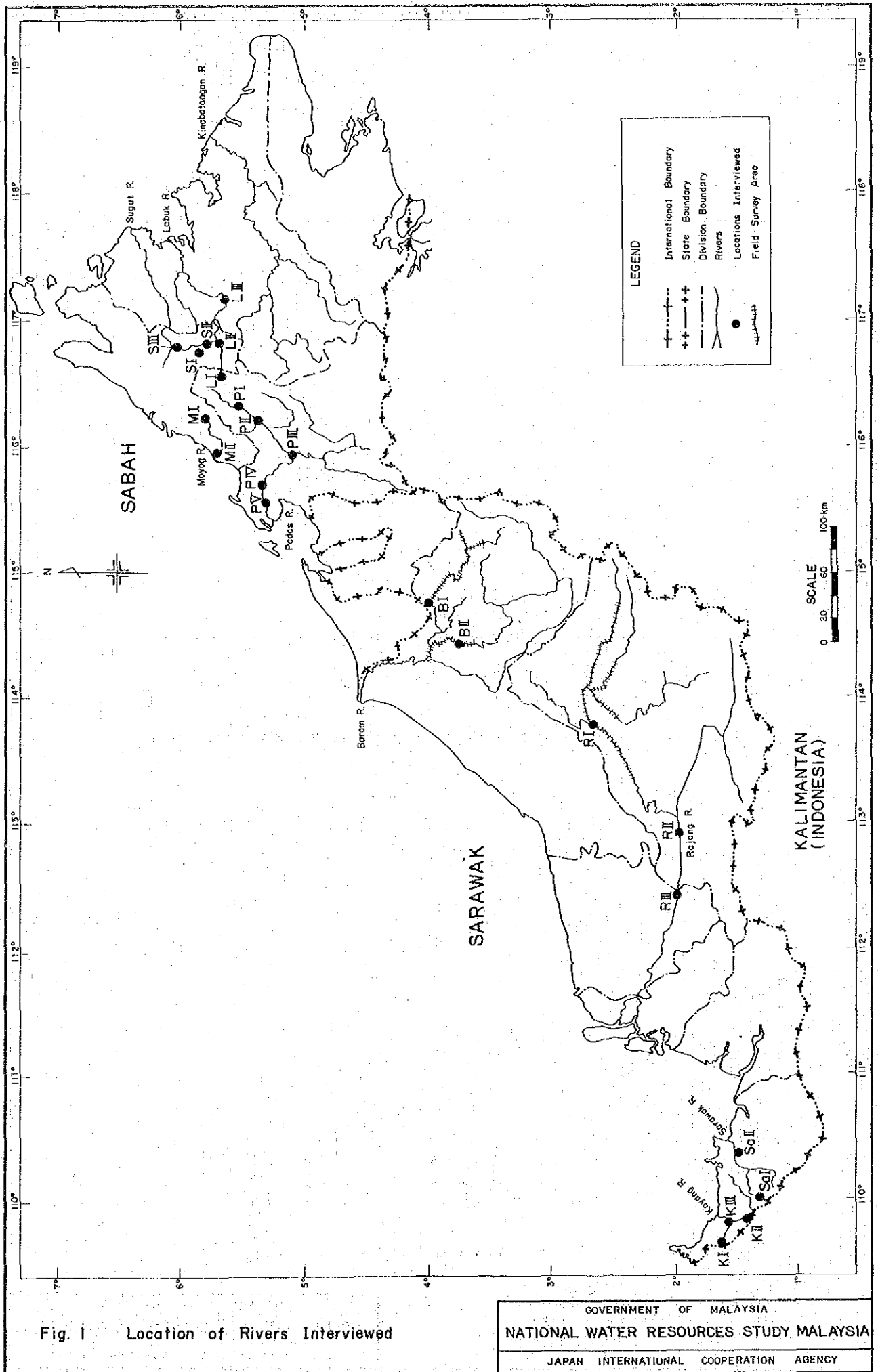


Fig. 1 Location of Rivers Interviewed

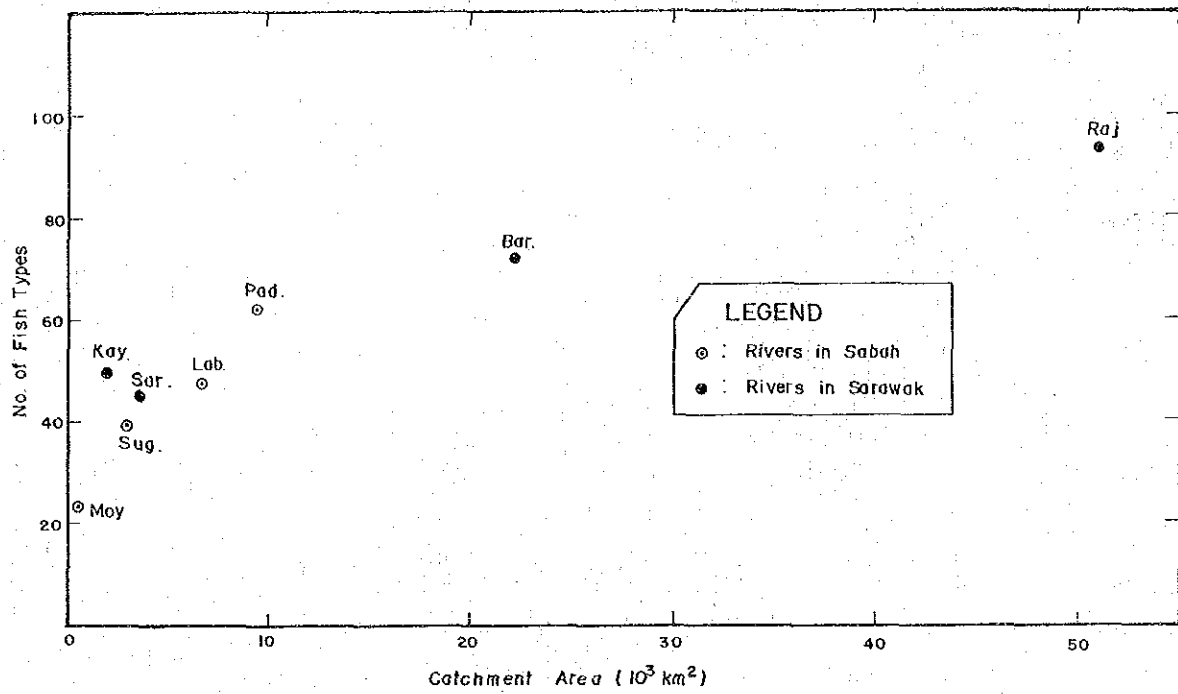


Fig. 2 Relation of No. of Fish Types with Catchment Area

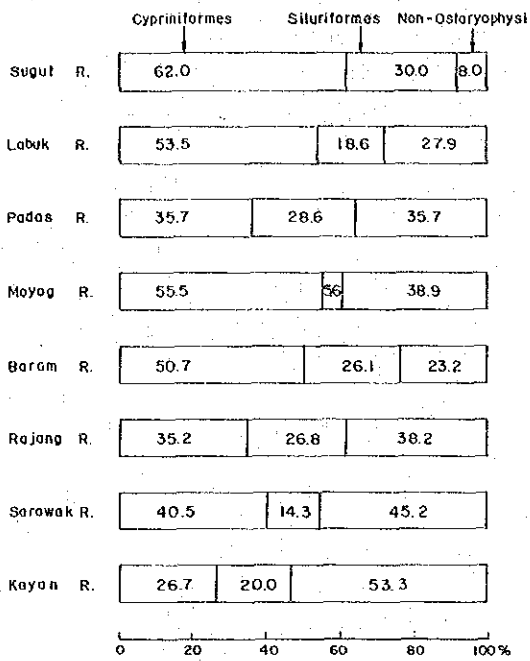
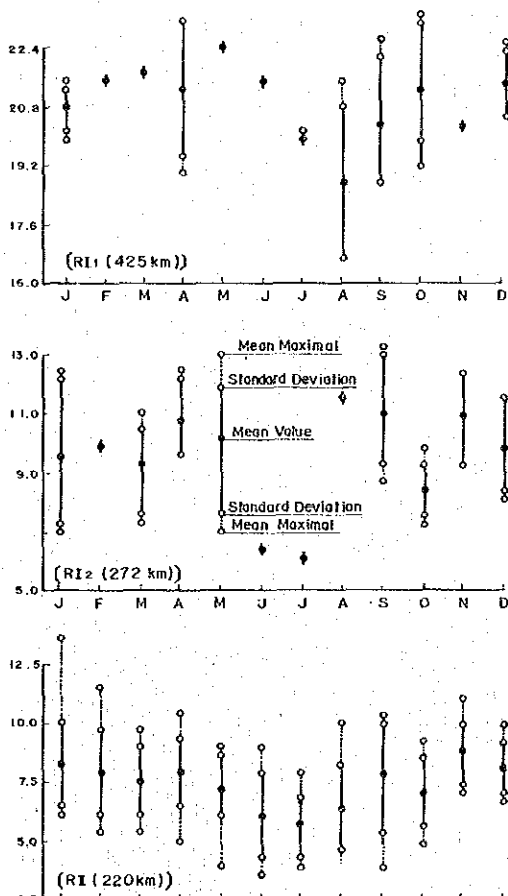


Fig. 3 Composition of Basic Fauna in Each River



Source: SESCO/KUCHING (Ref. SL.5)

Fig. 5 Water Level Fluctuation in the Rajang River

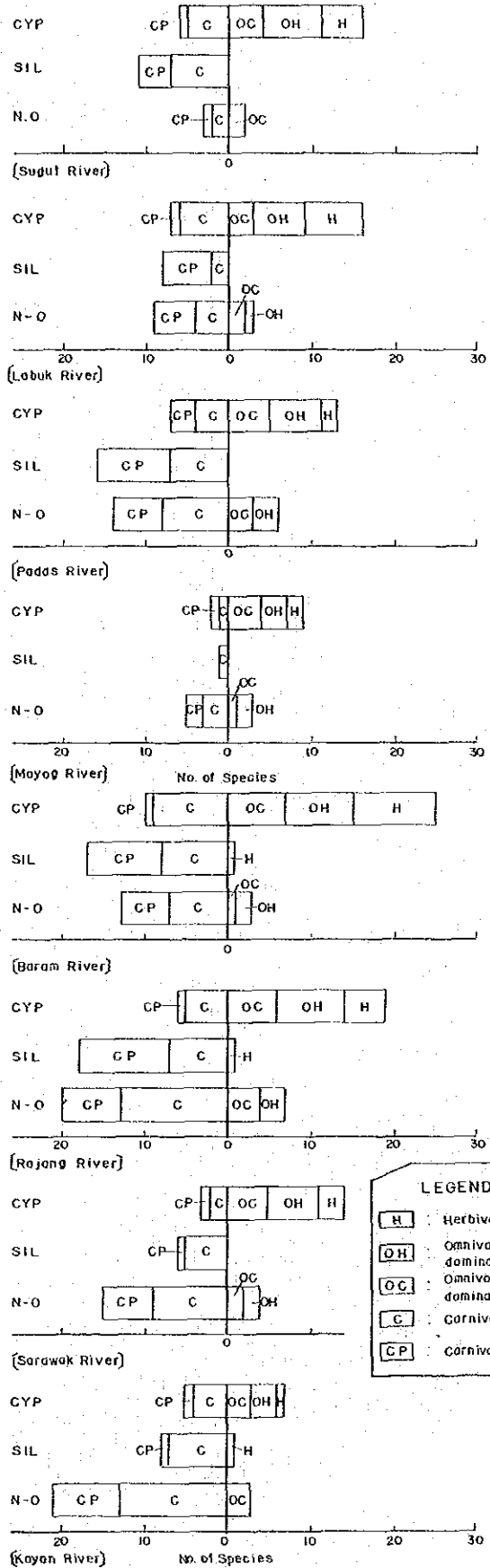


Fig. 4 Basic Fauna of the River Interviewed

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